

Elements of pharmacy, materia medica and therapeutics, by William Whitla

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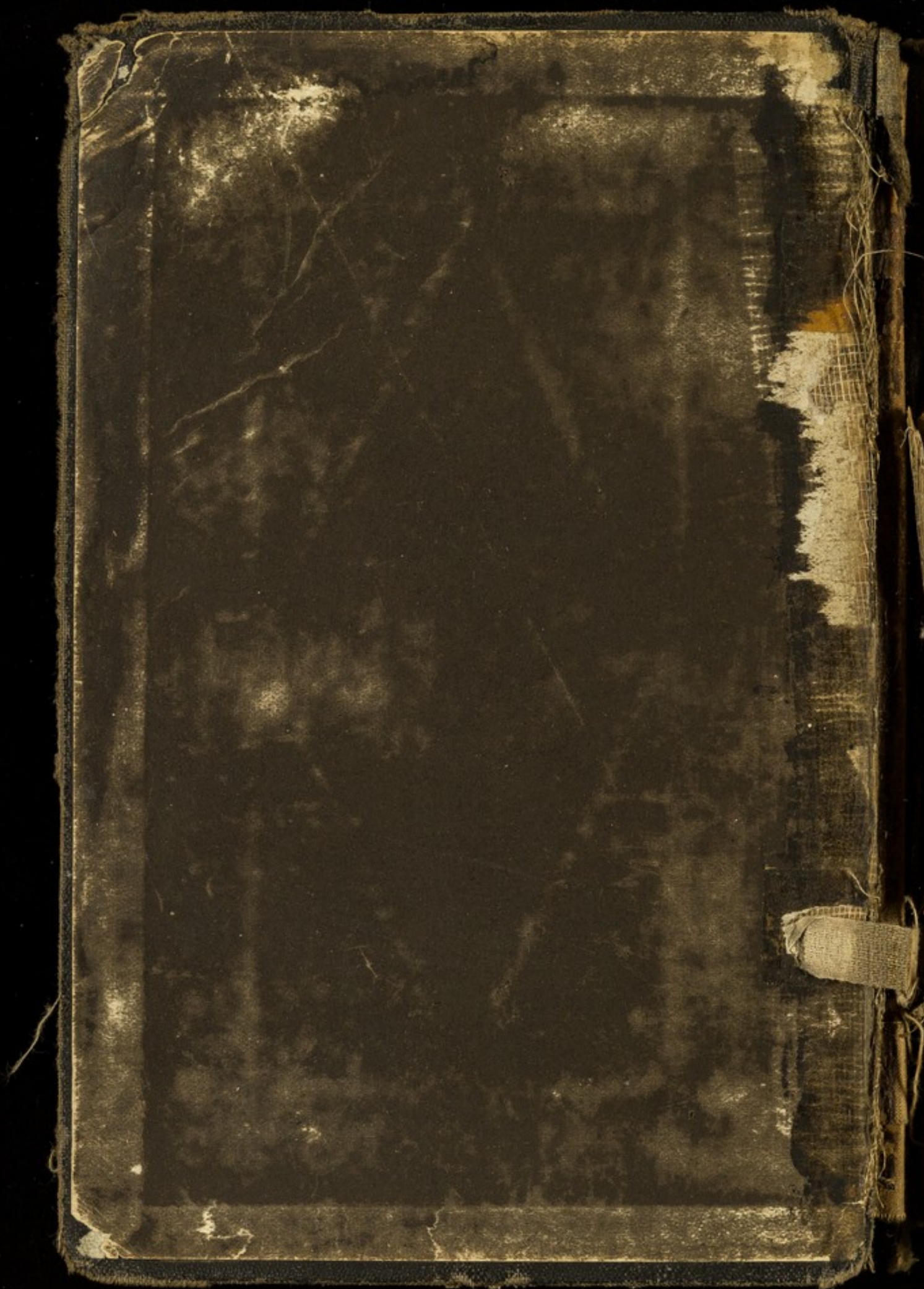
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RAMC 2087

ELEMENTS
OF
PHARMACY, MATERIA MEDICA,
AND
THERAPEUTICS.

(Ex Martindale)

Pigmentum Mandl.

R. Iodine Grs 6
Potassium Iodide Grs 20
Oil of Peppermint M 5
Glycerin to Ozs 1

Use as a Throat Stimulant.

WM. STRAIN AND SONS,
PRINTERS,
GT. VICTORIA STREET, BELFAST,
AND
97, QUEEN VICTORIA STREET, LONDON, E.C.

Revised
Ed. R. G. C.
ELEMENTS
OF *Woodward*
PHARMACY,

MATERIA MEDICA,
AND
THERAPEUTICS.

BY
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LATE MEMBER OF THE SENATE OF THE ROYAL UNIVERSITY,
ETC., ETC., ETC.

With Woodcuts.

EIGHTH EDITION.

London:
HENRY RENSHAW, 356, STRAND.

1903.

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☞ For Treatment in cases of
POISONING,
See Index at end of the Book,
Page 594.

Luminal
Bayer

Dose

Dose $1\frac{1}{2}$ - 8 grains
Dissolved in hot water
& where there is excitement
up to 12 grains (latter is
maximum dose)

3
4
5
6
7
8
9
0
1
2
3
4
5
6
7
8
9
0

Sig. Mr. Despatching Office.

Despatch Rider.

Despatched at _____

Received at _____

Date Stamp.

Date Stamp.

TO
SIR WILLIAM THOMSON, C.B., M.D.,

Ex-President Royal College of Surgeons, Ireland,

IN RECOGNITION OF HIS

MANY SERVICES

TO THE MEDICAL PROFESSION AT HOME

AND

TO THE EMPIRE IN SOUTH AFRICA,

THIS VOLUME IS DEDICATED BY HIS FRIEND

THE AUTHOR.

PREFACE TO THE FIRST EDITION.

THE aim of this little work is to give to the student of medicine such information in a concise form as he generally has to sift out of two or more of the larger manuals. So many valuable volumes have been written on *Materia Medica* and *Therapeutics* as to leave little necessity for another ; but it is not the intention of the writer to presume that this work will take the place of any of them, the question of space necessitating the knowledge being given to the reader often in a very fragmentary condition.

The arrangement of the subject, which has been sanctioned by custom, has been departed from, the work being divided into distinct and separate sections, and the drugs arranged alphabetically. The writer found that most students, in grappling with *Materia Medica*, generally read the *Therapeutics* of each remedy once or twice over, while its preparations had to be committed to memory. Thus, a process of confused selection always distracted and prevented that clear view of each detail so necessary to ensure a thorough grasp of every branch of the subject. Many students, too, have already mastered the chemistry of each drug in the laboratory, and hence to such, an arrangement like the one adopted will probably be beneficial ; whilst to those who have not, the condensed bird's-eye view of the subject may be appreciated. The writer is satisfied that this plan is open to serious objection, as is the most generally followed one, but he hopes that it may assist the already overtaxed student, who often fails to get any idea of the subject at all if the matter be not placed in a condensed form within his reach.

Actuated by the feeling that *Pharmacy* is one of the most important sections of *Materia Medica*, he has laboured to put this generally neglected branch in as attractive a light as possible, and has called to his aid the few original woodcuts in the first part of the work.

PREFACE.

7

This brief outline of Pharmacy is in no way intended to replace that *practical* knowledge of the art which the writer believes should be an essential accomplishment of every educated physician, and which he hopes to soon see rendered compulsory by examining bodies.

The condensation required in every page to keep the work in a small compass prevented that full recognition of the labours of many in the advancement of Materia Medica, which the writer would have desired.

He is grateful for the kind assistance of Mr. J. O'Neill, M.A., in the preparation of the Grammatical Aids to Prescription Writing.

BELFAST, *December, 1881.*

PREFACE TO THE EIGHTH EDITION.

THE seventh edition of this work has been out of print for about twelve months, mainly owing to the demands made upon the author's time in preparing the fourth edition of the "Dictionary of Treatment," which has been published during this period.

The present edition may fairly claim to be a new volume; much of it has been re-written, and all of it has been carefully revised and brought up to date. The section on the Non-Official Remedies is for the most part new matter. By increasing the size of the page and using a larger type, the work is now made a companion volume to the author's "Dictionary of Treatment."

He is again indebted to Dr. Victor Fielden, Demonstrator of Materia Medica and Pharmacy, Queen's College, Belfast, for his valuable revision of the proof sheets and index.

S, COLLEGE SQUARE N., BELFAST,
November, 1902.

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INTRODUCTION.

FORMERLY the term MATERIA MEDICA implied a description of the agents used in the treatment of disease, their preparation, actions, and uses ; but owing to the rapid advance made in our knowledge of remedies, special terms are now used to designate the different departments in this extensive subject ; and we should confine the words

Materia Medica to the description of remedies, their origin, source, distribution, chemical composition, and the methods by which they are obtained, &c.,

Pharmacy to the methods by which they are prepared for administration,

Pharmacology to the science of their action on a healthy organism, and

Therapeutics to their application in the treatment of disease.

Wood in the recent edition of his classical work still defines Pharmacology as the general term employed to embrace Pharmacy, Materia Medica and Therapeutics. In the present volume it is never employed in this sense, but always strictly in the sense as above defined, *i.e.*, the science of the action of a drug or agent upon a healthy body or healthy tissue.

The term Materia Medica, even so restricted in its application, embraces Botany, Zoology, and Chemistry, and, indeed, is built up of these sciences.

The term **Pharmacodynamics** is occasionally used, even by modern writers, when referring to Pharmacology ; and the old term **Pharmacognosy** is sometimes retained in text-books as a synonym of Materia Medica. Both these terms can be advantageously dispensed with.

We may divide the science and art of Pharmacy into two distinct divisions :

Extemporaneous Pharmacy, and
Official Pharmacy.

The first head will include the various operations of compounding and dispensing remedies from the prescriptions of the physician, and under Official Pharmacy will be briefly defined the different processes mentioned in the British Pharmacopœia

in the directions given for the preparation of its numerous drugs and formulæ.

Under the head of *Materia Medica*, in addition to the brief description of the physical characters, sources, chemical properties, doses, preparations, &c., of the various drugs in the "*Pharmacopœia*," will be grouped together the Official Preparations themselves, mostly in tabular form, so that the student can have a bird's-eye view of their composition and doses.

The Pharmacology of each drug will be given under its name in the section of this work devoted to Therapeutics, where its *physiological* action will be briefly discussed in connection with its *therapeutic* indications and uses.

Under the head of Administration of Medicines will be treated the science of writing and reading prescriptions, and a short glossary of terms and abbreviations used by physicians in ordering remedies. Under this division of the subject the classification of remedial agents and the important questions of dosage or posology and of incompatibility will be dealt with.

The *Materia Medica*, Pharmacy, Pharmacology, and Therapeutics of the most important drugs not yet included in the British Pharmacopœia will be detailed in the section dealing with Non-Official Remedies near the end of the volume.

PART I.

PHARMACY.

CHAPTER I.

EXTEMPORANEOUS PHARMACY, OR THE COMPOUNDING AND
DISPENSING OF PRESCRIPTIONS.

THE term "Compounding" applies to the mixing, blending, or preparing of the drugs ordered in a prescription, while "Dispensing" refers to the way in which they are put up, labelled, and sent out to the patient : thus the incorporation of a mixture of several substances is spoken of as its *compounding*, after which it is to be *dispensed* in a flat, square, or round bottle ; but if a prescription, for example, should contain an order for twelve five-grain Dover's powders, it would be simply a case of dispensing, since the medicine is always kept compounded by the dispenser.

It has been said that "no one should be allowed to *write* a prescription unless he is able to *compound* it," and if such were the rule of examining boards, doubtless more useful and more elegant prescriptions would be the fashion, and even if it were not so, the training requisite to make a good dispenser would be a great accomplishment to the practical physician, teaching him habits of neatness, readiness, and accuracy, and giving him a practical acquaintance with drugs obtainable in no other way.

The compounding of medicines can only be really learned at the dispensing counter ; but a few general directions will be here given as a guide to the student. It is an essentially practical study ; once the prescription is in the hand of the dispenser he must give to it his undivided and concentrated attention. Day-dreaming must be for the moment laid aside, and in proportion to the thoroughness with which he isolates himself from everything but the sheet of paper before him, so will his success be. The prescription should first be read carefully through, and any inconsistency of dose noticed. Difficulties in reading and deciphering will nearly always disappear on a careful comparison of the formation of the letters in the doubtful word with those in the unmistakeable portions of the prescription. If an evidently poisonous, or even an unusually large dose is ordered, or if

substances absolutely incompatible are prescribed, it will be well to consult the prescriber before proceeding further, but this will not be a likely or common occurrence. In compounding almost every prescription, there are several processes continually being employed which deserve a few passing remarks.

Weighing, the essential element of which is accuracy, is generally only required in dealing with small quantities, as rarely more than one ounce of any solid is ordered in a prescription; more commonly it is only with grains that the dispenser is directed to work, and in dealing with quantities from a few grains to as many drachms, the ordinary fixed upright beam and scales, which are found on every dispensing counter, answer all purposes.

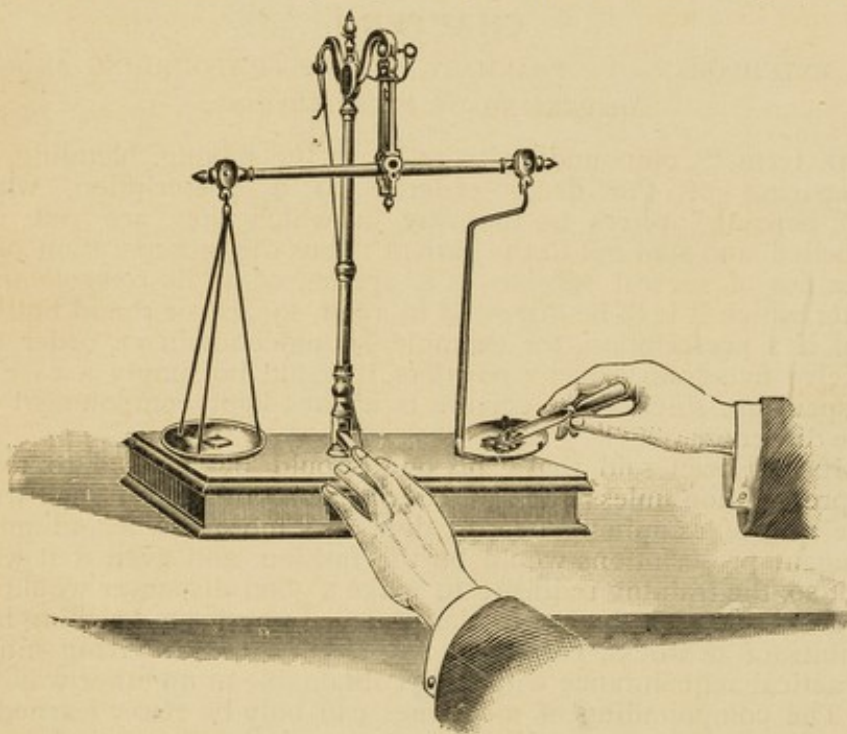


Fig. 1.

They are generally provided with one movable glass pan, which should be opposite the operator's right hand, and on to which the substance to be weighed is to be gradually placed, the weights having been previously put on the opposite scale. The pan, or scale, should invariably be wiped with a dry cloth each time after use. The omission of this is one of the minute points which stamps a slovenly compounder, and, as a rule, he who will not take the trouble to leave his scales and weights in a tidy condition will not take the trouble to weigh accurately the medicines prescribed.

For minute quantities of powerful drugs, like morphine, strychnine, and most active substances under two grains in weight, the scales that are being constantly used to weigh as much as two or three drachms should not be employed. For this purpose more delicate scales, or a chemical balance, should be used, and the substance gradually added, particle after particle, from a small spatula, till the scale comes to the level of the opposite, and remains there, as indicated by the pointer. In this manner the $\frac{1}{100}$ of a grain can be easily appreciated.

It is very often necessary to weigh small quantities of soft extracts for pills. This should only be done in this way:—Two little pieces of smooth wrapping paper should be made of the same size, which is accurately done by cutting a piece out of two sheets, one placed in contact with the other. When two pieces of precisely the same size and weight are thus obtained, one should be placed on the left-hand scale along with the weights; the other is to receive upon it the soft substance, and to be placed on the opposite scale, and when the requisite weight of material is added, it can easily be detached from the paper with a knife. The same plan should be used with corrosive substances, like iodine, if the scale-pan is not of glass.

The Pharmacopœia recognises no weight between a grain and an ounce, the ounce being equal to $437\frac{1}{2}$ grains, and the pound being equal to 16 ounces, or 7,000 grains.

It will be seen that in this weight, which is called the Imperial Standard or Avoirdupois weight, there is no drachm or scruple, but in the preface to the Pharmacopœia it is written that "it will be optional with the physician in prescribing to use the symbols of the drachm (\mathfrak{z}) and the scruple (\mathfrak{ss}), the former representing 60 and the latter 20 grains." However, it is now becoming the custom to order solids by grains or ounces, and confine the use of the drachm to the liquid measure of 60 minims, or the eighth part of a fluid ounce.*

If, therefore, the dispenser meets with a drachm or a scruple of a solid substance in a prescription, he is to put in 60 or 20 grains—though strictly about $54\frac{1}{2}$ grs. and 18 grs. are respectively equivalent to the $\frac{1}{8}$ and $\frac{1}{4}$ th of an avoirdupois ounce.

The Metric system which has been introduced into the present Pharmacopœia should be understood by all students and dispensers. All weights and measures in this system are easily calculated, being either multiples or fractions of ten. A prefix is used to indicate each quantity—deka=10 times, hecto=100 times, kilo=1,000 times, deci= $\frac{1}{10}$, centi= $\frac{1}{100}$, and milli= $\frac{1}{1000}$. For example, 1 kilogramme=1,000 grammes, 1 centigramme= $\frac{1}{100}$ gramme, &c. The foundation upon which all the metric weights and measures are built is the metre, which was considered to be the one ten-millionth part of the distance between the pole and the equator, and is equal to 39.37 inches. The metre is divided into tenths, hundredths, and thousandths, the

hundredth being, of course, 1 centimetre. The *cubic centimetre* (commonly written 1 c.c.) is the connecting link between measure and weight, for the *weight* of 1 c.c. of water at 4° C. is termed a gramme (=15.432 grains). 1,000 c.c. is the basis of measure by volume, and is called 1 litre (=35 oz. 1 dr. 35 mins.).

In another part of the book will be found tables giving the various weights and measures of this system with their English equivalents.

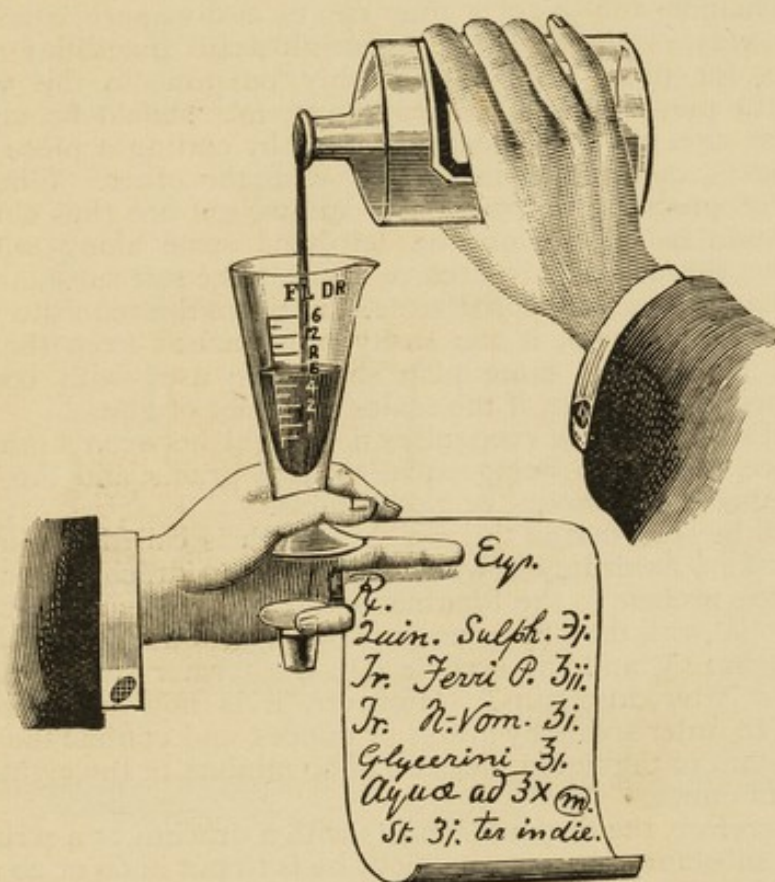


Fig. 2.

The **Measuring** of liquids is a simple process, but, like many others, requires care and practice, and should be done always according to rule. Graduated glass measures are used of various shapes, which should have the lines marked both in front and at the back. The measure should be held between the thumb and next two fingers of the left hand (Fig. 2), and raised nearly to the level of the dispenser's eye. The bottle to be poured from is grasped firmly by the right hand, the stopper being previously withdrawn and held by the little finger of the opposite hand. The fluid is then poured out, the foot of the measure being held horizontally, the level of the liquid being tested by the lines on

its front and back aspects. In looking through a quantity of liquid in a glass, two lines, or a double line, may be noticed, the upper one being caused by the concave surface of the liquid, produced by capillary attraction. The lower line, which is the true level, is the one to be taken into account in measuring. *Never pour out with the label downwards*, otherwise the drop of moisture left on the lip will trickle down and injure it. The label should be *always* on the side of the bottle which is upwards, as in the Figure.

For measuring small quantities of medicine (and it is generally an active medicine that is ordered in small quantity) the measure which is used for ounces should not be employed, as it will

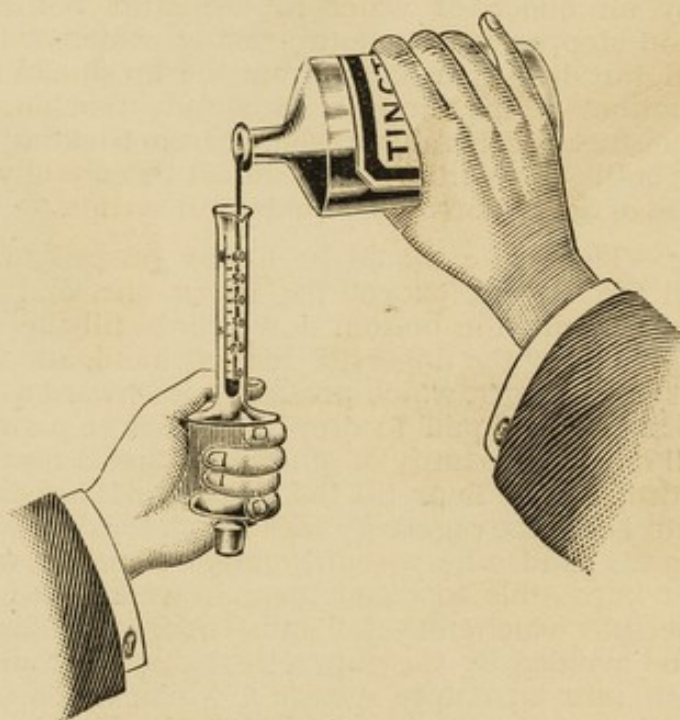


Fig. 3.

be found impossible to be accurate in pouring a drachm into the bottom of a two-ounce glass. The measure which is figured should be then used ; it is known as a minim measure, and is of the capacity of either one or two drachms.

It may be held like the larger glass, but the careful and neat dispenser will hold it as in Figure 3, which does not interfere with the light passing through even a minute quantity near the bottom. Some hold the larger measure in the same way. In measuring liquids in very narrow glasses like the one figured, the surface of the liquid will be found to be *deeply* concave, owing to capillary attraction being stronger than in wide vessels, and it is sometimes puzzling to get the true level, which should

be midway between the highest point close to the glass, and the lowest in the centre. It is not safe to count upon the lowest line as in working with the larger measures, because if we did the fluid which is attracted to the glass would not be included.

Substances like copaiba and castor oil should not be measured—not, however, because of the reason always assigned, that the measure is so difficult to clean, for accuracy should sacrifice every other consideration in compounding, but because of the fact that if one ounce of such a substance is carefully measured about seven-eighths of it only will be got out of the glass. Hence it is advisable either to weigh it, making allowance for its specific gravity, or else to pour it into the bottle in which it is to be dispensed, having previously marked with a strip of paper the space or bulk occupied by an ounce of water in the same bottle. Before returning the stopper into a bottle out of which a liquid has been poured, the drop that hangs from the lip should be caught upon the bottom of the stopper by simply touching it—thus continual moisture is generally prevented from trickling down the side of the bottle; this little detail should be carefully attended to in the case of acids, corrosive liquids, and syrups.

Dropping.—The bottle should be lightly grasped in the right hand by all the fingers, except the index one, and held in a vertical position with the bottom downwards, till the stopper is lifted partially out by the fingers of the left hand, and held there by the right index finger, which presses it downward as the bottle is sloped to allow the liquid to drop out. Before permitting the drops to fall into any quantity of other medicine, a few should be allowed to drop on the floor till the dispenser is satisfied he has perfect control over the regularity with which the drops issue from the bottle in his hand, otherwise they might come out with a rush, rendering it impossible to count them, in which case the liquid or medicine into which they fall must necessarily be rejected. This may be avoided by the unpractised dispenser allowing the drops to fall into an empty measure, when, if too many flow out, he can reject them without risking the liquid into which they are to go, but if the drops be volatile, this should not be done. Liquids like chloroform, hydrocyanic acid, ether, nitrite of amyl, &c., should not be dropped, but always measured. A ten or twenty per cent. solution of such substances can be kept in stock, so that there may be no difficulty in accurately measuring the smallest quantities, as when two or three drops of dilute hydrocyanic acid are ordered in a draught.

It is a good rule to let each drop reach its destination before another flows out. If the drops hesitate to flow at the start, the lip of the bottle should be wetted. When the dropping has concluded, the stopper is taken altogether out for an instant to allow the liquid accumulated about the neck to flow back again into the bottle before the stopper is thrust home; various

bottles, with patent stoppers, have been devised to facilitate dropping; but, as a rule, every requirement is met by the



Fig. 4.

above plan. The student should remember that a drop is a vague and indefinite quantity, supposed to be identical with a minim, which it seldom is. Elaborate tables have been prepared, showing how many drops of certain liquid preparations are found to correspond with one drachm: thus it is generally stated that there are 120 drops of tincture of digitalis or laudanum in one fluid drachm, and 45 of Prussic acid in the same bulk. It is, however, well known that the number and size of the drops depend, not so much upon the nature of the liquid, as upon some accidental circumstances—as the shape and size of the stopper, or especially *the shape of the lip of the bottle*, and the degree of moisture about it, &c. The practice of ordering drops should be entirely given up, and minims directed to be measured instead, unless, perhaps, when two or three drops of a flavouring essence are ordered in a mixture.

Hydrocyanic acid is best measured with a long graduated syringe, and many other liquids could be treated in a similar way with advantage. A graduated pipette with a small India-rubber teat or bulb at its blunt extremity answers most cases.

CHAPTER II.

MIXING OR MIXTURE-MAKING.

UNDER the term "Mixture" in Pharmacy is included every extemporaneous fluid compound intended for internal use, except a few bearing distinctive names—as draughts or enemata. It would be difficult to give such general directions to the dispenser as would equally apply to the preparation of so many really different compounds—as solutions, emulsions, decoctions, &c.; but a little practical experience will soon show him how he may apply the knowledge gained in making one class of preparations to aid him in compounding another.

Mixtures are prescribed and dispensed in 2, 3, 4, 6, 8, 10, and 12 ounce bottles, and occasionally in 16 and 20 ounce; and taking the simplest form of mixture where two or more fluid medicines are ordered together, it will be seen that the compounding of this will only mean the measuring of the different ingredients in a glass and pouring them into a bottle; still, this must be done methodically, and attention to the following is advisable:—Until the dispenser has had considerable experience he should, after reading over the prescription, carry the different medicine bottles required from their different places and set them down beside him before he begins to measure, otherwise he may "lose his head," or get confused in travelling from one part of the surgery to another. This practice, however, should be no excuse for bottles being left upon the dispensing counter. After the mixture is made each should be carefully put back into its proper position; and the same law applies to every operation in Pharmacy, for nothing should be left lying about out of its place; it is in this way mistakes are often made. It will be noticed that in carrying a stock bottle from its shelf, collecting it with others where the dispenser is to work, and putting it back after he has finished, its label will be certain to be examined at least *three* times. The skilful compounder will make up a mixture more expeditiously by taking the measure-glass in the left hand, as if about to use it as previously described, and the prescription between the middle two fingers of the same hand, and, proceeding with his right hand entirely free, walking to and fro, he can compound his mixture as quickly and accurately as if all were within reach of his hand—as they should be when possible. This is well shown in Figure 2. Care is requisite to prevent the paper being soiled.

As regards the *order* in mixing liquids for a simple mixture it is not of so much importance as in making emulsions, and often the ingredients can be mixed in the order in which they are written. It is a good plan to pour the tinctures or spirituous fluids (as they

are measured) into the bottle in which the mixture is to be made, mix them, and then add the syrups or essences, and finally fill up with the water or infusion ordered ; in this way a better mixture is often made than if the tinctures were each singly added to a large body of water, when their resinous principles would be sure to be precipitated. Suppose in a prescription of eight ounces of mixture, containing two ounces of tinctures, one ounce of mucilage, and five ounces of water, if the dispenser added the mucilage to the undiluted tinctures, an unsightly mess would be the result ; the mucilage should either be added last, or be largely diluted with the water, before adding the tinctures ; but the difficulty about the *order* of mixing ingredients will be found to be more imaginary than real—a little common sense and experience will soon overcome it. There is, however, one rule which is almost universally neglected, and it is of importance :—If there be a very poisonous substance, like Prussic acid, strychnine, aconite, arsenic, corrosive sublimate, &c., ordered in a mixture, it should be put in the *last thing* before corking, unless there be some reason for the contrary. The force of this is obvious, for, if this be the dispenser's habit or rule, the possibility of his putting it in twice is out of the question ; and often when the attention is unavoidably arrested, the ablest will forget what he has just accomplished. All mixtures should be briskly shaken before the label is put on, to ensure thorough incorporation.

Distilled water should be invariably used ; no doubt, in many instances, it will be of little moment, but a mixture made at one time with distilled water and at another with fountain water, will look or taste differently ; and, on the whole, it will be found advisable to use it to ensure uniformity.

Should a mixture be filtered if not bright and clear ? Unless specially ordered it should not, or unless some of the articles employed in its preparation were not as bright as they should be ; it should always be strained through wetted wool or tow plugged lightly into a funnel, if any foreign particles are observed in it ; this will almost always be necessary if the mixture has been made in a mortar ; and most of the next class of mixtures get dirt incorporated with them, no matter how careful the dispenser is, and there are often foreign particles mixed up with the salt before solution which are not visible till water is added. It will be always necessary to run a little water through the strainer before pouring in the medicine. Suppose, now, the prescription contains a solid substance to be dissolved in the mixture, the dispenser, if the substance is very easily dissolved, may weigh it, drop it into the bottle by means of a little paper bent into a V-shape (off which most powders will pour like liquids), add the water or vehicle ordered, and shake briskly till the salt is dissolved ; this often does away with the necessity of straining ; but if the salt dissolve slowly, or if there be more of it ordered than the water will dissolve, then it must be rubbed up with *cold*

water in a mortar with a pestle—to use which skilfully and neatly requires a good deal of practice and care.

Fig. 5 represents the mortar being used to triturate a hard substance. The pestle is firmly grasped by the right hand, and power is applied from the *shoulder and arm, the wrist being kept rigid*, and the elbow nearly stiff. By a series of rotatory movements, chiefly at the shoulder joint, the pestle is made to travel slowly round the sides of the mortar—always being brought in the same direction, that is *towards* the operator's body, not from it—each rotation becoming shorter and quicker until the centre of the mortar is reached, when a few large sweeps bring it out



Fig. 5.

to the sides again, and the same movements are repeated as before—the object being to crush each particle between the sides of the mortar and the pestle. The mortar should be steadied by the left hand, and as the material gathers towards the handle of the pestle, it is to be scraped off with a spatula—which should occasionally be swept round the inside of the mortar. In this manner hard gritty substances are reduced to a fine powder.

If a larger quantity of a salt is ordered than the water will dissolve, it should be in this way well rubbed up with successive portions of cold water, and dispensed as a fine powder lying at

the bottom of the mixture, and not, as is often done, presented to the patient in large crystals which he doubts whether to swallow or reject. Warm water would probably dissolve the salt and give a clear mixture, but, on cooling, large crystals would form on the bottom and sides of the bottle.

Another class of mixtures is often ordered where a vegetable powder, as rhubarb or ginger, or a substance like precipitated sulphur or bismuth, is directed to be compounded with water generally thickened with a little syrup or mucilage, in which cases the most careless would hardly think of pouring the powder into the bottle and filling up with water, as it would thus reach the patient in little hard lumps or pellets. The powder should be weighed and put into a porcelain or wedgewood mortar, with as much water as will make a thin paste, and after rubbing it

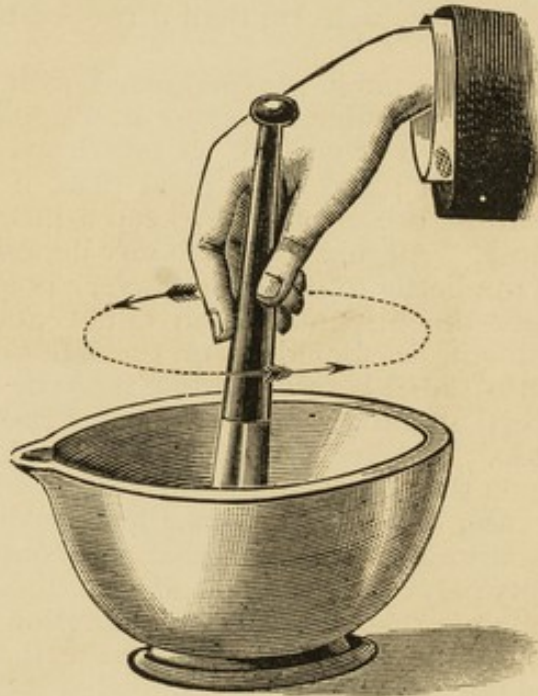


Fig 6.

smooth, more water is gradually added till a uniform mixture is obtained. The trituration here is of a different nature to that required in powdering substances or grinding them, as in the last Figure. In this instance the powder is already fine, and only its intimate admixture with water is required—hence the mortar is used in a different way, as Fig. 6 shows. A swift graceful movement is communicated to the pestle by the *wrist*, the handle being lightly grasped as a pen is held, and no motion should be allowed at the elbow or shoulder; as in the last instance, the pestle is made to sweep round the sides of the mortar always in the direction inwards or towards the dispenser, never “off” him.

If syrup or mucilage is ordered to help the suspension of such powder in a mixture, it is advisable to rub the powder up with it first before adding water, and shaking all thoroughly before labelling.

When calcined magnesia is ordered in a mixture, an exception to the above rule of rubbing in a mortar may be made; thus, suppose an 8 oz. mixture, with two ounces of syrups or tinctures, two drams of magnesia, and six ounces of water, be prescribed, here the dispenser may measure the water first in a large measure, weigh the magnesia and drop it on the surface of the water, when it will gradually sink to the bottom as a perfectly smooth and uniform sediment. During its sinking he measures out the fluid ingredients, pours them into the bottle in which they are to be dispensed, by which time the magnesia and water are ready for pouring in on the top of them. This completes the mixture, which is whiter and more uniform than if rubbed up in a mortar, however clean.

Often a good deal of trouble is experienced with the froth that rises, especially upon vegetable solutions after agitation, preventing the bottle being filled or corked. A few drops of spirit cause this to rapidly disappear; and it is a good plan, if there be any spirituous liquid in the prescription, to keep a little of this to the last for this purpose. All mixtures with any deposit should have a label directing the bottle to be shaken before pouring out; and in all cases where the dispenser is in doubt about a mixture depositing a sediment, he should err on the safe side, and put on a "shake the bottle" label before sending it to the patient. It is a custom to direct all mixtures containing Prussic acid to be shaken before use. This has arisen from a mistaken notion that the acid floats upon the top when the mixture is allowed to rest. Such is not the case, but the very volatile ingredient in a half-filled bottle of mixture may rise in vapour and condense upon the inside of the empty part of the bottle, and on a dose being poured out it would contain a relatively larger proportion of the volatile substance, hence even in these cases a "shake the bottle" label should be put on, one thing being certain—that it can do no harm if unnecessary.

The next class of mixture includes emulsions. They require more care and skill in their preparation and prescribing than most other extemporaneous compounds. An emulsion is a watery mixture resembling milk in appearance, containing an oil or resin in suspension, and not capable of easy or ready separation. The suspension of the oil or resin is effected through the agency of several substances, as gum, soap, alkali, or yolk of egg.

Several substances when rubbed up with water in a mortar make perfect emulsions; the gum-resins, ammoniacum, myrrh, and asafetida behave in this way. The milky mixtures thus prepared are called *natural* emulsions, and the explanation of the

phenomenon is simple—each substance contains, in addition to its resin, as much gum as will suspend it when water is added. If the pharmacist wishes, then, to make an emulsion with a resin, he imitates this natural preparation by adding gum acacia or tragacanth, such as the official mixture of guaiacum, in which the resin is ordered to be triturated with a little sugar and tragacanth, adding gradually the cinnamon water. The mucilage for emulsions should be always recently made, and should not show any acid reaction. The mucilage made from Pulv. Acaciæ is generally acid, and consequently that made with lump gum is much superior. To make this, however, impromptu is not generally possible, but if made in large quantity it can be kept for some time in a perfectly fresh condition by completely filling a number of 3 oz. bottles, corking them tightly, and after cutting off the corks flush with the mouths of the bottles, dipping the necks into a little melted wax or hard paraffin. The mucilage is thus kept free from air, and will be found most satisfactory in every way even after some weeks.

Oils are emulsified either by rubbing with gum or by adding an alkali (which makes a sort of soap with the oil), or by both gum and alkali, which is the most common method. Copaiba is made into an emulsion in a similar manner. Volatile oils require to be mixed with some fixed oil before being made into an emulsion, or they may be rubbed up with yolk of egg.

The powdered gum and water, or mucilage, should be measured into a mortar, and the oil gradually added, with continual *light* rubbing, the pestle being always moved in the same direction, more oil being put in only after the first added has been blended with the water. Generally speaking, there should be as much oil as watery fluid at this stage.

If the mixture gets too thick during the rubbing, a little water may be added from time to time to thin it; and when all the oil is thus incorporated, the mixture is poured into the bottle in which it is to be dispensed, and any other ingredients prescribed, are to be very cautiously added, each freely diluted before being poured in, tinctures or spirituous liquors always being added *last*, in very small quantity at a time, and diluted; neutral or acid salts, if ordered, must be very cautiously added, as they run a fair chance of spoiling the union of the oil and water, but many alkaline salts strengthen it.

The object of the dispenser should be to cause minute division of the particles of the oil, and to get each minute particle covered over with a film of mucilage or albumin, which prevents its uniting again with neighbouring globules.

Some dispensers put the powdered gum or mucilage into the bottle with a little water, adding gradually the oil, with brisk shaking; such a plan is not to be recommended. Alkaline emulsions may, however, be prepared in this way, and it is the way in which copaiba is generally treated; the alkali, commonly

solution of potash, mixed with as much water as there is balsam or oil, is put into the bottle, the balsam added, and after brisk agitation complete incorporation will be effected, the bottle being gradually filled up and thoroughly shaken upon each addition of the watery menstruum. The balsam or oil is often weighed into the dispensing bottle, and this is the most correct method; but it should be remembered, if a *perfect* emulsion is desired, this plan should not be followed, as the oil or balsam adheres so firmly to the sides that globules will always be floating to the surface after the dispenser thinks that all is safe. This may be obviated by pouring the emulsion into another clean bottle, after all the ingredients have been added.

Tincture of senega in small quantity has the power of emulsifying fats and oils very efficiently. 5 minims will emulsify $\frac{1}{2}$ oz. of fixed oil.

Tinctura Quillaia possesses the same power, and is much used for making emulsions.

The mixture, having been compounded and put into the bottle in which it is to be dispensed, should be corked, and this must be done with care, as there are few things impress the patient so unfavourably as a cracked, soiled, or badly-fitting cork; the dispenser should take the measure of the neck of the bottle with his eye, before fitting the cork, and once it has been tried in the bottle it should not be put back amongst the others into the drawer, but regarded as a *soiled* cork. It is the custom to seal over the top of the cork with wax; coloured paper, leather, or tinfoil may be used; if leather is used in tying over a bottle it should be very thin, and put on quite wet, and without a single crease; it makes the most elegant finish, but is not commonly used. Labelling should be done with the most scrupulous neatness and distinctness, all flourishes being condemned. The margins of the label should be carefully trimmed, and a new label should never be put over an old one. A mixture should never reach a patient without being checked with care, when possible, by a second person, and most chemists affix a small label bearing the initials of the compounder whose duty it is to check the work.

CHAPTER III.

MIXTURES—*Continued.*

It might not be out of place here to refer to a few of the difficulties in Mixture-making which the student may expect to meet with. The following may be taken as examples:—

Quinine Sulphate in the form of a mixture is one of the most frequently prescribed drugs in the Pharmacopœia. Sometimes it is prescribed in combination with a little flavouring syrup and water, without any acid for its solution—and the officious dispenser occasionally falls into the error of adding sulphuric acid to effect its solution. This is a mistake. The quinine should be rubbed up in a mortar with a little water, or added to the vehicle in its crystalline state, with directions that the bottle is to be well shaken before each dose is poured out.

When an acid is prescribed for its solution, the careless dispenser may drop the quinine into the concentrated acid previous to dilution with the vehicle or water, and a new sulphate is formed, which is only sparingly soluble. The acid should be freely diluted before the alkaloid is added.

Or quinine may be ordered with tinctures, spirit of nitrous ether, or other spirituous liquids along with glycerin or syrup and water. In this case the alkaloid may be dissolved in the concentrated spirit, and the watery portions *gradually* added after the glycerin or syrup, so that if the mixture be not too dilute, a clear solution, instead of a muddy mess, may be presented to the patient.

Or quinine may be ordered with sulphuric acid and tannin, or some vegetable containing tannin, when a precipitate of tannate of quinine is the result. The dispenser should not fall into the error of filtering this latter out of the mixture.

Alkalies—Aromatic Spirit of Ammonia, Carbonates, &c.—are incompatible with quinine salts, the alkaloid^s being precipitated. Great care is necessary in compounding mixtures containing these ingredients. They should be well diluted before mixing and should be thoroughly shaken. A “shake” label should be put on the bottle. In a prescription of this sort the physician would help the chemist greatly by including a little mucilage in his formula.

Salicylate of Sodium, or Salicylic Acid, is occasionally ordered in a mixture with quinine, and the dispenser will find that a disgusting looking semi-solid mass forms in the bottle, and refuses to pour out. This latter case he should regard as one of absolute incompatibility, calling for a consultation with the prescriber. If this is impossible, matters may be partially remedied by adding mucilage to the quinine, and gradually mixing in the salicylate, dissolved in a large quantity of water, and shaking briskly.

Scale Preparations when ordered in a mixture should either be dissolved in a clean mortar, with warm water, or poured into the bottleful of the vehicle and agitated; if put into the dry bottle, and the water or vehicle added afterwards, a sticky mass cakes at the bottom.

Vegetable Extracts when prescribed in mixtures should be most carefully rubbed up in a *slightly* warmed mortar, with a little water, until a soft cream results, to which the vehicle is to be gradually added. If the extracts contain resinous matters mucilage should be added by the prescriber.

Turpentine, or **Terebene**, will give the dispenser some trouble. If the emulsifying agent is left in his hands, he can make a good mixture with yolk of egg. It will require one egg at least for each ounce of turpentine. This applies to most ethereal or essential oils. Thick mucilage answers, but not so well. Turpentine has been successfully combined with a watery vehicle by rubbing it up in a mortar, with about 2 per cent. of powdered Castile soap, adding the watery vehicle gradually, and shaking briskly.

Almond Oil emulsifies unsatisfactorily with mucilage or powdered gum. A small quantity of liquor potassæ or potassium carbonate answers well, whilst a mixture of either of these with mucilage spoils an emulsion containing almond oil.

Spermaceti can be emulsified by rubbing it smooth in a mortar and adding a little spirit, just as in the powdering of camphor; after the evaporation of the spirit, yolk of egg, powdered gum, or thick mucilage—but preferably the former—will make a good mixture, especially if some syrup be present.

Cannabis Indica, **Castor**, **Guaiacum**, or other resinous tinctures, when ordered in the form of mixture, with directions for the use of an emulsifier according to the dispenser's fancy, will give some trouble. The best plan is to use a quantity of thick fresh mucilage, rather more than equal to the quantity of the tincture, which must be added only after dilution with water.

Borax, powdered and rubbed up with mucilage, forms a soft powder like moist sugar, which cannot be made liquid by the addition of any further quantity of mucilage, and acetate of lead, similarly treated, makes an opaque white jelly.

Spirit of Nitrous Ether will generally require to be neutralised with potassium bicarbonate before being compounded with potassium bromide or iodide, otherwise free Br. or I. will be liberated, and the mixture darkened.

Bismuth Subnitrate is often ordered in a mixture with sodium bicarbonate, and unless very great care is taken in compounding them, by permitting decomposition at a gentle heat, carbon dioxide will be produced, and the bottle will burst.

This may be prevented by using an equivalent quantity of the bismuth carbonate, with the prescriber's sanction.

Liquid Extract of Male Fern is generally ordered to be rubbed up with milk, fresh mucilage, or tragacanth, but egg will be found a better emulsifier.

Tincture of Tolu, Friar's Balsam, or Tincture of Myrrh, may be easily added to cough mixtures, when a small quantity of powdered tragacanth is ordered at the same time, and though the scrupulosity of the dispenser in closely following the letter of his prescription is to be admired, still if gum were added sometimes on his own responsibility, the unsightly messes which are presented to patients either through the oversight or innocence of the physician would be greatly improved. Sometimes the relations which exist between the physician and the dispenser will quite justify the latter in making an alteration, but it is a dangerous ground, and he must always hesitate before interfering, unless where there appears a very evident necessity. Each case must be considered on its own merits, and no rule can possibly be laid down for the guidance of the young dispenser.

A Draught is a small mixture which is to be swallowed at one dose ; it generally contains 1, 1½, or 2 ounces, and is compounded and dispensed in every way like a mixture.

Liniments, Injections, Lotions, Collyria or Eye Washes, and Gargles, are compounded in the same way as mixtures, and the dispenser will have no difficulty with them. All poisonous external applications should be dispensed in differently shaped bottles from those used for mixtures ; the blue glass hexagons with three fluted sides are by far the best for this purpose, and less likely to be mistaken for mixture bottles than any other. This is now rendered obligatory by the Poison Regulations (Pharmacy Act). Strong liniments, in addition to bearing the words, "For external use only," should be marked "Poison." Most chemists now supply labels for these printed upon a bright orange or other strongly tinted paper. Injections, mouth washes, or unusually strong gargles, should be marked "Not to be taken."

A Linctus or Lincture or Loch literally means any medicine of such a consistence that it has to be licked or lapped off a spoon. They are not now often prescribed, and when the dispenser meets with them he mixes the ingredients together as for an ordinary cough syrup or confection, and dispenses them in a plain bottle, or if too viscid for flowing, he puts them into a wide-mouthed bottle or ointment pot.

Electuaries, Conserves, or Confections, are mixtures of a pasty consistence, generally containing powdered substances made into a soft mass with treacle, syrup, honey, &c. The substances prescribed in this form, if not already in fine powder, must be reduced to this condition and sifted ; sulphur, rhubarb,

jalap, ginger, and magnesium sulphate are occasionally ordered in this form. The powders should be carefully triturated in a large mortar, and when thoroughly mixed the saccharine substance should be gradually added till a smooth, uniform, and impalpable paste is obtained. The powders should never be stirred into the treacle or honey, but the latter should be poured in upon the powder, and when compounded, the confection, if very soft, should be dispensed in a pot in which there is plenty of room for stirring up. If magnesium sulphate is ordered, the dispenser may use the dried salt, allowing for its extra strength, as it is almost impossible to pulverise the ordinary drug.

CHAPTER IV.

THE COMPOUNDING AND DISPENSING OF POWDERS.

THE physician may order substances to be dispensed in this form which are not kept in the powdered condition by the chemist, and the dispenser will consequently be obliged to pulverise them. This is done on the small scale by using a mortar like the one in Fig. 5; the pestle is grasped in the same manner, but wielded very differently; it is raised and lowered in a quick or jerky fashion for a few inches, and in a straight up and down motion from the elbow, each stroke being aimed at a particle, which is thus crushed between the end of the pestle and the bottom of the mortar. When the coarser pieces have disappeared, the pestle is to be used as in the figure, and the powder ground between the sides of the mortar and the end of the pestle till the required fineness is obtained. The mortar for such an operation should be of wedgewood, and not too highly polished, as the roughness of the interior facilitates pulverisation.

If the substance to be powdered for a prescription happens to be a root, or leaf, or herb, which is rare (as such are almost always kept powdered in stock), then an iron mortar with a lid is to be used, for any considerable force should not be employed with a wedgewood or porcelain pestle. After the grinding has been performed till single particles are no longer visible to the naked eye, the powder should be passed through a fine sieve, and for very small quantities it is sufficient to extemporise a little sieve by stretching a piece of fine muslin over a large chip ointment box, out of which the bottom has been knocked, and securing it with a string or tight hoop like a drum head.

The bulk of a powder varies. Generally prescribers order less than twenty grains, often about five grains are prescribed. If only one powder is to be sent to the patient, it is simply weighed on the scale and placed upon a piece of paper, and, if containing more than one ingredient in a single powder, they should be carefully mixed on the paper with the point of a knife, for though the

patient is to swallow the entire powder without division, and its mixture is practically of no importance, it looks careless, and does not impress him favourably on being able to distinguish different shades of colour in what he is about to take. Powder papers should be glazed, and for small powders, about 4×5 inches. Different shades of colour are used, and some even prefer the paper unpolished. As a rule, paper such as is used for writing on is suitable. The white glazed demy, manufactured specially for the purpose, and sold by druggists' sundrymen, is the best powder-paper. It may be had cut in different sizes. To fold a powder requires a good deal of care and practice, and once learned it is never forgotten, and is useful when applied to many other little operations. Though so simple, it is, however, a difficult task to describe in writing.

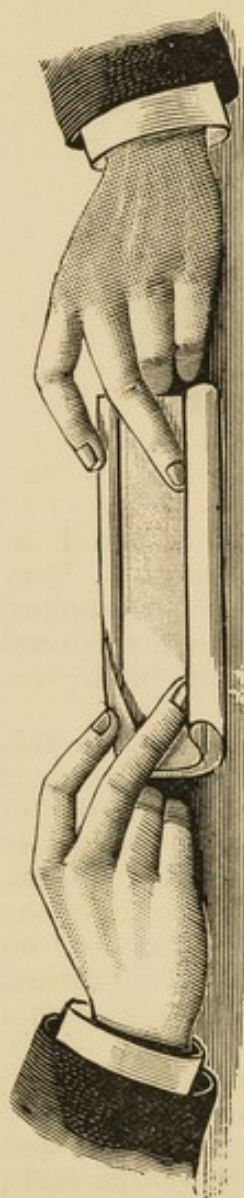


Fig. 7.

The following is the old-fashioned way of folding a powder:—The powder being placed on the centre of a paper, which lies flat on the counter before him, the folder seizes the margin farthest from him between the second finger and thumb of his left hand, at the same moment seizing the near margin with the corresponding fingers of the right hand; he brings them together, their edges looking directly upwards, only the edge of the margin nearest is half an inch higher than the edge which is farthest off him (Fig. 7). The margins are held in this position with the second finger and thumb of each hand, while the folder turns down in a flap with his index fingers the upper margin over the lower. (The figure shows this turning down as having commenced at the right hand corner). The flap thus produced is turned over upon itself, which finishes the folding process, except the bending down or in of the ends, which is done, as Fig. 8 describes, by simply bending them between the finger and thumb, or by creasing over a powder-folder made for the purpose, which secures all the powders being of exactly the same length.

Some dispensers bend down the ends over a flat-bladed knife. After the powder is thus folded its appearance is much improved by passing the blade of a spatula or ivory paper knife firmly and rapidly over it, removing every crease, and preventing the mass of powder causing a bulging in the

middle. This is always necessary when the powder weighs more than a scruple, and it is especially necessary when any considerable number is ordered to be dispensed in a box or envelope. Care is requisite in passing the spatula over bulky

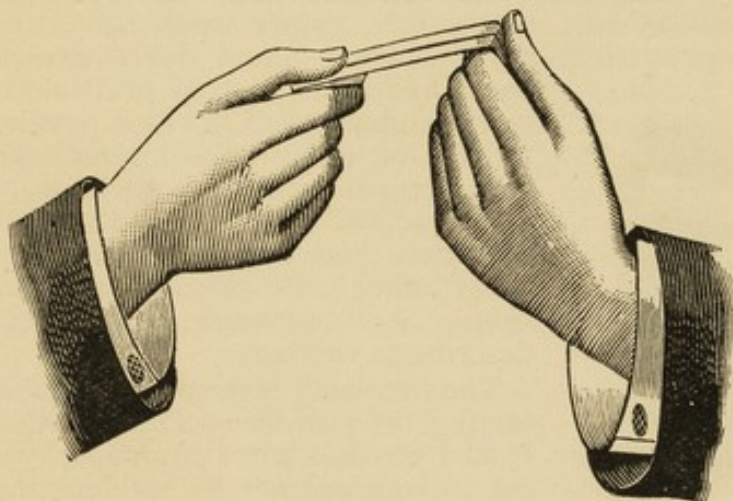


Fig. 8.

powders to keep the blade perfectly flat or horizontal, as otherwise its edge will readily tear through the paper. Very large powders, containing substances like Rochelle salt, sulphur, &c., can be uniformly flattened by striking them gently several times with the handle of the knife before passing the blade over them.

Pharmacists, however, nearly universally fold a powder in this way :—The dispenser places the paper before him on the counter or table with the powder in its centre, and brings the border of the paper farthest from him to within half an inch of the border next him ; secures it in this position with his index fingers, whilst with his thumbs he turns the half inch of margin of the paper next him in a flap over it. This is again folded over on itself, which completes the folding (Fig. 9), the ends being turned down, as in the first instance, by the fingers, over a knife or on a powder folder.

A represents the farthest edge brought towards the folder ; in B the edge next him is turned over in a flap upon this ; in C and in D both are together turned over in a second flap ; and the folding is completed except the turning back of the ends. The dotted lines show the space originally covered by the paper. In this method the powder is technically said to be folded "to" the dispenser. More commonly, however, it is folded "off" him, and this is the proper way, only it is more difficult to accomplish it for the first time. It is done in the same way precisely, except

that the near edge of the paper is brought to within half an inch of the farthest edge, which is turned over on it, and again both are turned over as before.

The following still simpler method of folding a powder may be easily mastered by the student :—He places the paper before him with the powder in its centre, and turning back into a flap about

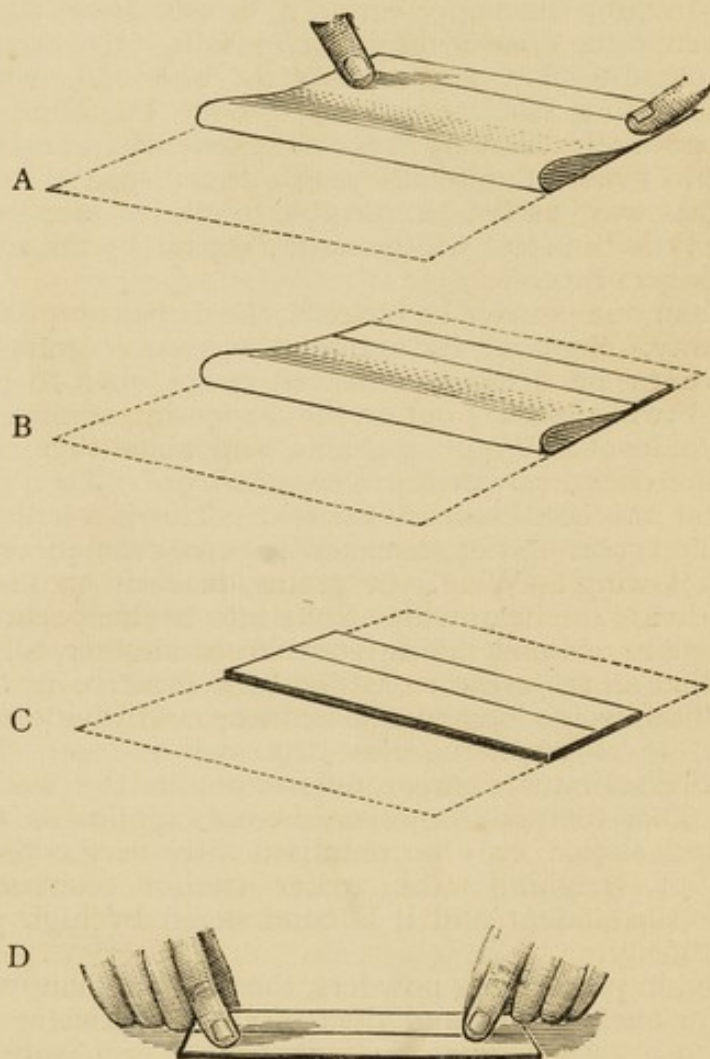


Fig. 9.

half an inch of the margin next him, he smooths it down flat upon itself. Into the crease of this flap he inserts the edge of the paper farthest from him, and bends both over exactly as in the two previous instances, and finishes the ends as before.

The first method is the most difficult to accomplish, but it is the best, as by it the dispenser folds large bulky powders, like magnesia, Gregory's powder, &c., which cannot be properly

folded otherwise. Suppose 1 oz. of the sulphate of magnesium is to be dispensed in a paper, the dispenser weighs it out on a paper, and proceeds exactly as in the first instance of folding a small powder, as in Fig. 7. He does not, however, fold back the ends over a folder, but gathering in loosely the left end, he closes it so that the packet can stand upon it, like an upright cylinder open at the opposite end. Into this end he inserts his right index finger, and folding the paper round it, he withdraws it, causing the end to retain the creases into which it falls. He then bends down the folded-in flap, and undoes the end upon which the packet was standing, which now goes through the same process as the right end, after shaking down the contents and making the surface even. Practice only will enable the dispenser to fold a packet in this way, as it is impossible to clearly describe it in a book. The little time lost will be amply repaid by the education which the fingers receive.

If more than one powder be ordered, the dispenser proceeds in a different way. Suppose, for example, twelve five-grain Dover's powders are to be dispensed, two ways are open to proceed. First, spread twelve papers out on the dispensing counter in four rows of three each. Weigh 5 grains, and place them on each paper till the dozen powders are weighed out. Then begin to fold one after another till all are finished. This is a tedious plan, for which the expert and experienced dispenser sometimes substitutes the following:—Weigh 60 grains, place it on the centre paper, and divide the heap with a knife into twelve portions, now adding a little to one and taking some from another, till the *eye* is satisfied that all are equal; or, till a little practice is obtained in this method, weigh out 30 grains twice and divide each into six papers. It is surprising how the eye so soon becomes educated to discriminate small differences in the size of the powders. This method, however, is not applicable to large powders, and should only be practised after very considerable experience of weighing; the writer cannot recommend it, especially to the student, and it is condemned by high pharmaceutical authority.

Ordinarily, in prescribing powders, the medical man writes the form as if for one powder, and then directs, say, twelve such to be sent; hence twelve times the quantity of each substance is weighed and put into a mortar, generally in the order in which it is prescribed, for, as a rule, it matters little in what order the ingredients are mixed, provided they have been previously in a state of fine powder. But if a very small quantity of an active ingredient be prescribed, it should first be put into the mortar with about twice its bulk of some of the more inert ingredients; and after careful trituration, using the pestle as shown in Fig. 6, the remaining substances are gradually added. Substances which are not in powdered form should be first rubbed down finely, and then mixed with the other ingredients. The mass of the powder

should not be divided until the most thorough admixture has been accomplished.

Should a drug, *e.g.*, potassium bromide, be ordered as a powder it is desirable to pulverise it to destroy its identity, and not have it sent out to the patient in crystalline masses.

Sometimes the physician orders a certain weight of the different ingredients to be mixed and *divided* into a number of powders. Here the dispenser might make a terrible mistake if he multiplied the quantity by the number of powders instead of dividing, and he should be always on his guard against such an accident. Substances which are perishable, as ergot, are sometimes ordered to be dispensed in this form ; or substances which are volatile, as camphor ; or deliquescent, as carbonate of potassium ; or liable to chemical decomposition, as sulphide of calcium, or the valerianates ; in which case they should be folded up in the ordinary paper first, or, preferably, in waxed paper, and then each one covered with tinfoil, and sent out in packets of 4 or 6, which are again covered with an extra piece of the foil, and if to be kept for any time they should be enclosed in a wide-mouthed bottle.

Sometimes a powder like Gregory's, ginger, soda, rhubarb, &c., is prescribed in quantity, with directions for a teaspoonful or other dose ; or powdered borax is prescribed for injecting. In such cases the dispenser should send it to the patient in a wide-mouthed bottle, well corked, or even in some instances in a bottle with a glass stopper.

When as many as six or eight small powders are ordered they should always be folded exactly of the same length on a folder, and sent in a cardboard box. Numbers under this are generally dispensed in small oblong envelopes, made for the purpose, and on which the directions can be written like the address on any ordinary letter. If sent in a box or bottle, a small label is gummed on the outside.

CHAPTER V.

COMPOUNDING AND DISPENSING OF PILLS.

THIS will give the compounder much more trouble than the simpler processes already described, owing to the complexity of the process through which the mass has to pass before the finished pills are in a proper condition to be presented to the patient, and partly also because he is often left completely to his own resources to unite in a pilular form ingredients unsuitable and without any cohesive property. Pills should be perfectly spherical, and should not be larger than can be readily swallowed without chewing ; each should not exceed 4 or 5 grains in weight, unless the ingredients are exceptionally heavy—as calomel,

bismuth, reduced iron, blue mass, &c.—when 8, 9, or even 12 grains may be with skill compounded in a fair-sized pill. On the other hand, as many as 5 grains of a light vegetable powder will be sure to make too bulky a pill, as the weight of the excipient or material added to give body must be taken into account. The choice of the excipient is often left to the



Fig. 10.

dispenser, and some experience is necessary to guide him in his selection. The most common are : gum or mucilage, soap, syrup, spirit, glycerin of tragacanth, or some soft extract, as gentian, inert in very small doses.

Mucilage, a commonly used excipient, is well adapted to make vegetable powders into pills, but, as a rule, its use should be restricted to pills that are soon to be consumed—otherwise they will get very hard and almost insoluble. For mineral powders it is not so suitable, as the pills made in this way are apt to flatten, or “fall.”

Tragacanth is a very good excipient ; in the form of the compound powder it is especially so when added to masses which are already too soft, as it gives body and elasticity ; but if used too freely, the pills retain the cylindrical form, and after a short time may lose all trace of rotundity. Tragacanth and water give good consistence to substances like nitrate of bismuth. (Upon page 40 Proctor's Paste is described).

Glucose first recommended by Mr. Lascheid is now used in the present British Pharmacopœia as an excipient for many of the official pill masses in the form of syrup of glucose.

Glucanth is the name given to an excipient consisting of $\frac{1}{2}$ oz. powdered tragacanth, $\frac{1}{2}$ oz. water, and 2 oz. syrup of glucose. Some authorities prefer, however, to make this excipient with $3\frac{1}{2}$ oz. pure glucose and add $1\frac{1}{2}$ oz. glycerin to the above quantities of tragacanth and water.

Honey and Treacle are used in preference to mucilage, as they make nearly as good a body, but with less risk of becoming hard.

Tincture of Gentian and Treacle, equal parts, make an excellent excipient, giving firmness and toughness, and ensuring solubility. It is particularly suitable for quinine.

Syrup is used for the same purpose when very little room is left for the excipient, but it makes crumbly masses with metallic salts.

Soap makes an excellent pill when added to resinous substances; it does not get hard, and is not apt to crumble, unless a substance like sulphate of iron be added.

Sawdust finely sifted has been highly recommended by Mr. Proctor, as an excipient to give toughness to soft masses; it imparts great retentiveness of shape, with little increase in size.

Spirit is used in working up resinous substances; it is, however, very difficult to work with, as there is great danger of adding too much, which causes the mass to "drop," and if too little be added no effect is produced at all.

Decoction of Aloes.—A very few drops of this liquid make a workable mass with aloes and gum resins. Care must be taken that the mass contains no substance which is incompatible with the carbonate of potassium in the decoction.

Kaolin is of great use in making a mass with substances which ordinary excipients decompose, as Pot. Permang., Argent. Nit., &c., and then adding a fat like lanoline. Kieselguhr is employed in the same way.

Liquorice and Marshmallow in powder give elasticity to soft masses.

Glycerin in very minute quantity occasionally assists dry crumbly masses; it is treacherously hygroscopic, but this difficulty is overcome by mixing with it $\frac{1}{3}$ of its bulk of water.

Glycerin, Mucilage of Acacia, Syrup, and Alcohol (90%), in equal parts, make a good all-round liquid excipient.

Wax melted or in shavings makes a beautiful mass with creosote, camphor, carbolic acid, and most essential oils; it, however, makes an indigestible pill, and is not to be recommended.

Water is a dangerous excipient to use except in cases where a powdered gum is present, as it forms a brittle pill liable to flatten. It is excellent for making powdered opium into a mass.

Bread-crumb for croton oil and carbolic acid, **Basilicon Ointment** for the scale preparations, **Confection of Roses** for vegetable powders, are deservedly little used now.

Calcium Phosphate is recommended in small quantities to give pilular consistence to greasy substances.

The dispenser will see that he has a long list of excipients, but a little experience will soon teach him that when he gets to *know* an excipient he can do almost anything with it; and most pill-makers have their favourite.

Proctor's Paste.—The writer, in recommending an excipient for *general purposes*, believes that none can be found equal to a paste made of—Powdered tragacanth, 1 dr.; glycerin, $3\frac{1}{2}$ drs.; water, 1 dr.

It improves by keeping. The inexperienced dispenser will be amazed how little of this substance will be sufficient to give consistency, toughness, and retentiveness to the most unpromising mass. The new B.P. glycerin of tragacanth may be used instead; it has almost the same composition.

The dispenser, having read over the prescription, and thought of the excipient which he will use, if such is not already directed by the physician, proceeds to weigh out the different ingredients, taking the substances that require pulverisation first; when all the dry ones are thoroughly mixed, the soft extracts are added, and the mass worked up in a mortar.

The proper mortar is figured at the beginning of this chapter. It is very shallow, there being one mortar or shallow depression generally in each end of it; it should be of unpolished wedgewood ware, and very thick, with a long, though small pestle—which is to be worked in a totally different way from any yet mentioned—the pestle being used as a lever, with the edge of the mortar next the operator as a fulcrum; and great force is necessarily applied, in order to squeeze the substance between the end of the pestle and the side of the mortar at each stroke, the mortar being firmly grasped by the left hand and turned round occasionally, so that all parts of the pill mass are exposed to the action of the pestle. By vigorous manipulation the heat produced by the friction so softens the mass that less excipient is necessary to produce a workable pill. It will thus be seen that the process is one of squeezing or kneading rather than pounding.

The student will do well to review at this place the different methods of using the mortar and pestle, as required for different results, and a little reflection will teach him more than a year's blind practice, for unless he has some idea of the scientific action of the machine, he can scarcely chance to wield the pestle efficiently or gracefully. It is used in at least four different ways:—1.—(As shown in Fig. 5.)—The pestle is grasped firmly, the wrist and elbow joints kept almost rigid, while the pestle is made to traverse the sides and bottom of the mortar, all the

motion being at the *shoulder* joint (circumduction). 2.—The pestle is grasped in the same way, the wrist and shoulder joints are fixed, while the fore-arm is raised and lowered alternately—as a gold-beater uses his mallet—all the motion being confined to the *elbow* joint (Fig. 5). 3.—The pestle is grasped like a pen, and with a light, quick, easy motion at the *wrist* it sweeps round the inside of the mortar (Fig. 6). 4.—The pestle is grasped by the fingers, the expanded end of the handle being firmly planted against the centre of the palm, its middle resting against the inside edge of the mortar, when the three previous movements are executed, and the pestle is driven slowly and forcibly against the opposite side of the mortar—the pill mass being between—here *shoulder*, *elbow*, and *wrist* are vigorously in motion (Fig. 10).

The ingredients being worked into a uniform stiff mass in the mortar, are to be scraped out, if necessary, with a small stiff spatula, and it is a good plan to work the mass for a few minutes between the fingers, in order to soften and toughen it. It is next rolled into a ball or cylinder with the finger and thumb, and transferred to the marble slab of the pill machine, on which may be dusted a little finely-powdered French chalk, starch, or lycopodium; the back of the handle of the machine is used to roll it into a long cylindrical form (the pipe), great care being required to prevent the cylinder tapering out thin at either end; a very light and quick motion backwards and forwards will prevent this—the handle being held perfectly horizontal as shown in the sketch (Fig. 11), and each hand bearing an equal weight on the mass as it is rolled backwards and forwards over the slab. It is brought from time to time alongside the scale, and when the number of pills into which it is to be divided corresponds with the number marked there, it is gently lifted or rolled with the fingers on to the grooved part of the machine; the handle, with its grooved

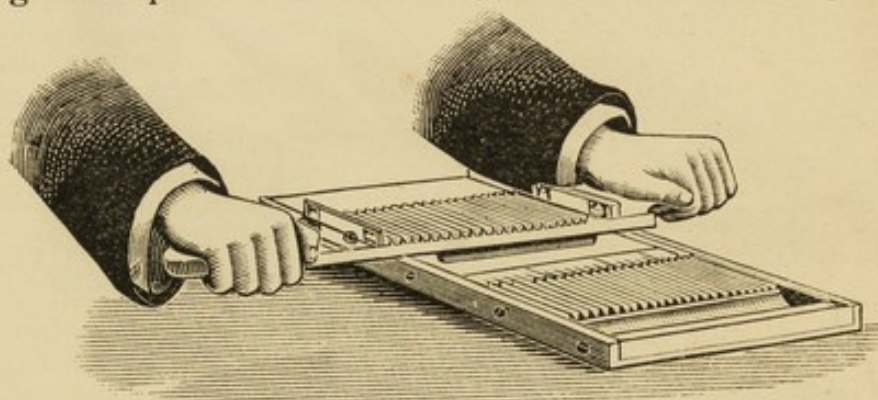


Fig. 11.

surface downwards, is laid on it, and by a series of rapid and short movements, with both hands, abruptly brought to a close by pushing the handle from the dispenser, at the same time

turning it on its own axis in his hands, the cylinder is cut and rounded into globular pills, which, with the last motion, are pushed into the box or tray at the end of the machine. If the operation is successful, and the mass of good consistence, no

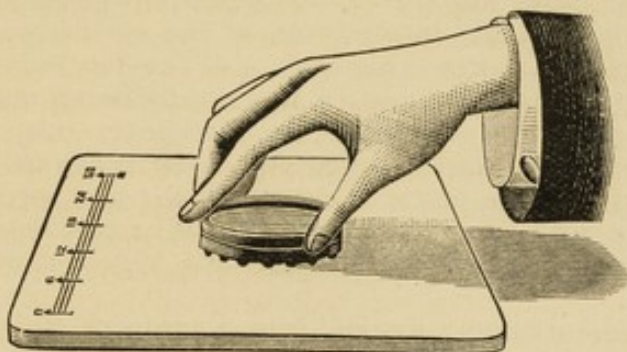


Fig. 12.

further handling will be necessary; but generally the track of the machine will be visible on each pill, and another process is required before the smooth globular form is perfect. The pills are again placed on the dusted slab, and covered with a pill-finisher—which is only a circular shallow boxwood tray, not so deep as the pills—and by a series of rapid rotatory movements the traces of the machine are dispelled, and a more spherical and polished appearance is given. (Fig. 12.)

If the pills are very soft this cannot be successfully done, but they must be rounded separately between the finger and thumb.

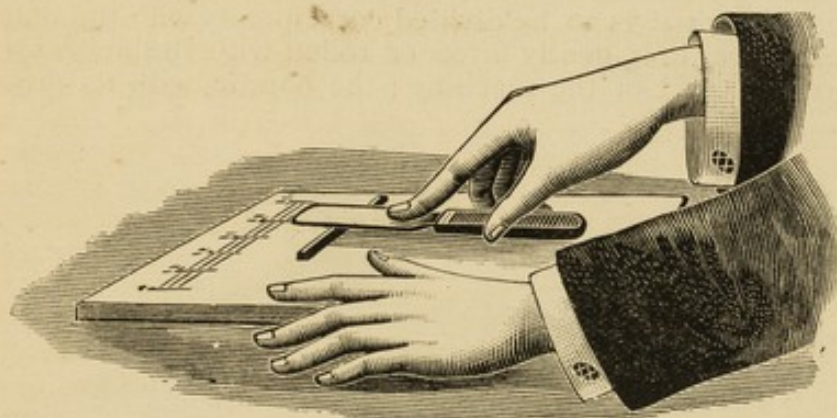


Fig. 13.

There is another and more convenient method of making pills in small quantities; it is by means of the graduated tile and a spatula. The ingredients are weighed and placed on the tile—which is of porcelain or wedgewood ware, with very little glaze on its surface.

With the square end of a stout spatula, technically called a spud, the mass is worked into a uniform consistence, and, after a little kneading with the fingers, it is rolled out between the blade of the knife and the dusted slab, brought to the scale and cut into pieces, which are rounded into pills between the thumb and next two fingers of each hand. Figure 13 shows the rolling out process. Or the mass may be made in the pill-mortar, and transferred to the tile, where it can be rolled out and cut.

By submitting the tile to a uniform heat—viz., by immersing in hot or boiling water and rapidly drying, hard masses which could not be otherwise brought into the pilular form, can be easily softened by kneading between the end of the spatula and the heated slab. In this way also small quantities of soft extracts can be dried or hardened by being spread out in a thin film on the *warm* slab, but great care is required lest the active principle of the extract be injured by the heat and exposure. Some pharmacists prefer a tile made of metal.

Machines are now made on the cylindrical roller principle, by which as many pills can be prepared in an hour as the old-fashioned machine could turn out in a week, but they are only useful where very large quantities are to be rolled out at once.

The pills having been prepared as described, should be left out to dry (unless urgently required), either on the slab of the pill machine, or in some dry and warm place, whilst the label is being written and the box prepared in which they are to be dispensed. The box should be large enough to hold them in a single layer, otherwise they will be liable to stick or become flattened. Pills containing volatile ingredients should be always dispensed in a bottle, of which there are many kinds manufactured for the purpose with wide mouths. If uncoated, some powder must be put into the box or bottle to prevent them adhering to each other or to the vessel, and different dispensers are in the habit of using different powders for the purpose. Chalk, lycopodium, flour, liquorice, &c., are used; powdered French chalk will probably be found to be the most elegant and efficient.

CHAPTER VI.

PILL MAKING.—*Continued.*

ALL first-class dispensers have discarded the old-fashioned powder, and now send out their pills with a smooth, firm, polished coating on them. Perhaps the most general coating is French chalk or talc, either alone or sweetened with sugar or saccharin. Sugar alone is also employed, but it requires more practice to be proficient in its use. Albumin is occasionally resorted to, and the same may be said of coating with silver leaf,

which was the favourite prior to the introduction of pearl coating, which is the name sometimes given to coating with chalk. Gold leaf is rarely used as a covering for pills. Gelatin is frequently employed, and often a physician orders keratin-coated pills. Yet another covering for pills is varnish composed of tolu, sandarach, or mastich (or a combination) dissolved in ether. This last process tends to render the pills insoluble, and is only here mentioned in order to be condemned.

Whatever the coating employed, the pills should be hard, else discolouration occurs either from saturation of the white coating with moisture from the coloured pill substance, or by reaction between the ingredients of the mass and the silver leaf.

Frequently, and this is especially so in extemporaneous pharmacy, pills cannot be kept in shallow trays to harden, and, as a consequence, the plan is sometimes adopted of giving a coat of varnish, and, as soon as that is dry, to proceed with the pearl or other coating. Such a practice is not to be advocated as it renders the pills insoluble.

Pearl Coating.—On the small scale as practised in extemporaneous pharmacy, splendid results can be obtained by the following process:—Having cut and rounded the pills, they should receive a covering of mucilage of tragacanth or of acacia (the former is preferable, producing a whiter coat); by transferring them to the palm of the left hand, a drop of the mucilage is placed on the ball of the thumb, and with one finger of the right hand the mucilage is applied to each pill. By this plan the quantity can be accurately gauged, whereas to pour the mucilage on to the pills the covering is not so likely to prove evenly distributed. Having received the coat of mucilage, they are thrown into some talc, which has been placed upon one compartment of the pill rounder (the other is kept perfectly clean). The rounder is then gently revolved in its own plane, care being taken to separate any pills which adhere to one another. By this means the coat is applied evenly over the pills. When they cease to take up chalk they are transferred to the clean portion of the rounder, where they are polished. The best method of doing this is to place over them a piece of glazed wrapping, or silvered paper, and with the finger tips placed over the paper the pills are rotated, and a brilliant polish is thus given to them, care being taken to keep the paper between the tips of the fingers and the pills during the process, and to use only light pressure. The polish will be permanent if time permits of the pills being allowed to dry in a tray for ten or twenty minutes, provided that sufficient moisture has not been present in the mass to discolour the coating. It is sometimes necessary to give a second coating, but practice will enable the pharmacist to judge of the consistence required to obtain desirable results, and of the amount of mucilage and chalk needed.

Instead of the above process, the pills may be moistened with mucilage in a shallow, flat-bottomed dish, and transferred to another dish containing talc, and the polishing carried out by finishing them on a polished slab with the rounder.

To give a more brilliant finish to pearl-coated pills, it has been suggested to very lightly roll them in a dish in which has been melted a small quantity of hard paraffin, and then allow them to dry. This, however, is scarcely advisable. The admixture of starch (1 dram.) with talc (1 oz.) gives a whiter coating than simple chalk, or the talc may be tinted by the addition of any harmless colouring agent.

In larger quantities other apparatus is generally employed. The pills are moistened with mucilage in a large covered pot, and then transferred to a "pill coater." The coater is used both to coat the pills and to polish them, or they may be polished on a slab with a rounder.

The process is the same if sugar or saccharin be mixed with the chalk.

It is hardly necessary to say that no loose powder should be put into the box or bottle in which coated pills are dispensed.

Sugar Coating requires practice before much success can be obtained. The *modus operandi* consists of moistening the pills thoroughly with syrup, or a mixture of syrup and mucilage, in a pill coater, carefully heating in a Bunsen flame, whilst the pills are constantly revolved, and powdered sugar added from time to time until a hard white coating results. Or if the pills be covered with a film of mucilage, syrup, or gelatin, and turned into a circular box containing finely-powdered sugar and starch in equal quantities, brisk circular movement for a few minutes is all that is necessary; the addition of a little finely-powdered tragacanth to the starch and sugar gives a more elegant finish. The process can only be successfully carried out when large quantities of pills are operated upon.

Silver Coating.—To properly coat pills with silver requires some neatness and care. The following directions, if followed, will give a successful result:—There should be no trace of powder about pills intended to be silvered. The silver leaf, as it lies flat in the book in which it is originally supplied by the manufacturer, is exposed, and each pill is rolled between the thumb and the next two fingers, which have been previously rubbed against a little mucilage dropped on the slab of the pill machine, and when a sticky layer is felt to be imparted to the pill, without being so abundant as to drop off or run, it is allowed to fall on the silver leaf, and another treated in the same way, until twelve or fifteen pills are dropped at equal distances apart on a single leaf.

The silver leaf with the pills on it is allowed to quickly slide off the book into a spherical, or egg-shaped, boxwood vessel, which

is to be shaken cautiously, the hand containing the box being turned round, making a circle in the air, for about one minute, so as to cause the pills to run round its inside, when an even and lustrous coating of metallic silver will be seen adhering to and completely covering each pill. Any loose fragments of leaf can be blown away, and after a short exposure to the air on the slab, the pills may be enclosed in the bottle or box in which they are to reach the patient.

Gold Coating.—Gold leaf may be applied in the same way as just described for silver coating. Pills containing blue mass in any considerable proportion should not be silvered, the mercury making an unsightly amalgam with the silver leaf. Asafetida, when coated, turns the silver black, and consequently gold should be used.

Gelatin Coating.—Various arrangements are made for rotating the pills after they have received their coating. The general process is briefly:—Each pill is impaled upon the point of a needle, and dipped into a solution of gelatin (one of gelatin with four of water liquefied by heat). It is rotated in the air for a few moments and set aside to harden. When the needle is withdrawn its mark is closed with a little fresh gelatin. By employing discs of cork, metal, &c., with numerous needle points, pills can be expeditiously coated in this way.

Keratin Coating.—Pills are coated with keratin, as originally recommended by Unna, when the physician desires that they shall pass through the stomach undissolved, so that their effect may be produced upon the intestine, in the alkaline secretions of which they will become disintegrated. Keratin is obtained from horn shavings by treatment with pepsin and acid, dissolving the residue in ammonia solution, and evaporating until the consistence of mucilage is reached. The resulting solution is that used for pill coating. Only oily excipients should be used in making the pills, and Martindale recommends that they get a thin coating of cacao butter first, and then three coats of keratin solution, each coat, of course, being allowed to dry before the next is applied, by shaking in a pot or dish with the necessary quantity of solution, after which they are placed on a slab to dry.

A **Bolus** is sometimes ordered in a prescription, as 10 grs. of quinine may be prescribed by the physician, with directions for the dispenser to make it into a "bolus," with honey, treacle, syrup, or any thick fluid. In England such a dose is sent out to the patient in one large, firm pill; but often in Ireland, and elsewhere, the pharmacist adds a sufficient quantity of the liquid substance to make a soft paste, like a confection or linctus, which he encloses in a piece of waxed or oiled paper, folded like a powder, with directions that it is to be scraped off with a spoon, and bolted or swallowed like jam. It is at the best an inelegant

and often disgusting form of administering medicine. The ordinary wafer papers, sold in circular boxes, afford an easy, elegant, and inviting method to the patient, whereby he can swallow the most nauseous powders, pills, or boluses, without tasting them. The wafers are composed of flour and water, which become limp when wetted, and they can be readily wrapped around the nauseous morsel and swallowed as easily as a spoonful of pudding (see under Cachet Making). Empty firm gelatin capsules are now procurable, which may be used for the administration of substances not easily convertible into pills or tablets.

The student will often be puzzled in compounding pills, especially as no rules can be laid down for his guidance in selecting an excipient for every case. The following are a few of the difficulties, and their solutions, which he may meet:—

Strychnine or other powerful alkaloid is ordered in minute quantity, say $\frac{1}{32}$ grain. It should be rubbed up with a little sugar of milk crystals to fine powder, and after the addition of about $\frac{1}{4}$ gr. of liquorice powder, Proctor's paste, extract of gentian or mucilage, will make a mass. The dispenser should have a rule of *making the gross weight of such pills up to one grain each.*

Aloes in any quantity in a mass is best made up on a heated slab with proof spirit or decoction of aloes in *minute* quantity.

Butyl-Chloral Hydrate should not be treated with the tragacanth paste, which dissolves it and causes the pills to flatten. It is best worked up with a little confection of hips and thick mucilage.

Croton Oil makes a good mass with powdered liquorice and mucilage or with bread crumb.

Camphor must be powdered with a few drops of spirit, and Proctor's paste added *after the spirit evaporates.*

Carbolic Acid may be easily made into a mass with $1\frac{1}{2}$ grs. wheaten flour to 2 grs. of the crystallised acid, or with bread crumb, or with powdered marshmallow or elm bark, to which a trace of Proctor's paste is added.

Creosote is made into a mass by Martindale by adding animal soap, and heating on a water bath. Powdered liquorice, to which a few atoms of beeswax are added, affords a plastic workable mass. If prescribed in a pill with oxide of silver, creosote will explode unless the oxide be first diluted by trituration with some inert powder like liquorice or gentian.

Copaiba can be made into firm pills with a little carbonate of magnesium. They soon become insoluble. Phosphate of Calcium makes a better excipient.

Citrate of Iron and Quinine can be best quickly worked up with the smallest possible quantity of spirit and water, mixed in equal proportions.

Calcium Sulphide should be mixed with an equal quantity of sugar of milk, and, after careful trituration, as much powdered decorticated liquorice root added as will make the weight up to, say, a grain. The mass can now be worked easily with a little tragacanth paste. Sugar of milk makes the best powder to aid the sub-division of an active substance, and the powdered decorticated root of liquorice is the best inert powder for making up pill masses, as it is so fine that it does not make a crumbly pill.

Extracts, when ordered without any powdered or dry substances, can be made into pills with gentian or liquorice powder.

Gallic Acid 5 grs. (in fine powder) and glycerin $\frac{1}{2}$ drop make a good pill.

Iodide of Potassium should be rubbed up with a few drops of water into a smooth paste, and made into a mass with a little liquorice powder; 6 grs. may thus be got into a fair-sized pill. The proportions of liquorice and water will depend upon the sample of iodide, as this salt varies much in its suitability for making pill masses.

Phosphorus should be dissolved in bisulphide of carbon, and whilst solution is being effected two or three drops of chloroform may be added, which produce a heavy vapour around the solution and prevent oxidation of the phosphorus by the atmospheric oxygen. A little liquorice powder is now added, and the mass quickly made into a workable form with Proctor's paste, divided into pills and coated. Phosphorus is made into a pill by some pharmacists by melting it in cacao butter or mutton suet, and, when cold, beating it into a plastic mass, to which a little powdered liquorice may be added.

Quinine 8 parts, tartaric acid 1 part, with q.s. of Proctor's paste, make a mass much less liable to crumble and of less bulk than if the acid be omitted. They soon become insoluble.

Rhubarb Powder makes an elegant mass with $\frac{1}{4}$ th its weight of glycerin.

Tannic Acid can be manipulated with $\frac{1}{4}$ th its weight of glycerin and about $\frac{1}{10}$ th part of mucilage.

Permanganate of Potassium, in a pill, requires much care at the hands of the dispenser, as it yields oxygen in contact with organic matter; it may be finely powdered and made into a mass with cacao butter and a little soft paraffin. Resin ointment makes also a good mass. Martindale advocates an excipient of soft paraffin, hard paraffin, and kaolin, whilst Proctor only uses kaolin and a little water.

Where the dispenser has the choice of an excipient in pills which are not to receive a coating of any kind, he should select an excipient which will not alter materially the colour of the mass; thus quinine, bismuth, camphor, and all white substances should be made into a white mass when practicable.

CHAPTER VII.

THE COMPOUNDING AND DISPENSING OF OINTMENTS.

THE making of an ointment is generally a very simple matter, only requiring perseverance and painstaking, which always repay the dispenser. It is often a matter of simple trituration; and a pestle and mortar, with a spatula, are all the implements required. Rarely, if ever, will the extemporaneous ointments prescribed by the physician require any melting.

If two ointments, or an ointment and a liquid or oil, are ordered to be mixed, the simplest method of procedure is to weigh and measure the ingredients out on a porcelain slab, and thoroughly blend them with a long spatula. This will answer in many instances, but the dispenser is cautioned against making extracts, powders, or gritty substances into an ointment in this way.

In such cases the substance to be incorporated with the fatty or oily basis is put into a mortar and ground with some minute quantity of excipient to the finest conceivable state of subdivision, and by far the best excipient ever devised is a little of the old-fashioned "elbow-grease." The pestle should be worked, as shown in Fig. 5, and the mortar should be capable of holding very many times more of the ointment than is about to be made. When the powder, or extract, or crystal is put into it, it is subjected to firm powdering or rubbing. A very little of the fatty basis is added, and trituration continued till a smooth, impalpable paste is obtained; then the remainder of the basis is added gradually, sweeping the sides of the mortar and pestle from time to time with a spatula, so that all is thoroughly mixed. Often, however, it will be necessary to add something to facilitate the grinding before adding the ointment: thus, if camphor is ordered, it must be rubbed very fine by the aid of a little spirit which evaporates during the mixing. If an extract is to be added to an ointment it is first put into the mortar and rubbed to absolute smoothness with a little spirit, water, or glycerin, before adding the unctuous basis. If the extract is hard, or even of pilular consistence, the best plan is to previously warm the mortar by pouring hot water into it, or by lighting a small quantity of methylated spirit which has been placed in it, and drying quickly with a cloth, when the extract can be rubbed to smoothness before a little of the basis is added. Soluble crystals, like iodide of potassium or carbonate of potassium or sodium, are trituated with a little water before adding the remaining ingredients. Iodine should be rubbed to powder, a few drops of spirit added, and the trituration continued. Iodide of sulphur should be most perseveringly rubbed down

with a little olive oil, borax with a little glycerin, and red precipitate with distilled water.

Volatile liquids should be added after the other ingredients are well mixed, so that evaporation is reduced to a minimum, as in the case of Prussic acid and chloroform.

Steel knives should not be used in the preparation of ointments with the alkaloids, or with acids, or especially with the acid nitrate of mercury, red precipitate, or yellow oxide of mercury ointments, which are ruined by the touch of iron. Many fine and pearly compounds made with cold cream are well prepared by mixing them up in a china cup with a silver or gilded spoon, and it is a safe rule for the young dispenser to use a bone or boxwood knife in making all ointments.

This is not intended as a complete list of the difficulties and their remedies in ointment making; but the writer has deemed it wise to enter more fully into the subject than its simplicity might apparently warrant, for just because the preparation of this class of compounds appears to be very easy, so are they often carelessly compounded, to the vexation of the physician and the annoyance of the patient. It is not at all an uncommon thing to see sores irritated and eyes inflamed by the very remedies prescribed to soothe them, the coarse angular particles acting like so many little setons. It is hardly necessary to say that any ointment with the least trace of rancidity should not be compounded by the dispenser.

When the mixing has been finished the ointment is scraped out of the mortar with a bone or wooden spatula, or horn ointment scraper, and generally dispensed in covered porcelain pots, and unless of very firm consistence, a piece of waxed paper should be inserted between the ointment and the lid, and pared neatly round. If it is at all approaching the fluid state a wide-mouthed bottle will be the best vessel. Occasionally, for the poor and in hospital, the common chip box is used.

CHAPTER VIII.

COMPOUNDING OF SUPPOSITORIES, PESSARIES, AND BOUGIES.

SUPPOSITORIES are seldom prescribed except in the Pharmacopœial form; but, as even these should be prepared by the dispenser himself, a passing notice may be made of their preparation. They are generally made in conical moulds, should weigh about 15 grains each, having cacao butter for their basis, and such other firmer substance, to enable them to solidify rapidly after being poured into the moulds; this latter *desideratum* is assisted by having the moulds made of a massive block of gun-metal, which causes their rapid cooling (Fig. 14). The ingredients should be treated as if an ointment was to be

made ; any powder or crystalline substance being rubbed to fineness with a little lard or a trace of the butter in a mortar or on a slab, whilst the remainder of it is being melted in a small cup on a water bath with the wax ; only enough heat must be used as will barely melt them, and when they begin to show signs of congealing the triturated ingredients may be added with a vulcanite or bone knife, and stirred constantly till a creamy mass is obtained, which is to be poured into the moulds. If the moulds are previously dipped in ice water, or in a little freezing mixture, made by dissolving sal ammoniac in water, the subsequent detachment of the congealed substance will be expedited. This latter part often gives trouble, the suppositories persistently adhering to the mould ; various plans are tried, and

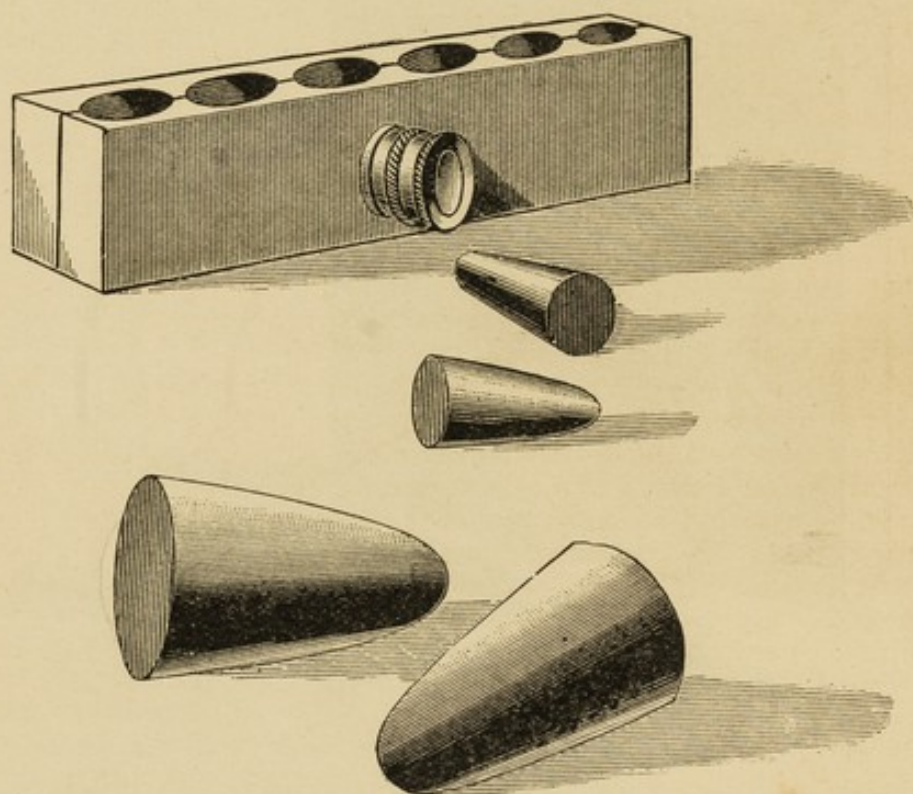


Fig. 14.

the simplest would be to wet the interior of the mould with water, but water will generally run off it in drops ; breathing into it often answers, or dusting over the surface with lycopodium and blowing out the excess ; but by far the best method is to smear over the interior with soap liniment. Spermaceti will be found a more satisfactory addition to the cacao butter than wax, as, owing to the rapidity of its congealing, the mass is not so liable to adhere ; oil applied to the interior of the moulds is liable to cause the suppositories to stick fast.

In the case of alkaloidal salts and watery extracts a more suitable basis than cacao butter will be found in the following Gelatin Basis:—1 oz. pure gelatin should be rapidly washed in a little cold water and left to soak for about one hour in 3 oz. water; glycerin 3 oz. by weight is then added and the mixture thoroughly incorporated on a water bath till the weight is reduced to 5 oz. The melted mass, after being skimmed, is then poured into a wide-mouthed stoppered bottle, and when cold covered with a layer of alcohol. The basis when required is melted with the alkaloid or extract in a small

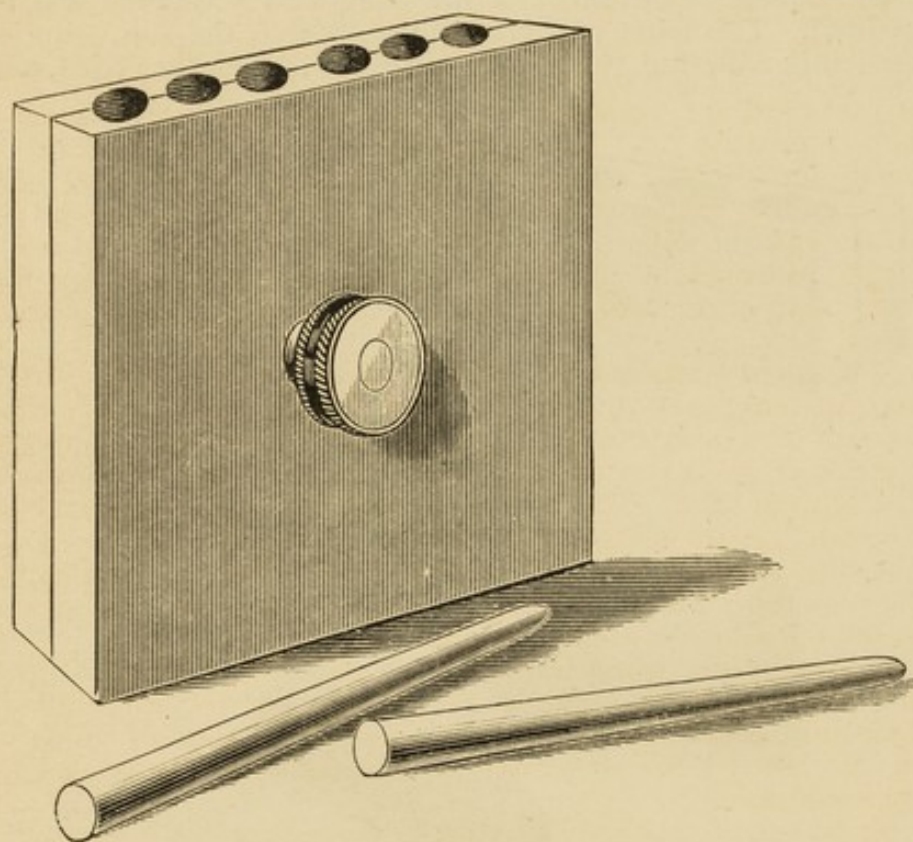


Fig. 15.

evaporating dish and poured into moulds previously greased with a little oil. The same plan may be employed in making the next class of preparation. Extract of Ergot, Cocaine, and Hazeline make elegant masses with such a basis. The relative proportions of glycerin, water, and gelatin may be varied to suit the amount of aqueous medicament. The official glycerin suppositories contain 70 per cent. glycerin.

Pessaries and suppositories, containing Green Extracts, may be readily made by first rubbing the extract with a few drops of warm water till of a creamy consistence, adding $\frac{1}{3}$ the oil of

theobroma, rubbing again till smooth, and adding the mixture to the remaining $\frac{2}{3}$ of the oil heated ; after thorough incorporation, and further heating if necessary, the mass may be poured into moulds.

Pessaries are made in precisely the same way, only they are from three to eight times larger (Fig. 14), generally weighing about one drachm, and made in larger moulds of a similar shape. If a very small pessary is ordered, it may be made as two suppositories fused at their bases, forming a double cone, and this shape answers well when it has to be moulded by the fingers.

Bougies are also made like suppositories, but they differ in shape, being long and thin (not conical) as is shown in Figure 15. They can be made in a mould, but great care has to be exercised, for, on account of the small bore of the mould, the melted mixture may become plugged in its transit down the canal, and thereby be spoilt. The material must consequently be more thoroughly liquefied before pouring into the mould than in the case of suppositories and pessaries, or the metal may be slightly warmed by immersion in warm water to prevent rapid congealing of the mixture whilst being poured down the narrow canal.

A mode of operation has been advocated as most successful in making bougies :—A long glass tube is obtained, having a bore the size of a bougie (about $\frac{3}{16}$ th of an inch in diameter), and also a piece of glass rod of equal length which can just be passed through the tube. The tube is slightly warmed if necessary, and the melted mass is sucked up into it. When it has set completely it is carefully pushed out by means of the glass rod, and cut into the required number of bougies of equal lengths. One end can be moulded by the fingers to a blunt point.

Suppositories, pessaries, and bougies should be dispensed in cardboard boxes, with cotton wool ; and the directions for their use should be plainly given by the physician, or written on the box by the dispenser, as sometimes in ignorance they are swallowed.

Should they contain any volatile ingredient, each ought to be wrapped either in tinfoil or in waxed paper.

CHAPTER IX.

DISPENSING OF BLISTERS AND PLASTERS.

BLISTERS are generally spread upon adhesive plaster. In the case of public charitable institutions, they may be spread upon brown paper ; but, unless directed otherwise, they should always be put upon the adhesive plaster, which is itself spread upon thin glazed calico, and sold in sheets of a yard each. The twilled

calico, swansdown, and other fabrics, as a rule, are not so suitable. The dispenser takes the size of the required blister, which is commonly oval or square, and prepares a "shape" by

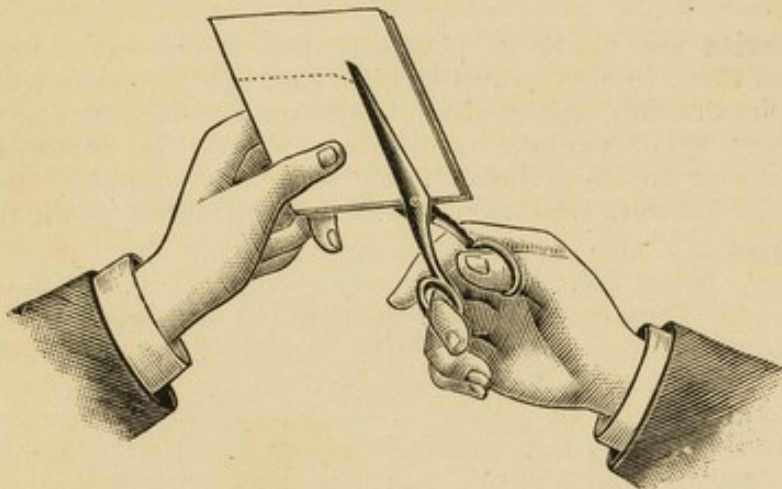


Fig. 16.

folding a square piece of waste writing or wrapping paper twice upon itself, and with a pair of scissors he cuts the form and size of the blister out of the middle of this, rejecting the cut out centre (Fig. 16).

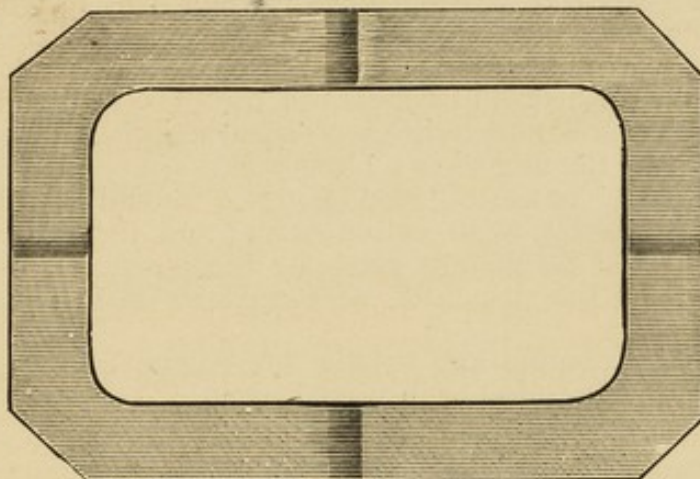


Fig. 17.

He has now an exact shape (Fig. 17), the inner margin or edge of which is the same size and form as the circumference of the required blister. (This is precisely the same manner in which plaster shapes are made.) A piece of the thin sheet of adhesive plaster is cut about one inch larger than the blister, and may be gently warmed, only enough heat being used to make it *slightly* sticky; it is then quickly laid upon some firm smooth surface,

and the shape pressed upon the adhesive side—where it should evenly adhere, but only to such a degree that it readily separates when pulled off. All is now ready for the spreading process, which should be accomplished by the thumb alone. The cantharides plaster of the Pharmacopœia is well adapted for this. A piece about the size required is kneaded between the fingers until *uniformly* softened throughout, when the dispenser, steadying the shape and plaster with the fingers of the left hand, spreads a piece about the size of a bean with the side and front of the last joint of the right thumb, beginning at the corner next him, and continuing in a series of rainbow strokes till the plaster is covered (Fig. 18).

A long spatula, not unlike a dinner-knife, warmed so slightly that its temperature can be borne by the skin when pressed

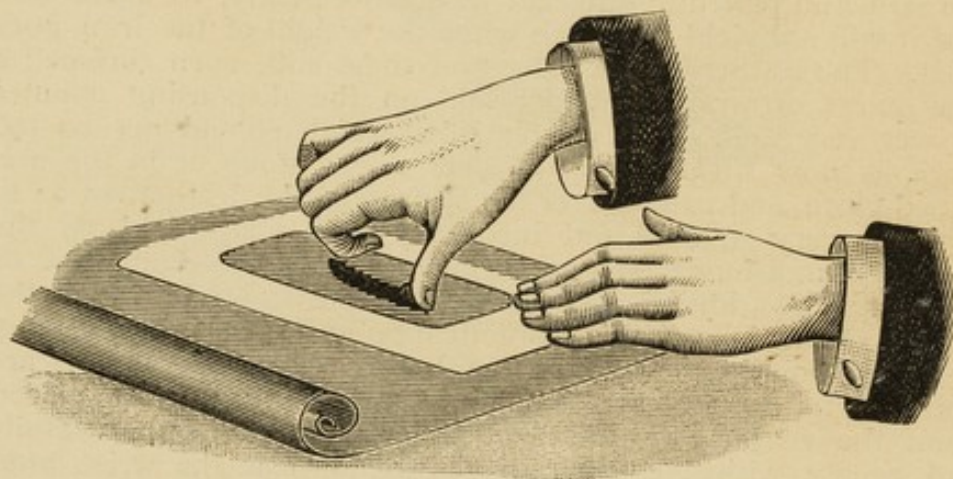


Fig. 18.

against the cheek, should now be firmly passed over the blister, removing superfluous plaster, and making its surface smooth and even. Some dispensers previously sprinkle a few drops of blistering liquid, or olive oil, over it to improve its appearance, but this is not necessary. The paper shape is now peeled off the plaster, and the edges trimmed neatly with a *large* pair of scissors, allowing a margin of plaster about three-eighths of an inch wide to remain; a piece of waxed or oiled paper is laid on its surface, and the whole enclosed in a paper box or envelope. The dispenser or physician should be careful to direct that this paper be removed before application, as blisters and plasters have sometimes been rejected as useless, the paper never having been removed. Instead of cutting the piece of plaster for the blister off the roll, the experienced spreader may lay the shape on the roll itself, thus saving the clippings, as shown in the Figure.

Plasters are more difficult to spread, since they require heat, and they are often liable to be burned, creased, or uneven; and the dispenser who can spread a plaster properly will be always found to be one who can perform every other duty of the art of compounding satisfactorily; hence it may be looked upon as the test of pharmaceutical accomplishment to be able to perform this operation neatly and excellently. Plasters are generally spread upon sheep-skin or stiff chamois, and sometimes over adhesive plaster which has been already spread upon linen, dimity, or moleskin; but when the physician orders a plaster without specifying the fabric upon which it is to be spread, he means it to be dispensed on the white sheep-skin which is kept by every dispenser. The same steps are gone through exactly in cutting the shape as if for making a blister; a piece of leather somewhat larger than the size of the intended plaster is cut off the skin, and pulled in different directions gently, to make sure that it will not yield too much when the weight of the iron goes on it. The leather is next placed on some soft, even surface; a few quires of wrapping-paper laid on the dispensing counter answer very well. The plaster iron, which should not be too large, is now *slightly* warmed over a gas stove or in the fire, wiped clean, and passed over the surface of the leather, so as to remove every wrinkle and inequality; the shape laid on the counter is moistened on one surface with a little damp tow or sponge. The addition of some soap to the water in which the sponge or tow is wetted is a practical point worth remembering, or a little flour paste may be employed. (Excellent results are obtained by dipping the shape into water.) It is now placed upon the *rough* side of the leather, and pressed carefully and evenly with the palm of the hand near the wrist, until it adheres at every point to the leather, when all is ready for spreading.

Some dispensers, especially those who have not much experience in plaster spreading, fasten the skin to a piece of board by means of a small tack at each corner so as to keep it thoroughly stretched, but yet capable of being moved about into any position during the spreading process.

The different plasters are kept in cylindrical rolls, and are melted as required, by means of the plaster iron, on the heating of which the success of the operation depends; it should be warm enough to readily melt the plaster, without spoiling the leather; its heat may be judged by pressing it against a clipping from the sheep-skin, which will become brown and curl up if the iron be too hot.

When the plaster iron is over-heated, a film forms on its surface, and often small particles of carbon adhere to it, which, coming off during the spreading, spoil the appearance of the plaster. To guard against this, the iron, after coming out of the fire, should be briskly rubbed against some soft solid

substance, as a piece of wood or coarse cloth. Irons are now made which can be heated by allowing gas jets to burn in their interior, and thus there is no limit to the amount of work which one iron can accomplish without interrupting the operation.

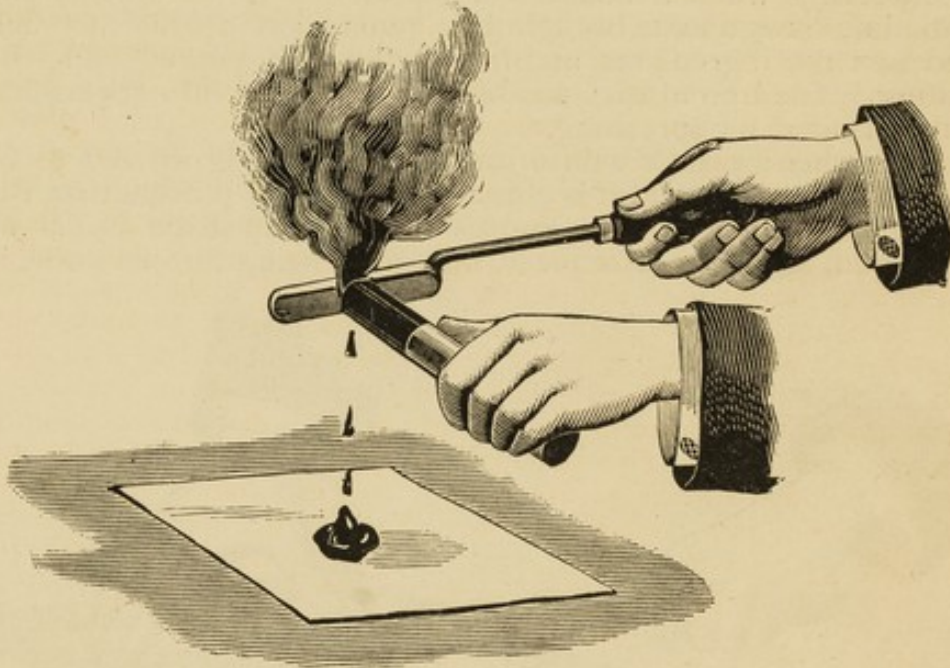


Fig. 19.

The iron then being heated to the right degree, its flat face is pressed with a slight circular movement against the end of the roll of plaster, and the liquid plaster which drops down is caught upon a piece of strong, smooth brown paper, as shown in Figure 19. If two or more varieties of plaster are ordered in combination, it is at this stage that they are melted together against the *face* of the iron, and mixed with its sharp *edge* on the paper; and, when a thoroughly uniform creamy mass is obtained, it is scraped along the surface of the paper to near its margin. The leather, with the shape attached, is now brought alongside, when a few strokes with the near edge and adjoining part of the face of the iron will spread the plaster over the surface of the leather, beginning at the edge next the operator, and sweeping round the far margin in a series of half ovals, watching the borders and corners, "for the centre will take care of itself." (Fig. 20.) Towards the end, when the leather is covered, the flat face of the iron may be used to smooth all irregularities, and, after a moment's delay, during which the plaster hardens, the shape may be pulled off, and the borders of the leather trimmed; in a medium-sized plaster at least three-quarters of an inch of border should be left. One iron will not do all this; and, before

beginning, two should be selected ; the second may come into use about the time the plaster is being transferred from the paper to the leather. If the plaster were melted directly on to the leather, as some advise, a mess would probably be the result.

Especially when a mixture of plasters is to be spread, one sometimes sees a ladle brought into requisition in which to melt and mix the ingredients, and from which it is poured on to the leather. The iron in such a case does not come into requisition until required for spreading.

Sometimes a plaster with an *adhesive* margin is ordered to be spread on leather, and it is a more troublesome process than the above. It may be done in this way :—The shape is cut as described, and the centre piece, instead of being thrown aside, is

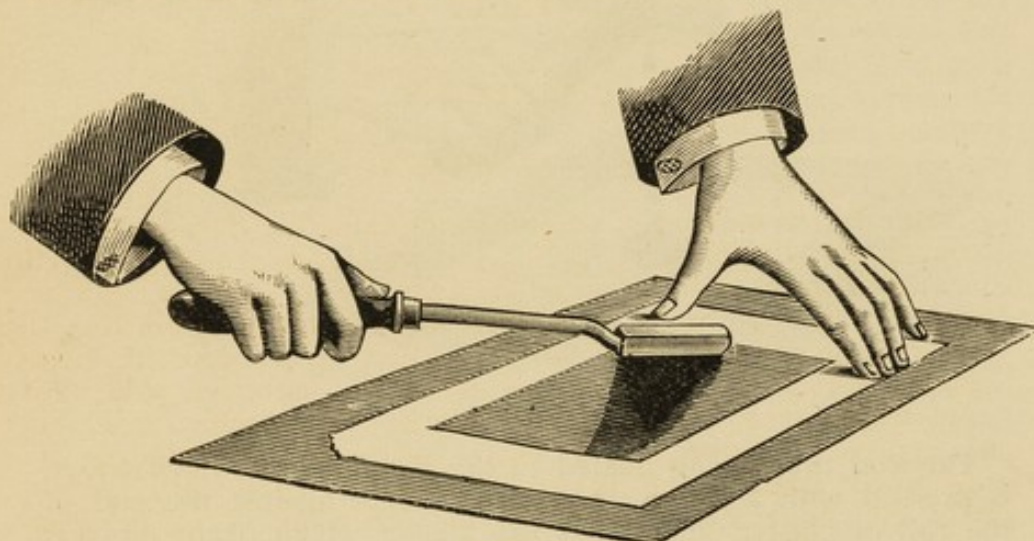


Fig. 20.

damped, and pressed against the middle of the leather ; the shape is taken, folded up again, and a piece cut out of it for the entire extent of its inner margin—thus enlarging it by the width of the intended adhesive margin ; it is then stuck to the leather, leaving a space between the inner margin and the central piece of paper, which space is to be spread over with adhesive plaster, both papers pulled off, and the vacant central part covered over with the plaster as ordered, the edge trimmed, the surface loosely covered with a piece of waxed paper, and dispensed in a flat paper box. The dispenser, until he has acquired great practice at spreading plasters, will be unable to finish the inside space without a shape ; and he may achieve all that is required in this way :—The leather to be covered with plaster is laid down flat as before, and, with one good circular sweep of a large iron, its circumference is surrounded with a margin of adhesive or resin plaster ; when this is cold, the shape, cut as before to the exact

size of the plaster required, is laid down on the leather and attached, by means of a little soft soap, to the adhesive marginal surface. The plaster, having been mixed as previously directed, on a separate bit of paper, is rapidly spread, as if there were no adhesive margin in the case, the shape is now torn off and the adhesive border trimmed. The student will observe that if these directions are followed he will have no plain margin outside the adhesive one, and seldom is such deemed necessary, so that this latter method is, on the whole, the better one for him to learn.

The great improvements made in plaster spreading by manufacturing chemists threaten to make this process a lost art in the hands of the ordinary dispenser.

CHAPTER X.

CACHET MAKING.

A MORE recent method of administering remedies than any of the foregoing is the form of Cachets, in which drugs are given in a powdered state, enclosed in a thin wafer paper cell. These are made of different sizes, which will hold from a grain, or less, to 20 or 25 grains. For the administration of nauseous or bitter substances, such as quinine, it is a very effective plan, and commends itself highly to physicians. The cachet machine, as figured, is made up of several pieces. The body of the machine is composed of three plates on hinges (*a*, *b*, and *c*), which, with the funnel (*d*), thimble (*e*), and felt roller (*f*) for moistening the rims of the cachets, complete the apparatus. There are six sizes of cachets, which vary in depth and diameter, three different diameters being employed.

To describe cachet making, we will suppose a dozen containing 5 grains of quinine in each are ordered. The size numbered $o\frac{1}{2}$ is most suitable, and 2 dozens of the "cachet-leaves" are taken, half being put into holes in plate *c*, and the others into the corresponding *depressions* in plate *a*, the middle plate. Plate *b* is now hinged over to cover plate *a*. The funnel in being placed in position rests on the edge of the hole in plate *b* so as to avoid pressing upon the cachet, and also to allow sufficient elevation of the powder when pressed in to fill the upper "cachet-leaf," when it is ultimately brought to cover it. Five grains of quinine are weighed, powdered, and placed in the funnel, and with the thimble (*e*) upon the index finger the drug is pressed lightly downwards into the "cachet-leaf." The end of the thimble is concave, so that the surface of the contents is convex. This

process is repeated until the dozen are finished. Plate *b* is now hinged off, and the filled half cachets or "cachet-leaves" are ready to receive the others to complete the process. This next step is the

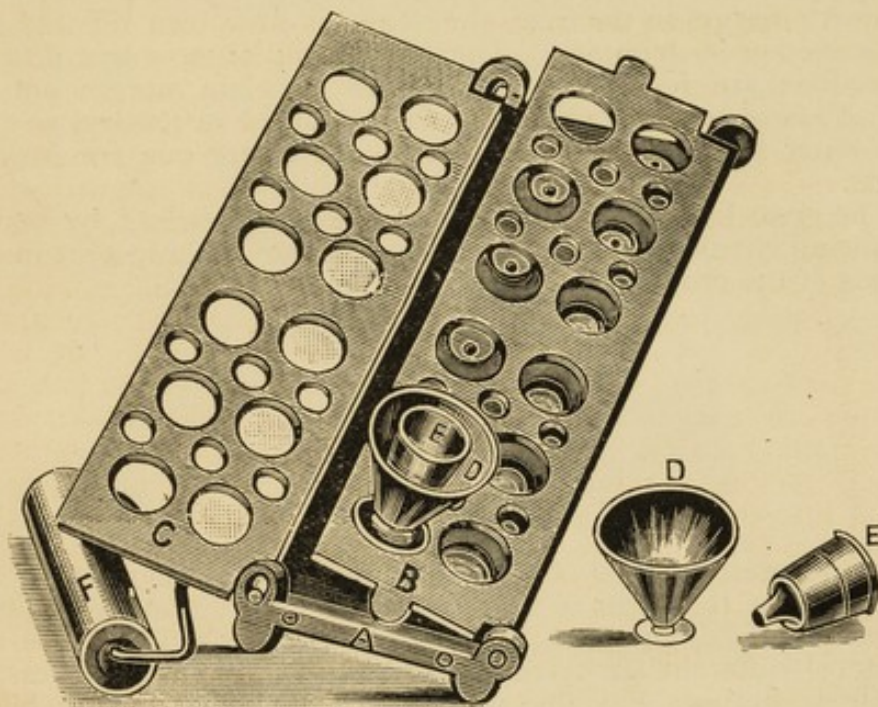


Fig. 21.

one which requires most skill, for the application of moisture to the rims is important. Neither too much nor too little should be applied. If too much, the rims are likely to be damaged; if too little, they gape. To moisten the rims the roller (*f*) is dampened by passing it over wet spongio-piline, and then it is rolled over the rims of the half cachets in plate *c*, which is then hinged over and pressed upon plate *a*. The finished cachets are gently removed from the circles in plate *c*, and are dispensed in boxes.



Fig. 22.

Cachets can be obtained having much the shape of a spoon with a broad, short handle. When the drug is placed in the bowl of the "spoon," the handle is bent over and encloses it.

Fig. 22 shows a cachet-leaf and two finished cachets.

CHAPTER XI.

GENERAL HINTS TO THE DISPENSER.

IN our limited space we can only give a very few additional hints to the student of pharmacy upon such matters as do not naturally fall under the previous chapters. It is hardly necessary here to remind him that upon his simplest manipulations hangs the life of the patient, and though this solemn sense of his responsibility should be ever before his mind, it should not be allowed to paralyse his exertions, or tend to render him "unpractical." Overconfidence is a fruitful source of mistakes in pharmacy, as it is in other departments, and the pharmacist must be cautioned against falling into the habit of working mechanically or automatically, so common amongst the absent-minded. It is a frequent occurrence, for example, to see a dispenser walk in an automatic way up to a well remembered place where a bottle has always stood, lift it from its shelf, and pour out its contents without looking at the label. If the student should find himself falling into this habit, his remedy is to occasionally remove the bottles and occupy their places with others unmistakeably different in shape and size.

Artificial Waters should not be employed, as they are wanting in the fragrance of the distilled preparations.

Solutions—As quickness and despatch are generally considerations in pharmacy, it is advisable to keep some of the more frequently prescribed salts in solution; and a few hints as to the most convenient strengths of these solutions may not be out of place here.

Alum, $2\frac{1}{2}$ ozs. (Troy) dissolve in 1 quart of distilled water, and each ounce of the solution represents half a drachm of the salt.

Potassium Bicarbonate, 1 ounce (Troy), dissolved in enough distilled water to measure 4 ounces, makes a very suitable stock solution, as half an ounce of it contains one drachm or 60 grs. of the salt.

Potassium Chlorate, 1 in 24, made in the same way, is the best strength to suit all variations of temperature. The salt is soluble in a smaller quantity of water, but is apt to crystallise with changes of temperature.

Epsom Salt, 1 in 2; **Potassium Bromide**, 1 in 3; and **Chloral Hydrate**, 1 in 1, make very convenient solutions, the latter particularly so; each minim represents one grain of chloral, and it is easily calculated, but is liable to decomposition.

Official Pill Masses.—Some of the official pill masses become very hard on keeping, and get so brittle as to be unmanageable; they may, with great advantage, be kept in the dry state, the powdered ingredients being mixed together, so that the menstruum

ordered in the Pharmacopœia to give consistence may be added at the time of dispensing. In this way Pil. Colocynth. Co., Pil. Aloes Barb., and Socot., Pil. Aloes et Ferri, and Pil. Hyd. Subchlor. Co. may be kept with the required proportions of the requisite menstruum marked on the bottles in which they are contained. This plan is often a great help if the physician happens to order too soft a mass.

Syrup. Ferri Iodidi for dispensing may be kept in the form of the liquor without decomposition or discolouration if a minute quantity of hypophosphorous acid be present to prevent oxidation. It can be made exactly to correspond with the official syrup by adding the requisite amount of sugar.

Mistura Ferri Co. can also be kept in a concentrated form, so that every drachm will contain the constituents of an ounce of the mixture, except the ferrous sulphate, which is to be weighed out and added with the remainder of the vehicle the last thing before dispensing.

Mistura Ammoniaci may be kept in concentrated form so that 1 drachm of the liquid will represent 1 oz. of the official mixture.

Mist. Cretæ can be easily kept in powder, ready for the addition of cinnamon water.

Concentrated Infusions and Decoctions, so often employed by pharmacists for convenience, are to be condemned. *These preparations should always be made fresh as required.* The new departure of encumbering the B.P. with these costly preparations is to be deplored.

Substitution.—It cannot be too strongly impressed upon the student's mind that substitution should never be practised. By substitution is meant the using of an equivalent quantity of one preparation of a drug for that of another; say for instance, infusion of cinchona is required, it would be absolutely wrong to use an equivalent quantity of the liquid extract, as it is more than probable that this latter preparation does not contain the full quantity of total alkaloids and extractives that an equivalent quantity of bark in the infusion does. The student of pharmacy never should depart from the strict observance of the Pharmacopœia.

Unofficial Nomenclature.—Often the dispenser will be at a loss to understand the meaning of the prescriber, when he orders some preparations out of their official names, and he then must have a consultation, or fall back upon the experience of himself or others. A few examples may be given:—When Magnes. Calc. is ordered, Magnesia Ponderosa B.P. should be used; when Magnes. Carb., the *heavy* preparation is usually intended; when Bismuth., or Bismuth. Alb., is prescribed, the subnitrate is the preparation generally in the mind of the physician; when Æther.

Chlor. is ordered, it is best not to dispense "chloric ether," but Spirit of Chloroform B.P.

Liq. Morphiae is very often written in a prescription, and the dispenser will do well to employ Liq. Morph. Hydrochlor. When Extract. Aloes is written, the rule was to use the Socotrine, but now that the Pharmacopœia recognises only Extract of Barbados Aloes it should be dispensed.

Much confusion unfortunately exists in the memory of some prescribers about the mercurial chlorides, and fatal consequences have resulted. The Subchloride is often written Hyd. Chlor., Hyd. Mur., Hyd. Submur., and the Perchloride is occasionally prescribed as Hyd. Chlor., or Hyd. Bichlor.

If the dispenser find it impossible to consult the physician in such cases, he will not regret giving the Subchloride, if more than $\frac{1}{8}$ grain is ordered in each dose.

It will be well to remember that Hydrate of Chloral is sometimes carelessly written Hyd. Chlor.

Loose or Dry Ingredients.—Roots, crystalline salts, leaves or seeds, when prescribed in the crude state by the physician, should be cut, chopped or bruised so as to alter their physical characters and prevent their being easily recognised by the patient.

Incompatibility.—When the pharmacist gets a prescription where incompatible substances are ordered it is clearly his duty to compound it, unless *absolutely* incompatible, in which case the different ingredients will not mix, and, if possible, then he should consult the prescriber. Instances of such might be given to fill a large volume, and, unfortunately, no rule can be laid down for the guidance of the young dispenser, as it is still an open question with pharmaceutical authorities whether a compounder is justified in altering a prescription, suppose he find the emulsifier or pill excipient ordered by a medical man unsuitable. Much will depend upon his knowledge of the prescriber; if he is satisfied that the incompatibility was known to him, it is clearly his best rule to follow the written law of the prescription, and carry out rigidly the intention of the prescriber. But if upon the other hand, the chemical action (inevitable upon the mixing of the ingredients) was *evidently unintentional*, the dispenser will be justified in averting it by any means at his disposal. If the incompatibility produces such a change in the ingredients of the prescription as would probably risk the life of the patient, the dispenser must not compound it without a consultation. An example of such incompatibility may be instanced in the case of compounding chlorate of potassium with syrup of iodide of iron, the free iodine and chlorine liberated having proved fatal when the mixture was administered.

Iodide of potassium is easily decomposed by nitric and

most other acids, which after a time liberate free iodine, which falling as a sediment, may be taken in such a dose as would prove fatal.

It is not an unusual mistake to order in tertiary syphilis large doses of iodide of potassium along with full doses of tincture of perchloride of iron; free iodine is precipitated, and in a concentrated mixture of this kind has caused death. A very dangerous combination has been occasionally prescribed when free iodine or a strong solution has been ordered with solution of ammonia or compound camphor liniment; the precipitated iodide of nitrogen is a most dangerous explosive. Reference has already been made to the explosive nature of pills containing oxide of silver and creosote; they have taken fire and caused serious injury to the patient. Fatal results have been reported in several instances where alkalies have been ordered in mixtures containing strychnine, as the alkaloid is precipitated by alkalies, and the last few doses containing the greater part of the insoluble strychnine have been swallowed and have killed the patient. Strychnine is also thrown down by bromide and sometimes by iodide of potassium, and the insoluble bromide or iodide has in the same way caused death.

Looking at the question from the physician's point of view, the writer thoroughly endorses Mr. Ince's opinion:—"We have no right to expose a patient to the risk of imperfect combination, and here as a dispenser, I would act upon my own responsibility. The interest of the physician is best served by the dispenser who is a sentient being, and not an automaton."

Poisonous Doses, or doses which may strike the dispenser as decidedly risky to the patient's life, should not be dispensed unless the dispenser happens to have some evidence that such is within the prescriber's knowledge. If, for instance, the poisonous dose was *underlined, initialled, &c.*, or as it is usual in Germany, followed by a note of exclamation, the dispenser can, without hesitation, send it to the patient.

We may conclude these necessarily brief suggestions on Extemporaneous Pharmacy by quoting the following guiding rules by Mr. Ince for the pharmaceutical student from the *Chemist and Druggist's Diary*, 1885. They epitomise the principles laid down in the foregoing chapters:—

"1. Read through a prescription rapidly, and in a manner suggesting no suspicion of doubt. 2. Write directions invariably before dispensing. 3. Avoid thus the use of blotting paper. A good dispenser uses almost none. 4. If a mixture contains readily soluble ingredients, never use a mortar. Avoid effecting solution by heat, for fear of recrystallisation. 5. With syrups, and also ingredients not water, arrange in dispensing to rinse out the measure and leave it clean. A skilled dispenser shows very little traces of his work. 6. Carefully clean and put away

weights and scales after each operation. 7. Hold the scales firmly by the left hand, never lift them high above the counter, and judge of the weight as much by the indicator as by the position of the scale. 8. Select glass pans for scales, preferably of heavy make, and discard flimsy brass material, which corrodes speedily and becomes inaccurate. 9. Learn to judge of the quantity to be weighed with tolerable accuracy; train the eye as well as hand. 10. If in doubt, always begin with that in which you have no doubt. 11. Be rapid in manipulation. Finish wrapping, tying, or sealing quickly. Slow dispensing is bad dispensing, and arises either from deficient practice or want of knowledge. 12. Never, when in a shadow of a doubt, hesitate to ask advice from a fear of compromising your own dignity."

CHAPTER XII.

OFFICIAL PHARMACY AND THE PHARMACOPŒIA.

THE *British Pharmacopœia* is published under the supervision of the Medical Council, and undergoes revision at irregular intervals. It must be regarded by the pharmacist as having all the authority of an Act of Parliament. The drugs, tests, and processes mentioned in it are said to be "Official" or "Officinal." The following pages will briefly describe the chief pharmaceutical processes referred to in it. The student will probably discover that many of these are but repetitions of processes already practised by him in the chemical laboratory—as precipitation, crystallisation, &c.; others, however, will be found to be peculiar to pharmacy—as percolation, infusion, &c.; and it will be advisable for him, before entering upon the study of the various preparations, to glance at a few of these more important processes—especially to those that are common to many groups of preparations, as—

Affusion or Ablution—by which is meant the pouring of water on any substance to cleanse it of its impurities. In the washing of a precipitate, for example, the student is directed to pour cold or hot water upon it, shake or stir briskly, allow the insoluble part to fall to the bottom by rest, and then to pour or draw off the supernatant liquid. In the *British Pharmacopœia* these simple operations are respectively dignified by the names of

*Affusion, Agitation, Subsidence or Deposition, and
Decantation.*

Analysis—In the *Pharmacopœia* both the *qualitative* and *quantitative* methods are frequently directed to be employed;

and of the latter sometimes the *volumetric* and sometimes the *gravimetric* process is made use of.—(See “Testing.”)

Baths—Sand, water, and steam are mentioned under “Fusion.”

Boiling or **Decoction** is largely employed in the manufacture of various decoctions, extracts, syrups, &c. Generally the directions are, that the article to be decocted is to be put into a covered vessel with cold water, and allowed to boil on the fire for a given time. If a larger quantity of water, with the substance in it, is to be boiled down to a smaller quantity, then the decoction is a mixed method of boiling and concentrating by evaporation, and an uncovered vessel is selected; decoction of pomegranate is made in this way. The process of making extracts is quite different; here the evaporation or boiling is performed after the drug is separated from the original decoction, juice, or infusion. **Ebullition** is the ordinary chemical term for boiling, and is occasioned by the formation of bubbles of vapour within the liquid, which rise to the surface like gas bubbles. Decoction, strictly speaking, is the ebullition of a liquid, containing some vegetable substance whose virtues are to be extracted by the boiling liquid.

Bruising, Contusion, or Comminution is a process by which soft, elastic, or ligneous substances have their structure broken up before being subjected to the action of a solvent by infusion or maceration. It is employed to break down the cohesion of fibrous roots, and is applicable to all tough drugs, like ergot, cloves, asafetida, &c., and to fresh leaves and young juicy branches. The article to be bruised is put into an iron or strong stone mortar, and, with a straight up-and-down movement of the pestle, it is bruised, crushed, or pounded till the requisite degree of destruction of tissue is obtained, a little only being operated on at a time. The same object is often attained by cutting.

Calcination or **Incineration** is the process of exposing a substance to a high heat, so that water and volatile matters are driven off, or oxygen absorbed, and the residue left in a finely-divided powdery condition. The process is carried on by placing the substance to be calcined in a Cornish, Hessian, or other crucible, which is placed in a furnace. In this manner the Pharmacopœia directs magnesia and lime to be prepared from their carbonates.

Carbonization is the process by which organic substances, like bones and wood, are heated without access of air, so that their chemical composition is altered or destroyed without oxidation, as in the manufacture of bone black and wood charcoal.

Clarification or **Depuration** is the purification of a substance, generally a liquid or semi-solid, by extracting its impurities, as in the case of honey, lard, suet, &c., by melting or heating, and,

whilst fluid, straining through some texture like flannel. It is a modification of the process of filtration.

Crystallisation is the process which bodies undergo in passing from the liquid or gaseous state to assume definite and regular geometrical forms called crystals. This process is generally directed to be carried out by the cooling or evaporation of a solution containing the substance to be crystallised, or more rarely it is ordered to be effected by fusion, as in the case of some metals and sulphur ; by sublimation, as benzoic acid and corrosive sublimate ; or by precipitation, as in the instance of the red iodide of mercury. In obtaining crystals by evaporation the liquid is either boiled till its volume is reduced by the loss of vapour, or it may be kept at a lower temperature than the boiling point for a longer time till the same effect is produced, and when the concentration has proceeded so far that a scum or pellicle forms on its surface, the liquid is set aside to cool, and as the temperature falls crystals form. When they have ceased to grow or increase, the fluid part, which is now called the "mother liquor," is poured off, and the crystals drained and dried. A second or third crop may be obtained from the mother liquor by further evaporation and cooling, as in the first instance. The process is hastened by the presence of foreign bodies, as threads or sticks, round which the crystals quickly gather ; or by agitation, when the crystals will be found to be small. The slower the process the larger and more regular will be the crystals, and it is advisable not to evaporate just so far as the Pharmacopœia directs usually for most of its salts. The six systems of crystals are all well represented in the B.P.

In the case of some salts like alum, carbonate of sodium, and sulphate of iron, the water of crystallisation, which the salt carries down with it on assuming the solid form, is directed to be expelled by heat, thus increasing the strength of the substance by the weight of the water lost, which ranges generally from $\frac{1}{4}$ to $\frac{3}{4}$ of the original salt ; thus dried sulphate of iron is nearly twice the strength of the crystals.

Decoloration—a process by which substances like the alkaloids Morphine, Atropine, &c., are deprived of colour—consists in treating a solution or mixture of the substance with powdered charcoal and filtering. Purified animal charcoal is directed to be used.

Despumation is the name given to the process by which many organic liquids are purified by the application of heat, when the impurity rises to the top as a scum, and is easily removed by skimming or by filtration. Though not directly mentioned under this name in the Pharmacopœia, this process is extensively employed, as in the making of the green extracts, and the practical pharmacist finds that the syrups made with organic liquids, like the majority of the official ones, keep much

longer by being despumated. This is the more necessary as it is difficult to find sugar perfectly pure and free from organic adulteration.

Desiccation is the name given to the process of drying drugs. (See under "Drying.")

Dialysis is the process by which crystalloids are separated from colloids by passing the liquid containing them through an animal membrane like parchment. The dialyser is floated upon the surface of water and the crystalloids pass through as in the preparation of solution of dialysed iron, which is now non-official.

Digestion is one of several allied processes often confounded. It means the prolonged treatment, at a heat elevated, but below the boiling point, of a substance (such as a powdered root) in the liquid intended to dissolve out its soluble principles. It is the same as maceration at a higher temperature than that of the air.

Distillation is the process by which a liquid is converted into a vapour on the application of heat, and the vapour is condensed into a liquid again in a separate vessel. The variety of apparatus for the process is endless. The simplest would consist of a closed vessel called a retort, from the top of which a long tube leads to a receiver. On partially filling such a vessel with volatile liquid, and applying heat till boiling, the vapour of the liquid would fill the upper part of the vessel and tube, during its passage through which it would be cooled or condensed, and drop into the cold receiver as a liquid. The object of distillation is to combine volatile substances which cannot otherwise be mixed, as in the preparation of the Waters, or to separate mixed volatile and fixed substances, as in making Spt. Ammon. Fetid., or to separate impurities from the liquid which could not be got rid of otherwise, or to regain the alcohol which has been used in the making of many of the extracts. Distillation is a mixed process, consisting of ebullition—by which, in the first instance, the volatile substance is converted into vapour—and of condensation, by which the vapour is again changed into a liquid.

Destructive or Dry Distillation is the process by which a body is decomposed by heat into volatile products which did not previously exist in it, the products being collected in a separate vessel, as in the production of acetic acid and tar from wood.

Fractional Distillation means the distilling of a mixture of substances volatile at different temperatures, whereby they may be separated and received into different vessels by regulating the temperature.

Drying is a process used in the preparation of a great many remedies. There are, however, no official directions given for

the drying of roots, leaves, seeds, &c.; these are generally submitted to a uniform temperature, after being spread out on shallow trays or drawers of network, in a room heated by steam or hot water pipes. The best heat is one ranging between 100° and 130° F. Many plants which are used in pharmacy are dried simply by exposure to the sunshine of their native country, but this is not practicable in our latitude. Flowers should be allowed to dry spontaneously. Fleshy roots should be transversely sliced before being placed in the drying room. Crystals and precipitates, as a rule, stand higher temperatures, and may be dried on a water bath. Others require still higher temperatures, especially when we aim at the expulsion of the water of crystallisation, as in drying alum and sulphate of iron—where a heat of nearly 400° is required. On the other hand, some salts, like the valerianate of zinc, must be dried at the ordinary heat of the surrounding atmosphere. Carbonate of potassium and slaked lime recently heated are used to absorb the water from alcohol, freshly burned lime from ether, whilst sulphuric acid is used in various drying processes.

Elutriation—The process of powdering rough insoluble substances like chalk, ores, &c., and mixing them with water, so that the finer, light, powdery portion may be poured off after the coarser particles have fallen to the bottom. It is done sometimes merely to wash away such impurities as sand, gravel, &c.; in its results it resembles sifting.

Expression is the process by which the juice or oil is squeezed out from vegetable substances, and the tincture or spirit from the marc after maceration or percolation. It is performed by putting the substance into a suitable press, and by mechanical power separating the solid from the liquid portions. Oils so obtained are called expressed or fixed oils, to distinguish them from volatile or distilled oils.

Evaporation is the process by which the volume of a liquid is reduced and its volatile constituents driven off by a heat ranging between that of the air and the boiling point of the liquid. It is employed in the making of extracts, in the crystallisation of salts, and many other operations in pharmacy. The vessels used should be very shallow, and present a large surface of the liquid exposed to the air. In evaporating vegetable juices and infusions, a moderate heat should be employed—say, about 140° F. The nearer the liquid is kept to the boiling point the quicker the evaporation; and small quantities only of vegetable infusions or juices should be subjected to the process, and in separate batches, which can be evaporated down still further if necessary, thus preventing deterioration by long heating. Stirring quickens the process, and the heat may be regulated by the use of a water, steam, or sand bath (for which see "Fusion.") Sometimes it is necessary that the evaporation

should be carried on over strong sulphuric acid, or in a vacuum, or by means of a current of dried air.

Filtration is a process by which we separate an insoluble matter or sediment from a liquid, by causing it to flow through the pores of blotting paper, flannel, felt, calico, or linen, the liquid after passing through being clear and bright. *Straining* or *colation* is a quicker, but rougher, process of the same nature, for the removal generally of *visible* foreign particles, by causing the liquid containing them to pass through the open meshes of muslin, tow, wool, asbestos, or wire netting. If a liquid is *perfectly* transparent, and offers no obstacle to the passage of light, it is said to be "bright," though it may be highly coloured. All tinctures should possess this quality; and if they do not, repeated filtration and rest will brighten them. In the case of very dark liquids, they should also be bright when examined in *minute* quantity by transmitted light. Opposed to this condition we have that of "muddiness," which is often an opprobrium to the pharmacist; it is caused by the presence of *invisible* particles in a state of suspension, producing translucency. A mixture or liquid is said to be "clear" when no *visible* particles of foreign matter are detected in it; hence a liquid may be bright, but not clear, if it contain a few coarse particles floating through it and is otherwise transparent. The treatment for muddiness or opalescence is Filtration; to produce clearness, *Straining* is the remedy. Filtration is hastened by the method of folding the filtering agent—generally unsized paper. When this is plaited or thrown into numerous folds or grooves the process is greatly expedited.

Fusion, Liquefaction or Melting, is the process by which solid bodies are rendered liquid by the application of heat; it is largely employed in making ointments, plasters, caustic sticks, and in purifying resins, and for the purpose of decomposition—as in making Potassii Permang. The substances are put into a suitable vessel and heat applied, varying from a temperature of 90° , sufficient to melt lard in an open jar, to one of 800° for fusing zinc in an earthen crucible. The water, steam, and sand baths are frequently employed. The *water bath* consists of an apparatus by means of which water, or its vapour, at a temperature not exceeding 212° , is applied to the outer surface of a vessel containing the substance to be heated. In the *steam bath*, the vapour of water at a temperature above 212° , but not exceeding 230° , is similarly applied; and in the *sand bath*, a vessel partially filled with fine sand is placed upon the top of a stove or on the open fire, and the substance to be heated in a jar or crucible is thrust down into the sand; it differs from the steam or water bath in not limiting the degree of heat, and is no safeguard against any high temperature being reached; but it effectually prevents sudden changes in the heat, keeping the substance at a

uniform degree. Since alkalies and oxide of lead attack silicious substances, for them iron or silver crucibles must be used. Platinum also is attacked by alkalies, though very feebly.

Gathering of Plants, &c., should be effected, when possible, in sunny weather, and at the time specified in any particular case in the Pharmacopœia. Generally, roots of annual plants should be dug up *before* flowering; and perennial roots should be gathered in autumn, and not till plants are two or three years old at least. Rhubarb should be six years of age. Leaves should be gathered before they begin to change colour, and those of biennial plants not till the second year—as hyoscyamus for example, collected in the first year of its life, is almost inert; some are directed to be gathered when the plant is beginning to flower, others when the fruit begins to form.

Barks should be collected when they come off most readily from the wood—*i.e.*, from trees in the spring and from shrubs in the autumn. Flowers should be gathered when about four-fifths expanded; the red rose, however, is collected in bud, otherwise it loses its astringency and colour; and the flower-buds of the clove become almost devoid of aroma if allowed to expand. Fruits and seeds, generally, are collected when ripe; but the pimento, pepper, and others are exceptions.

Granulation is the process by which a coarsely crystalline salt is reduced to the condition of a granular powder by dissolving it in water and evaporating the solution—incessantly stirring till the product becomes dry. Carbonate and citrate of potassium are thus made, and sometimes substances which can scarcely be reduced to powder otherwise are treated in this way, such as sal ammoniac and nitre.

The process is now modified in the B.P. for the making of several effervescing salts. Thus Epsom salt is first dried till its weight is considerably lessened; it is then reduced to powder and mixed with the powdered sugar, acids, and alkaline salts, the dry mixture is heated between 200° and 220° F., and kept stirred till granulation occurs. The granules are separated into uniform and convenient sizes by means of sieves.

Infusion is the process of extracting from a body, commonly of vegetable origin, its virtues or soluble parts, by treating it for a short time with water in a covered vessel, the substance being first reduced to a state of moderate subdivision or coarse powder; generally water in the act of boiling is used. Cold water is used to extract the virtues of calumba, in order to avoid dissolving the starch contained in it. As a rule the subdivision of the substance need not be carried to the same extent as for tinctures.

Levigation is the name given to a process like “Elutriation,” in which an insoluble substance is *ground* into powder in presence of water or some liquid in which it is insoluble, the finer parts

washed away and collected, the coarser being returned for further grinding with water, and so on till a fine powder is obtained. Red precipitate may be thus reduced. Elutriation is applicable to cheap, coarse materials like chalk and ores, where the refuse is not ground, but rejected.

Lixiviation is the process of acting upon a compound or mixed solid, with water, in order to dissolve out a soluble salt, the solution being poured off the insoluble residue and evaporated, as is done in the preparation of pearl-ash from wood-ashes.

Maceration is the process of steeping or soaking at the ordinary temperature of the atmosphere a substance in a liquid capable of dissolving some of its soluble constituents. The liquid is called the *menstruum*, and the rejected matter, which is insoluble, is spoken of as the *marc*. Several tinctures are directed to be prepared in this way. It differs from digestion in being carried on generally for a much longer time, and without heat, and alcohol is commonly the menstruum. The drug should be previously reduced to a proper state of comminution by bruising, cutting, or powdering.

The process is now described in the B.P. thus :—"Place the solid materials in the whole of the menstruum in a closed vessel for seven days, frequently agitating. Strain. Press the marc. Mix the expressed liquid with the strained liquid. Filter if necessary."

Percolation or Displacement is one of the most important processes in pharmacy, being extensively used in the preparation of tinctures. It consists in packing into a short, wide tube, closed at one end by tying a piece of calico over it, the substance, in a state of coarse powder, whose virtues are desired to be extracted, and pouring into the tube the menstruum—generally alcohol. As the spirit filters its way through the column of powder it dissolves out the soluble parts, and drops finally into the receiver below as a bright tincture. The process may thus be defined to be the "filtration of a liquid through a porous column of a powdered material, so that it may extract its soluble matter." It is not adapted to gummy or adhesive substances, but possesses the great advantages over maceration in being quicker, and in the fact that after the fluid has ceased to drop, the tincture still left in the tube can be displaced by pouring in more spirit or water on the top of the marc. At the bottom of the tube, immediately over the calico, a layer of fine pebbles or coarse river sand prevents the powder closing its pores (Fig. 23).

If the powder be too fine, it gets into a cake, and prevents the passage of the spirit; and, if too coarse, the spirit runs between the particles without dissolving out their active properties, flowing into little channels through the tube into the receiver. The B.P. now states the degree of fineness requisite for several vegetable

tinctures, by ordering the powder to be passed through sieves of definite make.

The following are the directions given in the B.P. for the process of percolation in the making of a tincture :—Moisten the solid materials with the prescribed quantity of menstruum, and set the mixture aside in a closed vessel for twenty-four hours. Pack the mixture in a percolator, lightly closed or otherwise, according to the nature of the materials. Pour over the contents, at intervals, further portions of the menstruum, always maintaining a layer of liquid above the materials, and allow percolation to proceed, slowly at first, and afterwards less slowly, until a sufficient quantity of the menstruum has been used to produce about three-fourths of the volume of the finished tincture, or until exhaustion of the solid materials has been effected. When liquid ceases to pass, remove the marc from the percolator, and submit it to pressure. Filter the expressed liquid, if necessary, either at once or after standing for twenty-four hours ; mix the filtrate with the percolate, and then add a sufficient quantity of menstruum to produce the prescribed volume of tincture.

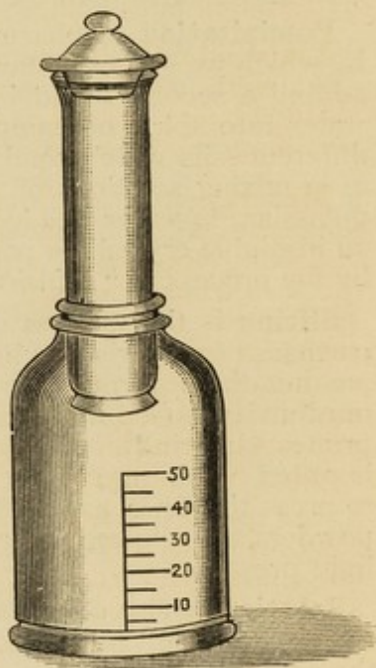


Fig. 23.

Pulverisation is the process of reducing solids to powder. The barks, roots, leaves, stems, and fruits of trees and vegetables are first thoroughly dried, and afterwards ground in a mill, of which there are many kinds. Leaves lose as much as 80 per cent. of their weight by drying and powdering, the powder often gaining greatly in strength over the fresh leaves. Substances are reduced to the coarse powdered state necessary for infusion and percolation just as they are required, by bruising in an iron mortar, operating only on small quantities at once, and then passing the particles through sieves whose meshes are formed of parallel wires arranged with varying degrees of closeness, the powder which passes through being designated according to the number of parallel wires within a linear inch of the sieve surface. Camphor can only be powdered by adding about the fourth of its weight of alcohol, and triturating it to dryness. Spermaceti, in like manner, by adding a little alcohol, may be easily reduced to powder, and tragacanth is best powdered warm. Some substances must be powdered and rubbed with water—"Levigation"—others by granulation, as zinc and tin ; and iron, by filing

or reducing with hydrogen. The powder differs from the vegetable drug of the same name, by having less water, essential oil, or volatile constituents, less woody fibre, and in being generally more active—powdered opium being one-eighth part at least more active than the fresh drug.

Precipitation in pharmacy, as in the laboratory, is the process by which we get a substance deposited from a solution, either by adding a second liquid in which it is insoluble, as in pouring water into spirit of camphor; or by mixing two solutions of different salts which combine and form an insoluble compound, as in mixing solutions of perchloride of mercury and iodide of potassium together, the iodide of mercury being thrown down as an insoluble crystalline powder, which is afterwards to be washed by the process of "Affusion."

Sifting is the process of separating the coarser from the finer particles of pulverised substances, and is generally performed by passing them through the meshes of fine wire, horse-hair, or muslin sieves (see also under Pulverisation). When fruits, like prunes, tamarinds, or figs, are ordered to be sifted, the operation is called "Pulping;" here considerable force must be employed to press the finer particles through, which, in the case of dried powders, are allowed to drop through by their own weight or by light pressure.

Solution.—The condition of a substance dissolved in a liquid is a state difficult to define. In the case of salts, acids, and bases the generally accepted view is that in dilute solutions of these electrolytes a greater part of their molecules are "dissociated;" these under the names of "ions" are supposed to be charged with opposite kinds of electricity, which cause them to move freely in different directions in the solution.

The theory that chemical change results when solution occurs goes under the name of the "hydrate theory." In some cases heat and in others cold is produced as a result of solution of a substance in water, the substance having united with xH_2O . That a chemical change occurs is exemplified in the behaviour of alcohol and chloroform as solvents of iodine. With alcohol, iodine forms a brown solution; with chloroform it is violet.

Most of the instances of solution in pharmacy are *simple*, as the solution of sugar in syrup, in which case the sugar is found unaltered on evaporation; in others, as in the saccharated solution of lime, the substance is in a state of *chemical* solution, and cannot be recovered unaltered on evaporating. The process of solution, with very few exceptions, is quickened by heating the solvent, and having the substance to be dissolved in fine division. Both these advantages are gained by the ordinary method of rubbing the substance in a mortar, with hot water. When the hot solvent ceases to dissolve any more of the substance, the solution is said to be saturated, and, on cooling, will always

deposit some of the salt in crystals, the liquid, when cold, being called a cold saturated solution.

Standardization is the name given to the process by which certain preparations, as those of opium, cinchona, belladonna, ipecacuanha, jalap, nux vomica, and cherry-laurel water, are made to contain a definite and uniform amount of the alkaloidal or active principle of the vegetable drug from which they are extracted.

Sublimation is the process by which a solid is reduced by heat to the state of a vapour, which is condensed and deposited on the surface of another vessel, either in masses, when it is called a *sublimate*, like arsenic ; or in a feathery pulverulent state called *flowers*, as in the preparation of sulphur.

Testing.—The B.P., to ensure the purity and identity of its different preparations, directs in every convenient case, certain tests; thus the ordinary *Qualitative* analysis is employed frequently. Take, for example, "Acid. Aceticum," which should contain 33 per cent. of hydrogen acetate. The pharmacist is directed to show that it contains no lead, copper, sulphates, chlorides, &c., with the tests for these substances, but it is necessary to prove also that it contains the requisite percentage of acetic acid by *Quantitative* analysis, and the *Volumetric* method, which estimates the quantity by *measuring* the volume of the reagent necessary to produce the change, and afterwards calculating the weight used ; and he is informed that "each gramme should require for neutralisation 5.5 cubic centimetres of the volumetric solution of sodium hydroxide." In testing the strength of diluted phosphoric acid, a different system—the *Gravimetric*—is directed. A given weight of this acid is poured upon a known weight of oxide of lead, and phosphate of lead is formed. This, after being dried, is weighed—the increase in weight giving the amount of phosphoric anhydride present. Complete volatilisation is the test used for several salts, as those of mercury.

Trituration is the process of reducing solid substances to the state of powder by continued rubbing. Generally, in pharmacy, the operation is conducted in a wedgewood mortar. (See under "Dispensing of Mixtures" and "Pills," pages 24 and 40.)

WEIGHTS AND MEASURES

OF THE BRITISH PHARMACOPŒIA.

IMPERIAL SYSTEM.

MEASURES OF MASS.

1 Grain	gr.	
1 Ounce (Avoir.)	oz.	= 437.5 grains
1 Pound	lb. = 16 ounces	= 7000 "

MEASURES OF VOLUME.

1 Minim	min.	
1 Fluid Drachm	fl. dr.	= 60 minims
1 Fluid Ounce	fl. oz.	= 8 fluid drachms
1 Pint	O.	= 20 fluid ounces
1 Gallon	C.	= 8 pints

MEASURES OF LENGTH.

1 Inch	in.	
1 Foot	ft. = 12 inches	
1 Yard	yd. = 36 inches	

RELATION OF VOLUME TO MASS.

1 Minim is the measure of		0.9114583 grain of water
1 Fluid Drachm	"	54.6875 grains of water
1 Fluid Ounce	" 1 ounce or	437.5 "
1 Pint	" 1.25 pounds or	8750.0 "
1 Gallon	" 10 pounds or	70000.0 "
* 109.7143 minims = the measure of 100		"

WEIGHTS AND MEASURES OF THE METRIC SYSTEM.

MEASURES OF MASS.

1 Milligramme	= the thousandth part of 1 gramme or	0.001 gramme
1 Centigramme	= the hundredth " "	0.01 "
1 Decigramme	= the tenth " "	0.1 "
1 Gramme	= weight of a cubic centimetre of water at maximum density	1.0 "
1 Dekagramme	= ten grammes or	10.0 "
1 Hectogramme	= one hundred grammes "	100.0 "
1 Kilogramme	= one thousand grammes "	1000.0 "

MEASURES OF VOLUME.

1 Millilitre	= 1 cub. centim. or the mea. of 1 gram. of water	
1 Centilitre	= 10 "	10 "
1 Decilitre	= 100 "	100 "
1 Litre	= 1000 "	1000 " (1 kilo.)

* Taken as 110 mins. throughout the B.P.

MEASURES OF LENGTH.

1 Millimetre	=	the thousandth part of 1 metre or 0.001 metre
1 Centimetre	=	the hundredth " " 0.01 "
1 Decimetre	=	the tenth " " 0.1 "
1 Metre	- - - - -	1.0 "

RELATION OF THE IMPERIAL STANDARDS TO THE METRIC STANDARDS.

Standards of Mass.

1 Pound	=	453.59243 grammes
1 Ounce	=	28.34953 "
1 Grain	=	0.064798918 gramme

Standards of Volume.

1 Gallon	=	4.5458547 litres
1 Pint	=	0.56823 litre or 568.23 cubic centimetres
1 Fluid Ounce	=	0.0284115 " 28.4115 "
1 Fluid Drachm	=	0.00355144 " 3.55144 "
1 Minim	=	0.00005919 " 0.05919 cub. centimetre

Standards of Length.

1 Yard	=	0.914399 metre
1 Foot	=	30.479967 centimetres
1 Inch	=	2.539997 "

RELATION OF THE METRIC STANDARDS TO THE IMPERIAL STANDARDS.

Standards of Mass.

1 Milligramme	=	0.01543235639 grain
1 Centigramme	=	0.1543235639 "
1 Decigramme	=	1.543235639 "
1 Gramme	=	15.43235639 grains
1 Kilogramme	=	2 lbs. 3 ozs.
119.8 grs., or	15432.35639	"

Standards of Volume.

1 Cubic Centimetre	=	15.43235639 grains* = 16.9315 minims
1 Litre	=	1.75985 pint, or 1 pint 15 ozs. 1 dr. 35 m.

Standards of Length.

1 Millimetre	=	0.03937012 inch
1 Centimetre	=	0.3937012 "
1 Decimetre	=	3.937012 inches
1 Metre	=	39.37012 inches, or 1 yard 3.37 inches

* The cubic centimetre is a standard at the temperature of the maximum density of water. 39.2° F., or 4° C., the grain at 62° F. (16.66° C.)

RELATION OF ENGLISH TO METRIC MEASURES.

1	Minim	=	·059 c.c. (cubic centimetres)		
2	Minims	=	·118 c.c.	"	"
3	"	=	177 c.c.	"	"
4	"	=	·236 c.c.	"	"
5	"	=	·295 c.c.	"	"
6	"	=	·355 c.c.	"	"
7	"	=	·414 c.c.	"	"
8	"	=	·473 c.c.	"	"
9	"	=	·532 c.c.	"	"
10	"	=	·591 c.c.	"	"
11	"	=	·650 c.c.	"	"
12	"	=	·710 c.c.	"	"
13	"	=	·769 c.c.	"	"
14	"	=	·828 c.c.	"	"
15	"	=	·887 c.c.	"	"
16	"	=	·946 c.c.	"	"
17	"	=	1·005 c.c.	"	"
18	"	=	1·065 c.c.	"	"
19	"	=	1·124 c.c.	"	"
20	"	=	1·183 c.c.	"	"
25	"	=	1·479 c.c.	"	"
30	"	=	1·775 c.c.	"	"
35	"	=	2·070 c.c.	"	"
40	"	=	2·366 c.c.	"	"
45	"	=	2·662 c.c.	"	"
50	"	=	2·958 c.c.	"	"
55	"	=	3·254 c.c.	"	"
60	"	=	3·550 c.c.	"	"
1	Fluid Drachm	=	3·55 c.c.	"	"
2	Fluid Drachms	=	7·099 c.c.	"	"
3	"	=	10·648 c.c.	"	"
4	"	=	14·198 c.c.	"	"
5	"	=	17·748 c.c.	"	"
6	"	=	21·297 c.c.	"	"
7	"	=	24·847 c.c.	"	"
8	"	(1 fl. oz.) =	28·397 c.c.	"	"
2	Fluid Ounces	=	56·793 c.c.	"	"
3	"	=	85·190 c.c.	"	"
4	"	=	113·586 c.c.	"	"
5	"	=	141·983 c.c.	"	"
10	"	=	283·966 c.c.	"	"
15	"	=	425·949 c.c.	"	"
20	"	(1 pint) =	567·932 c.c.	"	"
40	"	(1 qt.) =	1135·864 c.c.	"	"

or ·567932
litre.
or 1·135864
litre.

RELATION OF ENGLISH TO METRIC WEIGHTS.

	(Gramme.)		(Centigrammes.)		(Milligrammes.)
1 Grain	= '0648 grm.	or	6'48 c.grm.	or	64'8 m.g.
2 Grains	= '1296 grm.	or	12'96 c.grm.	or	129'6 m.g.
3 "	= '1944 grm.	or	19'44 c.grm.	or	194'4 m.g.
4 "	= '2592 grm.	or	25'92 c.grm.	or	259'2 m.g.
5 "	= '3240 grm.	or	32'40 c.grm.	or	324'0 m.g.
6 "	= '3888 grm.	or	38'88 c.grm.	or	388'8 m.g.
7 "	= '4536 grm.	or	45'36 c.grm.	or	453'6 m.g.
8 "	= '5184 grm.	or	51'84 c.grm.	or	518'4 m.g.
9 "	= '5832 grm.	or	58'32 c.grm.	or	583'2 m.g.
10 "	= '6480 grm.	or	64'80 c.grm.	or	648'0 m.g.
11 "	= '7128 grm.	or	71'28 c.grm.	or	712'8 m.g.
12 "	= '7776 grm.	or	77'76 c.grm.	or	777'6 m.g.
13 "	= '8424 grm.	or	84'24 c.grm.	or	842'4 m.g.
14 "	= '9072 grm.	or	90'72 c.grm.	or	907'2 m.g.
15 "	= '9720 grm.	or	97'20 c.grm.	or	972'0 m.g.
15'432,,	= 1 Gramme	or	100'00 c.grm.	or	1000'0 m.g.

	(Grammes.)		(Centigrammes.)		(Milligrammes.)
1 Scruple (20 grains)	= 1'296 g.	or	129'6 c.g.	or	1296 m.g.
2 Scruples (40 grains)	= 2'592 g.	or	259'2 c.g.	or	2592 m.g.
3 " or 1 Drachm	= 3'888 g.	or	388'8 c.g.	or	3888 m.g.
1 Ounce (Troy)	= 31'104 g.	or	3110'4 c.g.		

		(Grammes.)		(Centigrammes.)
$\frac{1}{4}$ oz. (Avoir.)	or 109'37 grs.	= 7'087375 g.	or	708'7375 c.g.
$\frac{1}{2}$ " "	or 218'75 "	= 14'17475 g.	or	1417'475 c.g.
1 " "	or 437'5 "	= 28'3495 g.	or	2834'95 c.g.
2 " "	or 875 "	= 56'699 g.	or	5669'9 c.g.
3 " "	or 1312'5 "	= 85'0485 g.	or	8504'85 c.g.
4 " "	or 1750 "	= 113'39 g.	or	11339'8 c.g.
5 " "	or 2187'5 "	= 141'7475 g.	or	14174'75 c.g.
6 " "	or 2625 "	= 170'097 g.	or	17009'7 c.g.
7 " "	or 3062'5 "	= 198'4465 g.	or	19844'65 c.g.
8 " "	or 3500 "	= 226'7963 g.	or	22679'63 c.g.
9 " "	or 3937'5 "	= 255'1455 g.	or	25514'55 c.g.
10 " "	or 4375 "	= 283'495 g.	or	28349'5 c.g.
11 " "	or 4812'5 "	= 311'8445 g.	or	31184'45 c.g.
12 " "	or 5250 "	= 340'1945 g.	or	34019'45 c.g.
13 " "	or 5687'5 "	= 368'5435 g.	or	36854'35 c.g.
14 " "	or 6125 "	= 396'893 g.	or	39689'3 c.g.
15 " "	or 6562'5 "	= 425'2425 g.	or	42524'25 c.g.
16 " " (1 lb.)	or 7000 "	= 453'5927 g.	or	45359'27 c.g.

RELATION OF METRIC TO ENGLISH WEIGHTS.

1	Milligramme, or '001 gramme	=		$\frac{1}{64}$ grain.
1	Centigramme, or '01 "	=		$\frac{1}{16}$ "
1	Decigramme, or '1 "	=		$\frac{1}{2}$ grains.
1	Gramme (1 millilitre)	=	nearly	15 $\frac{1}{2}$ "
5	Grammes	=		77 $\frac{1}{2}$ "
10	" (1 centilitre)	=		154 $\frac{1}{2}$ "
20	"	=		308 $\frac{2}{3}$ "
30	"	=	1 ounce and	25 $\frac{1}{2}$ "
40	"	=	1 " and	179 $\frac{3}{4}$ "
50	"	=	1 " and	334 "
60	"	=	2 ounces and	51 "
70	"	=	2 " and	205 $\frac{1}{2}$ "
80	"	=	2 " and	359 $\frac{1}{2}$ "
90	"	=	3 " and	76 $\frac{1}{2}$ "
100	" (1 decilitre)	=	3 " and	230 $\frac{3}{4}$ "
200	"	=	7 " and	24 "
300	"	=	10 " and	254 $\frac{3}{4}$ "
400	"	=	14 " and	48 "
500	"	=	17 " and	278 $\frac{3}{4}$ "
600	"	=	21 " and	72 "
700	"	=	24 " and	302 $\frac{3}{4}$ "
800	"	=	28 " and	96 "
900	"	=	31 " and	326 $\frac{3}{4}$ "
1000	" (1 kilogramme or 1 litre)	=	35 " and	120 "

RELATION OF METRIC TO ENGLISH MEASURES.

1	c.c. (cubic centimetre)	=		16.9 minims.
2	c.c. "	=		33.8 "
3	c.c. "	=		50.7 "
4	c.c. "	=	1 dr.	7.61 "
5	c.c. "	=	1 dr.	24.5 "
6	c.c. "	=	1 dr.	41.41 "
7	c.c. "	=	1 dr.	58.32 "
8	c.c. "	=	2 drs.	15.22 "
9	c.c. "	=	2 drs.	32.12 "
10	c.c. "	=	2 drs.	49.03 "
15	c.c. "	=	4 drs.	13.54 "
20	c.c. "	=	5 drs.	38.06 "
25	c.c. "	=	7 drs.	2.57 "
30	c.c. "	=	1 oz. 0 drs.	27.09 "
40	c.c. "	=	1 oz. 3 drs.	16.12 "
50	c.c. "	=	1 oz. 6 drs.	5.15 "
75	c.c. "	=	2 oz. 5 drs.	7.7 "
100	c.c. "	=	3 oz. 4 drs.	10.3 "
500	c.c. "	=	17 oz. 4 drs.	51.5 "
1000	c.c. " (1 litre)	=	35 oz. 1 dr.	43 "

PART II.

THE ADMINISTRATION OF MEDICINES.

METHODS OF ADMINISTERING MEDICINES.

THERE are various routes by which medicines may find their way into the circulating fluid. The most direct would be

(1) *By injection into the veins* : as ammonia and saline solutions are injected in desperate emergencies, or as blood may be transfused after excessive hæmorrhages, or as quinine solution is sometimes injected in very severe forms of malarial disease.

(2) Some authorities recommend the *injection* of the remedy *into an artery*.

(3) By injection under the *dura mater* or deeply into the substance of the frontal lobes, or even into the basal ganglia as recommended by Roux in tetanus.

(4) By *inhalation*, the vapour of the substance finding its way rapidly into the circulation through the extensive sheet of pulmonary blood vessels, as in the administration of anæsthetics and nitrite of amyl.

(5) By *swallowing*—the commonest and most convenient method—the medicines finding their way through the walls of the gastro-intestinal blood vessels, or lacteals, into the current.

(6) By absorption from the *rectum* ; in this way the great majority of substances (in the form of enemata or suppositories) may find their way into the blood.

(7) By absorption from the *vaginal* surface in the female, when given in the form of pessary.

(8) By absorption from the *bladder*. Some experimentalists have influenced the system by narcotic remedies injected into the vesical cavity.

(9) By absorption from the *peritoneal* cavity, as in cases of severe hæmorrhages by injecting saline solutions, &c., into the sac of the peritoneum.

(10) By absorption from the *deep tissues*, as strychnine is often injected into the centre of a large muscle, by the method known as "*parenchymatous injection*."

(11) By the *hypodermic method*, a solution or mixture containing the substance being injected by a fine syringe into the *subcutaneous areolar tissue*, from which it is rapidly absorbed by the small blood vessels and lymphatics. In this way morphine is best given to relieve severe pain, and ether to counteract the shock of formidable hæmorrhages.

(12) By the skin. Through the cutaneous tissue medicines may be administered with the view of affecting the system, by five methods :—

1. *The Enepidemic.*
2. *Cataphoresis.*
3. *The Epidermic or Iatroleptic.*
4. *The Endermic.*
5. *By Inoculation.*

In the *Enepidemic* method friction is not employed ; the medicine to be so administered is simply placed in contact with the skin. Though this is, at the best, a slow and uncertain way to introduce a remedy into the circulation, the results of experiments show that the alkaloids dissolved in chloroform, when placed in contact with the unbroken skin, are readily absorbed, and soon find their way into the blood. Waller has shown that this endosmotic quality of chloroform enables it to penetrate the skin of the cadaver and to carry the alkaloids with it. Watery or alcoholic solutions either do not enter the blood at all when administered in this way, or are absorbed in such small quantities that they may be regarded as inert. Guaiacol painted over the skin and covered with oiled silk is rapidly absorbed, and reduces temperature in this way, and so does sparteine.

The new method known as *Cataphoresis*, or *electric osmosis*, is a modification of the old *enepidemic* plan. The solution of the drug in contact with the unbroken skin or mucous membrane is acted upon by the platinum terminals of a galvanic battery, and it is found that most alkaloids, iodides, and perchloride of mercury find their way into the blood in this way.

By the *Epidermic* method the medicine is also introduced into the system through the unbroken cuticle, but friction is employed. In this way we administer cod-liver oil in wasting diseases, and mercurial ointment in syphilis.

By the *Endermic* method the difficulty of absorption through the cuticle is obviated by its removal. This is accomplished by soaking a piece of porous fabric in strong solution of ammonia, applying it to the surface of the skin, and instantly covering it over with a piece of oiled silk, or a watch-glass, when speedy vesication ensues. The remedy, in the state of fine powder, should be dusted over the denuded spot, when its rapid absorption will occur. In this way morphine, strychnine, or atropine can be administered. The same result follows if the

remedy be applied over a portion of skin whose cuticle has been removed by an ordinary blister.

By the operation of *Inoculation* (as for small-pox) remedies may be introduced into the system through the punctured cuticle.

These different methods or routes by which medicines find their way into the system should not be confounded by the student with the various *local* methods of applying remedies. Thus liniments, ointments, lotions, and antiseptics are applied to the skin with the view of causing local stimulation or sedative effects, and with the view of effecting its destruction caustics are sometimes employed. Sternutatories are applied to the nasal mucous membrane, and substances, by the method of insufflation, are brought in contact with the posterior nares and surrounding parts; or the nasal douche may be employed with the same intention. Sialagogues are used to act on the salivary glands through stimulation of the nerves distributed to the mucous membrane of the mouth. The fauces and tonsils are reached by gargles, and the larynx by atomised spray; while the bronchial mucous surface may be exposed to the local action of various inhalations, or to the fumes of volatile substances in a state of combustion.

In the same way, most of the cavities of the body, all tortuous wounds, and open sores, may be reached by injections, lotions, bougies, pessaries, suppositories, &c.

DOSAGE OR POSOLOGY.

Before the student considers the question of prescription writing, it will be necessary to say a few words about the doses of medicines. As the alphabetical arrangement of this work will enable him to find at a glance the dose of every drug in the *Materia Medica*, and in a similar way the doses of all the various Galenical preparations are tabulated, it will thus be unnecessary here to have any repetition in the form of tables or lists of doses.

Though the official doses may be regarded as safe guides, still the student must remember that there are many conditions which modify very considerably the effect of remedies, and should materially affect their dosage.

The most important of these modifying agents are :—

Age, Idiosyncrasy, Habit, Interval between the Doses, Disease, Climate, Race and Temperament, Sex, Body Weight, Method and Form in which the Medicine is Administered, Temperature, Hour of the Day, Mental Emotion, Fasting, Cumulative Action, &c.

Age—This is the most important factor in determining the amount of the dose, and is the one which gives most trouble to

the student. In the *Materia Medica* portion of this book, the dose for a child one year old is given under the heads of the most frequently employed infantile remedies. It should be remembered that children bear opiates very badly, and their use, consequently, is unsafe for children under one year old, even in most minute doses.

This intolerance of opium, it may be, has led to very erroneous ideas about the amount of the dose of other remedies for children.

Children will often bear nearly as full doses as adults, of various remedies, as may be seen in the case of arsenic, calomel, squill, belladonna, ipecacuanha, and many purgatives, like rhubarb, jalap, &c.

Gaubius took the average adult dose of a remedy as 1, say 1 grain, and calculated the requisite amount for the different ages thus:—

For a child 1 year old, $\frac{1}{12}$ gr. ; 2 years old, $\frac{1}{6}$ gr. ; 3 years old, $\frac{1}{4}$ gr. ; 4 years old, $\frac{1}{3}$ gr. ; 7 years old, $\frac{1}{2}$ gr. ; 14 years old, $\frac{1}{2}$ gr. ; 20 years old, $\frac{2}{3}$ gr. ; and for ages between 21 and 60 years, 1 gr.

Young's rule is—"That for children under 12 years the doses of most medicines must be diminished in the proportion of the age to the age increased by 12."

If the student wishes to find out the dose for a given age by this method, he has simply to add 12 to the age in years, and divide the age by the amount thus obtained, the answer giving a fraction, which is the required amount of the full adult dose. Thus, suppose the adult dose to be 1 grain, the dose will be:—

$$\text{For a child 1 year old} \quad \dots \quad \frac{1}{1+12} = \frac{1}{13} \text{ grain.}$$

$$\text{For a child 2 years old} \quad \dots \quad \frac{2}{2+12} = \frac{1}{7} \text{ grain.}$$

$$\text{For a child 3 years old} \quad \dots \quad \frac{3}{3+12} = \frac{1}{5} \text{ grain.}$$

$$\text{For a child 8 years old} \quad \dots \quad \frac{8}{8+12} = \frac{2}{5} \text{ grain.}$$

$$\text{For a child 12 years old} \quad \dots \quad \frac{12}{12+12} = \frac{1}{2} \text{ grain.}$$

Cowling's rule is to divide the number representing the age of the patient upon his next birthday by 24. Thus a child $5\frac{1}{2}$ years old would receive $\frac{6}{24}$ or $\frac{1}{4}$ of the full adult dose of ordinary remedies.

Brunton, in order to make Cowling's rule adapt itself to the metric system, proposes to use the number 25 instead of 24, and to multiply both the numerator and denominator of the fraction by 4. Thus, for a child 3 years, the dose would be ascertained in this way—

$$\frac{4}{25} = \frac{16}{100} = \cdot 160$$

Suppose the adult dose to be 1 gramme, the child of 3 years would receive $\cdot 160$ gramme, or 16 centigrammes.

Idiosyncrasy—The physician meets with individuals in whom an ordinary dose of some well-known drug causes symptoms more intense, or entirely different from those usually observed to follow its administration, and when these cannot be accounted for by any known law, the case is generally regarded as one of idiosyncrasy.

Patients are occasionally met with in whom the smallest dose of calomel will be followed by profuse salivation, whilst enormous doses of opium and chloroform are sometimes borne by those unaccustomed to their use. Iodide of potassium is the best example of a drug whose action is sometimes enormously increased by some idiosyncrasy in the patient.

Habit determines the dose of some medicines more than any other influence; this is particularly true of narcotics. Many instances are recorded of opium eaters who took a pint of laudanum daily without experiencing the soporific effects of the drug, and the arsenic eaters of Styria are examples of the same.

The *Interval between the Doses* should determine to a large extent the amount of the dose; this is too frequently overlooked in tables. No rule can, however, be laid down on the subject, but the student should be guided by the nature of the action of the medicine, the effects required to be produced by it, and the rate of its absorption, &c. The B.P. gives for certain remedies two series of doses—the larger as a single dose, and the smaller for repeated administration.

Disease modifies considerably the dose of a medicine; instances of this may be seen in the large quantities of opium needed in desperate inflammations and intensely painful conditions of various nerves. Mercury and opium are badly borne in albuminuria, whilst in syphilis large quantities of mercury can be freely given.

Climate and *Temperament* possess varying influence upon the amount of medicine required to produce its results in a healthy individual.

The *Temperature* of the patient and of the surrounding atmosphere has a very decided effect upon the dose of many medicines. Brunton has found that substances like veratrine, strychnine, &c., act in entirely different ways according as the temperature is high or low, this possibly being to some extent

the explanation of the indication for the administration of stimulants in the *early morning* in severe fevers.

Fasting—The rapidity with which medicines are absorbed and affect the system in this condition is well recognised.

The *Method by which the Medicine is Administered* affects the dose : thus, as a rule, the dose of remedies given by the rectum requires to be twice as great as if given by the mouth. Strychnine is an exception, being more active when given by the bowel than if swallowed. The dose may be said to be about a half, or two-thirds of the ordinary quantity when administered by the hypodermic method.

The *Form in which the Medicine is Administered* may affect its action, thus the active principles of drugs when isolated and given in a soluble form will act with greater rapidity and intensity than the corresponding amount of the crude drug, and some *conditions of the medicine* itself (chiefly those which relate to its rate of absorption or elimination) affect materially the amount of the dose.

Sex and Body Weight materially affect the action and dose of some drugs ; as a rule, women require smaller doses, and the dose should be less for a man weighing 100 lbs. than for one double this weight.

The *Presence of other Drugs* in the patient's blood—the presence in the body of any other drug which has a similar or an antagonistic action, will obviously affect dosage very considerably.

Accumulation or Cumulative Action modifies to some extent the dose of a medicine. After digitalis, strychnine, or bromide of potassium has been administered for a time some observers have noticed the sudden onset of the marked physiological symptoms produced by these remedies. In such a case the dose must be diminished or suspended ; and after its renewal the interval between the doses should be lengthened. The explanation in these cases is clearly that the elimination of the drug has been interfered with ; the active principle of digitalis so contracts the renal vessels that its exit from the system is delayed ; the same is true of strychnine as pointed out by Gärtner.

INCOMPATIBILITY.

It is of the utmost importance that the physician should avoid ordering remedies which, when mixed, destroy each other's virtues. Incompatibility is generally said to be threefold :—

1. *Chemical.* 2. *Therapeutical.* 3. *Pharmaceutical or Absolute.*

Of the first may be instanced syrup of squill and sal volatile ; acetate of lead and sulphuric acid or sulphate of zinc ; iron and the numerous substances containing tannic acid.

As an example of the second form of incompatibility may be mentioned a mixture, or pill, containing strychnine and Calabar bean.

Substances are said to be *absolutely* incompatible when they cannot be mixed together by the pharmacist, as borax and mucilage, or tincture of tolu, myrrh, or benzoin, when ordered with water. (See page 31).

Experience proves that many compounds, regarded formerly as incompatible, are valuable combinations. It does not follow if a mixture be *inelegant* that it is worthless, though some consider such should be regarded as incompatible and never employed. The official Mist. Ferri Co. and the formerly official Mist. Ferri Aromat. may be cited as popular preparations, though instances of incompatibles. Antipyrine should not be prescribed with spirit of nitre, iodine, Prussic acid, and ferric salts.

Unfortunately no rule can be laid down to prevent the student ordering substances which oppose each other in their action in the system, or which chemically decompose each other, or which will refuse to take the intended shape from the hand of the dispenser. Nevertheless, a fair preliminary knowledge of chemistry and pharmacology will generally prevent such a mistake.

Amongst the various general rules of incompatibility there is one which the student should remember—*that a drug should very rarely be ordered in combination with any of its tests or antidotes.*

The substances in the following short list can be combined with so few preparations that the student will be wise to order them alone in simple solution.

- ✕ Permanganate of Potassium, Tannic and Gallic Acids, Corrosive Sublimate, Iodide of Potassium, Salts of Lead, Salts of Zinc, Iodine and its liquid preparations, Nitrate of Silver, Tincture of Guaiacum, Citrate of Iron and Quinine, Free Chlorine in solution.

The student should turn to the short article on page 63 dealing with "Incompatibility" in dispensing.

✕ The following excellent summary of incompatibilities is from "The Art of Dispensing" :—

LIST OF INCOMPATIBILITIES.

- ✕ Acid arsenious, with lime-water, oxide of iron, magnesia.
- ✕ Acids generally, with alkalies, acetates, metallic oxides.
- Albumin, with acids, spirit, tannin, corrosive sublimate.
- Alkaloidal salts generally, with tannin, alkaline and earthy carbonates, iodine and its compounds, liquorice, strong mucilages, alkaline and ammoniated tinctures.
- Alum sulphate, with alkalies and alkaline carbonates.
- ✕ Ammonium bromide, with mineral acids, alkaline carbonates, chlorine, chlorate and bichromate of potash, nitrate of silver, calomel.

Apomorphine (hydrochloride) with carbonate and bicarbonate of soda, salts of iron, iodine, and tannin.

Barium chloride, with sulphuric and phosphoric acids and their salts, tartrates and carbonates, medicinal wines and vegetable infusions.

Bicarbonate of soda, with acids, tannin, salts of the metals and of the alkaloids.

Bismuth subnitrate, with tannin, sulphur, sulphide of antimony, calomel.

Chloral hydrate, with water (slow decomposition), warm water, alkaline carbonates, vegetable alkalies, ammonia salts, nitrate of mercury, calomel.

Chlorate of potash, with mineral acids, organic substances, sulphur, carbon, calomel, iodide of iron, &c.

Chlorine (chlorine water), with alkalies, alkaline carbonates, salts of ammonia, vegetable salts, nitrate of silver, lead salts, tannin, vegetable mucilages, extracts, waters, infusions, tinctures and syrups, milk, and emulsions.

Corrosive sublimate, with carbonates, lime-water, iodide of potassium, opium, vegetable infusions, tannin, but compatible with the carbonates of lime, baryta, and strontia, either in powder or super-carbonated solution.

Digitalis, with tannin, sugar of lead, iodine, iodide of potassium, alkaline carbonates.

Golden sulphuret of antimony, with bicarbonate of soda, cream of tartar, calomel, subnitrate of bismuth.

Gum arabic, with perchloride of iron, lead salts, spirit, ethereal tinctures, borax.

Iodine, with ammonia, starch, metallic salts, fatty or essential oils, emulsions, chloral, earthy carbonates, gum arabic, tragacanth, salep.

Iron powdered (iron reduced by hydrogen), with aloes, vegetable infusions and extracts, tannin, metallic and alkaloidal salts.

Iron salts, with alkaline carbonates, vegetable infusions and extracts, tannin, mucilage.

Lime-water, with acids, carbonates, ammonia salts, metallic salts, tartrates, infusions, tinctures, tannin.

Morphine and its salts, with oxide of iron, salts of iron, manganese, and silver.

Musk, with acids, acetates, tannin, ergot of rye, metallic salts.

Nitrate of silver, with hydrochloric, sulphuric, acetic, and tartaric acids and their salts, hydrocyanic acid and its compounds, iodine, iodide and bromide of potassium, alkaline and earthy carbonates, sulphur, and sulphide of antimony.

Nitrite of amyl, with tinctures, alkaline carbonates, calomel, lead salts, proto-salts of iron, iodide of potassium.

Opium, with alkaline carbonates, salts of the metals, tannin,

iodine, chlorine water, and nux vomica. Although opium and belladonna are supposed to be physiologically incompatible, they are often administered together with good results.

Pepsin, with alcohol, tinctures.

Permanganate of potash, with organic substances.

Salicylic acid and salicylate of soda, with iron salts, iodide of potassium, lime-water.

Strophanthus (tincture) in water undergoes hydrolysis, with formation of a toxic substance.

Tannin, with mucilage, all metallic salts, lime-water, alkaline carbonates and bicarbonates, egg albumin, gelatin.

Tartar emetic, with acids, alkalis, soap, calomel, tannin, rhubarb, cinchona, gum arabic, opium.

The various prescriptions scattered throughout the portion of this work devoted to Therapeutics will materially assist the student in selecting elegant and useful forms in which to administer the most important remedies. Some, indeed, of these may be open to the objection of containing incompatible substances, as iodide of potassium and corrosive sublimate; but where a combination has been proved by experience to be valuable, its inelegance or supposed incompatibility has been occasionally overlooked.

THE COMBINATION OF MEDICINES.

The compounds of the last generation, containing numerous absurd and incompatible ingredients, have forced many into the opposite extreme of simplicity. In this way combinations of remedies of the utmost value have fallen into disuse.

Paris pointed out the great advantages to be derived from a judicious combination of medicines: thus he found that the action of a medicine may be increased by combining several different preparations of it. Suppose, for example, we wish to get *all* the virtues of cinchona, we obtain them best from a mixture like the following:—

R. *Ext. Cinchonæ Liq.* ℥ij.

Tinct. Cinchonæ ℥j.

Decoct. Cinchonæ (B.P.85) ℥iv.

Infus. Cinchonæ ℥x. *misce.*

Fordyce showed that a much more valuable and reliable remedy may be obtained by combining various substances whose actions resemble, or are identical with, each other. Thus the best

diuretic would be a mixture of digitalis, squill, broom, and bicarbonate of potassium, infinitely superior to a proportionate dose of any one of them when administered singly.

The action of some medicines is increased by combining with them substances, the previously known qualities of which would have given no clue to their usefulness in this respect; thus the diuretic power of digitalis and squill is intensified by mercury.

By the judicious combination of two or more remedies we are often enabled to correct undesirable qualities possessed by one of them; thus alkalies correct the griping of aloes, and hyoscyamus that of colocynth; arsenic prevents the acne which follows the administration of bromide of potassium; and atropine corrects the unpleasant symptoms caused by a hypodermic dose of morphine.

By a regulation of the dose of various remedies of the same class, though differing in their methods of action, occasionally a better compound may be obtained, as pointed out by Paris; thus by giving a cholagogue with a saline, more effectual purgation is obtained; or by combining bromide of potassium with a narcotic, a more prolonged hypnotic action may be produced.

WEIGHTS, MEASURES, AND SYMBOLS USED IN PRESCRIBING.*

The weights used in prescribing and dispensing are of the official system, which starts with the Troy grain and ends with the Avoirdupois pound.

1 Grain, <i>gr.</i>		
1 Ounce, <i>oz.</i>	=	437.5 grs.
1 Pound, <i>lb.</i>	=	7,000 grs.

The official Measures of Capacity which are generally met with in prescriptions are:—

1 Minim	<i>min.</i>	=	91 grs. of water.
1 Fluid Drachm, <i>fl. dr.</i>	= 60 minims	=	54.68 " "
1 Fluid Ounce, <i>fl. oz.</i>	= 8 fluid drs.	=	437.5 " "

It will thus be noticed that there is no official weight between 1 grain and 1 ounce; but the ʒi. and ʒi. , which represented the $\frac{1}{8}$ and $\frac{1}{4}$ part of the old Troy ounce, are still permitted to exist under protest. They are, when used in a prescription, to

* Upon pages 76 and 77 will be found a full table of the Weights and Measures of the British Pharmacopœia.

be taken as meaning 60 grs. and 20 grs. respectively, and not the $\frac{1}{8}$ and $\frac{1}{24}$ of the Avoirdupois ounce, which would be 54.68 and 18.22 grains respectively.

The French Gramme, = 15.432 grs.

The following are the symbols and signs met with in prescription writing; they must not be confounded with the *official* symbols, which are simply the first two letters of the English words, as fl. oz., fl. dr., &c.

- Gr. = Granum, 1 grain = $\frac{1}{480}$ of a Troy ounce, or $\frac{1}{437}$ of an Avoirdupois ounce.
- ℞. = Scrupulum, 1 scruple = 20 grains.
3. = Drachma, 1 drachm = 60 grs. or 3 scruples; or $\frac{1}{8}$ of a fluid ounce, or 60 minims.
- ℥. = Uncia, 1 ounce = 1 Troy oz. (480 grs.) or 1 fluid oz. (480 minims), or 437.5 grains of water.
- M. = Minimum, 1 minim = $\frac{1}{60}$ part of a fluid drachm or the volume of .91145 grain of water.
- Gtt. = Gutta, 1 drop, erroneously supposed to represent 1 minim.
- O. = Octarius, 1 pint = 20 fluid ounces, or 1 $\frac{1}{4}$ lbs. of water.
- C. = Congius, 1 gallon = 8 pints, or 10 lbs. of water.

DOMESTIC MEASURES.

- | | | |
|-------------------------------------|---|--|
| A tea-spoonful | { Cochleare minimum or Cochleare parvum | { = 1 fluid drachm (3j.) |
| A dessert-spoonful—Cochleare medium | | |
| A table-spoonful | { Cochleare amplum or Cochleare magnum | { = 4 fluid drs. or $\frac{1}{2}$ oz. (3iv. or 3ss.) |
| A wine-glassful—Cyathus vinarius | | |
| | | = 2 $\frac{1}{2}$ fluid oz. (3iiss.) |

The practice of measuring medicines in spoons is open to very serious objections, since seldom will two be found just alike in capacity, and the physician should make a rule of examining the spoon and ascertaining its dimensions before the patient uses it as a measure. The common "kitchen" spoon, which is generally made of iron and coated over with tin, fluctuates less in size than the other domestic measures; it can be relied upon as holding two fluid drachms. The wine-glass is generally stated to contain 1 $\frac{1}{2}$ to 2 ozs. It will, however, be nearly always found to contain at least 2 $\frac{1}{2}$ ozs., or the eighth part of an imperial pint. The writer believes that most physicians when ordering medicine to be taken in doses of

a wine-glassful, calculate upon the wine-glass containing at most 2 ozs. This idea arises from the old wine-glassful being equal to the $\frac{1}{8}$ part of the old wine pint of 16 ozs.

A small tea-cup contains on an average about 7 fluid ounces, and a breakfast-cup about 12 fluid ounces. These figures are much above those mentioned in most books.

An ordinary tumbler holds generally half-a-pint.

In all cases where the physician prescribes an *active* medicine he should order the dose to be measured in a graduated glass.

The mistake of counting drops as minims has been already referred to in the Pharmacy section (p. 21).

PRESCRIPTION WRITING.

In one sense, this may be said to be the highest accomplishment of the educated physician, since it requires for its correct performance an intimate knowledge of all the medical sciences, and a practical acquaintance with the art of pharmacy. It is to be regretted that a more intimate knowledge of this latter art is not cultivated by the student of medicine. There could scarcely be a more erroneous idea than that which one occasionally meets with—*i.e.*, that pharmacy is beneath the notice of the physician.

The writer believes there are very few things which give so great advantages in after life to the physician as an intimate acquaintance with this art.

The Model Prescription should consist of the following parts :—

1. *The Superscription.* 2. *The Inscription.* 3. *The Subscription.*
4. *The Signature.*

1. *The Superscription*, which consists of the letter R., originally was used, it is supposed, to represent the symbol of the planet Jupiter, at a time when much of the virtue of a combination appeared to rest upon the deity or presiding star. By common consent, it is now regarded as representing the imperative mood of the Latin verb *Recipio*, to take ; and the French accordingly commence their prescriptions with P., or *Prenez*.

2. *The Inscription* may be called the *body* of the prescription ; it includes the names of the substances to be administered, with their quantities, written in Latin, and as it is the most important part of the prescription, it will be referred to presently at more length.

3. *The Subscription* is made up of the directions (in Latin) for the guidance of the dispenser ; thus *misce*, often written *m.*, is frequently the only part in a prescription which belongs to the subscription.

4. *The Signature* includes the directions or instructions intended for the benefit of the patient. They are frequently written by

the prescriber in English, and many recommend that Latin should never be used for this part of the prescription.

Mistakes are certainly more liable to occur if the signature be written carelessly, or if incorrect Latin be employed, but the same reasons which have determined the use of this language for prescriptions from an early time, apply equally well to the signature. Thus a prescription written in Latin can be read and understood in every civilised country. Abbreviations and contractions can be employed without fear of being misunderstood, which could not be the case if any other language were substituted; we are thus often able, by a single letter, to express the meaning of several English words.

It is often absolutely *necessary* to write the inscription in such a way that the patient may remain innocent of the nature of its contents.

The use of long and elaborate Latin phraseology is to be condemned in prescribing, and the student, when he feels any difficulty in expressing himself in this tongue, had certainly better fall back upon his English when writing the signature. This he can do by using the Latin word *Signa*, after which the signature may be written in unabbreviated English.

The patient's name is written at the top or bottom of the recipe, preferably the top, as it is thus less liable to be overlooked or mistaken than if written where space is often limited. The prescriber's initials generally follow at the right hand corner, and the date is written opposite.

It is hardly necessary to remind the student of the necessity of writing clearly and legibly, and of avoiding the use of such contractions as might lead to mistakes.

The *body* or inscription of a model prescription should contain the following :—

The *Basis*, or principal active ingredient.

The *Adjuvant*, or *Auxiliary*, to assist its action.

The *Corrective*, to correct or diminish some undesirable quality.

The *Vehicle*, or *Excipient*, to give a suitable form for administration.

The following prescription may be regarded as a very commonly ordered combination of remedies :—

R.		SUPERSCRPTION.
(Basis.)	<i>Pot. Acet. ʒv.</i>	} INSCRIPTION.
(Adjuvant.)	<i>Tinct. Digitalis ʒj.</i>	
(Corrective.)	<i>Syr. Aurantii ʒj.</i>	
(Vehicle.)	<i>Inf. Scopar. ad ʒviij.</i>	
<i>Misce, fiat mist.</i>		SUBSCRIPTION.
<i>Cpt. Cochl. mag. ii. ʒla. q.q. hora ex paul. aquæ.</i>		SIGNATURE.

Without abbreviations or contractions it would read thus :—

Recipe

Potassii Acetatis drachmas quinque.

Tincturæ Digitalis drachmam unam.

Syrupi Aurantii unciam unam.

Infusum Scoparii ad uncias octo.

Misce, fiat mistura. Capiat cochlearia duo magna quartâ quâque horâ ex paululo aquæ.

☞ The student should not confound the *initials* of the prescriber with that portion of the prescription called the signature—*i.e.*, the directions to the patient.

The student will find benefit from a careful study of the following pages, in which the Latin of the above prescription is arranged according to the English idiom, and each word parsed and translated.

Latin Idiom :

Recipe Potassii Acetatis drachmas quinque.

R. (Recipe)	...	{ v. irr. tr. im. m. 2nd per. s., to agree with its nom. <i>Tu</i> —“thou” (understood). Rule i., recipi-o, recep-i, receptum, recipere. }	Take thou
v (quinque)	...	{ num. adj. indec. ac. pl. qual. and agreeing with drachmas. Rule ii. }	five
3 (drachmas)	...	{ n. f. ac. pl. Rule viii. (a) drachma—æ. }	drachms
Acet. (acetatis),	...	{ n. f. gen. s. qual. drachmas. Rule vi. (a), acetis—atis. }	of acetate
Pot. (potassii)	...	{ n. n. gen. s. qual. acetatis. Rule vi. (a), potassium—ii. }	of potassium.

Latin Idiom.

Recipe Digitalis Tincturæ drachmam unam.

R. (Recipe)	...	(understood)	Take thou
j (unam)	...	{ num. adj. ac. s. qual. and agreeing with drachmam. Rule ii., unus—a—um. }			one
3 (drachmam)	...	{ n. f. ac. s. gov. by recipe. Rule viii. (a), drachma—æ. }			drachm
Tinct. (tincturæ)...		{ n. f. gen. s. qual. drachmam. Rule vi. (a), tinctura—æ. }			of the tincture
Digit. (digitalis)...		{ n. f. gen. s. qual. tincturæ. Rule vi. (a), digitalis—is. }			of digitalis.

Latin Idiom.

Recipe Aurantii Syrupi unciam unam.

R. (Recipe)	... (understood) ...	Take thou
j (unam)	... (parsed as before) ..	one
ȳ (unciam)	... { n. f. ac. s. gov. by recipe. Rule viii. (a), uncia—æ.	ounce
Syr. (syrupi)	... { n. m. gen. s. qual. unciam. Rule vi. (a), syrupus—i.	of syrup
Aur. (aurantii)	... { n. neu. gen. s. qual. syrupi. Rule vi. (a), aurantium—ii.	of orange.

Latin Idiom.

Recipe Infusum Scoparii ad uncias octo.

R. (Recipe)	... (understood) ...	Take thou
Infus.* (Infusum)	{ n. neu. s. acc. gov. by recipe. Rule viii. (a), infusum—i.	infusion
Scop. (scoparii)	{ n. masc. gen. s. qual. in- fusum. Rule vi. (a), sco- parius—ii.	of broom
Ad	... prep. gov. uncias. Rule viii. (b)	up to
viii (octo)	{ num. adj. indec. qual. uncias. Rule ii.	eight
ȳ (uncias)	{ n. f. ac. pl. gov. by ad. Rule viii. (b), uncia—æ.	ounces.

N.B.—The student must have a clear idea of the meaning of this Ad. It means that the dispenser, after measuring the other ingredients, must add enough of the infusion to make the entire quantity measure 8 ozs.

Latin Idiom.

Misce, fiat mistura.

M. (misce)	... { v. trans. imp. m. p. t. agree- ing with and gov. by tu (understood). Rule i., misceo, -ui, mixtum or mistum, miscere.	Mix thou, or mix,
Mist. (mistura)	... { n. f. nom. s. governing fiat. Rule i., mistura—æ.	let a mixture
Fl. (fiat)	... { v. used as passive of facio, pres. sub. 3rd s., used as imp. gov. by and agreeing with mistura; fio, factus sum, fieri; to be made or become.	be made.

* Some authorities put Infusum in the genitive (infusi)—a partitive genitive—i.e., "of infusion." In the same way, where the student meets *Aquam ad ȳ*, in the different prescriptions throughout the Fourth Part of this work, he may substitute *Aquæ ad ȳ*. Either form is correct.

Latin Idiom.

Capiat cochlearia magna duo quarta quâque horâ ex aquæ paululo.

<i>Cpl.</i> (capiat)	...	{ irr.v. tr. sub. m. pr. t. 3rd per. s. agreeing with and gov. by (is) understood. Rule i., capio, cepi, captum, capere, the pre- sent subjunctive used as an imperative. Rule x. (a). }	{ He may take, or let him take }
<i>ij</i> (duo)	...	{ num. adj. ac. pl. neut. qual. and agreeing with cochlearia. Rule ii., duo—æ—o. }	{ two }
<i>Mag.</i> (magna)	...	{ adj. ac. pl. neut. qual. and agreeing with cochlearia. Rule ii., magnus—a—um. }	{ large }
<i>Coch.</i> (cochlearia)		{ n. ac. pl. neut. gov. by capiat. Rule viii. (a), cochlear—is. }	{ spoonfuls }
<i>q.q.</i> (quâque)	...	{ pron. indef. abl. s. qualifying and agreeing with hora. Rule ii., quisque, quæque, quodque. }	{ at each }
<i>4tâ</i> (quartâ)	...	{ num. adj. abl. s. qualifying and agreeing with hora. Rule ii., quartus—a—um. }	{ fourth }
<i>Horâ</i>	...	{ n. f. abl. s. Rule ix. (a), hora —æ. }	{ hour }
<i>Ex</i>	...	{ prep. Rule ix. (c). }	{ out of (in) }
<i>Paul.</i> (paululo)	...	{ adj. abl. s. used as a noun, gov. by ex, paululus—a— um. }	{ a little }
<i>Aq.</i> (aquæ)	...	{ n. f. gen. s. qual. paululo. Rule vi., aqua—æ. }	{ of water. }

GRAMMATICAL AIDS TO PRESCRIPTION WRITING.

Two languages differ in *words*, *inflections*, and *idioms*.

"A student who wishes to read the Latin language must thus understand the *meaning* of its words, the *force* of its inflections, and the *nature* of its idioms."

As far as the *words* are concerned, a limited knowledge of this language, and one sufficient for the intelligent reading and writing of physicians' prescriptions, may be obtained from the following brief vocabulary.

The *inflections* may be learned from any Latin grammar; whilst the student may obtain a fair conception of the *idioms* or order of words from a careful study of the few important rules of Syntax which follow.

A FEW RULES OF LATIN SYNTAX, APPLICABLE TO THE
CONSTRUCTION OF PHYSICIANS' PRESCRIPTIONS.

Syntax is generally divided into two parts—CONCORD and GOVERNMENT.

Concord is the agreement between two Latin words, one influencing the other. There are three concords :—

1. A verb, with its subject (as Rule I.).
2. Adjectives, with the nouns which they qualify. (Rule II.)
3. The Relative, with its antecedent. (Rule III.)

RULE I.

A personal verb agrees with its subject or nominative, in number and person ; as, *Ego tero*—I rub ; *Tu sumas*—You may take ; *Id fiat*—It may be done.

In prescription writing, the *active* voice of verbs is generally only used in the 2nd person singular of the imperative mood, and 3rd person singular or plural of the present subjunctive.

The use of the *passive* voice is generally confined to the 3rd person singular or plural of the present subjunctive, and the different parts of the Gerundive.

RULE II.

Adjectives, participles, and pronouns, whether belonging to the subject or the predicate, agree in gender, number, and case with the noun or the pronoun to which they refer ; as *Pulvis unus*—One powder ; *Uncia una*—One ounce ; *Sevum Præparatum*—Prepared suet.

RULE III.

The relative must agree with its antecedent in gender, number, and person ; as, *Syrupus qui optimus est*—The syrup which is best ; *Mistura quæ bona est*—The mixture which is good ; *Medicamentum quod neglectum est*—The medicine which has been neglected.

RULE IV.

If a verb has more than one subject the verb must be put in the plural number ; as *Pilula et mistura capiantur*—The pill and mixture are to be taken.

RULE V.

A participle governs the same case as the verb to which it belongs ; as *Augendo quantitatem*—By increasing the quantity.

RULE VI.

The Genitive case primarily signifies the class to which a thing belongs ; therefore—

- (a) It depends on another noun as a notion which it qualifies or determines ; as, *pulveris granum*—a grain of powder.

- (b) Or it is used to signify the whole from which a part is taken ; as, *nimum doloris*—too much (of) pain.
- (c) Adverbs of quantity, time, place, &c., govern the Partitive Genitive ; as, *salis aquæ*—enough (of) water.
- (d) Adjectives of plenty or want govern a Genitive or Ablative ; as, *dives quininæ*—rich in quinine ; *dives aqua*—rich in water.

RULE VII.

Dative.—The sign of the Dative case is *to* or *for*.

- (a) Adjectives which imply likeness or unlikeness, advantage or disadvantage, &c., govern the Dative ; as, *ceræ similis*—like to wax.
- (b) Verbs of giving or imparting, &c., govern the Dative of the indirect object as well as the Accusative of the direct object : *contusam liquori redde*—return the bruised (substance) to the liquor.

RULE VIII.

Accusative.—The Accusative was originally used to mark the immediate object of an action.

- (a) Transitive verbs in the active voice generally govern the Accusative case ; as, *citratem calcis lava*—wash the citrate of lime.

- (b) The following prepositions govern the Accusative :—

<i>Ad</i>To, at, for.	<i>Inter</i>Between, among.
<i>Adversum, ad-</i>	
<i>versus</i> ,.....Against, Towards.	<i>Ob</i>On account of.
<i>Ante</i>Before.	<i>Per</i>Through, by.
<i>Apud</i>At, with.	<i>Pone</i>Behind.
<i>Circum</i>Around.	<i>Post</i>After.
<i>Contra</i>Against.	<i>Prope</i>Near.
<i>Extra</i>Outside.	<i>Secundum</i>According to.
<i>Infra</i>Below.	<i>Supra</i>Above.

- (c) The following prepositions govern the Ablative as well as the Accusative :—

<i>In</i> (ac.) Into ; (ab.) in.	<i>Subter</i> (ac. and ab.) Under.
<i>Sub</i> (ac.) Under ; (ab.) near.	

RULE IX.

The Ablative received its name because it signifies ablation or separation, the sign of which is *from*.

- (a) Cause, manner, means, instrument, time when, and place where, are put in the Ablative ; as, *balneo arenæ*—in a bath of sand.

- (b) *Opus* and *usus* are followed by an Ablative ; as, *cibo opus est nobis*—we have need of food.
- (c) The definite answer to the questions “when” or “how” is expressed by a noun or pronoun and a participle in the ablative case, and is called the Ablative absolute ; as, *liquoribus omnibus mixtis*—all the liquors having been mixed.

The following prepositions govern the Ablative :—

<i>A, ab, abs</i>Away from, by.	<i>Præ</i>Before, because of.
<i>Cum</i>With.	<i>Pro</i>For, before, according to.
<i>De</i>Down from, of, about.	

E, ex.....Out of, from, after. *Sine*.....Without.

- (d) *Utor, abutor*, and a few other verbs govern the Ablative ; as, *utatur sequenti*—let him use the following.

RULE X.

The Imperative mood is used to express requests or commands ; as, *Recipe*—Take (thou).

- (a) The Present Subjunctive mood is often used instead of the Imperative ; as, *fiat mistura*—let the mixture be made.

LATIN WORDS AND PHRASES MOST FREQUENTLY USED IN PRESCRIPTIONS BRIEFLY EXPLAINED.*

- ✓ *Aa, Ana* (Greek preposition). Of each.
- A, ab, prep.* By or from (governs abl.)
- ✓ *Ad 3tiam vicem*—ad tertiam vicem. For three times.
- ✓ *Ad lib.*—ad libitum. (*ac.*, *s.*, *libitus-i.* Rule viii.) At pleasure.
- Add.*—*Adde, im. m.* (*addo, -didi, -ditum, -ere.*) Add.
- Admov.*—*Admove, im. m.* (*Admoveo, -vi, -tum, -ere.*) Apply.
- Æger, ægra, ægrum, adj.* Sick. (The patient.)
- ✓ *Albus (-us, -a, -um, adj.)* White.
- ✓ *A. H., Alternis Horis.* (*ab. pl.* Rule ix.) Every other hour.
- Alvus (-i, n. fem.)* The bowels.
- Alvo Adst.*—*Alvo Adstrictâ.* The bowels being confined.
- ✓ *Amplus (-us, -a, -um, adj.)* Large.
- ✓ *App.*—*Applicandum.* (*-us, -a, -um, gerundive.*) To be applied.
- ✓ *Aq.*—*Aqua.* (*-æ, n. f.*) Water.

* ABBREVIATIONS USED.—*ab.*, or *abl.*, ablative ; *ac.*, accusative ; *ad.*, or *adj.*, adjective ; *adv.*, adverb ; *conj.*, conjunction ; *f.*, feminine ; *gen.*, genitive ; *im.*, or *imp.*, imperative ; *indecl.*, indeclinable ; *indef.*, indefinite ; *irr.*, irregular ; *m.*, or *masc.*, masculine ; *m.*, or *mo.*, mood ; *n.*, or *no.*, noun ; *nom.*, or *no.*, nominative ; *num.*, numeral ; *neu.*, neuter ; *pas.*, passive ; *part.*, participle ; *p.*, *pr.*, or *pres.*, present ; *pl.*, plural ; *prep.*, preposition ; *pron.*, pronoun ; *s.*, singular ; *sub.*, subjunctive ; *t.*, tense ; *tr.*, transitive ; *v.*, verb.

- Aq. Bull.** — Aqua Bulliens. (*-entis, adj.*) Boiling water.
„ Com. — „ Communis. (*-is, -e, adj.*) Common „
„ Dest. — „ Destillata. (*-us, -a, -um, adj.*) Distilled „
„ Ferv. — „ Fervens. (*-entis, adj.*) Hot „
„ Font. — „ Fontalis. (*-is, -e, adj.*) Spring „
„ Mar. — „ Marina. (*-us, -a, -um, adj.*) Sea „
„ Niv. — „ Nivalis. (*-is, -e, adj.*) Snow „
„ Pluv. — „ Pluvialis. (*-is, -e, adj.*) Rain „
Auris (*-is, n. f.*) The ear.
Aut (*conj.*) Or.
Balneum (*-ei, n. neu.*) A bath.
Bene (*adv.*) Well.
Bibo (*bibere v. 3rd conj.*) To drink.
Bis Ind. — Bis Indies. (*adv.*) Twice a day.
B. P. or Ph. B. — Pharmacopœia Britannica, British Pharmacopœia.
Brachium (*-ii, n. neu.*) The arm.
C. — Cum. (*prep. gov. abl. See Rule ix.*) With.
Calidus (*-us, -a, -um, adj.*) Warm.
Calor (*-oris, n. masc.*) Heat.
Capio (*See Cpt.*) To take.
Caput (*-itis, n. neu.*) The head.
Cataplasma (*-atis, n. neu.*) A poultice.
Ceratum (*-i, n. neu.*) An ointment or cerate.
Charta (*-æ, n. f.*) A powder or a paper.
Cibus (*-i, n. masc.*) Food.
Circa (*prep. gov. accus.*) Around.
Coch. — Cochlear, Cochleare, or Cochlearium. (*n. neu.*) A spoonful.
Coch. Amp. — Cochlear (*-aris*) Amplum. (*-us, -a, -um, adj.*)
 A table-spoonful.
„ Mag. — Cochlear (*-aris*) Magnum. (*-us, -a, -um, adj.*)
 A large spoonful; or a table-spoonful.
„ Med. — Cochlear (*-aris*) Medium or Modicum. (*-us, -a, -um, adj.*)
 A dessert-spoonful.
„ Min. — Cochlear (*-aris*) Minimum. (*-us, -a, -um, adj.*)
 A small spoonful; or a tea-spoonful.
„ Parv. — Cochlear (*-aris*) Parvum. (*-us, -a, -um, adj.*)
 A tea-spoonful.
Cochleat. — Cochleatim. (*Adv.*) By spoonfuls.
Cœna (*-æ, n. f.*) Supper.
Coll. — Collyrium. (*-ii, n. neu.*) An eye-wash.
Colo (*-avi, -atum, -are, v. a.*) To strain.
Co. — Compositus. (*-us, -a, -um, adj.*) Compound.
Comp. — Compositus. (*-us, -a, -um, part.*) Compounded.
Confectio (*-onis, n. f.*) A confection or electuary.
Cong. — Congius. (*-ii, n. masc.*) A gallon.
Conserva (*-æ, n. f.*) A conserve or electuary.
Coq. — Coque. (*coquo, -xi, -ctum, -ere, v., im. m.*) Boil.
Cpt. — Capiat. (*pr. sub., 3rd per. s., capio, cepi, captum, capere.*
Rule x.) Let the patient take.

- ✓ **Cras** (*adv.*) To-morrow.
- Crus** (*Cruris, n. neu.*) The leg.
- ✓ **Cuj.** — Cujus. (*gen. s. of qui, quæ, quod.*) Of which.
- Cum** (*prep. gov. abl.*) With.
- Cyath.** — Cyathus. (*-i, n. masc.*) A glass.
- ✓ **C. Vinar.** — Cyathus Vinarius. A wine-glass.
- D.** — Dosis. (*dosis, n. f.*) A dose.
- ✓ **Da.** { — Da. (*do, dedi, datum, dare, imp. m.,*) Give ;
- ✓ **Det.** { — Detur. (*pres. sub., 3rd p. s.*) } Let it be given.
- Decoctum** (*-i, n. neu.*) A decoction.
- Decub.** — Decubitus. (*-us, -a, -um, part.*) Lying down.
- De d.** { — De die (*-es, -ei, n. masc. ab. s. Rule ix.*) } From day
- in d.** { — in diem. (*Rule viii.*) } to day.
- Dej.** { — Dejectiones (*-onum, n. pl.*) } Stools, or motions
- Alv.** { — Alvi. (*-i, n. f. gen. s.*) } of the bowel.
- Dens** (*dentis, n. m.*) A tooth.
- Dexter** (*-tra, -trum, adj.*) Right.
- Dieb.** { — Diebus (*-es, -ei, n. ab. pl. Rule ix.*) } Every
- alt.** { — Alternis. (*-us, -a, -um, adj. pl. ab. m. Rule ii.*) } other day.
- Digitus** (*-i, n. m.*) A finger.
- ✓ **Dim.** — Dimidius. (*-us, -a, -um, adj.*) One half.
- Div.** — Divide. (*-do, -visi, -visum, -dere, im. m.*) Divide.
- Div.** { — Dividatur (*-vido, -visi, -sum, -ere, v. 3rd*) Let it be
- in** { — in (*prep. gov. partes. Rule viii.c.*) } divided
- p.** { — partes (*n. ac. pl. gov. by in*) } into
- ✓ **æq.** { — æquales (*adj., agreeing with partes.*) } parts
- Dolor** (*-oris, n. masc.*) Pain. equal.
- Donec** (*conj.*) Until.
- Durant.** { — Durante (*-ans, -antis, part.*) } While the pain
- Dolor.** { — Dolore (*-oris, n. masc.*) } lasts.
- ✓ **Dos.** — Dosis. (*-is, accusative dosin, n. f.*) A dose.
- Drachma** (*-æ, n. f.*) A drachm.
- Dulcis** (*-is, -is, -e, adj.*) Sweet.
- Dum** (*adv.*) Whilst.
- ✓ **Duo** (*duo, -æ, -o, adj.*) Two.
- E or Ex** (*prep. gov. abl.*) Out of.
- Ejusd.** — Ejusdem. (*idem, eadem, idem, gen. s.*) Of the same.
- Effervescentia** (*-æ, n. f.*) Effervescence.
- Elect.** — Electuarius. (*-ii, n. neu.*) An electuary.
- Emesis** (*-is, n. f.*) Vomiting.
- Emplastrum** (*-tri, n. neu.*) A plaster.
- Enema** (*-atis, n. neu.*) An enema or clyster.
- ✓ **Et** (*conj.*) And.
- Extractum** (*-i, n. neu.*) An extract.
- F.** — Fac. (*facio, feci, factum, facere, imp. m., 2nd p. s.*) Make.
- ✓ **F.A.O.** — Folio Argenti Obruantur. Let them be rolled in silver leaf.
- Febris** (*-is, n. f.*) Fever.

- Febricula (-æ, n. f.) Fever.
 Fer. — Ferrum. (-i, n. neu.) Iron.
 Ferv. — Fervens. (-ens, -entis, adj.) Hot.
 Flatus — (-us, n. masc.) Flatulence.
 Flavus (-us, a, -um, adj.) Yellow.
 Flos (-oris, n. masc.) A flower.
 Fol. — Folium. (-ii, n. neu.) A leaf.
 Frigidus (-a, -um, adj.) Cold.
 Frequenter (adv.) Frequently.
 Ft. — Fiat. (fio, factus, fieri, pres. sub. 3rd s.) Let it be made.
 Ft. — Fiant. (" " " " " " pl.) Let them be made.
 Garg. — Gargarisma. (-matis, n. neu.) A gargle.
 Genu (-us, n. neu.) The knee.
 Gradatim (adv.) By degrees.
 Gr. — Granum. (-i, n. neu.) A grain.
 Gtt. — Gutta. (-æ, n. f.) A drop.
 Guttat. — Guttatim. (adv.) By drops.
 H. — Hora. (-æ, n. f.) An hour.
 Haust. — Haustus. (-us, n. masc.) A draught.
 Hebdomas (-adis, n. f.) A week.
 Heri (adv.) Yesterday.
 Hodie (adv.) To-day.
 Hora (-æ, n. f.) An hour.
 H.S.S. — Hora Somni Sumendum. To be taken at bed-hour.
 Idem (idem, eadem, idem, pron.) The same.
 In (prep. gov. abl. or acc.) In or into.
 In d. — In-dies. (adv.) From day to day or daily.
 Injectio (-onis, n. f.) An injection.
 Infra (prep. gov. acc.) Below.
 Infrico (-cui, -ctum, and -catum, -are.) To rub in.
 Infusum (-i, n. neu.) An infusion.
 Intime (adv.) Thoroughly.
 Jecur (jecoris, n. neu.) The liver.
 Latus (-eris, n. neu.) The side.
 Laxativus (-us, -a, -um, adj.) Laxative.
 Levis (-is, -is, -e, adj.) Light.
 Libra (-æ, n. f.) A pound.
 Lin. — Linimentum. (-i, n. neu.) A liniment.
 Liquidus (-us, -a, -um, adj.) Liquid.
 Liquor (-oris, n. masc.) A liquid.
 Lytta (-æ, n. f.) Cantharides.
 Lotio (-onis, n. f.) A lotion.
 Macero (-avi, -atum, -are.) To macerate.
 Mag. — Magnus. (-us, -a, -um, adj.) Large.
 Mane (indecl. neu. n.—used adverbially.) In the morning.
 Mane Primo (adv.) Very early in the morning.
 M. — Massa. (-æ, n. f.) A mass.
 M. — Misce (misceo, miscui, mistum, miscere, pres. imper.) Mix.
 M. or Min. — Minimum (-i, n. neu.) A minim.

- Med. — Medicamentum (*-i, n. neu.*) A medicine.
 Medius (*-us, -a, -um, adj.*) Middle.
 Mensura (*-æ, n. f.*) A measure or by measure.
 Meridies (*-ei, n. masc.*) Mid-day or noon.
 Mist. — Mistura (*-æ, n. f.*) A mixture.
 Mitte (*mitto, misi, missum, mittere, 2nd p. s. pres. imper.*) Send.
 Modicus (*-us, -a, -um, adj.*) Middle-sized.
 Mol. — Mollis (*-e, adj.*) Soft.
 More dict. — More dicto. (*more, mos, -ris, n. masc.; dicto, dico, xi, -ctum, -ere, participle.*) In the manner directed.
 M.D.U. — More dicto utendum (*utendus, -a, -um; gerundive of ulor.*) To be used as directed.
 More Sol. — More solito (*solitus sum, solere, v. neu. passive.*) To be accustomed.) In the usual manner.
 Morbus (*-i, n. masc.*) Disease.
 M.P. — Massa Pilularis. A pill mass.
 Nig. — Niger (*-ra, -rum, adj.*) Black.
 Nisi (*conj.*) Unless.
 Nox (*noctis, n. f.*) Night.
 N.P. — Nomen Proprium. The proper name.
 Nux (*nucis, n. f.*) A nut.
 Octarius (*-ii, n. masc.*) A pint.
 Oculus (*-i, n. masc.*) An eye.
 Oleum (*-ei, n. neu.*) Oil.
 Om. — Omnis (*-is, -is, -e, adj.*) All; every.
 Omn. Hor. — Omni Hora. (*-æ, n. f.*) Every hour.
 Omn. Quadr. Hor. — Omni Quadrante Horæ. (*Quadrans, -tis, ab. f.*) Every quarter of an hour.
 Ope (*ops, opis, n. f. ab. s.*) Rule ix. (a). By the aid of.
 Optimus (*-us, -a, -um, adj.*) Best.
 Opus (*indeclinable n. neu.*) Need or occasion.
 Pars (*-tis, n. f.*) A part.
 P. Æ. — Partes Æquales (*-is, -is, -e, adj.*) Equal parts.
 Parvulus (*-us, -a, -um, adj.*) Very little.
 Paul. — Paululus. (*-us, -a, -um, adj.*) Little.
 Parvus (*-us, -a, -um, adj.*) Little; small.
 Pectus (*-oris, n. neu.*) The breast.
 Per (*prep. governs acc.*) Through.
 Pes (*pedis, n. masc.*) The foot.
 Pil. — Pilula (*-æ, n. f.*) A pill.
 Pocul. — Poculum (*-i, n. neu.*) A cup; a little cup.
 Pollex (*-icis, n. masc.*) The thumb.
 Pone (*prep. gov. acc.*) Behind.
 Post (*prep. gov. acc.*) After.
 Postea (*adv.*) Afterwards.
 Post singulas dejectiones liquidas. After each loose motion.
 P.P.A. — Phiala prius agitata—(*ablative absolute.*) The bottle having been first shaken.
 Prandium (*-ii, n. neu.*) Dinner.

- Primus** (-us, -a, -um, adj.) First.
- ✓ **P.R.N.** — Pro re nata (*adverbial phrase*.) Occasionally, or according to circumstances.
- ✓ **Pro** (*prep. gov. abl.*) Before.
- Pulmo** (-onis, n. masc.) A lung.
- Pulv.** — Pulvis (-veris, n. masc.) A powder.
- ✓ **Q.Q.** — Quaque f. or Quoque masc. (*quisque, quæque, quodque, abl. s. indef. prn.*) Each or every.
- ✓ **Q.S.** { — Quantum (*adv.*) } As much as
 { — Sufficiat. (*sufficio, -feci, -sectum, -ere.*) } is sufficient.
- ✓ **Quaque Hora** (*abl. of quisque, quæque, quodque, pron.*) Each hour.
- Quartus** (-us, -a, -um, adj.) Fourth.
- ✓ **Quintus** (-us, -a, -um, adj.) Fifth.
- Quor.** — Quorum (*qui, quæ, quod, pron.*) Of which.
- Quater** (*adv.*) Four times.
- Quibus** (*qui, quæ, quod, rel. pron. ab. pl.*) From which.
- Quotidie** (*adv.*) Daily.
- ✓ **R.** — Recipe (*recipio, recepi, receptum, recipere, im. m.*) Take thou.
- Rad.** — Radix (-icis, n. f.) A root.
- Rec.** — Recens (-ens, -ens, -ens, adj.) Fresh.
- ✓ **Rept.** { Repetatur (*repeto, -ivi, -itum, -ere, sub. m. 3rd s.*) } Let it be repeated.
 { Repetantur (*3rd pl.*) } Let them be repeated.
- ✓ **S.A.** — Secundum Artem (*secundum, prep; ars, artis, n. f.*) According to Art.
- Sæpe** (*adv.*) Often.
- Scrupulus** (-i, n. masc.) A scruple.
- Secundus** (-us, -a, -um, adj.) Second.
- Sem.** — Semen (-inis, n. neu.) Seed.
- ✓ **Semiuncia** (-æ, n. f.) A half-ounce.
- Separatim** (*adv.*) Separately.
- Sesquih.** — Sesquihora (*sesquihora, -æ, n. f.*) An hour and a half.
- Sextus** (-us, -a, -um, adj.) Sixth.
- ✓ **Si** (*conj.*) If.
- ✓ **Sig.** — Signa (*signo, -avi, -atum, -are, im. m.*) Mark thou.
- Simul** (*adv.*) Together ; at the same time.
- ✓ **Sine** (*prep.*) Without (*gov. abl.*)
- Sing.** — Singulorum (*singulus, -a, -um, adj.*) Of each.
- ✓ **Si op. sit** — Si opus sit. If necessary.
- Sit** (*sum, fui, esse, p. sub.*) Let it be.
- S.N.** — Secundum Naturam (-a, -æ, n. f.) According to nature.
- Solve** (*solvo, solvi, solutum,olvere.*) Dissolve.
- ✓ **Somnus** (-i, n. masc.) Sleep.
- Spt.** — Spiritus (-us, n. masc.) Spirit.
- Ss.** — Semis (-is, -issis, n. masc.) A half.
- ✓ **S.S.** — Statim Sumendum. To be taken immediately.
- ✓ **St.** — Sumat (*sumo, sumpsi, sumptum, sumere, pr. sub.*) Let him take.

- ✓ Stat. — Statim (*adv.*) Immediately.
- Sub (*prep. gov. acc. or abl.*) Under.
- Subinde (*adv.*) Frequently.
- Suc. — Succus (*-i, n. masc.*) Juice.
- Sum. — Sume (*sumo, sumpsi, sumptum, sumere, im. m.*) Take.
- Super (*prep. gov. acc. or abl.*) Over.
- Supra (*prep. gov. acc.*) Above.
- Syrupus (*-i, n. masc.*) Syrup.
- ✓ Talis (*talis, talis, tale, adj.*) Such.
- Ter (*adv.*) Thrice.
- Tere (*tero, trivi, tritum, terere, im. m.*) Rub.
- Tertius (*-us, -a, -um, adj.*) Third.
- Thorax (*-acis, n. masc.*) The chest.
- Tr. or Tinct. — Tinctura (*-æ, n. f.*) A tincture.
- Trit. — Tritura (*trituro, triturare, im. m.*) Triturate ; grind.
- Tussis (*-is, n. f.*) A cough.
- Una (*adv.*) Together.
- ✓ Uncia (*-æ, n. f.*) An ounce.
- Ungt. — Unguentum (*-i, n. neu.*) An ointment.
- Unus (*-a, -um, adj.*) One.
- ✓ Ut Dict. { — Ut Dictum. As directed.
- ✓ Utend. { — Utendum (*-us, -a, -um, gerundive.*) To be used.
- Vac. Ven. — Vacuo Ventriculo (*adj. & n., ab. sing.*) Rule ix. (a.)
On an empty stomach.
- Vel (*conj.*) Or.
- Vena (*-æ, n. f.*) A vein.
- Venenum (*-i, n. neu.*) Poison.
- Ver. — Verus (*-us, -a, -um, adj.*) Genuine.
- Vesicatorius (*-us, -a, -um, adj.*) Blistering.
- ✓ Vesp. — Vesper (*-eris, n. masc.*) The evening.
- Vetus (*-us, -us, -us, adj.*) Old.
- Vices (*n. f. defective.*) Time.
- Viginti (*numeral adj. indec.*) Twenty.
- Vinum (*-i, n. neu.*) Wine.
- ✓ Virus (*-i, n. neu.*) Poison.
- Vitellus (*-i, n. masc.*) Yolk (*i.e.* of egg).
- Vomicus (*-us, -a, -um, adj.*) Nauseating.
- Vomitus (*-us, n. masc.*) A vomit.
- Vulnus (*-eris, n. neu.*) A wound.

SPECIMEN PRESCRIPTION.

The accompanying recipe may be taken as a sample of a physician's prescription, and the student will do well to carefully study the various contractions and compare them with the Latin words which they represent upon the succeeding page. It is hardly necessary to insist upon the absolute necessity of writing all prescriptions in the most legible handwriting. Carelessness, which is generally the cause of illegibility, is in this department of therapeutics unpardonable.

8 COLLEGE SQUARE NORTH,
BELFAST.

Mr James Smythe

R_x. Ext. Cascar. Aq. Liq. 3ij.
Fr. Nuc. Vom. 3iv.
Spt. M. Pip. 3ii.
Glycerinum ad 3iv^m.
Ft. Mist. Cpt. Coch. min.
om. vespere et paul. Aq.

R_x. Ungt. Conii gr. L.
Menthol gr. ix.
Ol. Theobrom. q. s. ut
ft. Suppos. xii. Aq.
i. utend. h. s. om. n.
Mitte Sod. Tart. 3ss. s. s.
et aq. 1-12-02. W.W.

MR. JAMES SMYTHE.

Recipe

Extracti Cascaræ Sagradæ Liquidi, uncias duas.

Tincturæ Nucis Vomicae, drachmas quatuor.

Spiritus Menthæ Piperitæ, drachmas duas.

Glycerinum, ad uncias quatuor.

Misce.

Fiat Mistura. Capiat cochleare minimum omni vespere ex paululo aquæ.

Recipe

Unguenti Conii, grana quinquaginta.

Menthol, grana novem.

*Olei Theobromatis, quantum sufficiat ut fiat suppositoria
duodecim æqualia, unum utendum hora somni
omni nocte.*

Mitte Sodæ Tartaratæ semiunciam, statim sumendam ex aqua.

W. W.

1/12/1902.

MR. JAMES SMYTHE.

Take of

Liquid Extract of Cascara Sagrada, two ounces.

Tincture of Nux Vomica, four drachms.

Spirit of Peppermint, two drachms.

Glycerin, to four ounces.

Mix.

Make a mixture. Take one tea-spoonful every evening in a little water.

Take of

Ointment of Conium, fifty grains.

Menthol, nine grains.

Oil of Theobroma, a sufficient quantity that twelve equal suppositories may be made, one to be used at bed-time every night.

Send half an ounce of Tartarated Soda, to be taken immediately in water.

W. W.

1/12/1902.

GROUPS OF THERAPEUTIC AGENTS.

As the *junior* student will be frequently meeting in the *Materia Medica* portion of this work with words whose meaning he cannot understand, the following brief glossary is inserted here, not as an attempt to classify remedies, but merely for facility of reference, in order to explain terms in constant use which apply to many groups of well-known remedies.

A complete classification of drugs is not yet possible. The attempts of Buchheim and Schmiedeberg are not in many details successful.

There are *two* well-recognised and often-mentioned effects of a remedy—the physiological or pharmacological and the therapeutical—and the student should be familiar with both these terms.

By the physiological action of a medicine is generally meant the effects which the medicine will produce when administered to a person in *health*; though it should be remembered that to produce these effects a perfectly healthy state is not *necessary*. Thus, if 10 or 20 grs. of quinine be administered to a perfectly healthy subject, the constitutional effect of the remedy soon shows itself in the characteristic group of symptoms called cinchonism. This is spoken of as the physiological or primary action of quinine. If a medicinal dose of this drug be administered to a patient ill with the ague or neuralgia, it will be found to remove the disease; this is the therapeutical or secondary effect of the remedy. Suppose, however, the dose be a very large one, as in the first instance, the remedy may produce cinchonism, even though the patient have ague or neuralgia, and in this case the effects would still be called physiological. It will thus be understood that, in administering a remedy in disease, the physician often desires it to be given in such a quantity that the *physiological* effects of the drug should be made evident, as in treating syphilis with mercury, chorea with arsenic, paralysis with strychnine, or pertussis with belladonna.

To discuss the different theories which have from time to time prevailed about the way in which medicines produce their effects in the system, is beyond the intention of a short work like this. Under the name of each drug, in the Therapeutical part of this book, will be found a description of the way in which each is known or supposed to act. It will be hardly necessary to remind the student that the great bulk of remedies, after being swallowed, speedily find their way into the circulating fluid, accelerated or retarded by their crystalloid or colloid nature, and the well-known laws of osmosis. By the blood they are carried to the different tissues or glands, upon which they produce their characteristic effects, and by which, in many instances, they are eliminated or thrown out of the body. Why they exercise their peculiar

selective power over these particular tissues and organs is a difficult question, but the trend of opinion is certainly in the direction of regarding all such actions as being purely chemical. The general relationship between chemical *constitution* and pharmacological action first made manifest by the researches of Crum Brown and Fraser, strongly supports the chemic theory. These observers found that by altering slightly the structure of the strychnine molecule, its convulsing was changed into a paralyzing action.

There are several terms constantly employed in the description of the actions of drugs which are unfortunately used in different senses by different writers. The *local* or *direct* action of a drug is seen in the case of swallowing a corrosive poison which injures the mucous lining of the stomach. Its *remote* or *indirect* action would be seen in the stoppage of the heart which might result from its *secondary* influence upon the nerves and circulation. The *primary* or *immediate* action of a dose of croton oil would be to clear out the intestinal canal, its *secondary* or *remote* action might be to remove dropsical effusion in the brain or cellular tissue, or to relieve uræmia.

Absorbents are drugs like wood charcoal, which are used for causing absorption of irritating secretions on the surface of the body, or of gaseous products in the digestive tract.

Acids—Though these are always regarded as a group of remedies belonging to a chemical classification, the recent additions to our knowledge of the effects of acid substances justify the mention of them as a group in a therapeutical list. They are medicines which, in the concentrated form, act mostly as caustics, and when given in medicinal doses possess the power of *checking the acid secretions* of the body with which they come in contact, and, at the same time, they directly *increase alkaline secretions*. It is by this theory that Ringer explains their use in acid dyspepsia, sweating, &c. The principal members of the group are hydrochloric, acetic, nitric, sulphuric, phosphoric, nitro-hydrochloric, and citric acids.

Alkalies or Antacids—Under this head are included substances which have the power of *checking alkaline* and stimulating or *increasing acid secretions*. The most important are—caustic soda and potash, with their carbonates, bicarbonates, acetates, and citrates; ammonia and magnesia, with their preparations. Of this class, there are those which act *directly*, as soda does upon the gastric membrane, and those which also act *indirectly* through the blood.

Alteratives are a class of remedies which, when administered, cure disease without producing any obvious impression on any of the organs of the body; and because the way in which they act is not understood, or capable of demonstration, in the present state of our ignorance, they are said to *alter* the morbid processes,

and hence are called "Alteratives." The most important of this class are antimony, mercury, arsenic, iodine, colchicum, and their preparations.

Anaphrodisiacs are medicines which weaken the sexual functions, as camphor, bromides of ammonium and potassium, tobacco, hemlock, iodides of sodium and potassium.

Anæsthetics are medicines which produce loss of sensation and consciousness from their effects upon the brain and spinal centres. The term is usually restricted to volatile substances, like chloroform, ether, bromoform, nitrous oxide gas, &c., and does not include narcotics like alcohol and opium, which likewise produce anæsthesia.

Anæsthetics (Local) are agents which, when applied directly to a part, destroy its sensibility by their action on the sensory nerves, without injuring the tissues—as ether in the form of spray, cocaine, carbolic acid, ice, veratrine, &c.

Analgesics or Anodynes are remedies which relieve pain by their action on the brain, or their influence over the conductivity of the sensory nerve fibre, as opium, Indian hemp, belladonna, aconite, chloroform, antifebrin, antipyrine, &c.

Anhidrotics are medicines which restrain profuse perspiration. They act by (1) paralysing the terminals of the nerves going to the sweat glands, or (2) by their influence upon the gland cells, or (3) upon the sweat centres, or (4) the circulation, as belladonna, atropine, hyoscyamus, stramonium, muscarine, quinine, zinc salts, the vegetable and mineral astringents, and picrotoxin in small doses.

Antacids. (See Alkalies.)

Anthelmintics, Vermifuges or Antiscolics are medicines which destroy or cause the expulsion of worms, as santonin for the *round* worm, kousso, kamala, male-fern, turpentine, areca nut, and pomegranate for the *tape* and *broad* worms, and injections of salt, tannin, quassia, alum, iron, lime water, &c., for the *thread* worm.

Antagonists are medicines which act in direct opposition to each other, as atropine and muscarine ; atropine and hydrocyanic acid ; atropine and physostigmine ; atropine and pilocarpine ; digitalin and saponin ; chloral and strychnine ; opium and belladonna ; alcohol and strychnine.

Antidotes are medicines that relieve or remove the symptoms caused by poisons. Antidotes are *chemical*, as lime for sulphuric acid ; *physiological*, as strychnine for woorara ; or *vital*, as mercury for syphilis.

Antilithics or Lithontriptics are medicines supposed to possess the power of dissolving various concretions in the body, as the acids for phosphatic, and the alkalies for uric acid calculi ; and Castile soap and salicylate of soda for gall-stones.

Antiparasitics are medicines which destroy minute parasites—as sulphurous and carbolic acids, iodide of sulphur, and various mercurial salts, and the innumerable list of antiseptics.

Antiperiodics are medicines which antagonise the poison of periodic disorders like ague. The principal members of the group are quinine, arsenic, and iodine.

Antiphillogistics are remedies which are supposed to possess the power of subduing inflammations—as mercury, aconite, veratrum viride, purgatives, antimony, venesection, &c.

Antiseptics are medicines which prevent putrefaction by destroying or arresting the growth and development of the germs, upon whose presence putrefaction depends. Carbolic acid may be taken as the type of this class. They should not be confounded with Disinfectants like hot air, which destroy the germs causing disease, or with Deodorants like chlorine or charcoal, which destroy fetid smells and emanations.

Antisialics are remedies used to diminish or check the secretions of the salivary glands, as atropine, and physostigma in large doses.

Antipyretics are remedies which reduce the temperature in fevers and diseased conditions. They do so either (1) by lessening the production of heat, through their effect on the nervous system, as antipyrine, antifebrin, quinine, salicin, &c., or (2) by destroying the poison which causes the fever, as arsenic and iodine in ague, or (3) by their action on the skin or circulation, as alcohol, antimony, aconite, &c., or (4) they may act by extracting the heat, as the cold bath and diaphoretics and sudorifics do.

Antispasmodics—Several distinct groups of remedies are included under this heading.

(1) Medicines which *paralyse* the motor centres, as Calabar bean and woorara, or which merely *depress* them, as bromides of potassium and ammonium.

(2) Medicines which produce profound general depression of all the vital functions, as tobacco, aconite, lobelia, hellebore, Prussic acid; and many remedies called sedatives.

(3) Medicines which, by stimulating the bowel, cause the expulsion of gas and relieve colic, as asafetida, cajuput, castor, valerian, and a host of remedies called Carminatives and Aromatics.

(4) Medicines which overcome spasm of the bronchial tubes, as stramonium, belladonna, hyoscyamus, &c.

Aphrodisiacs are medicines which increase the sexual appetite and excite the functions of the genital organs, as phosphorus, cantharides, strychnine, damiana, cannabis indica, &c. They act directly upon the genital nerve centres in the cord and brain, as

strychnine, or indirectly by irritating the bladder and urethra, as cantharides.

Astringents are remedies which cause contraction of muscular fibre, and condensation of the tissues, mostly by precipitation of gelatin and albumin. The most important are tannic and gallic acids, and all substances containing them, the mineral acids and most metallic salts, alum, creosote, &c.

Carminatives. (See Antispasmodics.)

Cathartics, Aperients, Evacuants or Purgatives are medicines which increase or quicken the evacuations from the bowel. They are variously sub-divided :—

a. Laxatives, which slightly quicken the peristaltic movements, and cause only *softened* motions, as manna, sulphur, figs, prunes, olive oil, &c.

b. Purgatives proper or simple purgatives, which, by increasing the movements of the intestines, and stimulating the glands, cause *semi-fluid* motions, as senna, castor oil, mercurials, aloes, &c.

c. Drastics, which act like the former class, only more intensely, and by their local irritant action increase the intestinal fluid, and remove the serum from the intestinal vessels, causing *almost fluid* motions—as scammony, jalap, colocynth, gamboge, podophyllin, and large doses of class *b*.

d. Hydragogues, which cause *free* secretion from the intestinal glands, and remove much serum from the blood vessels, producing *fluid* or *watery* motions, as croton oil, elaterin, and many of the remedies in class *c*; and large doses of various salts, like cream of tartar, Epsom, Glauber, &c., which are often called *saline* purgatives, and which are supposed to act by virtue of their low diffusive powers.

e. Cholagogue Purgatives are remedies which are supposed to purge by stimulating the liver and increasing the bile, or by concentrating their action upon the duodenum they cause the bile to be swept out of the body before it has time to be re-absorbed by the intestinal surface (calomel and podophyllin); they produce *greenish liquid* motions; most brisk purgatives are included in this class by writers, as aloes, iridin, mercurials, rhubarb, euonymin, &c.

Cholagogues. (See Cathartics.) The term is sometimes used to include such mild hepatic stimulants as the dilute nitro-hydrochloric acid, soda salts, and the chloride of ammonium.

Ciliary Excitants are medicines which, when sucked in the mouth, promote expectoration of bronchial mucus by reflex action—as chloride of ammonium, chlorate of potassium, gum acacia, native chloride of sodium, &c.

Counter-Irritants—Under this heading are included—**RUBEFACIENTS**, remedies which cause redness of the skin; **EPISPASTICS**,

or **VESICANTS**, which produce inflammation, ending in the formation of a blister; **REVULSIVES** and **DERIVATIVES**, remedies which are supposed to remove the diseased action from the seat of mischief to the place of their application. Amongst this class are cantharides, turpentine, ammonia, camphor, mustard, most volatile oils, mezereon, capsicum, croton oil, &c.

Demulcents are medicines which protect the parts with which they come in contact, by their oleaginous or mucilaginous qualities, shielding them from irritating secretions. Linseed, olive, and almond oils, starch, glycerin, liquorice, &c., are included under this head.

Diaphoretics are medicines which increase the cutaneous secretion, either by stimulating the terminal nerves in the cells of the sweat glands, as pilocarpine does, or by causing the dilatation of the superficial capillaries, as antimony, ipecacuanha, and all depressing remedies; or by stimulating the sweat centres in the spinal cord, as the spirit of nitrous ether.

Delirifacients are drugs which produce delirium, followed afterwards by stupor, as cannabis, belladonna, hyoscyamus, and coca.

Diluents are remedies like water and weak fluid foods, which, when taken in quantity, on being eliminated, carry out some solids with them by the kidneys, lungs, or skin.

Digestants or Digestives are agents used to assist the stomach and intestines in their normal functions of digestion of foods. They are papain, pepsin, trypsin, taka-diastrase, and malt extract.

Disinfectants and **Deodorants** are referred to under Antiseptics.

Diuretics are remedies which increase the renal secretion. *Stimulating diuretics* act by stimulating the kidneys during their elimination, as copaiba, cubebs, turpentine, pepper, gin, alcoholic liquors, buchu, cantharides, juniper, &c. *Hydragogue diuretics* act by raising the blood pressure in the glomeruli, as digitalis, squill, casca, broom, caffeine, &c. *Refrigerant diuretics* act by washing out the kidneys, as large doses of diluents, like water, and solutions of the various potash salts.

Ecbolics are medicines which cause contraction of the uterine muscular fibre, as ergot, borax, savin, quinine, &c.; in smaller doses they are emmenagogue.

Emetics are medicines which cause the evacuation of the contents of the stomach. They are divided into (1) *Local Emetics* as zinc and copper sulphates, mustard, carbonate of ammonia, warm chamomile infusion, and solution of common salt, alum, &c., which act locally by irritating directly the nerves distributed to the gastric mucous membrane. (2) *General Emetics*, which act through the blood upon the vomiting centre, as tartar emetic, ipecacuanha, senega, squill, and apomorphine. Most of these latter drugs are eliminated by the gastric mucous membrane

after absorption, and then also act partly as local emetics. Apomorphine may, however, be regarded as a pure general emetic.

Emmenagogues are medicines which, by their stimulating action on the uterine fibre (1) directly assist in restoring disordered menstruation, as ergot, savin, and most ecbolics; or (2) by removing the cause of the suppression, allow the discharge to return, as iron, aloes, strychnine, &c.

Emollients or Protectives are external Demulcents, which protect and soothe the parts to which they are applied from all sources of irritation; or, by their oily nature, they help to relax and soften the tissues, as hot fomentations, poultices, oils, lard, spermaceti, chalk, starch, &c.

Errhines are medicines which increase the secretion of the nasal mucous membrane generally without causing sneezing, as the vapour of ammonia, acetic acid, &c. The term, is, however, often applied also to sternutatories.

Escharotics or Caustics are substances which destroy the life of the tissue to which they are applied, generally by depriving it of its moisture—as the strong mineral acids, soda, potash, lime, arsenic, chloride of zinc, &c.

Expectorants are medicines which assist the expulsion of the bronchial mucus—

(1) By relieving spasm of the bronchial tubes, as lobelia, opium, stramonium, tobacco, &c.

(2) By mechanically dislodging it in the act of vomiting, at the same time thinning the secretion, as all emetics *in large doses*, notably antimony, hippo, &c.

(3) By increasing the flow from the inflamed membrane, through their effects upon its gland cells, as all the emetic class *in small doses*—*Nauseating or Depressant* expectorants—as apomorphine, pilocarpine, emetine, and tartar emetic.

(4) By stimulating the membrane in the act of their elimination, they so alter the secretion that expectoration is rendered easy, as ammonia, senega, ammoniacum, and a host of volatile substances, notably the onion, tar, turpentine, balsams, asafetida, &c.—*Stimulating* expectorants. Iodide of potassium, by liquefying the secretion, is a valuable expectorant.

(5) By soothing the irritable respiratory centre, morphine and chloral may act as expectorants, and render the expulsion painless.

(6) By acting through the impression produced on the nerves of the mouth, many substances aid expectoration. (See Ciliary excitants).

(7) By stimulating the respiratory centre, and strengthening the muscles of the expulsive mechanism, strychnine and atropine may act as true expectorants.

Galactagogues are medicines which increase the secretion of the mammary glands, as chlorate of potassium, fennel, &c.

Hæmatics or Hæmatinics are medicines which enrich the blood by acting as restoratives to the red corpuscles, as iron and its preparations, manganese, cod liver oil, free phosphorus and lime phosphates, and potassium in small doses. They are also termed Blood Tonics.

Hæmostatics are drugs which check hæmorrhage after they have been absorbed and circulate in the blood. Adrenalin—the active principle of suprarenal gland—gelatin, and chloride of calcium are the best examples. Ergot, turpentine and lead salts were supposed to act in the same way.

Hypnotics or Soporifics are medicines which induce sleep without causing any previous cerebral excitement. Sulphonal, chloral, paraldehyde, urethane, and the new sleep producers belong to this class.

Mydriatics are remedies which cause dilatation of the pupil, paralysis of the ciliary muscle, and temporary loss of accommodation, as atropine, duboisine, belladonna, homatropine, daturine, &c.; they are generally used for their local action.

Myotics are remedies which cause contraction of the pupil and diminution of ocular tension, as eserine, Calabar bean, pilocarpine, &c.

Narcotics are medicines which produce sleep by their action upon the cerebrum. They are to be distinguished by their initial exciting stage from pure Hypnotics, like chloral and bromide of potassium, &c.; amongst them are opium, morphine, chloroform, Indian hemp, alcohol, and ether.

Nervines are agents which act upon the nervous system. The term includes narcotics, anæsthetics, hypnotics, excito-motors, &c.

Oxytocics are medicines employed to increase the activity of the uterine contractions during or immediately after labour, as quinine, ergot, and hydrastis.

Refrigerants are medicines which reduce the temperature of the body in fever; the term, however, is generally applied to a class of remedies which appear to allay thirst, as the vegetable acids, some mineral acids (much diluted), and many diaphoretics. (See Antipyretics.)

Resolvents or Discutients are medicines which are supposed to cause the absorption of inflammatory or other swellings. They appear to act by stimulating the lymphatics, as iodine, ammoniacum, &c.

Restoratives are medicines which exist already in the healthy blood or tissues, and are given in diseases where the system is supposed to be deficient in them, as iron, potash, phosphorus, chloride of sodium, &c. They are identical with Hæmatinics (which see).

Rubefacients. (See Counter-irritants.)

Sedatives or Depressants are medicines which depress the action of the (1) nervous system as tobacco, lobelia, bromide of potassium, &c.; (2) the circulatory system, as aconite, veratrum, Prussic acid, &c.; (3) the spinal cord, as Calabar bean, &c.

Sialagogues are medicines which increase the secretion of the salivary glands, either by a local irritation of the mouth, causing reflex activity of the glands, as pellitory, mezereon, tobacco, mustard, capsicum, &c.; or by exciting the glands during their elimination, as pilocarpine, muscarine, all the preparations of mercury, iodide of potassium, &c.

Sternutatories are substances which, by their local irritating action on the nasal mucous membrane, cause sneezing, as tobacco, hellebore, ginger, capsicum, and ipecacuanha, in powder.

Stimulants^{*}—Under this head may be included a great number of remedial agents. The sub-divisions are vague and misleading; thus there are medicines which excite the spinal cord, as strychnine, phosphorus, &c.; such are called spinal stimulants; others exalt the functions of the liver, as cholagogues; others the intestines, as calomel, Epsom salt, &c.; others the circulatory system, as digitalis, belladonna, &c.; others the stomach, as carminatives, and spices, &c.; others the skin. These latter are called external stimulants, and include all the Counter-irritants.

Stomachics are medicines which increase the vascularity of the stomach, promote digestion, and increase the appetite, as hippo, all the bitter tonics, arsenic, and aloes in small doses, &c.

Styptics are medicines which arrest bleeding by their local astringent action, either by causing coagulation of the blood, or by acting on the muscular tissue of the small vessels. Amongst this class will be found suprarenal gland substance, tannic acid, creosote, alum, chloride of zinc, perchloride of iron, &c.

Sudorifics. (See Diaphoretics.)

Tonics are, strictly speaking, medicines which improve the tone of the part upon which they act; thus it may be on the stomach, as the pure vegetable bitters and all stomachics; or on the cord, as strychnine; or on the heart, as digitalis; or on the nervous system, as quinine and the valerianates; or on the muscular tissues, as tannic acid; or on the circulating fluid, as iron.

Vermicides and Vermifuges. (See under Anthelmintics). The term vermicide is sometimes restricted to a drug which causes the death of the worm, while vermifuge is applied sometimes to any drug which causes the expulsion of the worm, though it may not have power to cause its death.

Vesicants. (See Counter-irritants.)

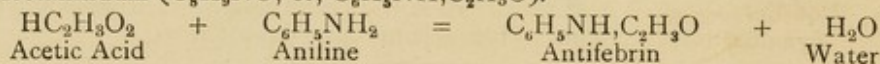
* The term "Stimulants" is frequently erroneously used as a synonym for alcohol and its preparations, which are true narcotics.

PART III.

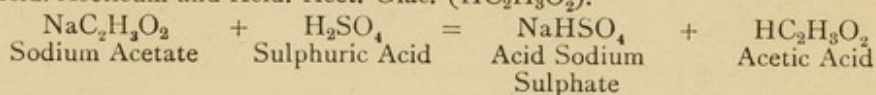
MATERIA MEDICA.

CHEMICAL REACTIONS OF THE OFFICIAL REMEDIES.

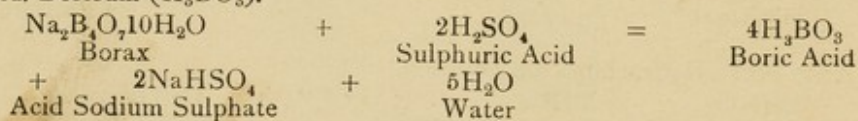
Acetanilidum (C_8H_9NO , or, $C_6H_5NH.C_2H_3O$).



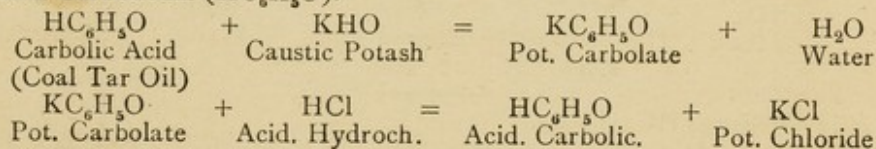
Acid. Aceticum and Acid. Acet. Glac. ($HC_2H_3O_2$).



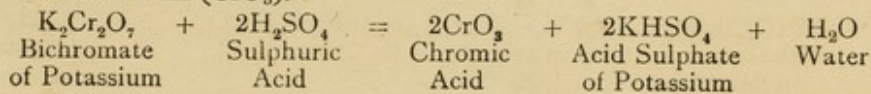
Acid. Boricum (H_3BO_3).

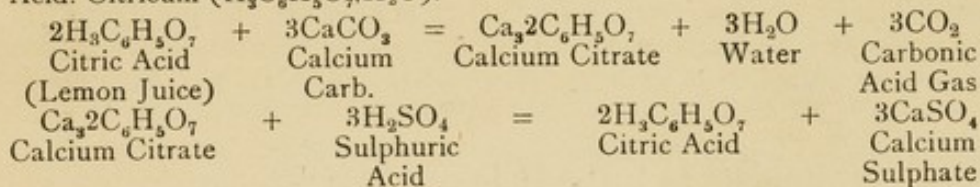


Acid. Carbolicum (HC_6H_5O).

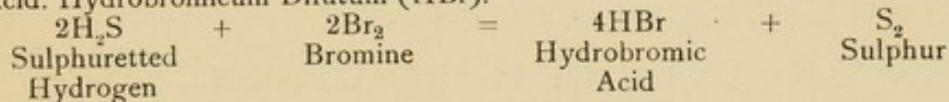


Acid. Chromicum (CrO_3).

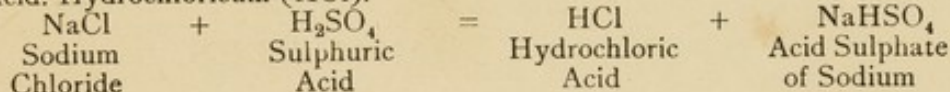


Acid. Citricum ($\text{H}_3\text{C}_6\text{H}_5\text{O}_7, \text{H}_2\text{O}$).Acid. Gallicum ($\text{H}_3\text{C}_7\text{H}_3\text{O}_5, \text{H}_2\text{O}$).

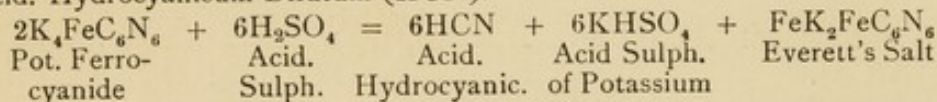
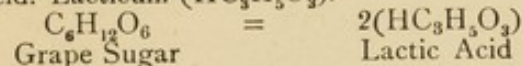
Acid. Hydrobromicum Dilutum (HBr).



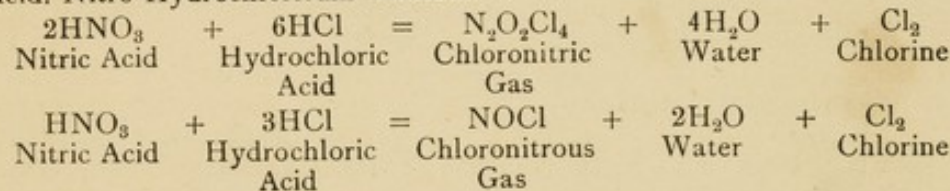
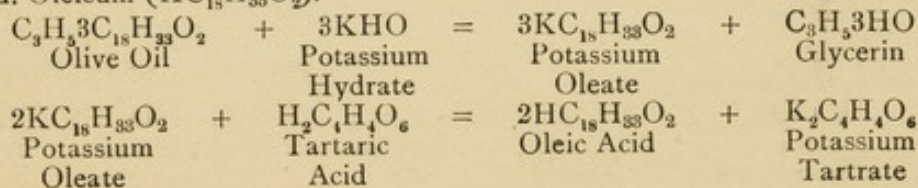
Acid. Hydrochloricum (HCl).

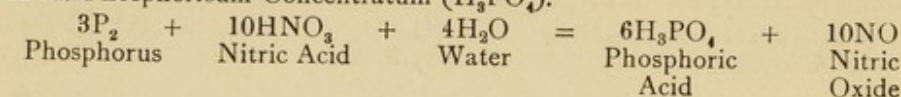
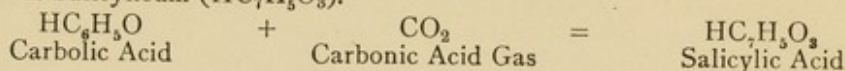
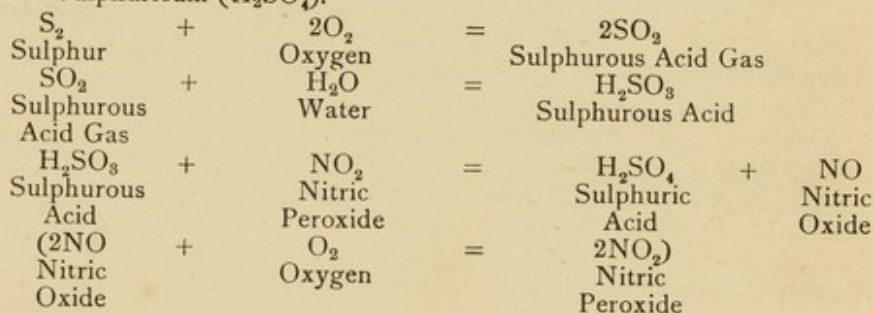
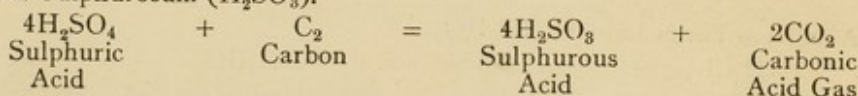
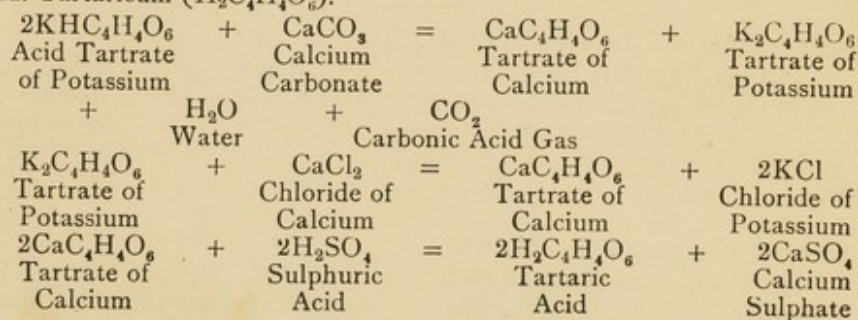
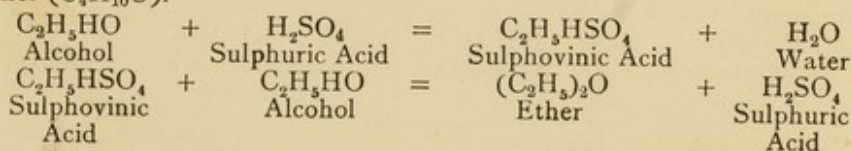
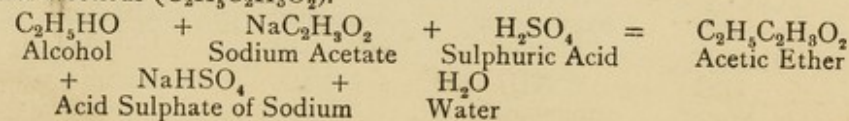


Acid. Hydrocyanicum Dilutum (HCN).

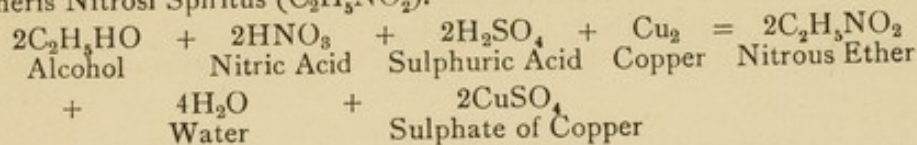
Acid. Lacticum ($\text{HC}_3\text{H}_5\text{O}_3$).Acid. Nitricum (HNO_3).

Acid. Nitro-Hydrochloricum Dilutum.

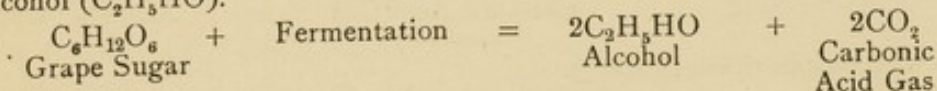
Acid. Oleicum ($\text{HC}_{18}\text{H}_{33}\text{O}_2$).

Acid. Phosphoricum Concentratum (H_3PO_4).Acid. Salicylicum ($\text{HC}_7\text{H}_5\text{O}_3$).Acid. Sulphuricum (H_2SO_4).Acid. Sulphurosum (H_2SO_3).Acid. Tartaricum ($\text{H}_2\text{C}_4\text{H}_4\text{O}_6$).Æther ($\text{C}_4\text{H}_{10}\text{O}$).Æther Aceticus ($\text{C}_2\text{H}_5\text{C}_2\text{H}_3\text{O}_2$).

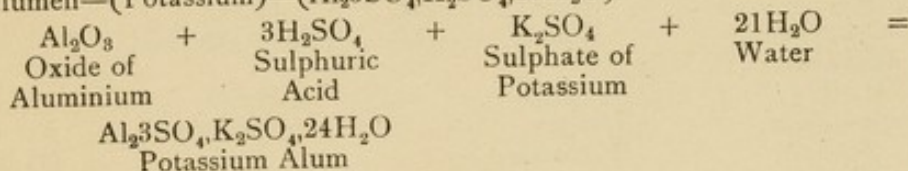
Ætheris Nitrosi Spiritus ($C_2H_5NO_2$).



Alcohol (C_2H_5HO).



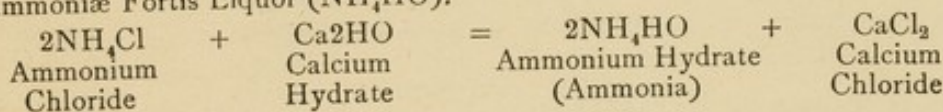
Alumen—(Potassium)—($Al_2SO_4, K_2SO_4, 24H_2O$).



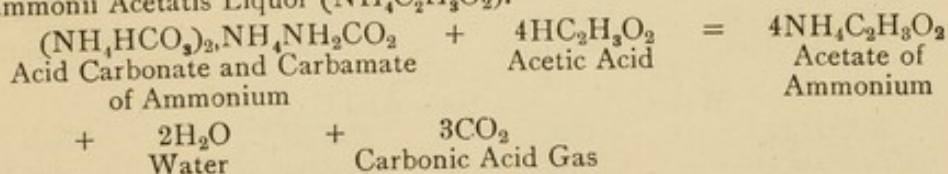
Alumen—(Ammonium)—($Al_2SO_4, (NH_4)_2SO_4, 24H_2O$).

As above, substituting $(NH_4)_2SO_4$ for K_2SO_4

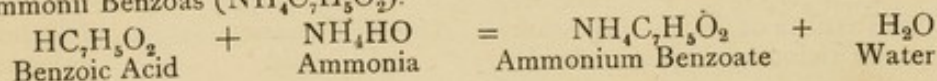
Ammoniae Fortis Liquor (NH_4HO).



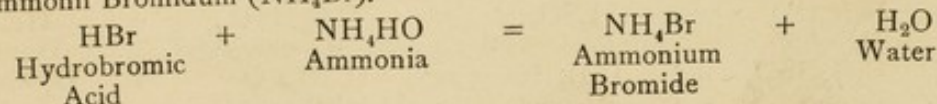
Ammonii Acetatis Liquor ($NH_4C_2H_3O_2$).



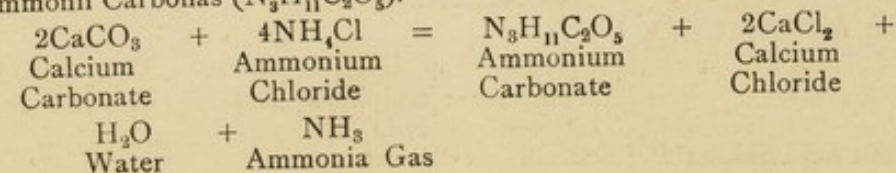
Ammonii Benzoas ($NH_4C_7H_5O_2$).



Ammonii Bromidum (NH_4Br).



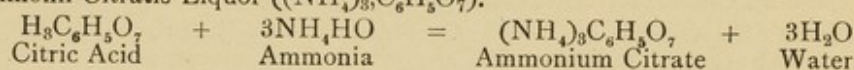
Ammonii Carbonas ($N_3H_{11}C_2O_5$).



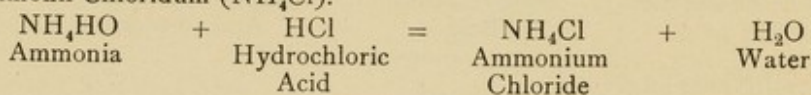
CHEMICAL REACTIONS.

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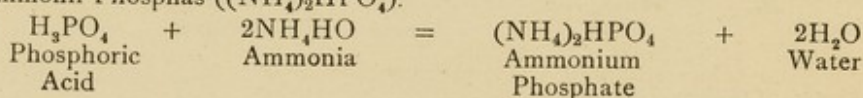
Ammonii Citratis Liquor $((\text{NH}_4)_3\text{C}_6\text{H}_5\text{O}_7)$.



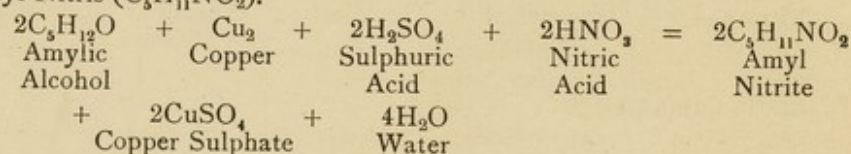
Ammonii Chloridum (NH_4Cl) .



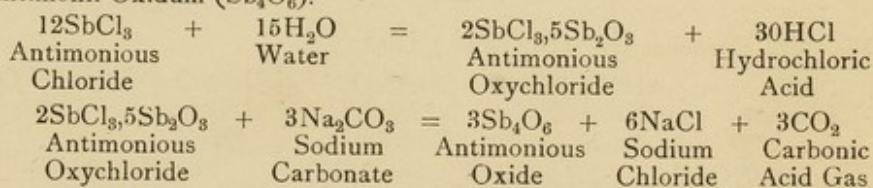
Ammonii Phosphas $((\text{NH}_4)_2\text{HPO}_4)$.



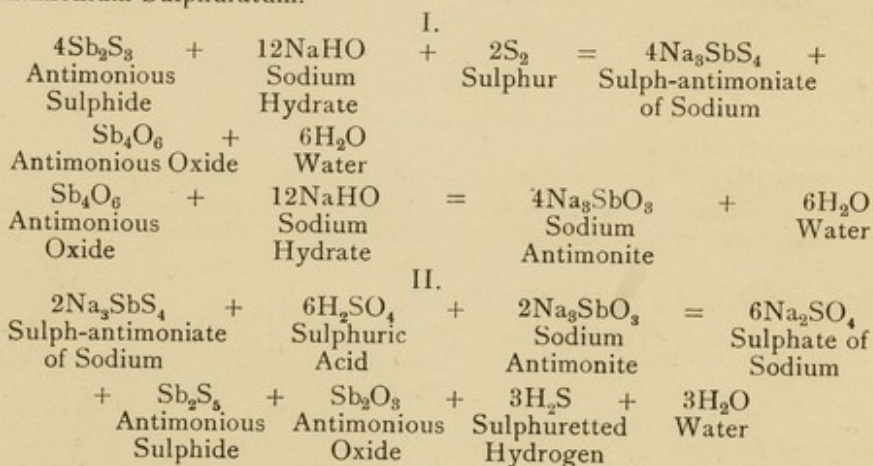
Amyl Nitris $(\text{C}_5\text{H}_{11}\text{NO}_2)$.



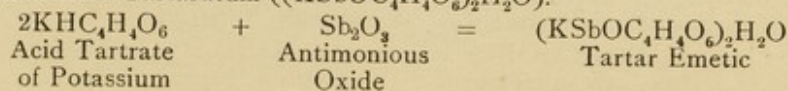
Antimonii Oxidum (Sb_4O_6) .

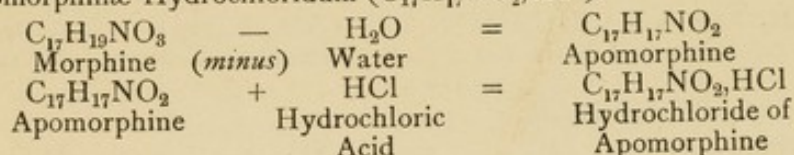
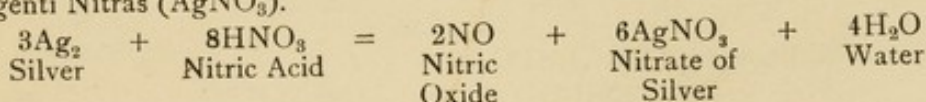
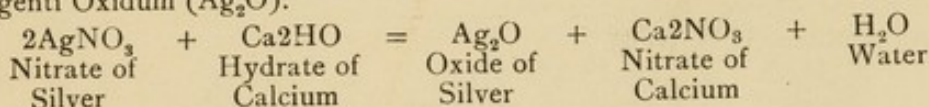
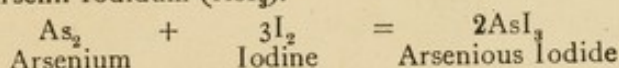
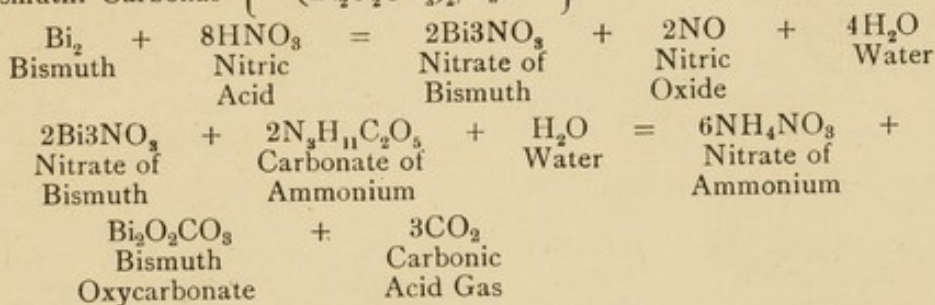
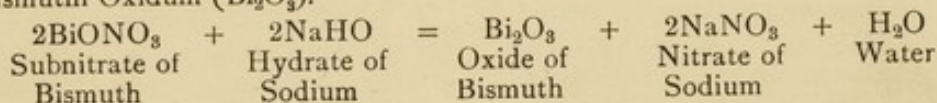
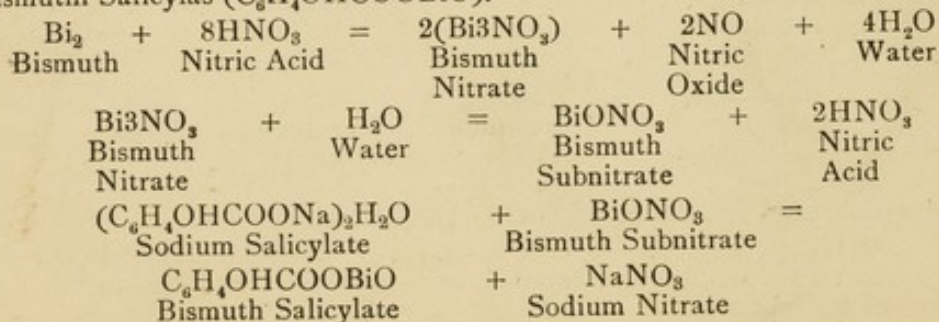


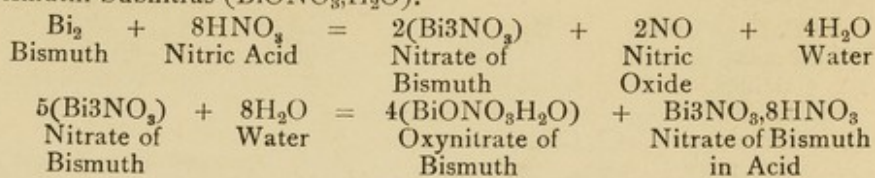
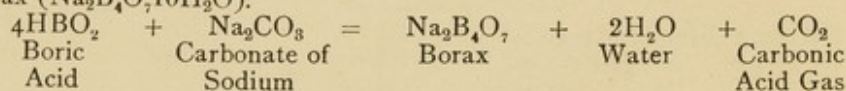
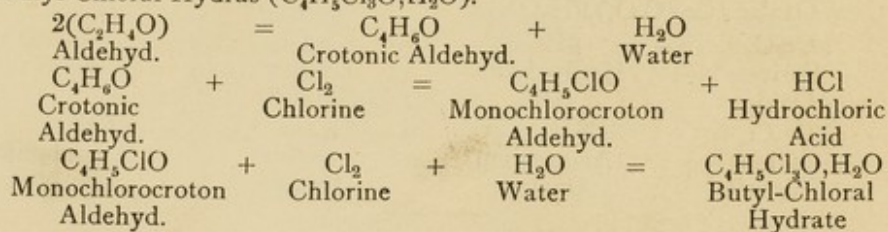
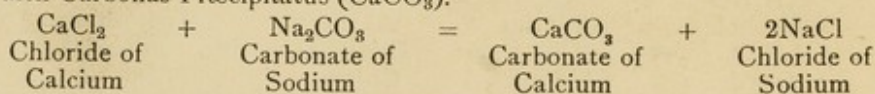
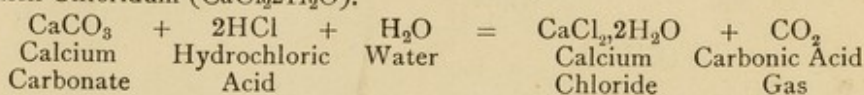
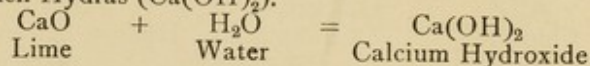
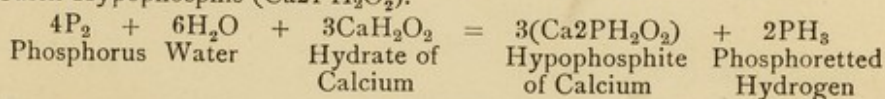
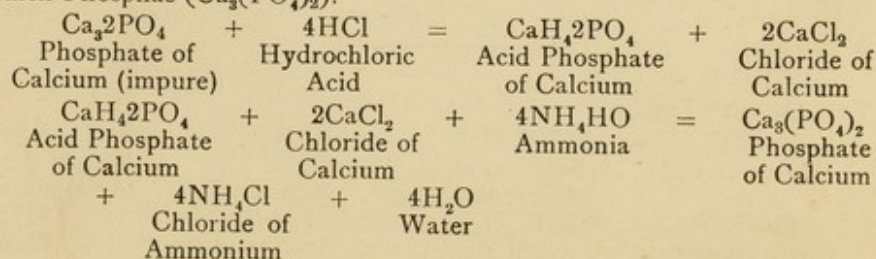
Antimonium Sulphuratum.



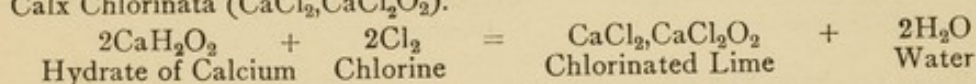
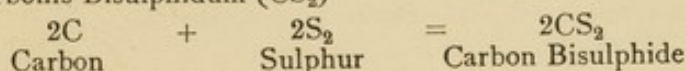
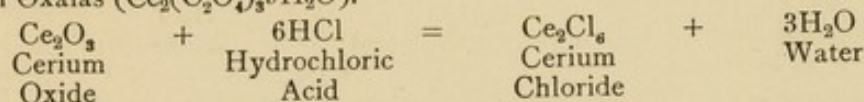
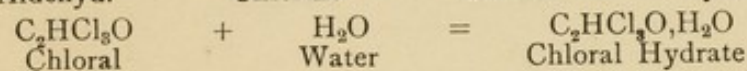
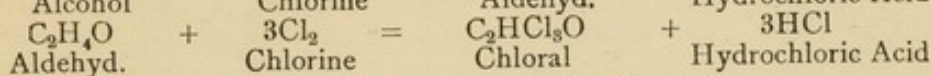
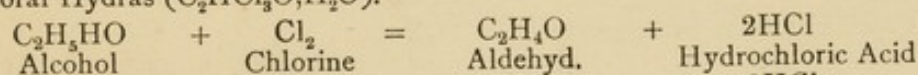
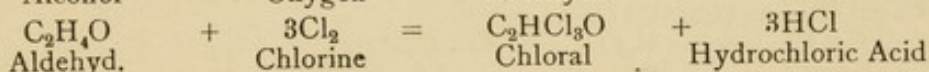
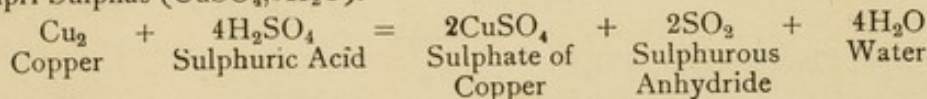
Antimonium Tartaratum $((\text{KSbOC}_4\text{H}_4\text{O}_6)_2\text{H}_2\text{O})$.



Apomorphinæ Hydrochloridum ($C_{17}H_{17}NO_2, HCl$).Argenti Nitras ($AgNO_3$).Argenti Oxidum (Ag_2O).Arsenii Iodidum (AsI_3).Bismuthi Carbonas { $(Bi_2O_2CO_3)_2, H_2O$ }.Bismuthi Oxidum (Bi_2O_3).Bismuthi Salicylas ($C_6H_4OHCOOBiO$).

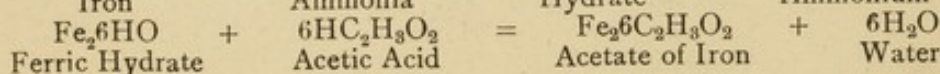
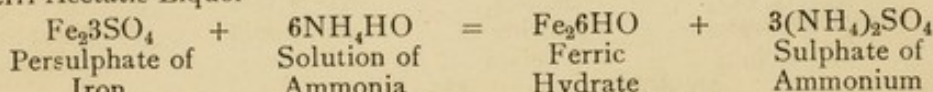
Bismuthi Subnitrates ($\text{BiONO}_3, \text{H}_2\text{O}$).Borax ($\text{Na}_2\text{B}_4\text{O}_7, 10\text{H}_2\text{O}$).Butyl-Chloral Hydras ($\text{C}_4\text{H}_5\text{Cl}_3\text{O}, \text{H}_2\text{O}$).Calcii Carbonas Præcipitatus (CaCO_3).Calcii Chloridum ($\text{CaCl}_2, 2\text{H}_2\text{O}$).Calcii Hydras (Ca(OH)_2).Calcii Hypophosphis ($\text{Ca}_2\text{PH}_2\text{O}_2$).Calcii Phosphas ($\text{Ca}_3(\text{PO}_4)_2$).

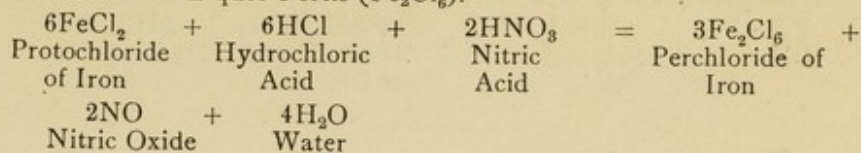
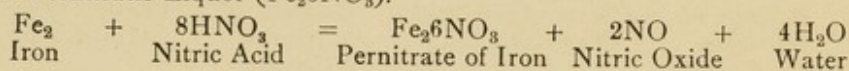
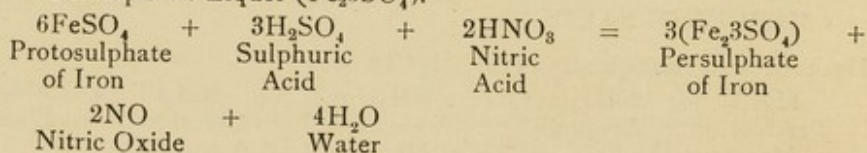
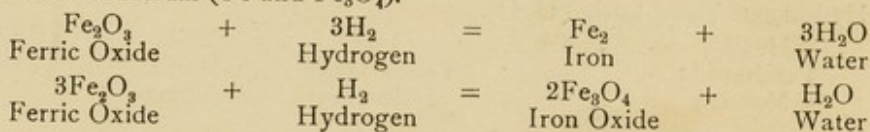
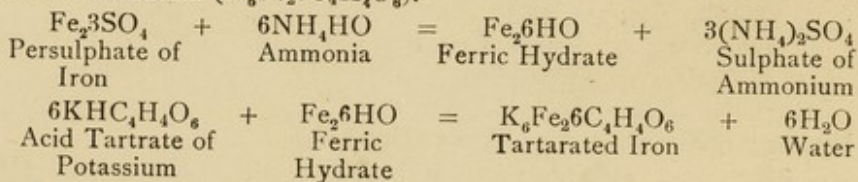
Calx (CaO).

Calx Chlorinata ($\text{CaCl}_2, \text{CaCl}_2\text{O}_2$).Carbonis Bisulphidum (CS_2)Cerii Oxalas ($\text{Ce}_2(\text{C}_2\text{O}_4)_3, 9\text{H}_2\text{O}$).Chloral Hydras ($\text{C}_2\text{HCl}_3\text{O}, \text{H}_2\text{O}$).Chloroformum (CHCl_3).Cupri Sulphas ($\text{CuSO}_4, 5\text{H}_2\text{O}$).

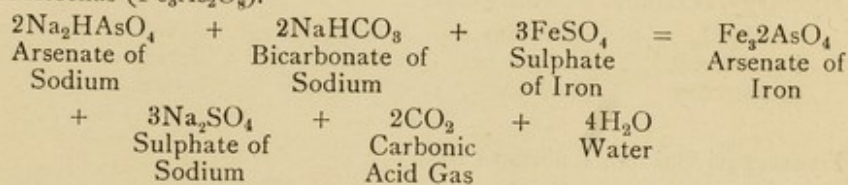
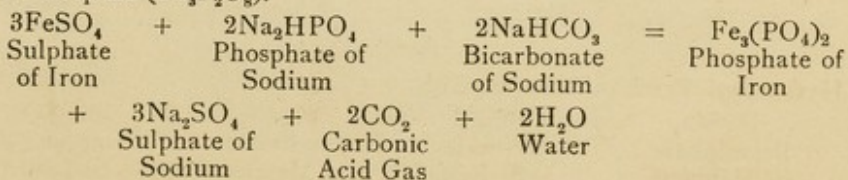
FERRIC SALTS—

Ferri Acetatis Liquor

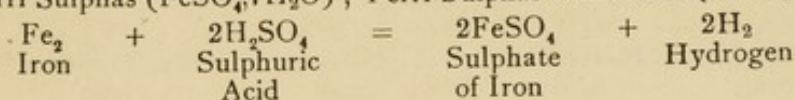


Ferri Perchloridi Liquor Fortis (Fe_2Cl_6).Ferri Pernitratidis Liquor (Fe_26NO_3).Ferri Persulphatis Liquor (Fe_23SO_4).Ferrum Redactum (Fe and Fe_3O_4).Ferrum Tartaratum ($\text{K}_6\text{Fe}_26\text{C}_4\text{H}_4\text{O}_6$).

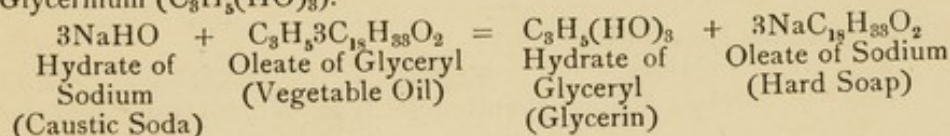
FERROUS SALTS—

Ferri Arsenas ($\text{Fe}_3\text{As}_2\text{O}_8$).Ferri Phosphas ($\text{Fe}_3\text{P}_2\text{O}_8$).

Ferri Sulphas ($\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$) ; Ferri Sulphas Exsiccatus ($\text{FeSO}_4 \cdot \text{H}_2\text{O}$).

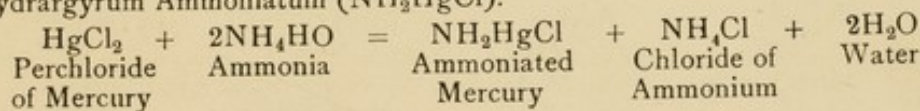


Glycerinum ($\text{C}_3\text{H}_5(\text{HO})_3$).

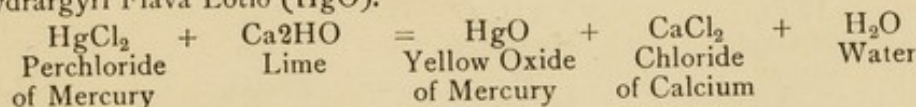


MERCURIC SALTS—

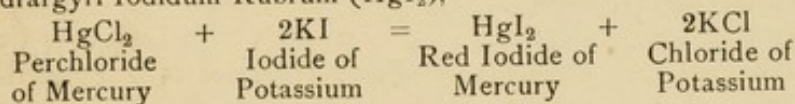
Hydrargyrum Ammoniatum (NH_2HgCl).



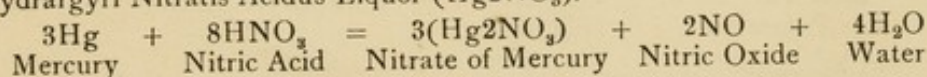
Hydrargyri Flava Lotio (HgO).



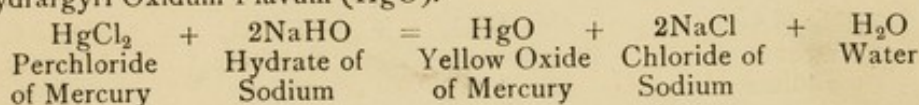
Hydrargyri Iodidum Rubrum (HgI_2).



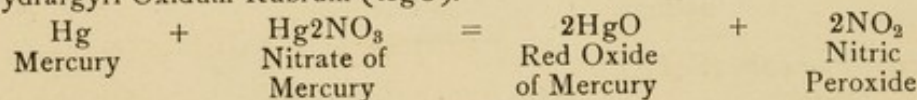
Hydrargyri Nitratis Acidus Liquor (Hg_2NO_3).



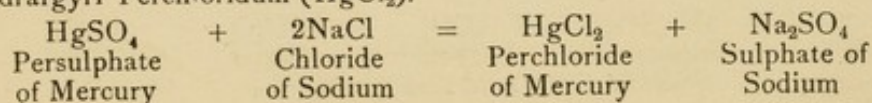
Hydrargyri Oxidum Flavum (HgO).



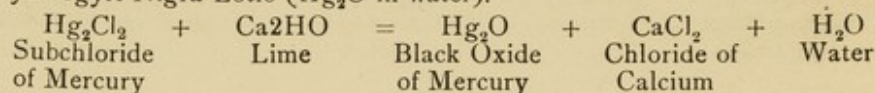
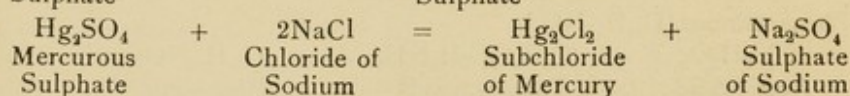
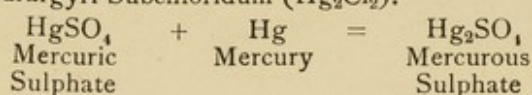
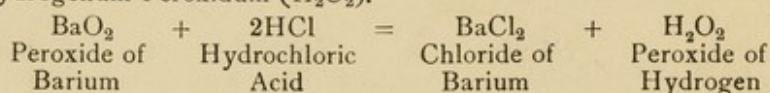
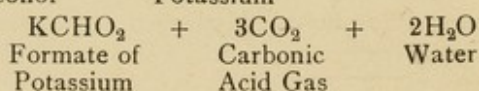
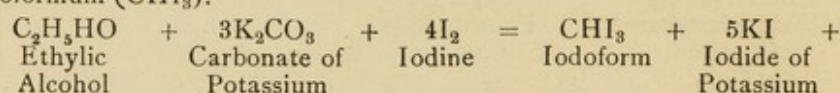
Hydrargyri Oxidum Rubrum (HgO).



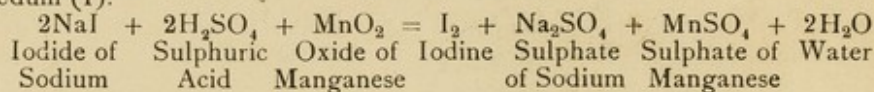
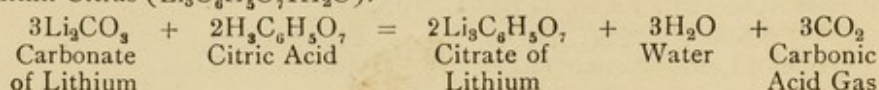
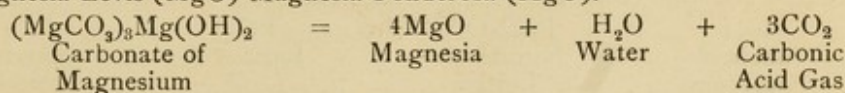
Hydrargyri Perchloridum (HgCl_2).



MERCUROUS SALTS—

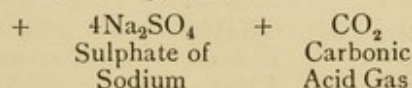
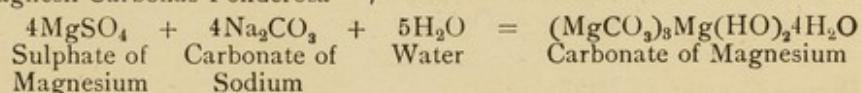
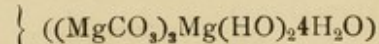
Hydrargyri Nigra Lotio (Hg_2O in water).Hydrargyri Subchloridum (Hg_2Cl_2).Hydrogenum Peroxidum (H_2O_2).Iodoformum (CHI_3).

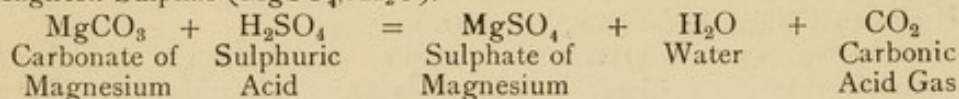
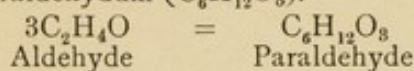
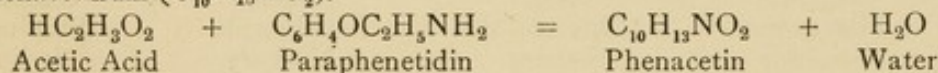
Iodum (I).

Lithii Citras ($\text{Li}_3\text{C}_6\text{H}_5\text{O}_7\cdot 4\text{H}_2\text{O}$).Magnesia Levis (MgO) Magnesia Ponderosa (MgO).

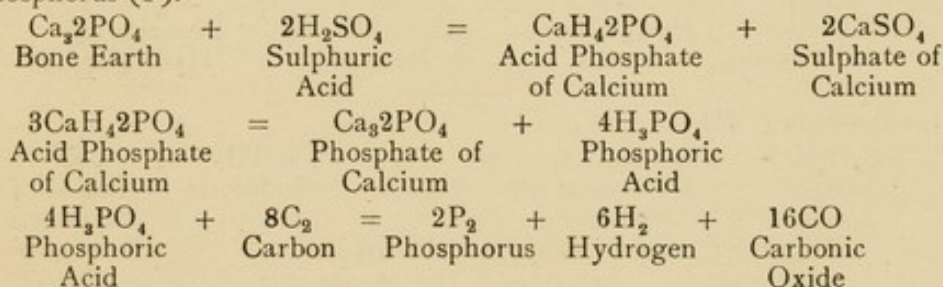
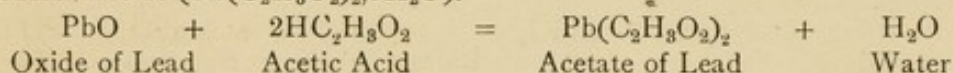
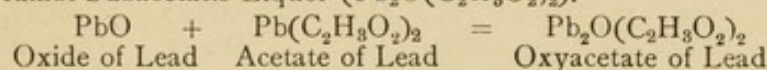
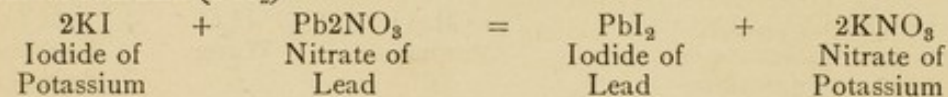
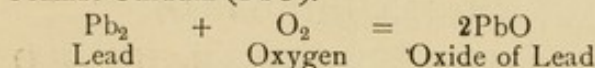
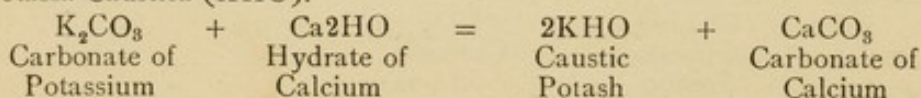
Magnesii Carbonas Levis

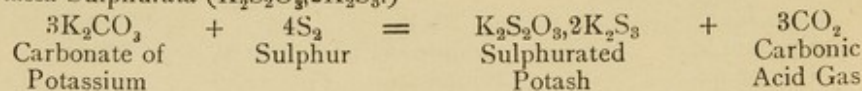
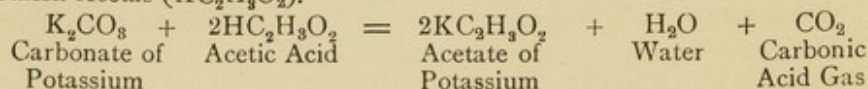
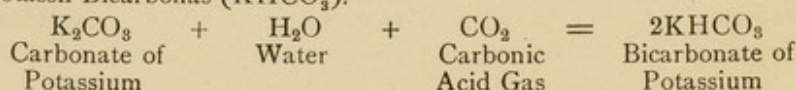
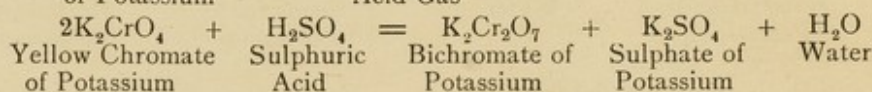
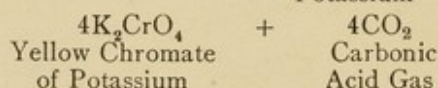
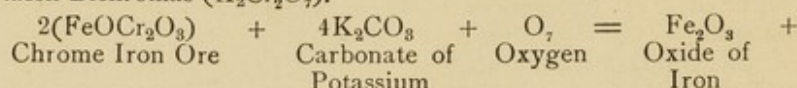
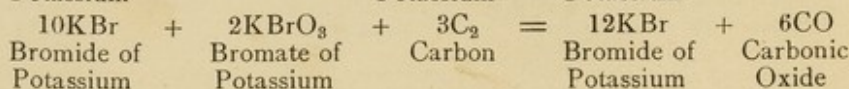
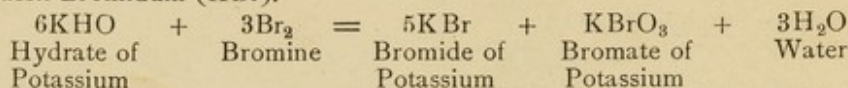
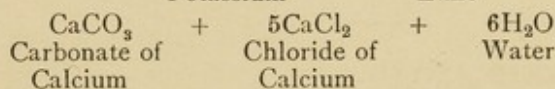
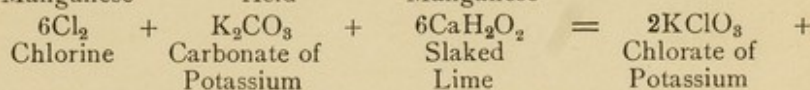
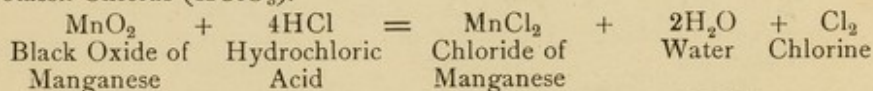
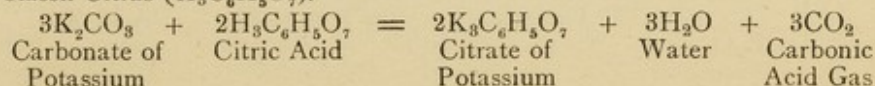
Magnesii Carbonas Ponderosa



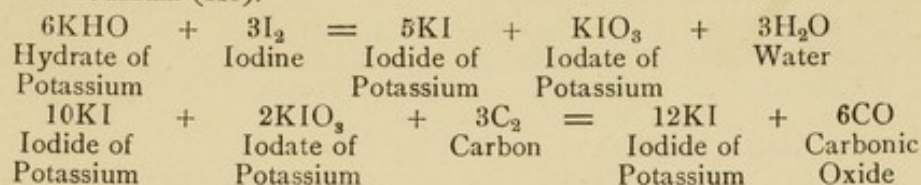
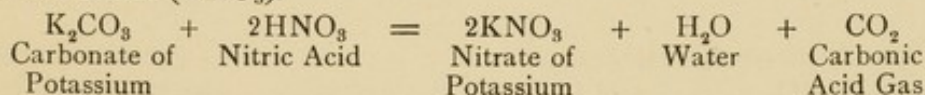
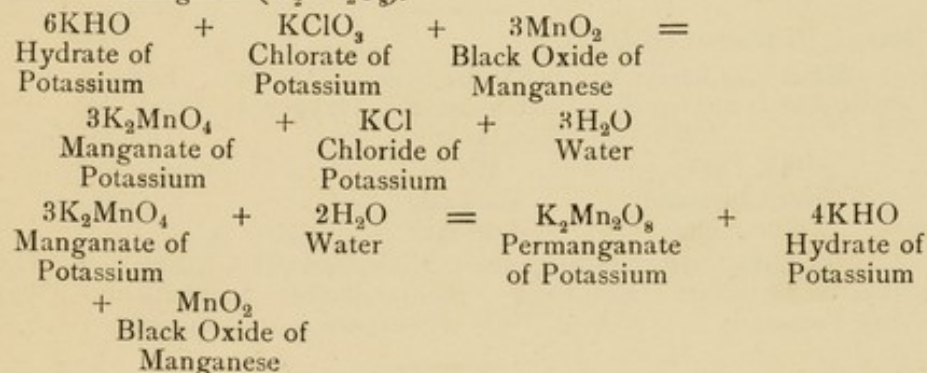
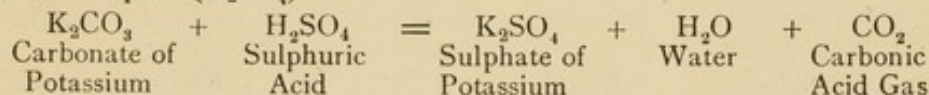
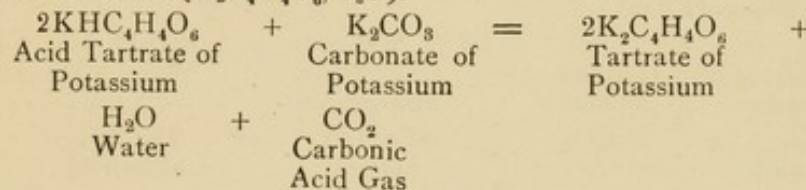
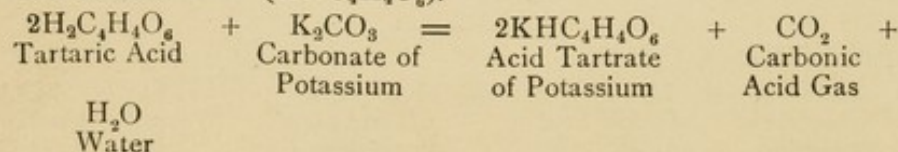
Magnesii Sulphas ($\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$).Paraldehydum ($\text{C}_6\text{H}_{12}\text{O}_8$).Phenacetinum ($\text{C}_{10}\text{H}_{13}\text{NO}_2$).

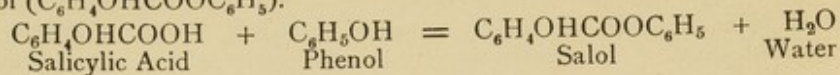
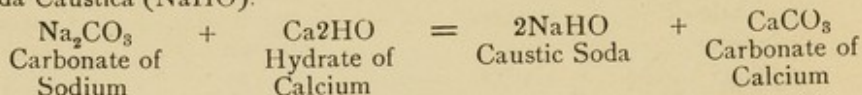
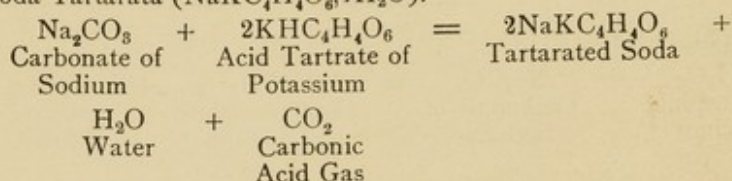
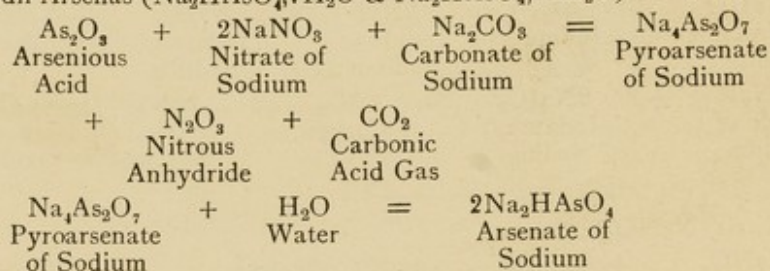
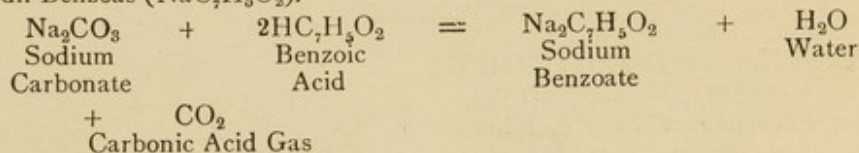
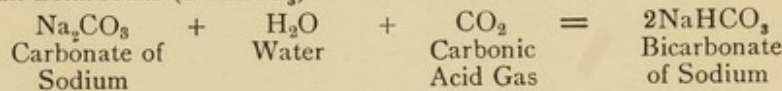
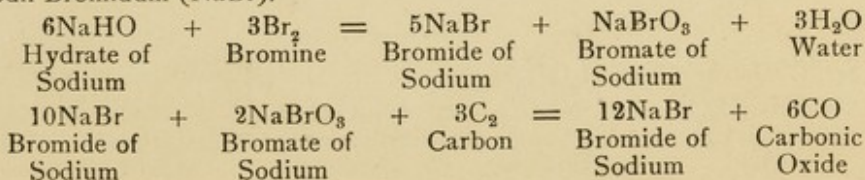
Phosphorus (P).

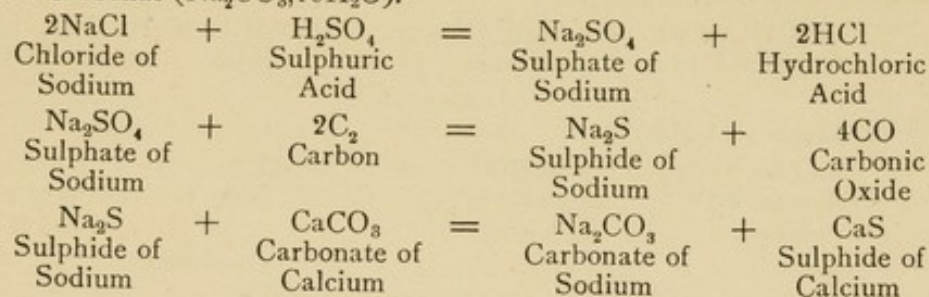
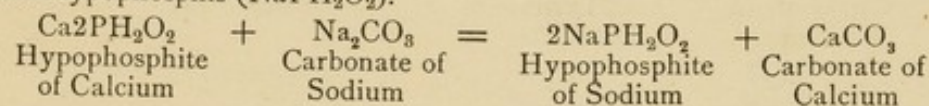
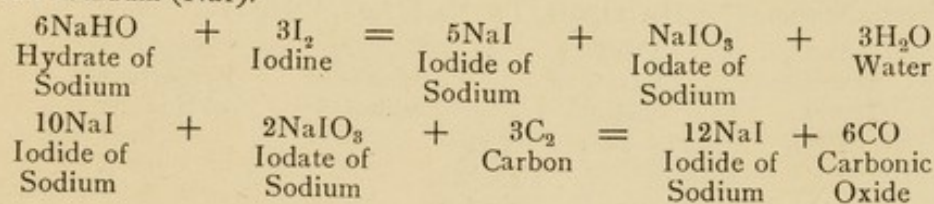
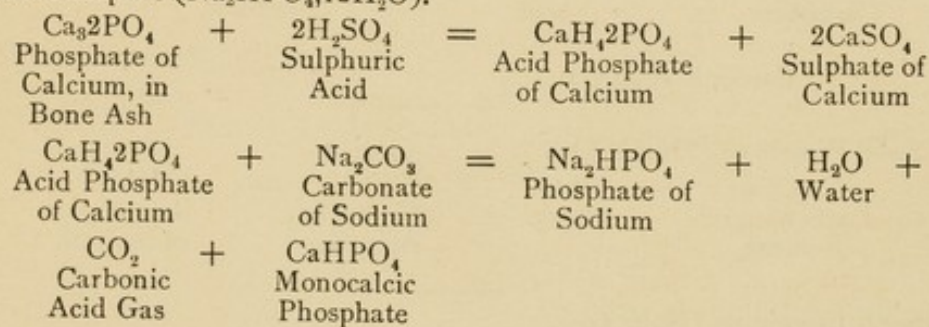
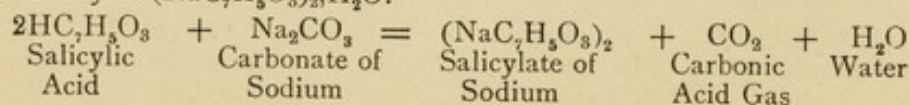
Plumbi Acetas ($\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2 \cdot 3\text{H}_2\text{O}$).Plumbi Subacetatis Liquor ($\text{Pb}_2\text{O}(\text{C}_2\text{H}_3\text{O}_2)_2$).Plumbi Iodidum (PbI_2).Plumbi Oxidum (PbO).Potassa Caustica (KHO).

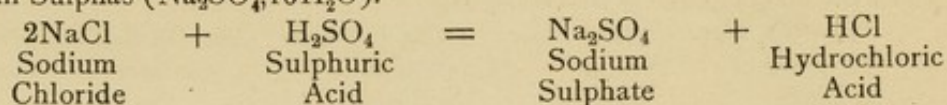
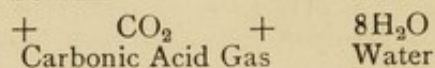
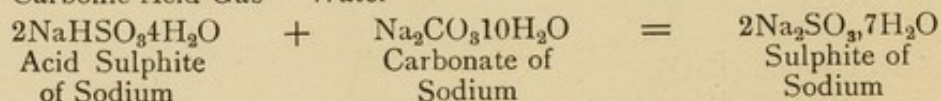
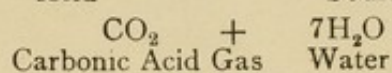
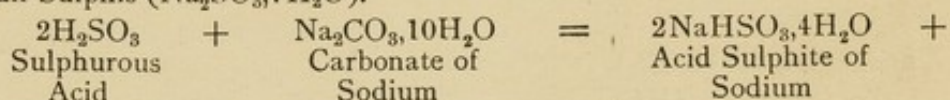
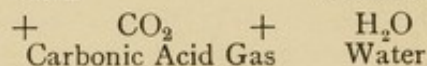
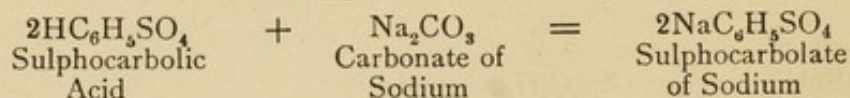
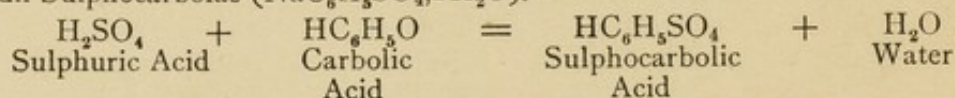
Potassa Sulphurata ($K_2S_2O_3, 2K_2S_8$.)Potassii Acetas ($KC_2H_3O_2$).Potassii Bicarbonas ($KHCO_3$).Potassii Bichromas ($K_2Cr_2O_7$).Potassii Bromidum (KBr).Potassii Chloras ($KClO_3$).Potassii Citras ($K_3C_6H_5O_7$).

Potassii Iodidum (KI).

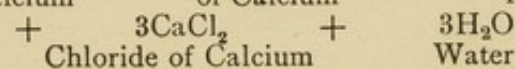
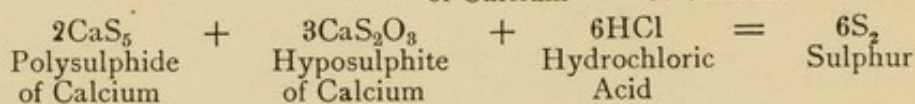
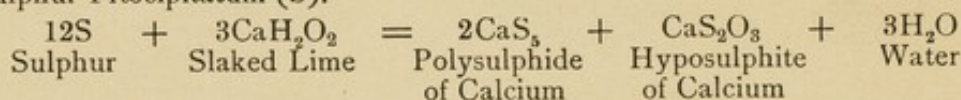
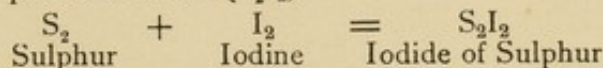
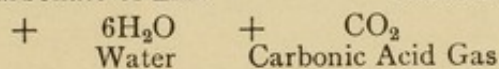
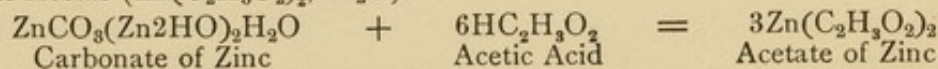
Potassii Nitras (KNO_3).Potassii Permanganas ($\text{K}_2\text{Mn}_2\text{O}_8$).Potassii Sulphas (K_2SO_4).Potassii Tartras ($\text{K}_2\text{C}_4\text{H}_4\text{O}_6, \text{H}_2\text{O}$).Potassii Tartras Acidæ ($\text{KHC}_4\text{H}_4\text{O}_6$).

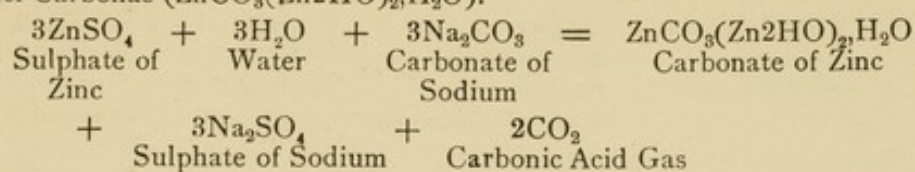
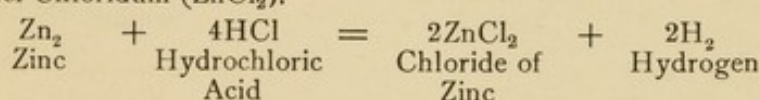
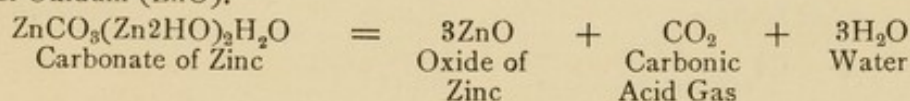
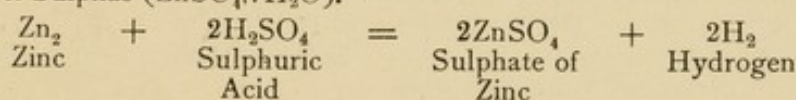
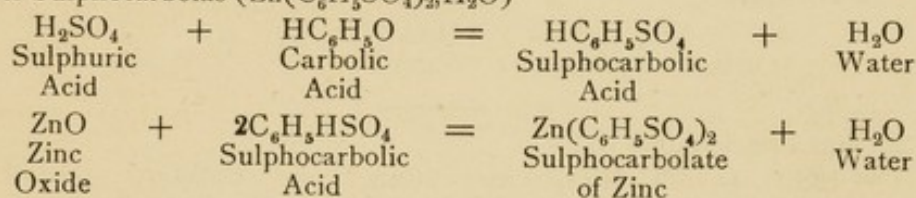
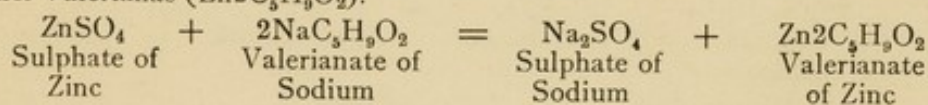
Salol ($C_6H_4OHCOOC_6H_5$).Soda Caustica ($NaHO$).Soda Tartarata ($NaKC_4H_4O_6, 4H_2O$).Sodii Arsenas ($Na_2HASO_4, 7H_2O$ & $Na_2HASO_4, 12H_2O$).Sodii Benzoas ($NaC_7H_5O_2$).Sodii Bicarbonas ($NaHCO_3$).Sodii Bromidum ($NaBr$).

Sodii Carbonas ($\text{Na}_2\text{CO}_3, 10\text{H}_2\text{O}$).Sodii Hypophosphis (NaPH_2O_2).Sodii Iodidum (NaI).Sodii Nitris (NaNO_2).Sodii Phosphas ($\text{Na}_2\text{HPO}_4, 12\text{H}_2\text{O}$).Sodii Salicylas ($\text{NaC}_7\text{H}_5\text{O}_3$), H_2O .

Sodii Sulphas ($\text{Na}_2\text{SO}_4, 10\text{H}_2\text{O}$).Sodii Sulphis ($\text{Na}_2\text{SO}_3, 7\text{H}_2\text{O}$).Sodii Sulphocarbolas ($\text{NaC}_6\text{H}_5\text{SO}_4, 2\text{H}_2\text{O}$).

Sulphur Præcipitatum (S).

Sulphuris Iodidum (S_2I_2).Zinci Acetas ($\text{Zn}(\text{C}_2\text{H}_3\text{O}_2)_2, 2\text{H}_2\text{O}$).

Zinci Carbonas ($\text{ZnCO}_3(\text{Zn}2\text{HO})_2, \text{H}_2\text{O}$).Zinci Chloridum (ZnCl_2).Zinci Oxidum (ZnO).Zinci Sulphas ($\text{ZnSO}_4, 7\text{H}_2\text{O}$).Zinci Sulphocarbolas ($\text{Zn}(\text{C}_6\text{H}_5\text{SO}_4)_2, \text{H}_2\text{O}$).Zinci Valerianas ($\text{Zn}2\text{C}_5\text{H}_9\text{O}_2$).

OUTLINE OF THE B.P. VEGETABLE MATERIA MEDICA

(WITH THE NATURAL ORDERS ARRANGED ALPHABETICALLY
FOR RAPID REFERENCE).

Amyridaceæ or Burseraceæ

1. Balsamodendron Myrrha (Myrrh).
2. Probably other species.

The gum-resin from the stem—Tincture 1 in 5 ; Pill of Aloes and Myrrh 1 in 4½. Also enters into 1 Decoction, 1 Mixture, and 2 Pills.

Apocynaceæ. (See Loganiaceæ.)

Aristolochiaceæ

1. Aristolochia Serpentaria, or } (Serpentary or Snake Root.)
2. Aristolochia reticulata }

The dried rhizome and rootlets — Infusion 1 in 20 ; Tincture 1 in 5 ;
Concentrated Solution 1 in 2.

Enters into Compound Tincture of Cinchona.

Asclepiadaceæ

Hemidesmus indicus (Indian Sarsaparilla).

The dried root — Syrup 1 in 8.

Aurantiaceæ

1. Citrus Aurantium, *var.* Bigaradia (Bitter Orange).

The *fresh* outer part of the pericarp — Wine ; Tincture 1 in 4 ; Syrup 1 of Tincture in 8.

The *dried* outer part of the pericarp — Infusion 1 in 20 ; Compound Infusion 1 in 40.

The fresh flowers — Orange-flower Water ; Syrup 1 in 6½. The water enters into 1 Mixture and 1 Syrup.

In addition, Orange-peel or its preparations enters into 3 Tinctures, 2 Wines, 1 Infusion, 1 Spirit, 1 Mixture, 1 Confection, and 2 Syrups.

2. Citrus Medica, *var.* B. Limonum (Lemon).

The outer part of the pericarp of the fruit — Tincture 1 in 4 and Syrup.

The oil from the same — Enters into 1 Liniment, 1 Tincture, and 1 Spirit.

The freshly expressed juice of the ripe fruit — Syrup. Citric Acid.

3. Citrus, various species.

Used as a source of Citric Acid.

Berberidaceæ

Podophyllum peltatum (May Apple).

The dried rhizome and rootlets — Resin ; Tincture, 2 grs. Resin in 1 dr.
(This is also classed under Ranunculaceæ.)

Burseraceæ. (See Amyridaceæ.)

Camelliaceæ or Ternstroemiaceæ

Camellia Thea (Tea Plant).

The dried leaves — Caffeine, Caffeine Citrate, and Effervescent Citrate.

Cannabinaceæ

1. *Cannabis sativa* (Indian Hemp).

The dried flowering or fruiting tops of the female plants grown in India, and from which the resin has not been removed.

Extract; and Tincture 1 in 20, which enters into Tr. Chlorof. et Morph. Co.

2. *Humulus Lupulus* (Hop).

The dried strobiles from cultivated plants.

Lupulin; Infusion, 1 in 20; Tincture 1 in 5.

Caprifoliaceæ

- Sambucus nigra* (Elder).

The fresh flowers separated from the stalks—Water, 10 lbs. to 1 gallon.

Celastraceæ

- Euonymus atropurpureus* (Wahoo).

The *dry* extract from the root bark.

Cinchonaceæ or Rubiaceæ

1. *Psychotria Ipecacuanha* (Ipecacuanha or Hippo).

The dried root—Lozenge $\frac{1}{4}$ gr. in each; Lozenge of I. and Morphine $\frac{1}{2}$ gr. each; Compound Powder 1 in 10; I. and Squill Pill 1 in 20; and Liquid Extract (= 2 to 2.25% alkaloids) from which are prepared Wine 1 in 20 and Vinegar 1 in 20.

2. Various species of *Cinchona*, and

3. Of *Remijia* may be used for obtaining the Salts of Quinine.

4. *Cinchona succirubra* (Red *Cinchona*).

The dried bark of the stem and branches of cultivated plants.

Liquid Extract (= 5% alkaloids); Acid Infusion 1 in 20; Tincture 1% alkaloids; Compound Tincture 1 in 10.

☞ In all the Galenical preparations the *red* bark only is permitted, and it may also be used as the source of Quinine Salts. Quinine enters into 2 Tinctures, 1 Wine, 1 Scale Preparation, and 1 Pill.

5. *Coffea arabica* (Coffee).

The dried seeds, used for obtaining Caffeine.

6. *Uncaria Gambier* (Catechu or Pale Catechu).

An extract of the leaves and young shoots—Tincture 1 in 5; Lozenge 1 gr. in each; Compound Powder 1 in 2½.

Compositæ

1. *Anacyclus Pyrethrum* (Pellitory).

The dried root—Tincture 1 in 5.

2. *Anthemis nobilis* (Chamomile).

The dried expanded flower heads from cultivated plants.
Extract and Oil.

3. *Arnica montana* (Arnica).

The dried rhizome and rootlets—Tincture 1 in 20.

4. *Artemisia maritima*, var. *Stechmanniana* (Santonica).

The dried unexpanded flower heads or capitula, yielding Santonin.

Lozenges 1 gr. in each.

5. *Taraxacum officinale* (Dandelion).

(a) The *fresh* roots collected in autumn—Extract.

(b) The *juice* from the above.

(c) The *dried* roots collected in autumn—Liquid Extract 1 in 1.

Coniferæ1. *Juniperus communis* (Juniper).

The oil distilled from the full-grown unripe green fruit.

Spirit 1 in 20. Enters into Creosote Mixture.

2. *Juniperus oxycedrus* and some other species.

The oily liquid (**Oil of Cade**) obtained by the destructive distillation of the woody portions.

3. *Pinus palustris* (Pitch Pine).4. *Pinus sylvestris* (Scotch Fir).5. *Pinus Tæda* (Frankincense Pine).

(a) The distilled and rectified oil (**Oil of Turpentine**) from the Oleo-Resin (Turpentine) obtained from *P. sylvestris* and other species.

Liniment 13 in 20; Acetic Liniment 4 in 9.

(b) The residue (**Resin**) left after the distillation of the above.

Plaster 1 in 9½; Ointment 1 in 3¾. Also enters into 7 Plasters.

(c) A bituminous Liquid (**Stockholm Tar**) obtained from the wood of *P. sylvestris* and other species by destructive distillation.—Ointment 5 in 7.

(d) The Concrete Turpentine (**Frankincense**) scraped off the trunks of *P. palustris* and *P. Tæda*—Enters into Pitch Plaster.

6. *Abies balsamea* (Balsam Fir).

The Turpentine (**Canada Turpentine**) obtained from above.

Enters into Flexible Collodion.

7. *Pinus Pumilio* (Pumilio Pine).

The oil distilled from the fresh leaves.

8. *Picea excelsa* (Spruce).

The resinous exudation (**Burgundy Pitch**) from the stem, melted and strained—Enters into Pitch Plaster 1 in 2.

Convolvulaceæ1. *Convolvulus Scammonia* (Scammony).

(a) The gum-resin obtained by incising the living root—Resin.

(b) The dried root, from which the resin is chiefly made, which enters into Compound Pill 1 in 3; Compound Powder 1 in 2; Compound Pill and Extract of Colocynth.

2. *Ipomœa Purga* (Jalap).

The dried tubercles—Extract; Tincture 1 in 5 = 1.5% resin; Compound Powder 1 in 3; Compound Scammony Powder 3 in 8; and Resin, which enters into Compound Scammony Pill.

Cruciferæ

1. *Brassica alba* (White Mustard).

The dried ripe seeds.

2. *Brassica nigra* (Black Mustard).

The dried ripe seeds.

Volatile Oil, and Compound Liniment, 1 in 27; Sinapis—the powdered seeds of white and black mustard mixed. Charta.

3. *Cochlearia Armoracia* (Horseradish).

The fresh roots from cultivated plants—Compound Spirit 1 in 8.

Cucurbitaceæ

1. *Citrullus Colocynthis* (Colocynth or Bitter Apple).

The dried pulp of the fruit freed from seeds—Compound Pill 1 in 6; Pill with *Hyoscyamus* 1 in 9; Compound Extract 1 in $4\frac{1}{2}$.

2. *Ecballium Elaterium* (Squirting Cucumber).

Elaterium (the sediment from the juice of the fruit), Elaterin (the active principle of Elaterium), Compound Powder 1 in 40.

Cupuliferæ or Corylaceæ

Quercûs infectoria.

Excrescences caused by the puncture and deposit of the eggs of *Cynips Gallæ tinctoriæ*—Ointment 1 in 5; Ointment with Opium 1 in 5; Gallic and Tannic Acids and their preparations.

Ericaceæ

Arctostaphylos Uva-ursi (Bearberry).

The dried leaves—Infusion 1 in 20.

Erythroxylaceæ

Erythroxylum Coca and its varieties (Coca).

The dried leaves.

Liquid Extract 1 in 1; Cocaine; Ointment 1 in 25; Hydrochloride of Cocaine; Discs $\frac{1}{50}$ gr. in each; Hypodermic Injection 10 grs. in 110 mins.; Lozenge with *Krameria* $\frac{1}{10}$ gr. in each.

Euphorbiaceæ

1. *Croton Eluteria* (Cascarilla).

The dried bark—Infusion 1 in 20; Tincture 1 in 5.

2. *Croton Tiglium* (Purging Croton).

The oil expressed from the seeds—Liniment 1 in 8.

3. *Hevea brasiliensis*, and probably other species (Caoutchouc).

The prepared milk-juice—Solution 1 in 20. In Charta Sinapis.

4. *Ricinus communis* (Castor Oil Plant).

The oil expressed from the seeds—Mixture 3 in 8.

Enters into 1 Collodion, 1 Liniment, and 1 Pill.

Filices

Aspidium Filix-mas (Male Fern).

The rhizome, collected late in autumn, divested of its roots, leaves, and dead matter, and carefully dried—Liquid Extract.

Fungi

Claviceps purpurea (Ergot).

The sclerotium (mycelium or spawn) originating in the ovary of *Secale cereale* (Common Rye).

Extract ; Hypodermic Injection 10 in 33 ; Liquid Extract 1 in 1 ; Infusion 1 in 20 ; Ammoniated Tincture 1 in 4.

Gentianaceæ

1. *Gentiana lutea* (Gentian).

The dried rhizome and roots — Extract, Infusion 1 in 80 ; Compound Tincture 1 in 10.

2. *Swertia Chirata* (Chiretta).

The dried plant, collected when in flower.

Infusion 1 in 20 ; Tincture 1 in 10 ; Concentrated Solution 1 in 2.

Graminaceæ

1. *Oryza sativa* (Rice).

Used as a source of starch.

2. *Secale cereale* (Common Rye).

The spawn of the fungus (*Claviceps purpurea*) originating in the ovary. (See Fungi.)

3. *Triticum sativum* (Wheat).

Used as a source of starch.

4. *Zea Mays* (Maize or Indian Corn).

Used as a source of starch.

Guttiferæ

Garcinia Hanburii (Gamboge).

The gum resin — Compound pill 1 in 6.

Hamamelidaceæ

Hamamelis virginiana (Witch Hazel).

The dried bark — Tincture 1 in 10.

The dried leaves — Liquid Extract 1 in 1 ; Ointment 1 in 10.

The fresh leaves — Solution 1 in 1.

Iridaceæ

Crocus sativus (Saffron).

The dried stigmas and tops of the styles — Tincture 1 in 20.

Enters into 1 Decoction and 1 Tincture.

Labiataæ

1. *Lavandula vera* (Lavender).

The oil distilled from the flowers — Spirit 1 in 10 ; Compound Tincture 45 minims to 1 pint. Enters into 1 Liquor and 1 Liniment.

2. *Mentha arvensis vars. piperascens et glabrata*.

The oil distilled from the fresh herb is used as a source of menthol.

3. *Mentha piperita* (Peppermint).

The oil distilled from the fresh flowering herb.

Water 77 mins. to 1 gallon; Spirit 1 in 10, and Menthol.

Enters into 1 Pill and 1 Tincture.

4. *Mentha viridis* (Spearmint).

The oil distilled from the fresh flowering herb.

Water 77 mins. to 1 gallon.

5. *Monarda punctata* (Horsemint).

The volatile oil—Used as source of Thymol.

6. *Rosmarinus officinalis* (Rosemary).

The oil distilled from the flowering tops—Spirit 1 in 10.

Enters into Soap Liniment and Compound Tincture of Lavender.

7. *Thymus vulgaris* (Garden Thyme).

The volatile oil—Used as a source of Thymol.

Lauraceæ1. *Cinnamomum Camphora* (Camphor).

A white crystalline substance obtained from the wood.

Water $\frac{1}{2}$ gr. in 1 oz.; Liniment 1 in 5; Ammoniated Liniment 1 in 8;
Spirit 1 in 10; Compound Tincture $1\frac{1}{2}$ grs. in 1 oz.

Also enters into 1 Ointment and 9 Liniments.

2. *Cinnamomum zeylanicum* (Ceylon Cinnamon).

The dried inner bark of shoots from the truncated stocks of the cultivated tree from Ceylon—Oil; Spirit 1 in 10; Water 1 in 10; Compound Powder 1 in 3; Tincture 1 in 5.

Cinnamon or its preparations also enters into 4 Mixtures, 2 Pills, 3 Powders, 3 Tinctures, 1 Acid, 1 Decoction, and 2 Syrups.

3. *Sassafras officinale* (Sassafras).

The dried root reduced to chips or shavings.

Enters into Concentrated Compound Solution of Sarsaparilla.

Leguminosæ1. *Acacia Senegal* and other species (Acacia).

A gummy exudation from the stems and branches.

Mucilage 4 and 6. Enters into 1 Pill, 2 Powders, and all the Lozenges.
Mucilage enters into Mist. Ol. Ricini.

2. *Andira Araroba* (Araroba).

A substance found in cavities in the trunk—Chrysarobin and its Ointment 1 in 25.

3. *Astragalus gummifer*, and other species (Syrian Tragacanth).

A gummy exudation from the stem.

Glycerin 1 in 5; Compound Powder 1 in 6; Mucilage 60 grs. in 10 ozs.

Also enters into 1 Compound Powder, 1 Confection, 1 Lotion, and 2 Mixtures.

4. *Cassia acutifolia* (Alexandrian Senna).

5. *Cassia angustifolia* (East Indian or Tinnivelly Senna).
The dried leaflets.
Confection 1 in 11; Infusion 1 in 10; Syrup 1 in 2; Compound Tincture 1 in 5; Concentrated Solution 1 in 1; and Co. Mixture. Also enters into Compound Liquorice Powder.
6. *Cassia Fistula* (Purging Cassia).
The pulp from the pods. Enters into Confection of Senna.
7. *Copaifera Lansdorfii* (Copaiba or Copaiva).
The oleo-resin from the trunk, and the oil distilled from it.
8. *Cytisus scoparius* (Broom).
The *fresh* and *dried* tops—Infusion 1 in 10 (dried tops).
The juice from the fresh tops.
9. *Glycyrrhiza glabra* (Liquorice).
The peeled root and peeled subterranean stem—Extract, Liquid Extract, Compound Powder 1 in 6. Also enters into 1 Mixture, 1 Decoction, 1 Tincture, 1 Confection, and 1 Pill.
10. *Hæmatoxylon campechianum* (Logwood).
The heart-wood—Decoction 1 in 20.
11. *Myroxylon Pereiræ* (Peru).
A balsam exuding from the trunk after the bark has been beaten and scorched.
12. *Myroxylon Toluifera* (Tolu).
A balsam exuding from the trunk—Tincture 1 in 10; Syrup 1 in 29.
Enters into 1 Compound Tincture, 2 Lozenges, and 1 Mixture.
13. *Physostigma venenosum* (Calabar Bean).
The dried seed—Extract, Physostigmine Sulphate or Eserine Sulphate and Discs, $\frac{1}{1000}$ gr.
14. *Pterocarpus Marsupium* (Kino).
The juice from the trunk evaporated to dryness—Tincture 1 in 10; Compound Powder 3 in 4. Enters into Compound Catechu Powder.
15. *Pterocarpus santalinus* (Red Sanders or Sandal Wood).
The heart-wood. Enters into Compound Tincture of Lavender.
16. *Tamarindus indica* (Tamarind).
The fruit freed from the brittle outer parts and preserved with sugar. Enters into Confection of Senna.

Lichenes

Roccella—various species—(Dyer's weed or Litmus).
Solution and Papers, introduced into B.P. Appendix for testing.

Liliaceæ

1. *Aloe vera* and *A. chinensis*, and probably other species (Barbados Aloes).
The juice which flows from the transversely cut leaves evaporated to dryness, imported from the Dutch West Indies.

Compound Decoction 4 grs. to 1 oz.; Extract; Pill 1 in 2; Pill with Iron 1 in $4\frac{1}{2}$; Tincture 1 of Ext. in 40; Gamboge Pill 1 in 6; Colocynth Pill 1 in 3; do. with Hyoscyamus 1 in $4\frac{1}{2}$; Compound Extract of Colocynth 1 in $2\frac{1}{4}$. Aloin.

2. Aloe Perryi, and probably other species (Socotrine Aloes).

The juice from the transversely cut leaves evaporated to dryness, imported by way of Bombay and Zanzibar.

Pill 1 in 2; Rhubarb Pill 1 in 6; Pill with Asafetida 1 in 4; Pill with Myrrh 1 in $2\frac{1}{4}$; Friar's Balsam 1 in 60. Aloin.

3. Urginea Scilla (Squill).

The bulb divested of its outer scales sliced and dried.

Acetum 1 in 8; Oxymel; Syrup 1 in 17; Tincture 1 in 5; Compound Pill 1 in 4; Pill with Ipecac, $3\frac{1}{5}$ in 20.

Linaceæ

Linum usitatissimum (Flax).

The dried ripe seeds—Oil.

The dried ripe seeds crushed.

Erythroxyton Coca is sometimes classed under this order. (See Erythroxyllaceæ.)

Liquidambaraceæ or Altingiaceæ

Liquidambar orientalis (Storax Tree).

A balsam obtained from the trunk—Enters into Friar's Balsam.

Storax has been placed also under the Styracaceæ, Balsamifloræ, and Hamamelidaceæ, which latter order is often made to include the Liquidambaraceæ.

Lobeliaceæ

Lobelia inflata (Lobelia).

The dried flowering herb—Ethereal Tincture 1 in 5.

Loganiaceæ or Apocynaceæ

1. Gelsemium nitidum (Yellow Jasmine).

The dried rhizome and roots—Tincture 1 in 10.

2. Strophanthus Kombé (The Kombé).

The dried ripe seeds freed from the awns—Tincture 1 in 40; Extract 1 in 2.

3. Strychnos Nux-vomica (Nux Vomica).

The dried ripe seeds—Extract 5% Strychnine; Liquid Extract $1\frac{1}{2}$ grs. Strychnine in 110 mins.; Tincture 2 of liq. ext. in $12 = \frac{1}{4}$ gr. Strychnine in 110 mins.

Strychnine; Strychnine Hydrochloride and Solution of Strychnine 1 gr. in 110 mins.

Magnoliaceæ

Illicium verum (Star-Anise).

The oil distilled from the fruit—Spirit 1 in 10.

Malvaceæ

Gossypium barbadense and other species (Cotton).

The hairs of the seed freed from fatty matter—Cotton.

Enters into Pyroxylin, which enters into 3 Collodions.

Melanthaceæ

1. *Colchicum autumnale* (Meadow Saffron).

(a) The fresh corm collected in early summer.
Extract.

(b) The corm stripped of its coats, sliced and dried under 150°.
Wine 1 in 5.

(c) The dried ripe seeds.
Tincture 1 in 5.

2. *Schœnocaulon officinale* (Cevadilla).

The dried ripe seeds—Used for obtaining Veratrine. Ointment 1 in 50.

Menispermaceæ

1. *Anamirta paniculata*.

Picrotoxin—A neutral principle from the seeds.

2. *Chondrodendron tomentosum* (Pareira).

The dried root—Liquid Extract.

3. *Jateorhiza Columba* (Calumba).

The dried root, sliced—Infusion 1 in 20; Tincture 1 in 10; and
Concentrated Solution 1 in 2.

Moraceæ (Sometimes regarded as a sub-order of Urticaceæ).

Ficus Carica (Figs).

The dried fleshy receptacles—Enters into Confection of Senna.

Myristicaceæ

Myristica fragrans (Nutmeg).

The dried seed divested of its testa.

Oil, and Spirit 1 in 10.

Enters into 2 Powders, 2 Spirits, 1 Pill, 2 Tinctures, and 1 Mixture.

Myrtaceæ

1. *Eucalyptus Globulus* (*Eucalyptus* or Blue Gum) and other species.

The oil distilled from the fresh leaves—Ointment 1 in 10.

2. *Eucalyptus rostrata* (Red Gum) and other species.

The ruby exudation from the bark. Lozenges 1 grain each.

3. *Eugenia caryophyllata* (Cloves).

The dried flower-bud—Oil, Infusion 1 in 40. Also enters into 1
Infusion, 1 Powder, and 2 Pills.

4. *Melaleuca Leucadendron* or *Melaleuca Cajuputi* (Cajuput).

The oil distilled from the leaves.

Spirit 1 in 10. Enters into Croton Liniment.

5. *Pimenta officinalis* (Pimento).

The dried unripe full-grown fruit—Water 8 ozs. to 1 gallon, and Oil.

6. *Punica Granatum* (Pomegranate).

The dried bark of the stem and root—Decoction 4 ozs. to 1 pint.

Oleaceæ*Olea Europæa* (Olive).

The oil expressed from the ripe fruit.

Enters into 2 Soaps, 3 Liniments, 4 Ointments, and 4 Plasters.

Papaveraceæ1. *Papaver somniferum* (White Poppy). The source of Opium.

The nearly ripe dried fruits.

2. *Papaver Rhœas* (Red Poppy).

The fresh petals. Syrup 1 in 3½.

Piperaceæ1. *Piper Cubeba* (Cubebbs.)

The dried unripe full-grown fruit—Oil, and Tincture 1 in 5.

2. *Piper Nigrum* (Black Pepper).

The dried unripe fruit—Confection 1 in 10.

Enters into Compound Powder of Opium.

Polygalaceæ1. *Krameria argentea* (Para Rhatany).2. *Krameria triandra* (Peruvian Rhatany).

The dried root—Extract; Infusion 1 in 20; Tincture 1 in 5; Lozenges, and Lozenges with Cocaine 1 gr. each; and Concentrated Solution 1 in 2.

Enters into Compound Catechu Powder.

3. *Polygala Senega* (Senega Snake Root).

The dried root—Infusion 1 in 20; Tincture 1 in 5, and Concentrated Solution 1 in 2.

Polygonaceæ1. *Rheum officinale*.2. *Rheum palmatum*.

3. Probably other species.

} (Rhubarb.)

The rhizome or so-called root, more or less deprived of its cortex, and dried in China and Thibet.

Extract; Infusion 1 in 20; Concentrated Solution 1 in 2; Syrup 1 in 15; Compound Tincture 1 in 10; Compound Pill 1 in 4; and Compound Powder 1 in 4½.

Ranunculaceæ1. *Aconitum Napellus* (Monkshood).

The dried root—Liniment 1 in 1½; Tincture 1 in 20; and Aconitine and its ointment 1 in 50.

2. *Cimicifuga racemosa* or *Actæa racemosa* (Black Snake Root).
Dried rhizome and roots—Liquid Extract 1 in 1; and Tincture 1 in 10.
3. *Delphinium Staphisagria* (Stavesacre).
The dried ripe seeds—Ointment 1 in 5.
4. *Hydrastis canadensis* (Golden Seal).
The dried rhizome and rootlets—Liquid Extract 1 in 1; Tincture 1 in 10.
5. *Podophyllum peltatum* (May Apple).
The dried rhizome and rootlets—Resin. Tincture, 2 grs. resin in 1 dr.

Rhamnaceæ

- Rhamnus purshianus* (Cascara Sagrada).
The dried bark—Extract, and Liquid Extract 1 in 1; and enters into Aromatic Syrup of Cascara 2 in 5.

Rosaceæ

1. *Brayera anthelmintica* (Kousso).
The dried panicles.
2. *Prunus Amygdalus var. amara* (Bitter Almond).
The ripe seed—Yields by expression the Oil.
3. *Prunus Amygdalus var. dulcis* (Sweet or Jordan Almond).
The ripe seed—Yields by expression the Oil, which enters into Spermaceti Ointment, Phosphorated Oil, and Liniment of Ammonia. Mixture 1 in 8; Compound Powder 8 in 13.
4. *Prunus domestica var. Juliana* (Prune).
The dried drupe. In Confection of Senna.
5. *Prunus Laurocerasus* (Cherry-Laurel).
The fresh leaves—The water 1 per cent. of HCN.
6. *Prunus serotina* (Virginian Prune).
The bark collected in autumn—Tincture 1 in 5; Syrup 3 in 20.
7. *Quillaja saponaria* (Quillaia or Panama Bark).
The inner bark—Tincture 1 in 20. Used in making Solution of Coal Tar.
8. *Rosa damascena* (Damask Rose).
The fresh flowers—Water; Distilled Oil; Ointment of Rose Water; and Rose basis for 3 Lozenges. Enters into Mist. Ferri Comp.
9. *Rosa gallica* (Red Rose).
The fresh and dried unexpanded petals from cultivated plants. Acid Infusion 1 in 40; Confection 1 in 4; Syrup 1 in 17.
The Confection enters into 3 Pills.

Rubiaceæ. (See Cinchonaceæ.)

Rutaceæ

1. *Barosma betulina* (Buchu).
The dried leaves—Infusion 1 in 20; Tincture 1 in 5.
2. *Cusparia febrifuga* (Cusparia or Angostura).
The dried bark—Infusion 1 in 30; Concentrated Solution 1 in 2.

3. *Pilocarpus Jaborandi* (Jaborandi).
The dried leaflets—Liquid Extract 1 in 1; Tincture 1 in 5; Nitrate of Pilocarpine.

Salicaceæ

Various species of *Salix* and *Populus*.
The bark is employed to make Salicin.

Santalaceæ

Santalum album (Sandal Wood).
The oil distilled from the wood.

Scrophulariaceæ

Digitalis purpurea (Foxglove).
The dried leaves of plants commencing to flower.
Infusion 3 grs. to 1 oz.; Tincture 1 in 8.

Simarubaceæ

Picraena excelsa (Quassia).
The wood of the trunk and branches.
Tincture 1 in 10; Infusion 88 grs. to 1 pint; and Concentrated Solution 1 in 10.

Smilaceæ

Smilax ornata (Sarsaparilla).
The dried roots imported from Costa Rica.
Liquid Extract 1 in 1; Concentrated Compound Solution 1 in 1.

Solanaceæ

1. *Capsicum minimum* (Capsicum).
The dried ripe fruit—Tincture 1 in 20; Ointment 1 in 4½. Enters into Compound Tincture of Chloroform and Morphia.
2. *Atropa Belladonna* (Belladonna).
 - (a) The *fresh* leaves and branches gathered when the plant is in flower. Extract (*green*).
 - (b) The *juice* from the above.
 - (c) The dried root collected in autumn—Liquid Extract $\frac{3}{4}$ gr. alkaloids in 110 mins. From this are prepared Alcoholic Extract 1 per cent. alkaloids; Suppository $\frac{1}{80}$ gr. alkaloids; Plaster 2 in 3 (.5 per cent. alkaloids); Liniment 1 in 2; Ointment .6 per cent. alkaloids; and Tincture 1 in 15 (.048 to .052 per cent. alkaloids).
From leaves or root:—Atropine and Atropine Sulphate; Liquor 1 gr. in 110 mins.; Ointment 2 per cent.; and Discs $\frac{1}{5000}$ gr.
3. *Datura Stramonium* (Stramonium).
The dried ripe seeds—Extract.
The dried leaves—Tincture 1 in 5.
4. *Hyoscyamus niger* (Henbane).
 - (a) The *fresh* leaves and flowers and branches collected from flowering biennial plants—Green Extract, which enters into 1 Pill.
 - (b) The *juice* extracted from the above.
 - (c) The *dried* leaves and flowering tops separated from branches—Tincture 1 in 10; Hyoscyne Hydrobromide and Hyoscyamine Sulphate.

5. Various species of *Scopola*.
Used for obtaining Hyoscine Hydrobromide.
6. Possibly other Solanaceous Plants.
Used for obtaining Hyoscyamine Sulphate and Hyoscine Hydrobromide.

Sterculiaceæ

Theobroma Cacao (Chocolate Tree).
The concrete oil, expressed from the seeds. Enters into 6 Suppositories.

Styracaceæ or Styraceæ

1. *Styrax Benzoin* (Siam and Sumatra Benzoin).
2. Probably other species of *Styrax*.
The balsamic resin.
Compound Tincture 1 in 10; Benzoic Acid and its preparations;
Benzoated Lard 1 in 33½. Enters into Spermaceti and various other Ointments.

Ternstroëmiaceæ. (See *Camelliaceæ*.)**Thymelaceæ**

1. *Daphne Mezereum* (Mezereon).
2. *Daphne Laureola* (Spurge Laurel).
3. *Daphne Gnidium*.
The dried bark. Enters into Concentrated Compound Solution of Sarsaparilla.

Umbelliferæ

1. *Carum copticum*.
The volatile oil is used as a source of Thymol.
2. *Carum Carvi* (Caraway).
The dried fruit—Water 1 lb. to 1 gallon, and Oil. Enters into 1 Confection, 2 Tinctures, 1 Powder, and 1 Pill.
3. *Conium maculatum* (Hemlock).
(a) The fresh leaves and young branches of wild British plants, collected when the fruit begins to form.
The juice—Ointment 2 in 1.
(b) The dried fully developed unripe fruit—Tincture 1 in 5.
4. *Coriandrum sativum* (Coriander).
The dried ripe fruit—Oil. Enters into the Syrup, Confection, and Compound Tincture of Senna, and into the Syrup and Tincture of Rhubarb.
5. *Dorema Ammoniacum* (Ammoniacum).
6. Probably other species.
The gum resin exuding from the flowering and fruiting stem.
Mixture ¼ oz. to 8 ozs.; Plaster of A. and Mercury 12 in 15.
Enters into 2 Pills.
7. *Ferula foetida* (Asafetida), and

8. Probably other species.

A gum-resin from incisions in the root.

Tincture 1 in 5; Pill of Aloes and A. 1 in 4; Fetid Spirit 33 grs. to 1 oz.
Enters into Pil. Galbani Co.

9. *Ferula Sumbul* (Sumbul).

The dried transverse slices of the root—Tincture 1 in 10.

10. *Ferula galbaniflua* (Galbanum).

11. Probably other species.

Gum-resin—Compound Pill 1 in 3½.

12. *Foeniculum capillaceum* (Fennel).

The dried ripe fruit of cultivated plants.

Water 1 lb. to 1 gallon. Enters into Compound Liquorice Powder.

13. *Peucedanum graveolens* (Dill).

The dried fruit—Water 1 lb. to 1 gallon, and Oil.

14. *Pimpinella Anisum* (Anise).

The dried fruit.

Oil; Water 1 lb. to 1 gallon; Spirit 1 in 10. Enters into 2 Tinctures.

Star-Anise (*Illicium verum*) belongs to the Magnoliaceæ.

Valerianaceæ

Valeriana officinalis (Valerian).

The dried rhizome and roots, collected in autumn.

Ammoniated Tincture 1 in 5.

Vitaceæ

Vitis vinifera (Grape Vine).

The dried ripe fruit (Raisins) from Spain. Enters into 2 Tinctures.

Zingiberaceæ or Scitamineæ1. *Curcuma longa* (Turmeric).

The dried rhizome—The Paper and Tincture 1 to 6 are contained in the B.P. Appendix, and are used for Testing.

2. *Elettaria Cardamomum* (Malabar Cardamom).

The dried ripe seeds—Compound Tincture 1 in 80.

Enters into 1 Compound Extract, 2 Powders, and 2 Tinctures.

The Tincture enters into 1 Decoction and 1 Mixture.

3. *Zingiber officinale* (Ginger).

The scraped and dried rhizome.

Syrup 1 in 40; Tincture 1 in 10. Ginger or its Compounds also enters into 14 official preparations.

Zygophyllaceæ

- | | |
|------------------------------------|------------------|
| 1. <i>Guaiacum officinale</i> , or | } (Lignum Vitæ.) |
| 2. <i>Guaiacum sanctum</i> | |

The heart-wood.

Enters into Concentrated Compound Solution of Sarsaparilla.

The resin obtained from the stem of 1 or 2. Mixture 11 grs. to 1 oz.;

Ammoniated Tincture 1 in 5; Lozenge 3 grs. in each. Enters into Compound Calomel Pill.

MATERIA MEDICA

OF THE

BRITISH PHARMACOPŒIA.

PHARMACOPŒIAL PREPARATIONS.*

THE student having obtained some idea of the general processes of Pharmacy, should now glance at the groups of the preparations; but until he has mastered the Official Remedies he cannot expect to grasp all the information contained in this part of the subject; and hence, since these groups are of vital importance, he should repeatedly turn back to them during his study of the *Materia Medica*.

The Aceta or Vinegars of the Pharmacopœia are three in number :—

Acetum Cantharidis—2 ozs. cantharides, 10 ozs. glacial acetic acid, and 10 ozs. water.

Acetum Ipecacuanhæ—1 oz. liq. extract of ipecacuanha, 2 ozs. alcohol (90 per cent.), and diluted acetic acid to 1 pint.

Acetum Scillæ—2½ ozs. squill to 1 pint diluted acetic acid.

Aquæ (The Waters—15 in number), viz.:—

Aqua Anethi—One gal. distilled from 1 lb. fruit and 2 gals. water.

Aqua Anisi—One gal. distilled from 1 lb. fruit and 2 gals. water.

*These preparations are often called "Galenical" (*pertaining to Galen*) to distinguish them from those prepared from the extemporaneous formulæ of the physician, which are called "Magistral" (*because ordered by a magister or master of his profession*).

Aqua Aurantii Floris—The water distilled from the flowers of the bitter orange—*Citrus Aurantium*—as found in commerce.

Aqua Camphoræ—A solution of camphor in water, by aid of alcohol (90 per cent.), nearly $\frac{1}{2}$ gr. to 1 oz.

Aqua Carui—One gal. distilled from 1 lb. of fruit and 2 gals. of water.

Aqua Chloroformi—A solution of $\frac{1}{2}$ dr. chloroform in 25 ozs. water.

Aqua Cinnamomi—One gal. distilled from 1 lb. of bark and 2 gals. water.

Aqua Destillata—Perfectly pure H_2O distilled from potable water.

Aqua Fœniculi—One gal. distilled from 1 lb. fruit and 2 gals. water.

Aqua Laurocerasi—One pt. distilled from 1 lb. fresh leaves and $2\frac{1}{2}$ pts. water, and made to contain '1 per cent. real Hydrocyanic Acid.

Aqua Menthæ Piperitæ—One gal. distilled from 77 mins. oil and $1\frac{1}{2}$ gals. water.

Aqua Menthæ Viridis—One gal. distilled from 77 mins. oil and $1\frac{1}{2}$ gals. water.

Aqua Pimentæ—One gal. distilled from 8 ozs. pimento and 2 gals. water.

Aqua Rosæ—Distilled water of the flowers of *Rosa Damascena*, as found in commerce.

Aqua Sambuci—One gal. distilled from 10 lbs. fresh flowers (or an equivalent amount of the preserved flowers) and 5 gals. water.

It should be remembered that all the waters are distilled except two—*Aqua Camphoræ* and *Aqua Chloroformi*, and that their doses all range from $\frac{1}{2}$ to 1 or 2 ozs., except *Aqua Laurocerasi*, which contains Hydrocyanic Acid, and whose dose is only $\frac{1}{2}$ to 2 drachms.

Aq. Aurant. Flor. and *Aq. Rosæ* in commerce are saturated solutions of oil in water, and for dispensing are to be diluted, immediately before use, with twice their volume of water.

Charta (Paper—1 in number).

Charta Sinapis—The fixed oil is extracted with Benzol by percolation from black and white mustard, bruised. The residue is dried and powdered, and 75 grs. mixed with 5 fl. drs. of solution of India-rubber, and spread on cartridge paper and dried. The paper should be dipped in tepid water before use.

Collodia (Collodions—3 in number).

Collodium—Pyroxylin 1 oz., Ether 36 ozs., Alcohol (90 per cent.) 12 ozs.

Collodium Flexile—Collodion 12 ozs., Canada Turpentine $\frac{1}{2}$ oz., Castor Oil $\frac{1}{4}$ oz.

Collodium Vesicans—Blistering Liquid 20 ozs., Pyroxylin $\frac{1}{2}$ oz.

Confections (4 in number). The last two are Cathartic, the first two faintly Astringent. Confections are soft preparations of a pasty consistence, containing a medicine blended with some form of sugar, either to preserve it, or to make its administration more agreeable. Under this heading are included the old Conserves and Electuaries.

CONFECTIONS.

CONFECTIO.	COMPOSITION.	STRENGTH.	DOSE.
Piperis . . .	Powdered black pepper 2, powdered caraway fruit 3, clarified honey 15; mix.	1 in 10.	60 to 120 grs.
Rosæ Gallicæ	Fresh red rose petals 1, beaten with sugar 3.	1 in 4.	—
Sennæ . . .	Powdered senna 7 oz., powdered coriander 3 oz., figs 12 oz., tamarind and cassia pulp 9 oz. each, prunes 6 oz., extract of liquorice 1 oz., sugar 30 oz., water q.s. to 75 oz. Boil the figs and prunes in 24 oz. water for 4 hours; in this digest the cassia and tamarind for 2 hours; sift, add the sugar and liquorice, dissolve, add the senna and coriander, and make up to 75 ozs.	1 in 11.	60 to 120 grs.
Sulphuris. .	Sulphur 4 oz., acid potassium tartrate 1 oz., tragacanth 18 grs., syrup 2 oz., tincture of orange $\frac{1}{2}$ oz., glycerin $1\frac{1}{2}$ oz.	1 in $2\frac{1}{2}$.	60 to 120 grs.

Decocta (Decoctions—3 in number) are watery vegetable solutions prepared by boiling. Aloes only is made in a covered vessel. All are made with distilled water and strained. Dose of each is $\frac{1}{2}$ to 2 ozs.

DECOCTIONS.

DECOCTUM.	COMPOSITION.	STRENGTH.
Aloes Co. . . .	Extract of Barbados aloes $\frac{1}{2}$ oz., myrrh, saffron, and potassium carbonate, of each $\frac{1}{4}$ oz., extract of liquorice 2 oz., compound tincture of cardamoms 15 oz., water q.s. to 50 oz. Boil all for 5 minutes, except the saffron and tincture, in 1 pint of water; add the saffron, and when cooled add the tincture 2 hours before straining, and make up to 50 oz. with water.	1 in 100
Granati Corticis	Pomegranate bark 4 oz., boiled in 24 oz. water for 10 minutes. Product to measure 1 pint.	1 in 5
Hæmatoxyli .	Logwood chips 1 oz., cinnamon bark 70 grs., water 24 oz., boil for 10 minutes and strain. Product 1 pint.	1 in 20

Emplastra (Plasters—12 in number) are solid, adhesive applications for external use, either for support or intended to act as a local means of applying various active remedies. As the various ingredients are only added to the active medicine for the sake of such physical qualities as adhesiveness, softness, hardness, and the like, it is not necessary for the student to learn *their* proportions, and as the directions are complicated, and seldom required by the student of Pharmacy, who never makes them, he is referred to the name of the drug in the Materia Medica, where he will find the plasters amongst the other preparations of each remedy.

PLASTERS.

EMPLASTRUM.	ARTICLES EMPLOYED IN THE PREPARATION.	STRENGTH.
Ammoniacum ..	Ammoniacum, mercury, olive oil, and sublimed sulphur.	1 of Hg in 5
Hydrargyro ..	Liquid extract of belladonna, evaporated to $\frac{1}{4}$ bulk, resin plaster.	2 in 3—5 p.c. alkaloids.
Belladonnæ ..	Cantharides, yellow beeswax, resin, resin plaster, soap plaster, and boiling water.	1 in 24 of Cantharides.
Calefaciens ..	Cantharides, yellow beeswax, lard, resin, and soap plaster.	1 in 3 (nearly).
Cantharidis ..	Mercury, olive oil, sulphur, and lead plaster.	1 in 3.
Hydrargyri ..	Menthol, yellow beeswax, and resin.	3 in 20.
Menthol ..	Powdered opium and resin plaster.	1 in 10.
Opii ..	Burgundy pitch, frankincense, resin, yellow beeswax, olive oil, and water.	1 in 2.
Picis ..	Lead oxide, olive oil, and water. No strength need be given, as it is chiefly <i>oleate of lead</i> , with a little glycerin.	
Plumbi ..	Lead iodide, lead plaster, and resin.	1 in 10.
Plumbi Iodidi ..	Resin, lead plaster, and hard soap.	1 in 9 $\frac{1}{2}$.
Resinæ ..		
(Adhesive Plaster)		
Saponis ..	Hard soap, lead plaster, and resin.	1 in 7.

Extracta (Extracts—39 in number) are mostly semi-solid products, obtained by the evaporation of vegetable solutions.

There are four classes of extracts, if we divide them according to the methods directed for their preparation—

1. The Fresh or Green Extracts, as hyoscyamus, &c.
2. The Aqueous or Watery, as aloes and opium.
3. The Alcoholic, as physostigma and rhubarb.
4. The Liquid, as coca and male fern.

The student should remember that these names have no connection with the *physical qualities* of the extract, except in the case of the liquid ones. Thus, the Fresh or Green extracts are either dark brown or black in colour: the Watery extracts

may be of pilular consistence like opium, or hard and brittle like aloes.

The extracts may be, however, better divided, according to their consistence, into three well-marked groups—

1. The *Semi-solid* or pilular extracts, of which there are 16.
2. The *Hard*, Dry, or Brittle, of which there are 6.
3. The *Fluid*, of which there are 17.

The Fluid extracts will be found in the table on page 154. The table on page 155 contains both the Solid and Semi-solid; but the student should remember that the Solid extracts are—*Extracta Aloes Barbadensis, Krameriaë, Cascaraë Sagradaë, Rhei, Strophanthi*, and *Euonymi Siccum* (the last two being in the form of powder).

The Fresh or Green Extracts, of which there are four—viz : *Belladonna Viride, Hyoscyamus Viride, Colchicum*, and *Taraxacum*—are prepared by expressing the juice of the drug, heating to 130° F., to coagulate the green colouring matter. This is separated and laid aside. The fluid is heated to 200° F. to coagulate all the albumin, which is useless, and which if retained would promote the decomposition of the preparation; it is consequently rejected. The fluid resulting is evaporated by the heat of a water-bath to a syrupy state. The colouring, previously separated and passed through a hair-sieve is now added, and the evaporation continued below 140° till the consistence of a soft extract is reached. In the case of *Colchicum* and *Dandelion* the juice is at first heated to the boiling point, and maintained at this temperature for ten minutes, to coagulate the albumin, filtered and evaporated at a temperature under 160°.

The Watery Extracts (7 in number) are prepared by boiling, macerating, or infusing the substance in hot or cold distilled water, and evaporating the resulting decoction, infusion, or solution to a suitable consistence. Thus *Aloes Barb.* is made by exhausting with *boiling* water. *Chamomile* is made by first boiling, hence it is an evaporated *decoction*, to which a little essential oil is added. *Liquorice* and *Opium* are aqueous extracts prepared by maceration of the drug in *cold* water; but the *Liquorice* infusions, after being strained, are boiled, and again strained before evaporation. *Cascara Sagrada* and *Krameria* are exhausted by percolation, and *Gentian* is first infused in *cold* water and afterwards boiled.

The Alcoholic Extracts (11 in number) are prepared by treating the substance with alcohol of different strengths, and subsequent evaporation after the alcohol has been regained by distillation. The student should note that there are *two semi-solid*

extracts of Belladonna, one a Green or Fresh extract, and the other prepared from the liquid extract, and known as the Alcoholic extract. Nux Vomica also is prepared from its liquid extract, Sugar of Milk being added to each of them to give a definite alkaloidal strength.

Liquid Extracts (17 in number) are either Alcoholic extracts dissolved in spirit and water, or *concentrated* infusions of drugs, to which enough spirit is added for their preservation. Opium is made from its semi-solid extract.

EXTRACTUM.	MATERIALS USED.	STRENGTH.	DOSE.
Belladonnæ Liq. . . .	Belladonna root, alcohol (90%), and water.	0.75 % alkaloids.	—
Cascaræ Sagradæ Liq.	Cascara sagrada, water and alcohol (90%).	1 in 1.	$\frac{1}{2}$ to 1 dr.
Cimicifugæ Liq. . . .	Cimicifuga and alcohol (90%).	1 in 1.	5 to 30 min.
Cinchonæ Liq. . . .	Red cinchona bark, hydrochloric acid, glycerin, alcohol (90%), and water.	1 in 1, or 5% alkaloids.	5 to 15 min.
Cocæ Liq.	Coca leaves and alcohol (60%).	1 in 1.	$\frac{1}{2}$ to 1 dr.
Ergotæ Liq.	Ergot, water, and alcohol (90%).	1 in 1.	10 to 30 min.
Filicis Liq.	Male fern (dried rhizome), and ether.	10 yield 1.	45 to 90 min.
Glycyrrhizæ Liq. . . .	Liquorice root, water and alcohol (90%).	S.G. 1.20.	$\frac{1}{2}$ to 1 dr.
Hamamelidis Liq. . .	Hamamelis leaves and alcohol (45%).	1 in 1.	5 to 15 min.
Hydrastis Liq. . . .	Hydrastis rhizome and alcohol (45%).	1 in 1.	5 to 15 min.
Ipecacuanhæ Liq. . .	Ipecacuanha root, slaked lime, and alcohol (90%).	2 to 2.25% alkaloids.	$\frac{1}{2}$ to 2 min. as an expectorant; 15 to 20 min. as an emetic.
Jaborandi Liq. . . .	Jaborandi leaves and alcohol (45%).	1 in 1.	5 to 15 min.
Nucis Vomicae Liq. . .	Nux Vomica seeds, alcohol (70%), and alcohol (90%).	1.5% strychnine	1 to 3 min.
Opil Liq.	Extract of opium, water and alcohol (90%).	$\frac{3}{4}$ in 20. .7 to .8% morphine.	5 to 30 min.
Pareiræ Liq.	Pareira root, boiling water, and alcohol (90%).	25% extractives.	$\frac{1}{2}$ to 2 drs.
Sarzæ Liq.	Sarsaparilla, alcohol (20%), and glycerin.	1 in 1.	2 to 4 drs.
Taraxaci Liq.	Dry dandelion root, alcohol (60%), and water.	1 in 1.	$\frac{1}{2}$ to 2 drs.

Abstracts are alcoholic extracts mixed with an inert powder, evaporated to dryness and powdered. They are not mentioned

in the B.P., but the Dry Extract of *Euonymus* and Extract of *Strophanthus* are abstracts.

EXTRACTS.

EXTRACTUM.	SOURCE.	MENSTRUUM USED.	DOSE.
Aloes Barb.	Barbados aloes, in fragments.	Boiling water.	1 to 4 grs.
Anthemidis	The dried flowers and essential oil.	Do.	2 to 8 grs.
Bellad. Alcohol. ..	Liquid extract of belladonna.	Sugar of milk.	$\frac{1}{4}$ to 1 gr.
Belladonnæ Viride	Juice of the fresh leaves and young branches.	None.	$\frac{1}{4}$ to 1 gr.
Cannabis Indicæ ..	The dried flowering tops.	Alcohol (90°/o).	$\frac{1}{4}$ to 1 gr.
Cascaræ Sagradæ ..	The powdered bark.	Cold water.	2 to 8 grs.
Colchici	Juice of the fresh corms.	None.	$\frac{1}{4}$ to 1 gr.
Colocynth. Comp. ..	Pulp of colocynth, extract of Barbados aloes, scammony resin, curd soap, and cardamoms.	Alcohol (60°/o).	2 to 8 grs.
Ergotæ	Sclerotium	Alcohol (60°/o), water, diluted hydrochloric acid, and sodium carbonate.	2 to 8 grs.
Euonymi Siccum. ..	The powdered bark.	Alcohol (45°/o) and calcium phosphate.	1 to 2 grs.
Gentianæ	The sliced root, dried.	Cold water.	2 to 8 grs.
Glycyrrhizæ	The dried powdered root.	Cold water.	—
Hyoscyami Viride	Juice of fresh leaves and branches.	None.	2 to 8 grs.
Jalapæ	The dried powdered root.	Alcohol (90°/o) and water.	2 to 8 grs.
Kramerizæ	The dried powdered root.	Cold water.	5 to 15 grs.
Nucis Vomizæ	Liquid extract of nuxvomica. (5% strychnine)	Sugar of milk.	$\frac{1}{4}$ to 1 gr.
Opil	Opium sliced.	Cold water.	$\frac{1}{4}$ to 1 gr.
Physostigmatis ..	The dried powdered bean.	Alcohol (90°/o) and milk sugar.	$\frac{1}{4}$ to 1 gr.
Rhei	The dried powdered root.	Alcohol (60°/o).	2 to 8 grs.
Stramonii	The dried, coarsely powdered seeds.	Alcohol (70°/o).	$\frac{1}{4}$ to 1 gr.
Strophanthi	The seeds coarsely powdered and dried at 110° F.	Purified ether, alcohol (90°/o), and milk sugar.	$\frac{1}{4}$ to 1 gr.
Taraxaci	The juice of the fresh root.	None.	5 to 15 grs.

No extract has now a maximum dose less than 1 gr. Nine are $\frac{1}{4}$ to 1 gr.—namely, Alcoholic and Green Belladonna, Indian Hemp, Colchicum, Nux Vomica, Opium, Calabar Bean, Stramonium, and Strophanthus. The Pharmacopœia gives no doses for Extracta Bellad. Liq. and Glycyrrhizæ.

Glycerina (Glycerins—9 in number) are solutions of the drug bearing the name, in glycerin or in glycerin and water.

The fact of the solid constituents being weighed, and the fluid

ones being measured, leads to difficulties in stating accurately their strengths. All are fluid except Glycerina Amyli et Tragacanthæ.

GLYCERINS.

GLYCERINUM.	INGREDIENTS.	Strength by Weight.	Strength by Volume.
Acidi Borici ..	Boric acid and glycerin.	6 in 20.	6 in 16.
Acidi Carbolici..	Phenol and glycerin.	1 in 6½.	1 in 5.
Acidi Tannici ..	Tannic acid and glycerin.	1 in 6½.	1 in 5.
Aluminis	Alum, glycerin, and water.	1 in 7½.	1 in 6.
Amyli	Starch, glycerin, and water.	1 in 10.	1 in 9.
Boracis	Borax and glycerin.	1 in 8½.	1 in 6½.
Pepsini	Pepsin, hydrochloric acid, glycerin, and water.	—	5 grs. in 1 dr.
Plumbi	Lead acetate and oxide, glycerin and water.	1 in 6.	1 in 4
Subacetatis }			
Tragacanthæ ..	Tragacanth, glycerin, and water.	1 in 5½.	—

Infusa (Infusions—22 in number) are watery solutions of vegetable principles prepared without boiling. 20 are prepared by pouring boiling distilled water on the vegetable properly comminuted, and placed in a suitable pot with a covered lid, and allowed to stand a definite short time.

Two—Quassia and Calumba—are prepared with cold water. All will darken on the addition of persalts of iron, except Quassia and Calumba, and all should be prepared fresh. All are directed to be strained. The product should not be made to measure any particular quantity. All infusions are made with 1 pint water. The most important infusion for the student to remember is Digitalis. It contains 60 grs. to a pint, and the dose is only two to four drachms. 14 are made with 1 oz. of the vegetable; 3—Compound Orange, Caryophylli, and Acid Rose—with ½ oz.; 1—Compound Gentian—with ¼ oz.; 2—Broom and Senna—with 2 ozs.; and Quassia with 88 grs. All the infusions are to stand for ¼ of an hour except Calumba and Senega (½ hour), and Cinchona Acidum (1 hour).

In the preparation of an infusion only distilled water should be employed, and it is a matter of considerable importance that the water should be placed in the vessel in which it is to be boiled and briskly heated, and when ebullition occurs it should at once be poured upon the vegetable substance. Previous prolonged boiling of the water gives a much less satisfactory product, as all the gases in the liquid are expelled by protracted boiling.

INFUSIONS.

INFUSUM.	INGREDIENTS.	STRENGTH.	TIME.	DOSE.
Aurantii ..	Dried bitter-orange peel cut small & boiling water.	1 in 20	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Aurantii Co.	Dried bitter-orange peel cut small, fresh lemon peel cut small, cloves bruised, & boiling water.	1 in 40	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Buchu	Leaves freshly broken and boiling water.	1 in 20	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Calumbæ ..	Root thinly sliced and cold water.	1 in 20	$\frac{1}{2}$ hour.	$\frac{1}{2}$ to 1 oz.
Caryophylli	Cloves bruised and boiling water.	1 in 40	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Cascarillæ ..	Bark powdered and boiling water.	1 in 20	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Chiratae ..	Chiretta cut small and boiling water.	1 in 20	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Cinch. Acid. .	Red bark powdered, aromatic sulphuric acid, and boiling water.	1 in 20	1 hour.	$\frac{1}{2}$ to 1 oz.
Cuspariæ ..	Bark powdered and boiling water.	1 in 20	$\frac{1}{4}$ hour.	1 to 2 oz.
Digitalis ..	Leaves powdered and boiling water.	60 grs. in 1 pt. or 1 in 160	$\frac{1}{4}$ hour.	2 to 4 drs
Ergotæ	Ergot freshly crushed and boiling water.	1 in 20	$\frac{1}{4}$ hour.	1 to 2 oz.
Gentianæ Co.	Root thinly sliced, dried bitter-orange peel cut small, fresh lemon peel cut small, and boiling water.	1 in 80	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Krameria ..	Root bruised and boiling water.	1 in 20	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Lupuli	Hops freshly broken and boiling water.	1 in 20	$\frac{1}{4}$ hour.	1 to 2 oz.
Quassia	Wood finely rasped, cold water.	1 in 100	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Rhei	Root in thin slices, boiling water.	1 in 20	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Rosæ Acidum	Red-rose petals dried and broken, diluted sulphuric acid, and boiling water.	1 in 40	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Scoparii ..	Tops dried and bruised and boiling water.	1 in 10	$\frac{1}{4}$ hour.	1 to 2 oz.
Senegæ	Root powdered and boiling water.	1 in 20	$\frac{1}{2}$ hour.	$\frac{1}{2}$ to 1 oz.
Sennæ	Senna, ginger sliced, and boiling water.	1 in 10	$\frac{1}{4}$ hour.	$\frac{1}{4}$ to 1 oz.; as draught 2 oz.
Serpentariæ	Rhizome powdered and boiling water.	1 in 20	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Uvæ Ursi ..	Leaves bruised and boiling water.	1 in 20	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.

There are 5 Infusions which are really compound preparations, containing more than one ingredient; they are—*Aurantii Co.*, *Cinchonæ Acid.*, *Gentianæ Co.*, *Rosæ Acid.*, and *Sennæ*, though

the student will note that the title compound is only conferred upon two of them—viz., Gentian and Orange.

Injectiones Hypodermicæ—There are 4 preparations under this head in the Pharmacopœia. In each the vehicle is boiled and cooled before the drug is dissolved. Apomorphine and Ergot are ordered to be recently prepared.

HYPODERMIC INJECTIONS.

INJECTIO HYPODERMICA.	COMPOSITION.	STRENGTH.	DOSE, by subcutaneous injection.
Apomorphinæ	Hydrochloride of apomorphine, 1 gr.; diluted hydrochloric acid, 1 minim; water, to 110 minims.	1 gr. in 110 mins.	5 to 10 mins.
Cocainæ	Cocaine hydrochloride, 33 grs.; salicylic acid, $\frac{1}{2}$ gr.; distilled water, to 6 fl. drs.	10 grs. in 110 mins.	2 to 5 mins.
Ergotæ	Extract of Ergot, 100 grs.; Phenol, 3 grs.; water, to 330 mins.	33 grs. in 110 mins.	3 to 10 mins.
Morphinæ	Morphine tartrate, 50 grs.; water, q.s. to 1,100 mins. = $\frac{3}{4}$ p. 37 in 20.	5 grs. in 110 mins.	2 to 5 mins.

Lamellæ (Discs) are 4 in number—

Lamellæ Atropinæ—Discs of gelatin and some glycerin, each weighing about $\frac{1}{30}$ gr., and containing $\frac{1}{5000}$ gr. atropine sulphate.

Lamellæ Cocainæ—Discs of gelatin, with some glycerin, each weighing about $\frac{1}{30}$ gr., and containing $\frac{1}{30}$ gr. cocaine hydrochloride.

Lamellæ Homatropinæ—Discs of gelatin, with some glycerin, each weighing about $\frac{1}{30}$ gr., and containing $\frac{1}{100}$ gr. of homatropine hydrobromide.

Lamellæ Physostigminæ—Discs of gelatin, with some glycerin, each weighing about $\frac{1}{30}$ gr., and containing $\frac{1}{1000}$ gr. physostigmine sulphate.

Linimenta (Liniments or Embrocations—15 in number) are preparations for external application to the skin, and intended to be applied with friction. They are really very thin ointments, though the majority of them are perfectly limpid liquids. The iodide of potassium with soap liniment is a soft solid—like shaving paste. All contain either a fixed or volatile oil, or a soap, camphor entering into 11 of them. Those without camphor

are ammonia, lime, croton oil, and iodide of potassium with soap. The old Liniment of Iodine is now called *Liquor Iodi Fortis*.

LINIMENTS.

LINIMENTUM.	COMPOSITION.	STRENGTH.
Aconiti	20 oz. root, 1 oz. camphor, and alcohol (90%) to 30 oz.	1 in 1½
Ammoniaë ..	1 oz. solution of ammonia, 1 oz. almond oil, and 2 oz. olive oil.	1 in 4.
Belladonnæ ..	10 oz. liquid extract, 1 oz. camphor, 2 oz. water, and alcohol (90%) to 20 oz.	1 in 2.
Calcis	2 oz. lime water, and 2 oz. olive oil, agitated together.	1 in 2.
Camphoræ ..	1 oz. camphor, in flowers, and 4 oz. olive oil.	1 in 5.
Camphoræ Ammoniatum	2½ oz. camphor, 1 dr. oil of lavender, 5 oz. strong solution of ammonia, and alcohol (90%) to 20 oz.	1 in 8.
Chloroformi ..	2 oz. chloroform, and 2 oz. camphor liniment.	1 in 2.
Crotonis	1 oz. croton oil, and 3½ oz. each oil of cajuput and alcohol (90%).	1 in 8.
Hydrargyri ..	1 oz. of mercurial ointment, 160 mins. strong solution of ammonia, and liniment of camphor to 3 oz.	1 of oint. in 3, or 1 of Hg. in 6.
Opii	2 oz. tincture of opium, and 2 oz. soap liniment.	1 in 2.
Potassii Iodidi cum Sapone	2 oz. curd soap, 1½ oz. potassium iodide, 1 oz. glycerin, 1 dr. oil of lemon, and 10 oz. distilled water.	54½ grs. in 1 fl. oz. or 1 in 10 by weight.
Saponis	2 oz. soft soap, 1 oz. camphor, 3 drs. oil of rosemary, 4 oz. distilled water, and 16 oz. alcohol (90%).	1 in 12.
Sinapis	1½ dr. oil of mustard, 120 grs. camphor, 5 drs. castor oil, and 4 oz. alcohol (90%).	1 in 27.
Terebinthinæ	1½ oz. soft soap, 1 oz. camphor, 13 oz. oil of turpentine, and water to 1 pint.	13 in 20.
Terebinth. Acet.	4 oz. oil of turpentine, 1 oz. glacial acetic acid, 4 oz. camphor liniment.	4 in 9.

Liquores (Solutions—53 in number) are solutions of vegetable principles or inorganic substances, mostly in distilled water. Three—*Pancreatis*, *Thyroidei*, and *Epispasticus*—come from the animal kingdom. The last named is made with acetic ether. The several vegetable solutions are prepared with alcohol of various strengths.

The following 11 are all of the same strength—1 grain in 110 minims (1 per cent.); they are most important preparations:—

Arsenicalis.	Atropinæ Sulph.	Pot. Permang.
Arsenici Hydr.	Morphinæ Tart.	Strychninæ Hydr.
Arsenii et Hyd. Iod.	Morphinæ Hydr.	Trinitrini.
Sodii Arsen.	Morphinæ Acet.	

LIQUORS OR SOLUTIONS.

LIQUOR.	STRENGTH.	DOSE.
Acid. Chromici	25 p. cent. anhydrous.	Used externally.
Ammonia	1 in 3. (10 per cent.)	Used externally.
Ammonia Fortis	32.5 per cent.	Used externally.
Ammonii Acetatis	about 6½ per cent.	2 to 6 drs.
Ammonii Citratis	nearly 16 per cent.	2 to 6 drs.
Arsenicalis	1 gr. in 110 mins.	2 to 8 m.
Arsenici Hydrochloricus ..	1 gr. in 110 mins.	2 to 8 m.
Arsenii et Hydr. Iod. ..	1 gr. in 110 mins.	5 to 20 m.
Atropinae Sulphatis	1 gr. in 110 mins.	½ to 1 m.
Bismuthi et Ammon. Cit. ..	about 3 grs. oxide in 1 dr.	½ to 1 dr.
Calcis	½ gr. in 1 oz.	1 to 4 oz.
Calcis Chlorinatae	about 3 per cent. Cl. when fresh.	—
Calcis Saccharatus	about 8 grs. in 1 oz.	20 to 60 m.
Calumbae Conc.	1 in 2.	½ to 1 dr.
Caoutchouc	1 to 20.	Used externally.
Chiratae Conc.	1 in 2.	½ to 1 dr.
Cuspariae Conc.	1 in 2.	½ to 1 dr.
Epispasticus	1 in 2.	Used externally.
Ethyl Nitritis	2½ to 3 per cent.	20 to 60 m.
Ferri Acetatis	almost 10 per cent.	5 to 15 m.
" Perchloridi	1 in 4.	5 to 15 m.
" Fortis	1 oz. iron in 5.	—
" Pernitratiss	1 oz. iron in 30.	5 to 15 m.
" Persulphatis	36 per cent.	—
Hamamelidis	1 in 1.	Used externally.
Hydrargyri Nit. Acidus ..	48 per cent.	Used externally.
Hydrargyri Perchloridi ..	½ gr. in 1 oz.	½ to 1 dr.
Hydrogenii Peroxidi	10 of oxygen in 1.	½ to 2 drs.
Iodi Fortis	1 in 9.	Used externally.
Krameriae Conc.	1 in 2.	½ to 1 dr.
Magnesii Carbonatis	nearly 10 grs. in 1 oz.	1 to 2 oz.
Morphinae Acetatis	1 gr. in 110 mins.	10 to 60 m.
Morphinae Hydrochloridi ..	1 gr. in 110 mins.	10 to 60 m.
Morphinae Tartratis	1 gr. in 110 mins.	10 to 60 m.
Pancreatis	1 in 4.	—
Picis Carbonis	1 in 6.	Used externally.
Plumbi Subacetatis Fortis ..	24 per cent.	Used externally.
" Dilutus	1 in 80.	Used externally.
Potassae	27 grs. in 1 oz.	10 to 30 m.
Potassii Permanganatis ..	1 gr. in 110 mins.	2 to 4 drs.
Quassiae Conc.	1 in 10.	½ to 1 dr.
Rhei Conc.	1 in 2.	½ to 1 dr.
Sarzæ Co. Conc.	1 in 1.	2 to 8 drs.
Senegæ Conc.	1 in 2.	½ to 1 dr.
Sennæ Conc.	1 in 1.	½ to 1 dr.
Serpentariae Conc.	1 in 2.	½ to 2 drs.
Sodæ Chlorinatae	2½ per cent. Cl.	10 to 20 m.
Sodii Arsenatis	1 gr. in 110 mins.	2 to 8 m.
Sodii Ethylatis	18 per cent.	Used externally.
Strychninae Hydrochloridi ..	1 gr. in 110 mins.	2 to 8 m.
Thyroides	100 mins.=1 gland.	5 to 15 m.
Trinitrini	1 gr. in 110 mins.	½ to 2 m.
Zinci Chloridi	46 grs. in 1 dr.	Used externally.

The Concentrated Liquors of Calumba, Chiretta, Cusparia, Krameria, Quassia, Rhubarb, Sarsaparilla, Senega, Senna, and Serpentary, are introduced into the new B.P. as representatives of the class of "Concentrated Infusions."

Lotiones (Lotions—2 in number) are liquid preparations for external application.

Lotio Hydrargyri Flava, 20 grs. hyd. perchlor. and 10 ozs. lime water.

Lotio Hydrargyri Nigra, 30 grs. calomel, $\frac{1}{2}$ oz. glycerin, $1\frac{1}{4}$ oz. mucilage of tragacanth, and lime water, to 10 ozs.

Mella (Honeys—4 in number) are preparations of honey.

Mel Depuratum—Honey melted and strained through flannel.

Mel Boracis—1 oz. powdered borax mixed with 8 ozs. clarified honey, and $\frac{1}{2}$ oz. glycerin.

Oxymel—40 ozs. clarified honey, 5 ozs. acetic acid, and distilled water (about 5 ozs.) to give a S.G. of 1.32. Dose—1 to 2 drs.

Oxymel Scillæ— $2\frac{1}{2}$ ozs. squill, $2\frac{1}{2}$ ozs. acetic acid, 8 ozs. water, macerated for 7 days, and the product mixed with clarified honey, liquefied (about 27 fluid ozs.), to give S.G. 1.32. Dose— $\frac{1}{2}$ to 1 dr.

Misturæ (Mixtures—9 in number).

MISTURA.	COMPOSITION.	STRENGTH PER OZ.
Ammoniaci ..	$\frac{1}{4}$ oz. ammoniacum rubbed up with $7\frac{1}{2}$ oz. water, and 4 drs. syrup of tolu, and strained.	$13\frac{1}{2}$ grs.
Amygdalæ ..	2 oz. compound powder of almonds and 16 oz. water, and strained.	54 grs.
Creosoti	16 minims each creosote and spirit of juniper, 1 oz. syrup, & water to 16 oz.	1 minim.
Cretæ	$\frac{1}{4}$ oz. prepared chalk, 15 grs. tragacanth in powder, $\frac{1}{2}$ oz. sugar, and cinnamon water to 8 oz.	$13\frac{1}{2}$ grs.
Ferri Comp. ..	25 grs. ferrous sulphate, 30 grs. potassium carbonate, 60 grs. each myrrh and sugar, 50 mins. spirit of nutmeg, rose water to 10 oz.	$2\frac{1}{2}$ grs.
Guaiaci	$\frac{1}{2}$ oz. guaiacum resin, $\frac{1}{2}$ oz. sugar, 35 grs. tragacanth powdered, and 1 pt. cinnamon water.	11 grs.
Olei Ricini .	3 oz. castor oil, $1\frac{1}{2}$ oz. mucilage of acacia, 1 oz. orange flower water, and $2\frac{1}{2}$ oz. cinnamon water.	3 drs.
Sennæ Co. ..	5 oz. magnesium sulphate, 1 oz. liq. extract of liquorice, 1 oz. aromatic spirit of ammonia, 2 oz. compound tincture of cardamoms, infusion of senna to 1 pint.	$\frac{1}{4}$ oz. mag. sulph.
Spt. Vini Gallici	4 oz. each brandy and cinnamon water, the yolks of 2 eggs, $\frac{1}{2}$ oz. sugar.	3 drs.

The formula of each of the official mixtures may be regarded as a carefully-written recipe in which a mixture is ordered, the ingredients being mostly in suspension. The dose is the same for all—from $\frac{1}{2}$ to 1 or 2 ozs.

The Mistura Sennæ Co. is the official representative of "Black Draught," and may be more correctly regarded as a magnesium sulphate preparation, with the infusion of senna added as an adjuvans.

Mucilagines (Mucilages—2 in number) are watery solutions of a gum.

Mucilago Acaciæ—4 ozs. gum acacia dissolved in 6 ozs. distilled water after rinsing with water.

Mucilago Tragacanthæ—60 grs. of the powdered gum mixed with 2 drs. alcohol (90 per cent.) and distilled water added to make 10 ozs.

These preparations are of no therapeutical interest, being merely introduced as excipients or vehicles with the intention of being prescribed in mixtures containing insoluble metallic salts or insoluble vegetable powders, to assist their suspension in the liquid medium. They are used as excipients in pill making, and are employed in the various methods of pill coating.

Olea (Oils).—Under this name there are 33 substances in the Pharmacopœia. They may be divided into two well-marked classes—fixed and volatile—the fixed being obtained by expression (hence sometimes called expressed oils), and the volatile (sometimes termed distilled oils) being products of distillation, except in the case of Ol. Limonis, a vegetable oil, which is volatile though obtained by expression. In addition to these, which are only known as oils, there are others in the Pharmacopœia equally deserving the name, as camphor, which is a volatile oil; lard, wool fat, beeswax, suet, and spermaceti, which are fixed.

Of the 33 oils, one is an animal product—cod liver oil—which is a fixed oil, and, omitting lemon, six are expressed—Almond, Croton, Linseed, Olive, Castor, and Theobroma; Cade is obtained by *destructive* distillation. Theobroma is solid.

As a rule, they vary from colourlessness through straw and yellow to a pale brown, but cajuput is a deep green colour, and cade is nearly black.

Cloves, cinnamon, pimento, and mustard oils *sink* in water.

The dose of each of the volatile oils is, speaking generally, about $\frac{1}{2}$ to 3 minims. The oil of mustard is a powerful poison, and should only be used externally. Of the fixed oils, croton is only given in doses of $\frac{1}{2}$ to 1 minim, while of the remaining five nearly an ounce each may be given.

The volatile oils are added to the official pill masses for

two reasons—to correct griping, and to serve as a means of distinguishing the various pill masses from each other by their odour.

OILS.

OLEUM.	SOURCE AND HOW PREPARED.	DOSE.
Amygdalæ ..	Expressed from bitter or sweet almonds.	—
Anethi	Distilled from dill fruit.	$\frac{1}{2}$ to 3 mins.
Anisi	Distilled from the fruit of anise or star-anise.	$\frac{1}{2}$ to 3 mins.
Anthemidis ..	Distilled from the flowers.	$\frac{1}{2}$ to 3 mins.
Cadinum	Obtained by the <i>destructive</i> distillation of the wood of juniperus oxycedrus and other species.	Used externally
Cajuputi	Distilled from the leaves.	$\frac{1}{2}$ to 3 mins.
Carui	Distilled from the fruit.	$\frac{1}{2}$ to 3 mins.
Caryophylli ..	Distilled from the flower buds.	$\frac{1}{2}$ to 3 mins.
Cinnamomi ..	Distilled from cinnamon bark.	$\frac{1}{2}$ to 3 mins.
Copaibæ	Distilled from copaiba.	5 to 20 mins.
Coriandri ..	Distilled from the fruit.	$\frac{1}{2}$ to 3 mins.
Crotonis	Expressed from the seeds.	$\frac{1}{2}$ to 1 min.
Cubebæ	Distilled from the unripe fruit.	5 to 20 mins.
Eucalypti ..	Distilled from the fresh leaves.	$\frac{1}{2}$ to 3 mins.
Juniperi	Distilled from the unripe fruit.	$\frac{1}{2}$ to 3 mins.
Lavandulæ ..	Distilled from the flowers.	$\frac{1}{2}$ to 3 mins.
Limonis	Expressed from the fresh peel.	$\frac{1}{2}$ to 3 mins.
Lini	Expressed without heat from the seeds.	Used externally.
Menthæ Piperitæ	Distilled from the fresh flowering herb.	$\frac{1}{2}$ to 3 mins.
Menthæ Viridis	Distilled from the fresh flowering herb.	$\frac{1}{2}$ to 3 mins.
Morrhuae	Extracted by a heat under 180° from the fresh liver.	1 to 4 drs.
Myristicæ ..	Distilled from the dried seeds.	$\frac{1}{2}$ to 3 mins.
Olivæ	Expressed from the ripe fruit.	—
Phosphoratum	Expressed oil of almonds and phosphorus, heated to 180°.	1 to 5 mins.
Pimentæ	Distilled from the unripe berry.	$\frac{1}{2}$ to 3 mins.
Pini	Distilled from the fresh leaves.	—
Ricini	Expressed from the seeds.	1 to 8 drs.
Rosæ	Distilled from the fresh flowers.	—
Rosmarini ..	Distilled from the flowering tops.	$\frac{1}{2}$ to 3 mins.
Santali	Distilled from the wood.	5 to 30 mins.
Sinapis Volatile	Distilled from the black seeds, after maceration with water.	Used externally
Terebinthinæ ..	Distilled usually by aid of steam from the oleo-resin.	2 to 10 mins.; 3 to 4 drs. as anthelmintic.
Theobromatis	Expressed with heat from the ground seeds.	Not given.

Pilulæ (Pills—20 in number) are soft solid masses, capable of being easily made into little globular forms. More than the half of them are purgative, and the dose is generally 4 to 8 grs. The dose of Pil. Phosphori is only 1 to 2 grs., of Pil. Saponis Co. and of Pil. Plumbi C. Opio 2 to 4 grs., of Pil. Quininæ 2 to 8 grs., and of Pil. Ferri 5 to 15 grs.

PILLS.

PILULA.	INGREDIENTS.	STRENGTH.
Aloes Barbadosis	Barbados aloes, hard soap, oil of caraway, and confection of roses.	1 n 2.
Aloes et Asafet.	Socotrine aloes, asafetida, hard soap, and confection of roses.	1 in 4.
Aloes et Ferri ..	Exsiccated ferrous sulphate, Barbados aloes, compound powder of cinnamon, and syrup of glucose.	2 & 1 in 9.
Aloes et Myrrhæ	Socotrine aloes, myrrh, and syrup of glucose.	2 & 1 in 4½
Aloes Socotrinæ	Socotrine aloes, hard soap, volatile oil of nutmeg, and confection of roses.	1 in 2.
Cambogiæ Co. ..	Gamboge, Barbados aloes, hard soap, compound powder of cinnamon, and syrup of glucose.	1 in 6.
Colocynth. Co. ..	Colocynth, Barbados aloes, scammony resin, potassium sulphate, oil of cloves, and water.	1 in 6.
Colocynth. et Hyoscyami..	Compound colocynth pill and extract of hyoscyamus.	2 & 1 in 3.
Ferri	Dried ferrous sulphate, dried sodium carbonate, acacia, tragacanth, syrup, glycerin, and distilled water.	1 in 5.
Galbani Co. ..	Asafetida, galbanum, myrrh, and syrup of glucose.	1 in 3½.
Hydrargyri ..	Mercury, confection of roses, and powdered liquorice.	1 in 3.
Hydrarg. Sub- chlor. Co.	Calomel, sulphurated antimony, guaiacum resin, castor oil, and alcohol (90%).	1 in 4½.
Ipecacuanhæ C. Scilla	Dover's powder, squill, ammoniacum, and syrup of glucose.	1 in 20.
Phosphori	Phosphorus, white beeswax, lard, kaolin, carbon bisulphide, gum acacia.	1 in 50.
Plumbi c. Opio ..	Lead acetate, opium, syrup of glucose.	6 & 1 in 8.
Quininæ Sulph- atis	Quinine sulphate, tartaric acid, glycerin, tragacanth.	5 in 6.
Rhei Co.	Rhubarb, socotrine aloes, myrrh, hard soap, oil of peppermint, and syrup of glucose.	1 in 3½.
Saponis Co.	Opium, hard soap, and syrup of glucose.	1 in 5. (of opium.)
Scammonii Co. ..	Resins of scammony and jalap, curd soap, and tincture of ginger.	1 in 3½.
Scillæ Co.	Squill, ginger, ammoniacum, hard soap, and syrup of glucose.	1 in 4½.

Nearly all the pill masses are dark brown or black in colour, only a few can be distinguished by sight—thus Pil. Hydrarg. is *blue*; Hyd. Subchlor. Co. a *bright orange*; and Quininæ Sulph. *white*. The majority are distinguishable by smell—thus, Colocynth is known by its odour of cloves; Barbados aloes by its caraway; Socotrine aloes by its nutmeg; Aloes et Asafetidæ by its powerful fetid odour; whilst in Pil. Galbani Co. the myrrh almost conceals the stinking gum; Pil. Cambogiæ smells strongly of Barbados aloes, and is not of the yellow colour which the student might expect; Pil. Scillæ Co. is known by the odour of its ammoniacum; Saponis by its tawny colour and opium smell; Rhubarb by

its peppermint; and Lead and Opium by the odour of acetic acid.

Pulveres (Powders) are 16 in number—

PULVIS.	INGREDIENTS.	DOSE IN GRAINS.	STRENGTH.
Amygdalæ Co. . . .	Sweet almonds, refined sugar, and acacia gum.	—	8 in 13.
Antimonialis	Antimonious oxide and calcium phosphate.	3 to 6.	1 in 3.
Catechu Co.	Catechu, kino, krameria, cinnamon, and nutmeg.	10 to 40.	1 in 2½.
Cinnamomi Co.	Cinnamon, cardamoms, and ginger.	10 to 40.	1 in 3.
Cretæ Aromaticus . .	Cinnamon, nutmeg, cloves, cardamoms, sugar, and chalk.	10 to 60.	1 in 4.
Cretæ Aromat. C. Opio	Aromatic chalk powder, and opium.	10 to 40.	1 in 40. (opium.)
Elaterini Co.	Elaterin and milk sugar.	1 to 4.	1 in 40.
Glycyrrhizæ Co. . . .	Senna, liquorice root, sugar, fennel fruit and sulphur.	60 to 120.	1 in 6.
Ipecacuanhæ Co. . . .	Ipecacuanha, opium, and potassium sulphate.	5 to 15.	1 in 10.
Jalapæ Co.	Jalap, cream of tartar, and ginger.	20 to 60.	1 in 3.
Kino Co.	Kino, opium, and cinnamon.	5 to 20.	1 in 20 (opium.)
Opii Co.	Opium, black pepper, ginger, caraway, and tragacanth.	2 to 10.	1 in 10.
Rhei Co.	Rhubarb, light (or heavy) magnesia, and ginger.	20 to 60.	1 in 4½.
Scammonii Co.	Scammony resin, jalap, and ginger.	10 to 20.	1 in 2.
Sodæ Tart. Efferves.	Tartarated soda 120 grs., sodium bicarbonate 40 grs. in blue paper; tartaric acid 38 grs. in white paper.	198.	120, 40, and 38.
Tragacanthæ Co. . . .	Tragacanth, gum acacia, starch, and sugar.	20 to 60.	1 in 6.

The official powders are all called "compound" except 4—Antimonial, Aromatic Chalk, Aromatic Chalk with Opium, and Seidlitz Powder. They can be for the most part distinguished by their colour, which is given with the exact weight of each constituent under the name of the drug, in the "Materia Medica." The student cannot, however, depend upon colour *alone*, as cinnamon, aromatic chalk, aromatic chalk with opium, ipecacuanha, jalap, rhubarb, and scammony closely resemble each other, only differing by very faint gradations of colour. The smell, along with the colour, will distinguish most of them—thus, the odour of opium distinguishes the aromatic chalk and opium powder from the plain aromatic chalk.

Spiritus (Spirits—of which there are 18 in number) are for the most part alcoholic solutions of a volatile oil. The student should remember that all are colourless when freshly prepared, except brandy and cajuput.

SPIRITUS.	COMPOSITION.	STRENGTH.	DOSE.
<i>Ætheris</i>	Ether and alcohol (90%).	1 in 3.	20 to 40 m. or 60 to 90 m.
<i>Ætheris Compositus</i> (<i>Hoffman's Anodyne</i> .)	Ethereal oil, ether, and alcohol (90%).	S. G. ·808 to ·812	20 to 40 m. or 60 to 90 m.
<i>Ætheris Nitrosi</i> ..	An alcoholic solution containing ethyl nitrite, aldehyde, and other substances.	S. G. ·838 to ·842	20 to 40 m. or 60 to 90 m.
<i>Ammoniaë Aromat.</i>	Carbonate, strong solution of ammonia, oil of nutmeg, oil of lemon, alcohol (90%), and water.	1 in 40. (Carbonate). 1 in 20. (Liq. Am. F.)	20 to 40 m. or 60 to 90 m.
<i>Ammoniaë Fetidus</i> ..	Asafetida, strong solution of ammonia, and alcohol (90%).	1½ in 20.	20 to 40 m. or 60 to 90 m.
<i>Anisi</i>	Oil of anise and alcohol (90%).	1 in 10.	5 to 20 m.
<i>Armoracia Composit.</i>	Horseradish root, bitter orange peel, nutmeg, alcohol (90%), and water.	1 in 8.	1 to 2 drs.
<i>Cajuputi</i>	Oil of cajuput and alcohol (90%).	1 in 10.	5 to 20 m.
<i>Camphoræ</i>	Camphor and alcohol (90%).	1 in 10.	5 to 20 m.
<i>Chloroformi</i>	Chloroform and alcohol (90%).	1 in 20.	5 to 20 or 30 to 40 m.
<i>Cinnamomi</i>	Oil of cinnamon and alcohol (90%).	1 in 10.	5 to 20 m.
<i>Juniperi</i>	Oil of juniper and alcohol (90%).	1 in 20.	20 to 60 m.
<i>Lavandulæ</i>	Oil of lavender and alcohol (90%).	1 in 10.	5 to 20 m.
<i>Menthaë Piperitæ</i> ..	Oil of peppermint and alcohol (90%).	1 in 10.	5 to 20 m.
<i>Myristicæ</i>	Oil of nutmeg and alcohol (90%).	1 in 10.	5 to 20 m.
<i>Rectificatus</i>	Alcohol, with 10 per cent. of water.	90%	—
<i>Rosmarini</i>	Oil of rosemary and alcohol (90%).	1 in 10.	—
<i>Vini Gallici</i>	Spirit distilled from wine.	43½% ethyl hydrate.	—

Six spirits, it will be noticed, have two ranges of doses given; the larger is for a single dose, the smaller for repeated administration.

Spiritus Rectificatus is Alcohol (90 per cent.), and from it the diluted alcohols are prepared. Spirits of juniper and nutmeg are ordered, if not clear, to be shaken with a little powdered talc and filtered.

Succi (Juices—6 in number).—Lemon juice is the *freshly* expressed juice which is used to make the syrup, the remaining five, which are regarded as the juices proper, are prepared by adding 1 measure of alcohol (90 per cent.) to 3 measures of the freshly expressed juice of the recently collected plants.

SUCCUS.	SOURCE.	DOSE.
Belladonnæ	Fresh leaves and young branches.	5 to 15 mins.
Conii	Fresh leaves and young branches.	1 to 2 drs.
Hyoscyami	Fresh leaves, flowering tops, and young branches.	$\frac{1}{2}$ to 1 dr.
Limonis	The ripe fruit.	—
Scoparii	Fresh tops.	1 to 2 drs.
Taraxaci	Fresh root.	1 to 2 drs.

Suppositoria (Suppositories—7 in number) are small, solid masses, weighing about 15 grs. and of conical shape, containing some active ingredient blended with a fatty or gelatin basis for introduction into the rectum. The glycerin suppository is made to weigh 30, 60, or 120 grs. each.

SUPPOSITORIA.	INGREDIENTS.	STRENGTH.
		GRS. IN EACH.
Acidi Carbolici ..	Phenol, white beeswax, and oil of theobroma.	1 gr.
Acidi Tannici ..	Tannic acid and oil of theobroma.	3 grs.
Belladonnæ ..	Alcoholic extract of belladonna, glycerin, and oil of theobroma.	$1\frac{1}{2}$ gr. each = $\frac{1}{50}$ gr. alkaloids.
Glycerini	Gelatin, glycerin, and water.	70 per cent.
Iodoformi	Iodoform and oil of theobroma.	3 grs.
Morphinæ	Morphine hydrochloride and oil of theobroma.	$\frac{1}{4}$ gr.
Plumbi Co.	Lead acetate, opium, and oil of theobroma.	3 grs. and 1 gr. opium.

Syrupi (Syrups—22 in number) are strong solutions of sugar, each charged with some preparation either to preserve it or make its administration more agreeable. 14 are of vegetable origin. They are mostly—the S.G. being generally about 1.33— $\frac{1}{3}$ heavier than water, and loaf sugar only is used in their preparation, and the water that enters into their composition is to be distilled; the dose averages 1 drachm.

The syrups are recognised by their colour, with which the student should be familiar. Syrup, syrup of orange flowers,

chloral, iodide and phosphate of iron, lactophosphate of lime, codeine, and tolu are *colourless*. Syrups of squill, lemon, orange, and ginger and aromatic syrup are straw-coloured; the last 3 being somewhat muddy. Syrups of rhubarb, prune, and hemidesmus are brown, whilst syrup of senna is a dark coffee-brown. Syrups of red poppy and red rose are of brilliant shades of red.

SYRUPS.

SYRUPUS.	INGREDIENTS.	STRENGTH. (by volume)
Syrupus	Sugar, 5 lbs., water q.s. to 7½ lbs.	1 in 1½.
Aromaticus ..	Tincture of orange 5, cinnamon water 5, syrup 10.	—
Aurantii .. .	Syrup and tincture of orange.	1 in 8.
Aurantii Floris..	Orange flower water, sugar, and water.	1 in 6½.
Calcii Lactophosphatis .. .	Calcium carbonate, lactic acid, concentrated phosphoric acid, sugar, orange flower water, water.	—
Cascaræ Aromaticus .. .	Liquid extract of cascara sagrada, tincture of orange, alcohol (90%), cinnamon water, syrup.	1 in 2½
Chloral .. .	Chloral hydrate, syrup, and water.	1 in 6.
Codeinæ .. .	Codeine phosphate, water, syrup.	1 in 240.
Ferri Iodidi.. .	Iron wire, iodine, sugar and water, 1 gr. in 11 minims.	1 in 11.
Ferri Phosph. ..	Iron wire, concentrated phosphoric acid, syrup, water.	1 in 60.
Ferri Phosphatis cum Quinina, et Strychnina	Iron wire, concentrated phosphoric acid, strychnine, quinine sulphate, syrup, and water.	1, ⅔, and ⅓ gr. in 1 dr
Glucosi .. .	Syrup and liquid glucose.	1 in 3.
Hemidesmi .. .	Hemidesmus root, sugar, and water.	1 in 8.
Limonis.. .	Fresh lemon peel juice, alcohol (90%), and sugar.	1 in 2.
Pruni Virginianæ	Virginian prune bark, sugar, glycerin, water.	3 in 20
Rhei.. .	Rhubarb root, coriander fruit, sugar, alcohol (90%), and water.	1 in 15.
Rhœados .. .	Fresh red poppy petals, sugar, water, and alcohol (90%).	1 in 3½.
Rosæ .. .	Dried red rose petals, sugar, and water.	1 in 17.
Scillæ .. .	Vinegar of squill and sugar.	1 in 17. (of squill.)
Sennæ .. .	Senna, oil of coriander, sugar, water, and alcohol (90%).	1 in 2.
Tolutanus .. .	Balsam of tolu, sugar, and water.	1 in 29.
Zingiberis .. .	Ginger, alcohol (90%), and syrup.	1 in 40.

Tabellæ (Tablets—only one preparation is official).

Tabellæ Trinitrini—Tablets of chocolate each weighing 5 grs., and containing $\frac{1}{100}$ gr. of trinitroglycerin of commerce.

Tincturæ (Tinctures—67 in number) are alcoholic solutions, chiefly of vegetable substances, though two are from the animal kingdom—viz., cochineal and Spanish fly. Two are from the

inorganic world—viz., perchloride of iron and iodine, the remaining 63 being of vegetable origin.

One pint is the quantity ordered in all the tinctures with two exceptions—viz., Belladonna (30 ozs.) and Nux Vomica (12 ozs.).

The B.P. process of *percolation* for tinctures, as given in an Appendix, is briefly :—Moisten the solids with a small quantity of the menstruum, and set aside in a closed vessel for 24 hours. Pack in a percolator, and percolate with the menstruum added gradually until about $\frac{3}{4}$ of the amount of tincture is obtained. Press the marc removed from the percolator, and filter the expressed liquid, mix it with the percolate, and make up to the required product with the menstruum.

In the *maceration* process the solid ingredients are placed in the whole of the menstruum in a closed vessel for 7 days, frequently agitating. Strain, press the marc. Mix the liquids, and filter if necessary.

25 are made by simple maceration.

29 are made by percolation.

13 are made by simple solution or mixing.

Alcohol of various strengths is used in making 65 of the tinctures—Alcohol (90 $\frac{0}{100}$) in 20, alcohol (70 $\frac{0}{100}$) in 14, alcohol (60 $\frac{0}{100}$) in 21, alcohol (45 $\frac{0}{100}$) in 10, whilst water, in addition, is used in 6 tinctures.

1 is made with spirit of ether (Ethereal Tincture of Lobelia).

1 with tincture of orange (Tincture of Quinine).

49 tinctures consist of one ingredient and the solvent—"Simple Tinctures."

9 tinctures are called compound—"Compound Tinctures."

9 tinctures, though not *called* compound, contain more than one ingredient and the solvent—"Complex Tinctures."

7—Belladonna, Compound Camphor, Cinchona, Compound Cinchona, Nux Vomica, Opium, and Ammoniated Opium—have a definite alkaloidal strength, and Tincture of Jalap is made to contain 1 $\frac{1}{2}$ $\frac{0}{100}$ resin. Only 1—Digitalis—has a strength of 1 in 8, and 1—Belladonna—of 1 in 15. Belladonna and Nux Vomica are prepared from their liquid extracts; Camph. Co. and Opii Ammon. from Tinct. Opii; and Cinchona Co. from Tinct. Cinchonæ.

The dosage of 6 tinctures—Aconiti, Aloes, Cantharidis, Opii, Rhei Co., and Sennæ Co.—is given both for a single dose and for repeated administration.

SIMPLE TINCTURES.

TINCTURA.	INGREDIENTS.	STRENGTH.	DOSE.
Aconiti	Root, alcohol (70%).	1 in 20	5 to 15 or 2 to 5 m.
Arnicae	Rhizome, " (70%).	1 in 20	—
Asafetidae ..	Gum, " (70%).	1 in 5	$\frac{1}{2}$ to 1 dr.
Aurantii	Fresh peel, " (90%).	1 in 4	$\frac{1}{2}$ to 1 dr.
Belladonnæ ..	Liquid extract, " (60%).	1 in 15 ('048 to '052% alkaloids)	5 to 15 m.
Buchu	Leaves, " (60%).	1 in 5	$\frac{1}{2}$ to 1 dr.
Calumbæ	Root, " (60%).	1 in 10	$\frac{1}{2}$ to 1 dr.
Cannab. Ind. ..	Extract, " (90%).	1 in 20	5 to 15 m.
Cantharidis ..	Flies, " (90%).	1 in 80	5 to 15 or 2 to 5 m.
Capsici	Fruit, " (70%).	1 in 20	5 to 15 m.
Cascarillæ ..	Bark, " (70%).	1 in 5	$\frac{1}{2}$ to 1 dr.
Chiratae	Herb, " (60%).	1 in 10	$\frac{1}{2}$ to 1 dr.
Cimicifugæ ..	Rhizome, " (60%).	1 in 10	$\frac{1}{2}$ to 1 dr.
Cinchonæ	Red bark, " (70%).	1% alkaloids	$\frac{1}{2}$ to 1 dr.
Cinnamomi ..	Bark, " (70%).	1 in 5	$\frac{1}{2}$ to 1 dr.
Cocci	Insects, " (45%).	1 in 10	5 to 15 m.
Colchici Sem. ..	Seeds, " (45%).	1 in 5	5 to 15 m.
Conii	Fruit, " (70%).	1 in 5	$\frac{1}{2}$ to 1 dr.
Croci	Stigmas, " (60%).	1 in 20	5 to 15 m.
Cubebæ	Fruit, " (90%).	1 in 5	$\frac{1}{2}$ to 1 dr.
Digitalis	Leaves, " (60%).	1 in 8	5 to 15 m.
Ferri Perchlor.	Strong liquor, water, and " (90%).	1 in 4	5 to 15 m.
Gelsemii	Root, " (60%).	1 in 10	5 to 15 m.
Hamamelidis ..	Bark, " (45%).	1 in 10.	$\frac{1}{2}$ to 1 dr.
Hydrastis	Rhizome, " (60%).	1 in 10	$\frac{1}{2}$ to 1 dr.
Hyoscyami ..	Leaves, " (45%).	1 in 10	$\frac{1}{2}$ to 1 dr.
Jaborandi ..	Leaves, " (45%).	1 in 5	$\frac{1}{2}$ to 1 dr.
Jalapæ	Root, " (70%).	1.5% resin	$\frac{1}{2}$ to 1 dr.
Krameria	Root, " (60%).	1 in 5	$\frac{1}{2}$ to 1 dr.
Limonis	Fresh peel, " (90%).	1 in 4	$\frac{1}{2}$ to 1 dr.
Lobeliae Æth. ..	Herb, spirit of ether.	1 in 5	5 to 15 m.
Lupuli	Strobiles, alcohol (60%).	1 in 5	$\frac{1}{2}$ to 1 dr.
Myrrhæ	Gum resin, " (90%).	1 in 5	$\frac{1}{2}$ to 1 dr.
Nuc. Vomicae ..	Liquid extract, water, " (90%).	.24 to .26% strychnine	5 to 15 m.
Opil	Opium, water, " (90%).	.7 to .8% morphine	5 to 15 or 20 to 30 m.
Podophylli ..	Resin, " (90%).	2 grs. in 1 dr.	5 to 15 m.
Pruni Virg. ..	Bark, water, " (90%).	1 in 5	$\frac{1}{2}$ to 1 dr.
Pyrethri	Root, " (70%).	1 in 5	Not taken.
Quassia	Chips, " (45%).	1 in 10	$\frac{1}{2}$ to 1 dr.
Quillaia	Bark, " (60%).	1 in 20	$\frac{1}{2}$ to 1 dr.
Quinine	Quinine hydrochlor., tinct. of orange.	1 in 50	$\frac{1}{2}$ to 1 dr.
Scilla	Bulb, alcohol (60%).	1 in 5	5 to 15 m.
Senegæ	Root, " (60%).	1 in 5	$\frac{1}{2}$ to 1 dr.
Serpentariae ..	Rhizome, " (70%).	1 in 5	$\frac{1}{2}$ to 1 dr.
Stramonii ..	Leaves, " (45%).	1 in 5	5 to 15 m.
Strophanthi ..	Seeds, " (70%).	1 in 40	5 to 15 m.
Sumbul	Root, " (70%).	1 in 10	$\frac{1}{2}$ to 1 dr.
Tolutana	Balsam, " (90%).	1 in 10	$\frac{1}{2}$ to 1 dr.
Zingiberis ..	Rhizome, " (90%).	1 in 10	$\frac{1}{2}$ to 1 dr.

COMPLEX TINCTURES.

TINCTURA.	INGREDIENTS.	STRENGTH.	DOSE.
Aloes	Extract of Barbados aloes, liquid extract of liquorice, alcohol (45%).	1 in 40.	$\frac{1}{2}$ to 1 dr. or. 1 $\frac{1}{2}$ to 2 drs.
Catechu	Catechu, cinnamon, alcohol (60%).	1 in 5.	$\frac{1}{2}$ to 1 dr.
Ergotæ Ammon.	Ergot, solution of ammonia, alcohol (60%).	1 in 4.	$\frac{1}{2}$ to 1 dr.
Guaiaci Ammon.	Resin, oil of nutmeg, oil of lemon, strong solution of ammonia, alcohol (90%).	1 in 5.	$\frac{1}{2}$ to 1 dr.
Iodi	Iodine, potassium iodide, water and alcohol (90%).	1 in 40.	2 to 5 mins.
Kino	Gum kino, glycerin, water, and alcohol (90%).	1 in 10.	$\frac{1}{2}$ to 1 dr.
Opii Ammon. ... (Scotch Paregoric.)	Tincture of opium, benzoic acid, oil of anise, strong solution of ammonia, alcohol (90%).	5 grs. opium in 1 oz.	$\frac{1}{2}$ to 1 dr.
Quininæ Am. ..	Quinine sulphate, solution of ammonia, alcohol (60%).	1 in 50.	$\frac{1}{2}$ to 1 dr.
Valerianæ Ammon.	Rhizome, oil of nutmeg, oil of lemon, solution of ammonia, and alcohol (60%).	1 in 5.	$\frac{1}{2}$ to 1 dr.

COMPOUND TINCTURES.

Benzoini Co. .. (Friar's Balsam.)	Benzoin, storax, tolu, socotrine aloes, alcohol (90%).	1 in 10.	$\frac{1}{2}$ to 1 dr.
Camphoræ Co. (Paregoric.)	Tincture of opium, benzoic acid, camphor, oil of anise, alcohol (60%).	2 grs. opium in 1 oz.	$\frac{1}{2}$ to 1 dr.
Cardamomi Co.	Seeds, caraway, raisins, cinnamon, cochineal, alcohol (60%).	1 in 80.	$\frac{1}{2}$ to 1 dr.
Chloroformi et Morphinæ Co.	Ohloroform, morphine hydrochloride, diluted hydrocyanic acid, tincture of capsicum, tincture of Indian hemp, oil of peppermint, glycerin, alcohol (90%).	$\frac{3}{4}$ min. & $\frac{1}{11}$ gr. in 10 mins.	5 to 15 m.
Cinchonæ Co. ..	Tincture of cinchona, orange peel, serpentary, saffron, cochineal, alcohol (70%).	.45 to .55% alkaloids.	$\frac{1}{2}$ to 1 dr.
Gentianæ Co. ..	Root, orange peel, cardamoms, alcohol (45%).	1 in 10.	$\frac{1}{2}$ to 1 dr.
Lavandulæ Co.	Oil of lavender, oil of rosemary, cinnamon, nutmeg, red sanders wood, alcohol (90%).	1 in 213.	$\frac{1}{2}$ to 1 dr.
Rhei Co.	Root, coriander fruit, cardamoms, glycerin, and alcohol (60%).	1 in 10.	$\frac{1}{2}$ to 1 dr. or 2 to 4 drs.
Sennæ Co. ..	Leaves, raisins, caraway, coriander, and alcohol (45%).	1 in 5.	$\frac{1}{2}$ to 1 dr. or 2 to 4 drs.

Trochisci (Lozenges—17 in number) are small tablets, composed of a basis, blended with a medicinal substance. The 4 bases ordered are—Fruit, Rose, Simple, and Tolu, the directions for

preparation of each being given at length in an Appendix to the Pharmacopœia. Briefly, *Simple* basis consists of sugar, gum acacia, mucilage of gum acacia, and water. For *Rose* basis, rose water, instead of distilled water, is used; whilst for *Tolu* and *Fruit* basis, tincture of tolu and black currant paste of commerce are used respectively in addition to the other four materials.

LOZENGES.

TROCHISCUS.	INGREDIENTS.	STRENGTH OF EACH.
Acidi Benzoici ..	Benzoic acid, fruit basis.	$\frac{1}{2}$ gr.
Acidi Carbolici ..	Phenol, tolu basis.	1 gr.
Acidi Tannici ..	Tannin, fruit basis.	$\frac{1}{2}$ gr.
Bismuthi Compositus	Bismuth oxycarbonate, Magnesium carbonate, Precipitated calcium carbonate, Rose basis.	2 grs. 2 grs. 4 grs.
Catechu	Catechu, simple basis.	1 gr.
Eucalypti Gummi..	Eucalyptus gum, fruit basis.	1 gr.
Ferri Redacti ..	Reduced iron, simple basis.	1 gr.
Guaiaci Resinæ ..	Guaiacum resin, fruit basis.	3 grs.
Ipecacuanhæ ..	Ipecacuanha, fruit basis.	$\frac{1}{4}$ gr.
Krameria	Extract of krameria, fruit basis.	1 gr.
Krameria et Cocainæ	Extract of krameria, Cocaine hydrochloride, Fruit basis.	1 gr. $\frac{1}{10}$ gr.
Morphinæ	Morphine hydrochloride, tolu basis.	$\frac{1}{36}$ gr.
Morphinæ & Ipecac.	Do. with the addition of ipecacuan.	$\frac{1}{36}$ and $\frac{1}{12}$ gr.
Potassii Chloratis	Potassium chlorate, rose basis.	3 grs.
Santonini	Santonin, simple basis.	1 gr.
Sodii Bicarbonatis	Sodium bicarbonate, rose basis.	3 grs.
Sulphuris	Precipitated sulphur, cream of tar, sugar, gum acacia mucilage, and tincture of orange.	5 grs.

Unguenta (Ointments—44 in number) are mixtures of medicinal substances with lard, paraffin, lanoline or wax and oil, of the consistence of butter, for external application; 21 contain lard in some form. White, in preference to yellow soft paraffin, is to be employed in making white ointments. The 10 ointments of mercury require separate notice.

OINTMENTS.

UNGUENTUM.	COMPOSITION.	STRENGTH.
Acidi Borici	Boric acid, paraffin ointment.	1 in 10.
Acidi Carbolic.. ..	Phenol, glycerin, paraffin ointment.	1 in 25.
Acidi Salicylici.. ..	Salicylic acid, paraffin ointment.	1 in 50.
Aconitinæ	Aconitine, oleic acid, lard.	1 in 50.
Aquæ Rosæ	Rose water, white beeswax, spermaceti, almond oil, oil of rose.	7 in 19.
Atropinæ	Atropine, oleic acid, and lard.	1 in 50.
Belladonnæ.. ..	Liquid extract (evaporated) and benzoated lard.	6% alkaloids
Cantharidis	Cantharides, benzoated lard.	1 in 10.
Capsici	Capsicum fruit, spermaceti, olive oil.	1 in 4½.
Cetacei	Spermaceti, white beeswax, almond oil, and benzoin.	1 in 5.
Chrysarobini	Chrysarobin and benzoated lard.	1 in 25.
Cocainæ	Cocaine, oleic acid, lard.	1 in 25.
Conii	Juice of hemlock, hydrous wool fat.	2 in 1.
Creosoti	Creosote, hard and soft (white) paraffins.	1 in 10.
Eucalypti	Oil of eucalyptus, soft (white) and hard paraffins.	1 in 10.
Gallæ	Galls and benzoated lard.	1 in 5.
Gallæ cum Opio	Gall ointment and opium.	7½%
Glycerini Plumbi Subacetatis	Glycerin of lead subacetate, paraffin ointment.	1 in 6.
Hamamelidis	Liquid extract and hydrous wool fat.	1 in 10.
Iodi	Iodine, potassium iodide, glycerin, lard.	1 in 25.
Iodoformi	Iodoform and paraffin ointment.	1 in 10.
Paraffini	Hard paraffin, soft paraffin (white or yellow).	3 and 7 in 10
Picis Liquidæ	Tar and yellow beeswax.	5 in 7.
Plumbi Acetatis	Lead acetate and paraffin ointment.	1 in 25.
Plumbi Carbonatis	Lead carbonate and paraffin ointment.	1 in 10.
Plumbi Iodidi	Lead iodide and paraffin ointment.	1 in 10.
Potassii Iodidi	Potassium iodide and carbonate, water, and benzoated lard.	1 in 10.
Resinæ	Resin, yellow beeswax, olive oil, and lard.	1 in 3¼.
Staphisagriæ	Stavesacre seeds, yellow beeswax, and benzoated lard.	1 in 5.
Sulphuris	Sublimed sulphur, benzoated lard.	1 in 10.
Sulphuris Iodidi	Sulphur iodide, glycerin, benzoated lard.	1 in 25.
Veratrinæ	Veratrine, oleic acid, lard.	1 in 50.
Zinci	Zinc oxide and benzoated lard.	3 in 20.
Zinci Oleatis	Zinc oleate, prepared with zinc sulphate, hard soap, and water, mixed with soft paraffin.	1 in 2.

OINTMENTS OF MERCURY.

UNGUENTUM.	COMPOSITION.	STRENGTH.
Hydrargyri	Mercury, lard, suet.	1 in 2.
Hydr. Ammoniat. ..	Ammoniated mercury, paraffin ointment.	1 in 10.
Hydr. Comp. ..	Mercury ointment, olive oil, yellow beeswax, camphor.	1 in 5. (of Hg.)
Hydr. Iodidi Rubri	Red iodide, benzoated lard.	1 in 25.
Hydr. Nitratis ..	Mercury, nitric acid, lard, olive oil.	1 in 15. (of Hg.)
Hydr. Nitratis Dil. .	Mercuric nitrate ointment, soft paraffin (yellow).	1 in 5.
Hydr. Oleatis .. .	Mercuric oleate, benzoated lard.	1 in 4.
Hydr. Oxidi Flavi. .	Yellow mercuric oxide, soft paraffin (yellow).	1 in 50.
Hydr. Oxidi Rubri. .	Red mercuric oxide, paraffin ointment (yellow).	1 in 10.
Hydr. Subchloridi. .	Mercurous chloride, benzoated lard.	1 in 10.

Vina (Wines—of which there are 8 in number) are simply tinctures made with sherry or orange wine instead of alcohol.

VINUM.	COMPOSITION.	STRENGTH.	DOSE.
Antimoniale ..	Tartar emetic, boiling water, and sherry.	2 grs. in 1 oz.	10 to 30 m.; 2 to 4 drs. as emetic.
Aurantii .. .	(Used for citrate of iron and quinine wines.)	10 to 12 per cent. [alcohol.]	—
Colchici .. .	Dried corm and sherry.	1 in 5.	10 to 30 m.
Ferri	1 oz. iron wire and 1 pint sherry.	Variable.	1 to 4 drs.
Ferri Citratis	Iron and ammonium citrate, orange wine.	1 gr. in 1 dr.	1 to 4 drs.
Ipecacuanhæ	Liquid extract of ipecacuanha and sherry.	1 in 20.	10 to 30 m. as expectorant; 4 to 6 drs. as emetic.
Quininæ .. .	Quinine hydrochloride and orange wine.	1 gr. to 1 oz.	$\frac{1}{2}$ to 1 oz.
Xericum. . .	(A Spanish wine.)	16 per cent. [alcohol.]	—

The following groups of vegetable substances in the B.P. are of considerable importance :—

Alkaloids.—The following are a few of the distinguishing characters of this group of active nitrogenous principles or organic bases—They all contain nitrogen ; they turn red litmus blue ; they may be regarded as compound ammonias ; they

combine with acids to form salts easily soluble as a rule in water, though they themselves are generally insoluble in water. The following are the pure alkaloids of the B.P.:—

Aconitine,
Atropine,
Caffeine,
Cocaine,

Codeine,
Strychnine,
Veratrine.

The following salts of alkaloids are contained in the B.P.:—

Apomorphine Hydrochloride,
Atropine Sulphate,
Caffeine Citrate,
Cocaine Hydrochloride,
Codeine Phosphate,
Homatropine Hydrobromide,
Hyoscine Hydrobromide,
Hyoscyamine Sulphate,

Morphine Tartrate,
Morphine Acetate,
Morphine Hydrochloride,
Physostigmine Sulphate,
Quinine Hydrochloride,
Quinine Acid Hydrochloride,
Quinine Sulphate,
Strychnine Hydrochloride.

Neutral Principles are bodies closely resembling the alkaloids in action and of complicated chemical constitution. They are Chrysarobin, Elaterin, Salicin, Santonin, and Picrotoxin. (Chrysarobin is not a *pure* principle.)

Glucosides.—Some of the above neutral principles under the action of ferments and acids split up into glucose, alcohols, &c.; these are known as Glucosides, as Picrotoxin, Santonin, Salicin, and Tannic Acid or Tannin.

The student should note the terminology of these bodies. The English names of the alkaloids end in *ine*, and the Latin in *ina*, whilst the neutral principles and glucosides end in *in*, and the Latin in *inum*. (Lupulin, Ergotin, and Euonymin do not belong to these groups.)

Gums are complex viscid bodies obtained by exudation from the stems, or stems and branches of plants. They contain arabin, or bassorin, or both. The B.P. representatives are Acacia and Tragacanth. (Eucalyptus and Kino are not true gums.)

Resins are solid, brittle, non-volatile, complex bodies, generally resulting from the oxidation of volatile hydrocarbons; they are insoluble in water and soluble in alkalies and spirit.

The B.P. representatives are Guaiacum, Jalap, Scammony, and Podophyllum Resins.

Burgundy Pitch and common Resin are generally included in the list of resins.

Gum-Resins are exudations containing variable proportions of gums, resins, and volatile oils. They form emulsions when rubbed up with water, the soluble viscid gum forming a solution which keeps the resinous and oily particles in suspension.

The B.P. representatives are Ammoniacum, Asafetida, Galbanum, Gamboge, Myrrh, and Scammony.

Oleo-Resins are complex bodies consisting of various proportions of resins and volatile oils. The following drugs are true Oleo-resins :—Copaiba, Canada Turpentine, and Frankincense.

Balsams are resinous or oleo-resinous bodies containing either benzoic or cinnamic acid or both. Those contained in the B.P. are Peruvian and Tolu Balsams, Benzoin and Prepared Storax.

Neither of the so-called Canada and Copaiba Balsams belong to this group.

Stearoptenes are crystalline oxidised hydrocarbons, or solid volatile oils, as Camphor, Menthol, and Thymol.

OFFICIAL REMEDIES.

ACACIÆ GUMMI (Gum Acacia)—Leguminosæ.

Gum Arabic ; an exudation from the stem and branches of Acacia Senegal, and other species, in spheroidal, colourless tears, or in angular, glistening, colourless or yellowish fragments. Consists chiefly of Arabic Acid or Arabin.

Demulcent. Used to suspend insoluble powders in mixtures.

Gum Acacia enters into Compound Almond, and Tragacanth Powders, Phosphorus Pill, the Lozenge Bases, and the following :—

Mucilago Acaciæ 4 and 6.

An almost colourless, translucent, viscid liquid ; prepared by dissolving 4 ozs. gum acacia, after rinsing with water, in 6 ozs. cold distilled water.

Enters into the Lozenge Bases, and into Mist. Ol. Ricini.

ACETANILIDUM (Acetanilide) $\text{CH}_3\text{CONHC}_6\text{H}_5$

(Synonym—Phenyl-Acetamide.)

Commonly known as Antifebrin. Colourless, glistening, scaly crystals obtainable by acting on aniline by glacial acetic acid.

Antipyretic and Analgesic. Dose—1 to 3 grains.

Acetum Cantharidis, Acetum Ipecac., and Acetum Scillæ— (See under "Cantharis, Ipecac, Scilla.")

ACIDUM ACETICUM (Acetic Acid) CH_3COOH

A colourless acid liquid, with a pungent odour, prepared from wood by destructive distillation, and by oxidation of ethylic alcohol, and containing 33 per cent of hydrogen acetate.

Counter-irritant, Vesicant, and Caustic.

The following preparations contain free acetic acid :—

Acetum Cantharidis ; Acetum Ipecac. ; Acetum Scillæ ; Acid. Aceticum ; Acid. Aceticum Dilutum ; Acid. Aceticum Glaciale ; Liniment. Terebinth. Acet. ; Liquor Morphinæ Acetatis ; Oxymel ; Oxymel Scillæ ; Syrupus Scillæ.

Acidum Aceticum Dilutum 1 in 8.

A colourless liquid, prepared by mixing acetic acid $2\frac{1}{2}$ ozs. and sufficient distilled water to make one pint. Contains 4.27 per cent. of hydrogen acetate.

Refrigerant and Diuretic. Dose— $\frac{1}{2}$ to 2 drs.

IN—Acetum Scillæ, Acetum Ipecac., and Liquor Morphinæ Acetatis.

Acidum Aceticum Glaciale (Glacial Acetic Acid).

Concentrated acetic acid—a colourless fluid, crystallising when cooled, and containing 99 per cent. of hydrogen acetate.

Powerfully Caustic.

IN—Acetum Cantharidis, Lin. Tereb. Acet., and Liq. Ferri Acet.

The following are the percentages of real acetic acid found in : Acetic Acid, 33.0 : Dilute Acetic Acid, 4.27 ; Glacial Acetic Acid, 99.

ACIDUM ARSENIOSUM (Arsenious Anhydride) As_2O_3

(Synonyms—Arsenic ; White Arsenic ; Arsenious Acid.)

An anhydride (not a true acid), occurring as a heavy white powder or in sublimed vitreous masses, obtained by roasting arsenical ores. It is also known as arsenious oxide.

Alterative, Tonic, and Caustic. Dose— $\frac{1}{10}$ to $\frac{1}{15}$ gr.

Liquor Arsenicalis 1 gr. in 110 mins. (1 %). (Synonyms—Liquor Potassæ Arsenitis ; Fowler's Solution).

A pinkish liquid, composed of arsenious anhydride in powder, and potassium carbonate, of each $87\frac{1}{2}$ grs., compound tincture of lavender 3 drs., distilled water to 1 pint.

Dose—2 to 8 mins.

This is the most frequently used preparation of arsenic ; and, like all the preparations of the drug, should be commenced in small doses and gradually increased. A good rule is to begin in adults with 2 minims and gradually increase to 8 or more—always after meals, and freely diluted. Children bear as large doses as adults.

Liquor Arsenici Hydrochloricus 1 gr. in 110 mins. (1 %)

A colourless liquid, prepared by dissolving arsenious anhydride $87\frac{1}{2}$ grs. in hydrochloric acid 2 drs., and distilled water to 1 pint. (This is three times the strength of De Valangin's Solvent).

Dose—2 to 8 minims freely diluted.

Arsenii Iodidum (Arsenious Iodide) AsI_3

Small orange crystals obtained by direct combination of iodine and arsenium.

Alterative and Tonic. Dose— $\frac{1}{20}$ to $\frac{1}{5}$ gr.

Liquor Arsenii et Hydrargyri Iodidi 1 gr. in 110 mins. (1 %)

A clear, pale yellow liquid, prepared by dissolving $87\frac{1}{2}$ grs. of arsenious iodide and $87\frac{1}{2}$ grs. of mercuric iodide in distilled water to 1 pint.

Known as Donovan's Solution.

Alterative and Antisymphilitic. Dose—5 to 20 minims.

Ferri Arsenas (Ferrous Arsenate, $\text{Fe}_3(\text{AsO}_4)_2 \cdot 6\text{H}_2\text{O}$, with Ferric Arsenate and some Iron Oxide). (Arsenate of Iron B.P. 85.)

A tasteless, amorphous, greenish powder, insoluble in water, but readily soluble in hydrochloric acid. Prepared by mixing solu-

tions of sodium arsenate and bicarbonate with one of ferrous sulphate, filtering and drying at a low temperature.

Alterative like Arsenic. Dose— $\frac{1}{16}$ to $\frac{1}{4}$ gr., in pill.

Sodii Arsenas Na_2HAsO_4 (Sodium Arsenate.)

(Arseniate of Sodium, hydrous, B.P. 85.)

A soluble white powder obtained by exposing to 300°F . crystallised sodium arsenate, which may be prepared by treating with water the product of the fusion of arsenious anhydride, sodium nitrate, and sodium carbonate.

Dose— $\frac{1}{40}$ to $\frac{1}{10}$ grain., in pill or in mixture.

Liquor Sodii Arsenatis 1 gr. in 110 mins. (1%)

A colourless solution of *anhydrous* sodium arsenate, $17\frac{1}{2}$ grs. in distilled water to 4 ozs. (Pearson's Solution is 1 in 600.)

Dose—2 to 8 minims, diluted, after food.

ACIDUM BENZOICUM (Benzoic Acid) $\text{C}_6\text{H}_5\text{COOH}$.

A crystalline acid, obtained from benzoin by sublimation. It is also obtained from toluene, from hippuric acid, and from other organic compounds. In light feathery plates and needles, nearly colourless, and odourless when quite pure, but when obtained from benzoin has an aromatic odour.

Antiseptic, Expectorant, and Diuretic. Dose—5 to 15 grs.

IN—Benzoates of Sodium and Ammonium, Tr. Camph. Co., and Tr. Opii Ammon.

Trochiscus Acidi Benzoici $\frac{1}{2}$ gr. in each.

Composed of benzoic acid and fruit basis.

ACIDUM BORICUM (Boric Acid) H_3BO_3

(Synonyms—Boracic Acid; Hydrogen Borate). Colourless, pearly, lamellar crystals, obtained by the action of sulphuric acid on borax, or from native boric acid. Dose—5 to 15 grs.

Antiseptic and Diuretic.

Glycerinum Acidi Borici 6 in 16 (by vol.). *FA.*

Boric Acid 6 ozs. added to 9 ozs. (by weight) glycerin heated to 302°F . When dissolved, maintain at this temperature till it weighs 10 ozs., then add 10 ozs. (by weight) glycerin.

Unguentum Acidi Borici 1 in 10.

A white or faintly yellow ointment, prepared by mixing sifted boric acid 1 oz. with 9 ozs. paraffin ointment (white).

Antiseptic.

ACIDUM CARBOLICUM (Phenol) $\text{C}_6\text{H}_5\text{OH}$

An acid obtained by the fractional distillation of coal-tar oil. In colourless acicular crystals, which become an oily liquid like creosote, at at least 102°F .

Antiseptic and Escharotic. Dose—1 to 3 grs., in pill.
Commonly called Carbolic Acid.

Enters into Injectio Ergotæ Hypoderm. and Liquor Thyroidei.

Acidum Carbolicum Liquefactum (Liquefied phenol) 90.9 per cent.

A colourless liquid, usually changing to pink, prepared by the addition of 10 per cent. of water to phenol liquefied by heat.

Dose—1 to 3 minims, largely diluted.

FA. **Glycerini Acidi Carbolic** 1 in 5 (1 in 6½ by weight).

A thick, colourless liquid, prepared by dissolving phenol 1 oz. in glycerin to 5 fl. ozs. One fluid drachm contains 12 grs.

Suppositoria Acidi Carbolic 1 gr. in each.

Phenol 12 grs. ; white beeswax 24 grs. ; oil of theobroma, q.s.
Divided into 12 small conical masses.

Antiseptic and Local Anæsthetic.

Trochiscus Acidi Carbolic 1 gr. in each.

Each lozenge contains phenol 1 gr. with tolu basis.

Unguentum Acidi Carbolic 1 in 25.

Phenol ½ oz. ; paraffin ointment (white) 10½ ozs. ; glycerin 1½ ozs.

Antiseptic and Deodorant.

ACIDUM CHROMICUM (Chromic Anhydride) CrO_3

(Commonly called Chromic Acid).

In crimson acicular crystals, prepared by interaction of potassium bichromate and sulphuric acid.

Caustic.

Liquor Acidi Chromici 1 in 4, or 29½ per cent. real acid, H_2CrO_4

An orange-red, inodorous acid liquid, prepared by dissolving 1 oz. chromic anhydride in 3 ozs. distilled water.

Caustic.

ACIDUM CITRICUM (Citric Acid) $\text{C}_3\text{H}_4\text{OH}(\text{COOH})_3, \text{H}_2\text{O}$.

An acid, in colourless rhombic crystals, obtained from the juice of the fruit of various species of Citrus.

Refrigerant. Dose—5 to 20 grs. in water.

20 grs. dissolved in half an oz. of water, are equivalent to one table-spoonful of fresh lemon juice, and will saturate in an effervescing mixture,

30 grs. bicarbonate of potassium in 1 oz. water.

24 grs. carbonate of potassium in 1 oz. water.

41 grs. carbonate of sodium in 1 oz. water.

24 grs. bicarbonate of sodium in 1 oz. water.

17 grs. carbonate of ammonium in 1 oz. water.

Succus Limonis, Syr. Limonis, Sodii Phosp. Efferves., Sodii Sulph. Efferves., Mag. Sulph. Efferves., Lithii Citras Efferves., contain free citric acid.

ACIDUM GALLICUM (Gallic Acid) $C_6H_2(OH)_3COOH, H_2O$

An acid in yellowish-white, satiny needles, prepared by the action of dilute sulphuric acid on tannic acid. Soluble in 100 parts of cold water.

Astringent. Used in internal hæmorrhages.

Dose—5 to 15 grs. in solution, in pill, or in powder.

Preparations containing gallic or tannic acids should not be combined with any preparation containing iron.

ACIDUM HYDROBROMICUM DILUTUM 1 in 10.

A colourless aqueous solution, containing 10 per cent. of hydrogen bromide, HBr ., prepared by distilling potassium bromide with concentrated phosphoric acid.

Hypnotic and Sedative, like KBr . Dose—15 to 60 minims.

ACIDUM HYDROCHLORICUM (Hydrochloric Acid).

Hydrogen chloride gas (HCl), produced by interaction of H_2SO_4 and $NaCl$, dissolved in water, and forming 31.79 per cent. of the solution, which is nearly colourless and strongly acid, emitting white pungent fumes.

Caustic—not used internally in this form.

IN—Acid. Nitro-Hydrochlor. Dil. ; Liq. Arsenici Hydrochlor. ; Glycerinum Pepsini, and the following :—

Acidum Hydrochloricum Dilutum 1 in 33. (10.58 per cent. Hydrogen Chloride.) *6.535 grs.*

A colourless mixture of hydrochloric acid and distilled water.

Dose—5 to 20 minims, in water.

IN—Liq. Morph. Hydrochlor. and Inj. Apomorph. Hypoderm. Used in making Ext. Ergotæ.

ACIDUM HYDROCYANICUM DILUTUM 1 in 50. (Diluted Hydrocyanic Acid) HCN

Hydrogen Cyanide, dissolved in water, and forming 2 per cent. of the solution ; prepared by interaction of potassium ferrocyanide and diluted sulphuric acid. It is a colourless liquid with a peculiar odour. Known as Dilute Prussic Acid.

Should be stored in a dark place, in small inverted stoppered bottles of amber-coloured glass, the stoppers being tied over with impervious tissue.

Sedative—a deadly poison. Dose—2 to 6 minims, in water.

Scheele's Prussic Acid is $2\frac{1}{2}$ times stronger than the above.

IN—Tinct. Chlorof. et Morph. Co. 1 in 20, and Aq. Laurocerasi 1% of real acid.

ACIDUM LACTICUM (Lactic Acid) $CH_3CHOHCOOH$

A colourless syrupy liquid, consisting of hydrogen lactate and

25 per cent. of water, prepared by the action of a special ferment on lactose.

A solvent of false membranes. Used in preparing Syr. Calcii Lactophos.

ACIDUM NITRICUM (Nitric Acid) HNO_3

An acid prepared by interaction of potassium nitrate or sodium nitrate and sulphuric acid, and containing 70 per cent. by weight of real HNO_3 . A colourless heavy liquid, emitting an acrid, corrosive vapour.

Corrosive—Not used internally in this form.

IN—Liq. Ferri Pernit., Liq. Hydrarg. Nit. Acidus, Ungt. Hyd. Nit., and

Acidum Nitricum Dilutum 1 in $5\frac{1}{2}$.

A colourless mixture of nitric acid 3 ozs. and 7 drs. and distilled water to make 1 pint—corresponding to 17.44 per cent. real acid.

Tonic and Astringent. Dose—5 to 20 minims.

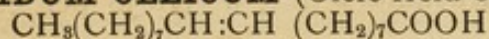
Acidum Nitro-Hydrochloricum Dilutum $\frac{3}{4}$ and 1 in 8.

Unaltered

Nitric Acid, 3 ozs.; hydrochloric acid, 4 ozs.; distilled water, 25 ozs., making a colourless liquid, which should be kept in a stoppered bottle 14 days before being used. It contains free chlorine, hydrochloric, nitric and nitrous acids.

Dose—5 to 20 minims, freely diluted.

ACIDUM OLEICUM (Oleic Acid or Hydrogen Oleate)



A straw-coloured liquid, nearly odourless and tasteless, obtained by the saponifying action of alkalies and subsequent action of acids, or by the action of superheated steam, upon the olein of fats. Usually not quite pure.

Used in making Mercuric Oleate and Ointments of Aconitine, Atropine, Cocaine, and Veratrine.

ACIDUM PHOSPHORICUM CONCENTRATUM (Concentrated Phosphoric Acid) 66.3 per cent. H_3PO_4

A colourless syrupy liquid, consisting of hydrogen orthophosphate with 33.7 per cent. of water, obtained by treating the product of burning phosphorus in air with water and nitric acid.

Externally, Caustic. Internally, Tonic.

IN—Syrups of Calcium Lactophosphate, of Ferrous Phosphate, and of Phosphate of Iron with Quinine and Strychnine; in preparation of Dilute Hydrobromic Acid; and

Acidum Phosphoricum Dilutum 3 in 20. (13.8 per cent. H_3PO_4)

A colourless liquid, prepared by mixing 3 fl. oz. concentrated phosphoric acid with q.s. distilled water to measure 1 pint.

Tonic and Refrigerant. Dose—5 to 20 minims.

ACIDUM SALICYLICUM (Salicylic Acid) $C_6H_4OHCOOH$

An acid in distinct, prismatic, colourless crystals, obtained from natural salicylates, as oils of wintergreen (*Gaultheria procumbens*) and sweet-birch (*Betula lenta*), or by the interaction of sodium carbolate and carbonic anhydride.

Antipyretic and Antirheumatic. Dose—5 to 20 grs.

Enters into *Injectio Cocainæ Hypodermica* and *Liq. Atropin. Sulph.*

Unguentum Acidi Salicylici 1 in 50.

A white ointment, prepared by mixing 10 grs. salicylic acid and 490 grs. white paraffin ointment.

Antiseptic.

Sodii Salicylas ($C_6H_4OH, COONa)_2H_2O$

Small colourless crystalline scales or in tabular crystals of pearly lustre if prepared from natural acid, obtained by interaction of salicylic acid and sodium carbonate or sodium hydroxide.

Antipyretic and Antirheumatic. Dose—10 to 30 grs. in water.

Used in making *Bismuthi Salicylas*.

Salicylic Acid or its Sodium Salt should not be prescribed with Quinine in a mixture.

ACIDUM SULPHURICUM (Sulphuric Acid) H_2SO_4

A heavy, colourless liquid, of oily consistence, formed by burning sulphur, and acting on the resulting sulphurous acid by means of nitrous and aqueous vapours. It contains 98 per cent. of real H_2SO_4 .

A powerful Corrosive.

Acidum Sulphuricum Aromaticum 1 in 14.

(Synonym—Elixir of Vitriol.)

An aromatic liquid, prepared by mixing 3 fl. ozs. sulphuric acid gradually with $29\frac{1}{2}$ ozs. alcohol (90 per cent.), and adding $\frac{1}{2}$ oz. spirit of cinnamon, and 10 ozs. tincture of ginger. Contains 13.8 per cent. H_2SO_4 .

Tonic and Astringent. Dose—5 to 20 minims, freely diluted.

IN—*Infusum Cinchonæ Acidum*.

Acidum Sulphuricum Dilutum 1 in 12 nearly. *109 5¼ drachms.*

A colourless mixture of sulphuric acid 1 oz. $5\frac{1}{4}$ drs. and distilled water q.s. to measure 1 pint. Contains 13.65 per cent. H_2SO_4 .

Tonic and Astringent. Dose—5 to 20 minims, freely diluted.

IN—*Infusum Rosæ Acidum*.

ACIDUM SULPHUROSUM (Sulphurous Acid) H_2SO_3

Sulphurous anhydride (SO_2) dissolved in water, forming a colourless liquid, with a pungent sulphurous odour, and constituting 5 per cent. of the solution, equivalent to 6.4 per cent.

H_2SO_3 . The SO_2 is prepared by burning S, or by boiling H_2SO_4 with carbon, mercury, or copper.

Antiseptic. Externally—Antiparasitic. Dose— $\frac{1}{2}$ to 1 dr.

ACIDUM TANNICUM (Tannic Acid) $C_{14}H_{10}O_9 \cdot 2H_2O$

(Synonym—Tannin).

An acid in pale brownish powder, consisting of thin glistening scales, extracted by water-saturated ether from galls which have been subjected to a special fermentation.

Powerfully Astringent. Readily soluble in water.

Dose—2 to 5 grs. in pill, powder, or solution.

Glycerinum Acidi Tannici 1 in 5. (1 in $6\frac{1}{4}$ by weight).

A brownish green viscid liquid, prepared by triturating tannic acid 1 oz. with glycerin to make 5 ozs.

Local Astringent and Styptic.

Suppositoria Acidi Tannici 3 grs. in each.

Tannic acid 3 grs., and oil of theobroma 12 grs.

Local Astringent and Styptic.

Trochiscus Acidi Tannici $\frac{1}{2}$ gr. in each.

Composed of tannic acid with fruit basis.

ACIDUM TARTARICUM (Tartaric Acid) $C_4H_6O_6$

An acid, in colourless crystals, prepared from the acid tartrate of potassium.

Refrigerant. Chiefly used in effervescing mixtures.

Dose—5 to 20 grains in water.

IN—Mag. Sulph. Efferves., Sodii Phosph. Efferves., Sodii Sulph. Efferves., Pulv. Sodæ Tart. Efferves., and Lithii Citras Efferves.

ACONITI RADIX (Aconite Root)—Ranunculaceæ.

The dried root of Aconitum Napellus, marked with the scars and bases of broken rootlets. A brownish-black tapering root, collected in autumn from cultivated British plants.

Cardiac Sedative. Active principles—Aconitine, Benzaconine and Aconine.

Linimentum Aconiti 1 in $1\frac{1}{2}$

A brown liquid prepared by macerating and percolating aconite root 20 ozs. in No. 40 powder with 30 ozs. alcohol (90 per cent.) and adding 1 oz. camphor. Product 30 ozs.

A powerful Sedative and Anodyne. For external use only.

Tinctura Aconiti 1 in 20.

A pale sherry-coloured liquid, prepared by percolating dried aconite root 1 oz. in No. 40 powder with alcohol (70 per cent.) 1 pint.

Dose—5 to 15 mins. : if very frequently repeated, 2 to 5 mins.

Aconitina (Aconitine) $C_{33}H_{45}NO_{12}$

A colourless alkaloid, obtained from aconite root.

A powerful poison. Should not be given internally.

Unguentum Aconitinæ 1 in 50.

An ointment, composed of aconitine 10 grs. ; oleic acid 80 grs. ; lard, 410 grs.

Similar in action to the liniment.

ADEPS (Lard).

The internal fat of the hog, *Sus scrofa*, purified by melting and straining.

It enters into the preparation of 20 ointments (either as lard or benzoated lard), into *Emplastrum Cantharidis*, and *Pil. Phosphori*.

ADEPS BENZOATUS (Benzoated Lard) 1 to 33 $\frac{1}{3}$.

Made by heating 1 lb. of lard and 210 grs. of benzoin for two hours on a water-bath and straining.

Emollient. Less liable to decompose than *Adeps*.

Enters into the composition of 12 ointments.

ADEPS LANÆ (Wool Fat).

A yellowish, sticky unctuous, almost odourless, substance, being the purified cholesterin-fat of sheep's wool. Used for the preparation of

Adeps Lanæ Hydrosus (Hydrous Wool Fat).

Commonly known as Lanoline, and prepared by triturating in a warm mortar, 3 ozs. distilled water added gradually to 7 ozs. wool fat.

Emollient. Used as a basis for ointments.

IN—*Unguentum Conii* and *Ung. Hamamelidis*.

ÆTHER (Ether) $(C_2H_5)_2O$ *Æther sulphuric.*

A colourless, volatile, inflammable liquid, with a strong odour, containing not less than 92 per cent. by vol. of ethyl oxide, prepared from alcohol by interaction with sulphuric acid. Formerly termed sulphuric ether.

A general diffusible Stimulant, Anæsthetic and Narcotic.

Dose—10 to 30 mins. for repeated administration ; 40 to 60 mins. for single dose, in syrup or water.

IN—*Collodium*, *Collodium Flexile*, *Tinct. Lobeliæ* *Ætherea*, and the following :—

Æther Purificatus (Purified Ether).

Ether freed from alcohol and water by the action of chloride of calcium, lime, and redistillation.

Used externally as a Local Anæsthetic.

Spiritus Ætheris 1 in 3.

Ether 10 ozs., alcohol (90 per cent.) 20 ozs. (mixed)—making a colourless liquid.

Dose—20 to 40 minims for repeated use ; 60 to 90 minims for single dose.

IN—Tinctura Lobeliæ Ætherea.

Spiritus Ætheris Compositus 1 in 8 nearly.

(Synonym—Hoffman's Anodyne). A colourless liquid, consisting of heavy oil of wine—prepared by the action of 36 ozs. sulphuric acid on 40 ozs. alcohol (90 per cent.)—5½ ozs. of ether, and 38 ozs. alcohol (90 per cent.).

Stimulant and Anodyne. Dose—same as Spt. Ætheris.

Spiritus Ætheris Nitrosi (Spirit of Nitrous Ether).

(Synonym—Sweet Spirit of Nitre). A transparent and almost colourless "alcoholic solution containing ethyl nitrite, aldehyde, and other substances," obtained by cautiously heating together 3 ozs. nitric acid, 2 ozs. sulphuric acid, 2 ozs. copper wire, and 1 pint alcohol (90 per cent.) in a retort, and afterwards adding q.s. alcohol (90 per cent.) to the distillate, so that it may contain 2½ per cent. ethyl nitrite.

Diaphoretic, Diuretic, and Antispasmodic.

Dose—Same as Spt. Ætheris ; 8 minims for a child 1 year old.

ÆTHER ACETICUS (Acetic Ether) $\text{CH}_3\text{COO}(\text{C}_2\text{H}_5)$.

A colourless liquid, with an agreeable odour, prepared by distilling dried sodium acetate, ethylic alcohol, and sulphuric acid, and purifying by the action of potassium carbonate.

Stimulant. Dose—20 to 40 mins. for repeated administration ; 60 to 90 mins. for single dose.

IN—Liquor Epispasticus.

ALCOHOL ABSOLUTUM (Absolute Alcohol) $\text{C}_2\text{H}_5\text{HO}$.

A colourless liquid, containing not more than 1 per cent. of water, prepared by extracting water from less strong ethylic alcohol and subsequent distillation. S.G from '794 to '7969.

Used in the preparation of Chloroform, Liq. Sodii Ethylatis, and Liq. Ethyl Nitritis.

ALCOHOLS (90 per cent., 70 per cent., 60 per cent., 45 per cent., and 20 per cent.), see under Spiritus Rectificatus.

ALOE BARBADENSIS (Barbados Aloes)—Liliaceæ.

The juice which flows from the transversely cut leaves of Aloe vera, A. chinensis, and probably other species, evaporated to dryness ; from the West Indian Islands in masses varying in colour from yellowish- or reddish-brown to chocolate-brown or almost black, with a disagreeable odour like the axilla. The powder is a dull greenish yellow. Known as Barbados and Curaçao aloes.

Dose—2 to 5 grs.

ALOE SOCOTRINA (Socotrine Aloes)—Liliaceæ.

The juice which flows from the transversely cut leaves of Aloe Perryi, and probably other species, evaporated to dryness. Imported principally by way of Bombay in *golden* or reddish-brown masses, the small fragments of which are translucent at the edges, with an agreeable strong odour. The powder is a bright yellow or orange-brown colour.

Cathartic—Both varieties are similar in action and dose, and their active principle is Aloin (Barbaloin and Socaloin).

ALOINUM (Aloin) $C_{16}H_{16}O_7 \cdot 3H_2O$

Yellow inodorous tufts of acicular crystals, extracted from Barbados or Socotrine aloes by solvents, and purified by recrystallisation.

Cathartic. Dose— $\frac{1}{2}$ to 2 grs. in pill.

In addition to the preparations bearing the name Aloes, all of which are given in the following pages, the drug enters into

Pil. Cambogiæ Co. 1 in 6.

Pil. Rhei Co., 1 in 6.

Pil. Colocynth. Co., 1 in 3.

Extract. Colocynth. Co., 1 in 24.

Pil. Colocy. et Hyoscy., 1 in 4½.

Tinct. Benzoini Co., 1 in 60.

Decoctum Aloes Compositum 4 grs. (Ext.) in 1 oz.

A rich dark-brown liquid, prepared by boiling together for five minutes extract of Barbados aloes $\frac{1}{2}$ oz.; myrrh, saffron, and potassium carbonate, of each $\frac{1}{4}$ oz.; extract of liquorice, 2 ozs.; compound tincture of cardamoms, 15 ozs.; distilled water to 50 ozs. The tincture should be added after cooling.

Dose— $\frac{1}{2}$ to 2 ozs.

Extractum Aloes Barbadensis 4 parts from 5.

A *solid* extract, obtained by dissolving Barbados aloes in boiling water, and evaporating the solution.

Dose—1 to 4 grs. in pill. It is less liable to gripe than the powdered aloes.

Pilula Aloes Barbadensis 1 in 2.

Barbados aloes (in powder), 2 ozs.; hard soap (in powder), 1 oz.; oil of caraway, 1 dr.; confection of roses, 1 oz.

Dose—4 to 8 grs.

Pilula Aloes Socotrinæ 1 in 2.

Socotrine aloes (in powder), 2 ozs.; hard soap (in powder), 1 oz.; oil of nutmeg, 1 dr.; confection of roses, 1 oz.

Dose—4 to 8 grs.

Pilula Aloes et Asafetidæ 1 in 4.

Socotrine aloes, asafetida, hard soap, and confection of roses, of each 1 oz.

Cathartic and Antispasmodic. Dose—4 to 8 grs.

Pilula Aloes et Ferri 1 in 9.

Exsiccated ferrous sulphate, 1 oz. ; Barbados aloes, 2 ozs. ; compound powder of cinnamon, 3 ozs. ; syrup of glucose, 3 ozs.

Cathartic and Emmenagogue. Dose—4 to 8 grs.

Pilula Aloes et Myrrhæ 1 in $2\frac{1}{4}$.

Socotrine aloes, 2 ozs. ; myrrh, 1 oz. ; syrup of glucose, $1\frac{1}{2}$ ozs. Known as Rufus' Pill.

Cathartic and Emmenagogue. Dose—4 to 8 grs.

Tinctura Aloes 1 of Ext. in 40.

A dark brown liquid, prepared by macerating extract of Barbados aloes $\frac{1}{2}$ oz. in liquid extract of liquorice 3 ozs., and alcohol (45 per cent.) to 1 pint.

Dose— $\frac{1}{2}$ to 1 drachm for repeated use ; $1\frac{1}{2}$ to 2 drs. for single dose.

ALUMEN (Alum) $\text{Al}_2(\text{SO}_4)_3\text{K}_2\text{SO}_4, 24\text{H}_2\text{O}$

Or $\text{Al}_2(\text{SO}_4)_3(\text{NH}_4)_2\text{SO}_4, 24\text{H}_2\text{O}$

Aluminium and potassium sulphate (potassium alum), or aluminium and ammonium sulphate (ammonium alum), produced by the combination of aluminium sulphate with potassium sulphate or with ammonium sulphate, in colourless transparent crystalline masses. Crystals soluble in 10 parts of water.

Astringent. In large doses Emetic. Dose—5 to 10 grs.

Alumen Exsiccatum (Exsiccated Alum) $\text{Al}_2(\text{SO}_4)_3\text{K}_2\text{SO}_4$

Prepared by heating potassium alum until it loses 45 to 46 per cent. of its weight.

Externally—Styptic.

FA.

Glycerinum Aluminis 1 in 6 (1 in $7\frac{1}{2}$ by weight).

A thick syrupy liquid, prepared by triturating and warming (if necessary) 1 oz. alum with 3 drs. water, and glycerin to 6 ozs., and pouring off the clear liquid from any deposit after settling.

Local Astringent.

AMMONIACUM (Ammoniacum)—Umbelliferæ.

A gum-resin exuded from the flowering and fruiting stem of *Dorema Ammoniacum*, and probably of other species, in pale brown or yellow tears or masses ; the fractured surface has a waxy lustre.

A Stimulating Expectorant. Dose—5 to 15 grs.

Emplastrum Ammoniaci Cum Hydrargyro 12 in 15.

Ammoniacum, 12 ozs. ; mercury, 3 ozs. ; olive oil, 56 grs. ; sulphur, 8 grs. ; mixed with the aid of heat.

Resolvent to enlarged glands.

Mistura Ammoniaci $13\frac{1}{2}$ grs. in 1 oz.

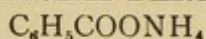
Ammoniacum $\frac{1}{4}$ oz. rubbed with $7\frac{1}{2}$ ozs. distilled water, and

4 drs. syrup of tolu, and strained through muslin to form a whitish emulsion, like dirty milk.

Dose— $\frac{1}{2}$ to 1 oz.

Ammoniacum also enters into the composition of Pil. Scillæ Co. and Pil. Ipecac. cum Scilla.

AMMONII BENZOAS (Ammonium Benzoate).



Colourless laminar crystals, prepared by neutralising solution of ammonia with benzoic acid.

Diuretic. Dose—5 to 15 grs. in water.

Ammonii Bromidum NH_4Br

In colourless crystals, very soluble in water ; formed by neutralising hydrobromic acid with ammonia.

Laryngeal Sedative. Useful in Whooping Cough.

Dose—5 to 30 grains. For a child 1 year old, 2 grains.

Ammonii Carbonas $\text{N}_3\text{H}_{11}\text{C}_2\text{O}_5$ ($\text{NH}_4\text{HCO}_3 + \text{NH}_4\text{NH}_2\text{CO}_2$)

A volatile salt, consisting of a variable mixture of ammonium hydrogen carbonate with ammonium carbamate, occurring in translucent crystalline masses, with strong ammoniacal odour, and produced on heating ammonium sulphate or chloride with calcium carbonate.

A Diffusible Stimulant, Expectorant and Emetic.

Dose—3 to 10 grs. ; 17 grs. neutralise $\frac{1}{2}$ oz. lemon juice.

Used in preparing—Liq. Ammon. Acet., Liq. Ammon. Cit., Spt. Ammon. Aromat., and Bismuth. Carb.

Ammonii Chloridum NH_4Cl

In colourless, inodorous crystals ; very soluble in water ; prepared by neutralising hydrochloric acid with ammonia. Known as Sal Ammoniac.

Expectorant and Ciliary Excitant.

Dose—5 to 20 grains.

Used in preparing—Liq. Ammoniaë Fortis.

Ammonii Phosphas $(\text{NH}_4)_2\text{HPO}_4$

In transparent colourless prisms, obtained by neutralising ammonia with phosphoric acid.

Diuretic. Dose—5 to 20 grs. in water.

Linimentum Ammoniaë 1 in 4.

An emulsion known as "hartshorn and oil," composed of—solution of ammonia, 1 oz.; almond oil, 1 oz.; and olive oil, 2 ozs.

Rubefacient.

Liquor Ammoniaë Fortis NH_3 15·8 grs. NH_3 in 1 dr.

Ammoniacal gas, dissolved in water, and constituting 32·5 per cent. of the solution, prepared by heating a mixture of ammonium

chloride and slaked lime, and passing the resulting ammonia into water.

Vesicant. Should not be used internally.

IN—Liniment. Camph. Co., Lin. Hydrarg., Liquor Ammoniaë, Spiritus Ammoniaë Aromaticus, Spt. Am. Fetid., and Tr. Guaiaci Ammon.

Liquor Ammoniaë NH_3 1 in 3. 5·2 grs. NH_3 in 1 dr.

Ammoniacal gas, dissolved in water, and constituting 10 per cent. of the liquid, prepared by mixing 1 pint of strong solution of ammonia with 2 pints of distilled water.

Stimulant and Rubefacient.

IN—Linim. Ammoniaë, Tr. Quininaë Ammon., Tr. Ergotæ Ammon., Tr. Valer. Ammon., and Tr. Opii Ammon.

Liquor Ammonii Acetatis $\text{NH}_4\text{C}_2\text{H}_3\text{O}_2$ about 6½ %.

A colourless liquid, prepared by neutralising 1 oz. ammonium carbonate with acetic acid, and adding water to 1 pint.

Diuretic and Diaphoretic. Dose—2 to 6 drs.

Liquor Ammonii Citratis $(\text{NH}_4)_3\text{C}_6\text{H}_5\text{O}_7$ nearly 16 %.

A colourless liquid, prepared by neutralising 2½ ozs. citric acid with about 1¾ ozs. ammonium carbonate, and adding distilled water to 1 pint.

Diuretic. Dose—2 to 6 drs.

Spiritus Ammoniaë Aromaticus 1 of Carbonate and 2 of Liq. Ammon. Fort. in 40. (Synonyms—Spiritus Ammoniaë Compositus; Spirit of Sal Volatile).

An almost colourless liquid, prepared by distilling 4½ drs. oil of nutmeg, 6½ drs. oil of lemon, 6 pints alcohol (90 per cent.), and 3 pints of water. 7 pints are collected and set aside; 9 ozs. are then collected, and in this quantity are dissolved with a gentle heat 4 ozs. carbonate of ammonia, and 8 ozs. strong solution of ammonia, the solution being then added to the 7 pints of distillate.

Cardiac Stimulant. Dose—20 to 40 mins. for repeated use; 60 to 90 mins. for single dose, diluted.

Often wrongly prescribed with Syrup of Squill.

IN—Mist. Sennæ Co.

Spiritus Ammoniaë Fetidus 1 of Liq. Am. Fort. in 10.

Prepared by distilling 1½ ozs. asafetida with q.s. alcohol (90 per cent.), and adding to the distillate 2 ozs. strong solution of ammonia and alcohol (90 per cent.) to measure 20 ozs.

Stimulant and Antispasmodic. Dose—20 to 40 mins. for repeated use; 60 to 90 mins. for single dose, diluted.

AMYGDALA AMARA (Bitter Almond)—Rosaceæ.

The ripe seed of *Prunus Amygdalus var. amara*. Has a bitter

taste, is broader and shorter than the sweet almond, and its aqueous emulsion has the odour of peach blossom.

Yields, when pressed, *Oleum Amygdalæ*, and contains Amygdalin and Emulsin, which form with water—Prussic Acid.

Amygdala Dulcis (Sweet or Jordan Almond)—Rosaceæ.

The ripe seed of *Prunus Amygdalus var. dulcis*; about one inch in length, narrow, and sharp-pointed, with clear brown seed coat, and a sweet taste.

Nutrient and Demulcent.

Yields, when pressed, *Oleum Amygdalæ*, and enters into

Pulvis Amygdalæ Compositus 8 in 13.

A coarse, whitish powder, composed of 8 ozs. of *sweet* almonds (with their coats removed by steeping in hot water), 4 ozs. sugar, and 1 oz. powdered gum acacia.

Mistura Amygdalæ 1 in 8.

A white emulsion, made by rubbing 2 ozs. of compound powder of almonds with 16 ozs. of distilled water, and straining through muslin.

Dose— $\frac{1}{2}$ to 1 oz.

Chiefly used as a vehicle for other medicines, and as a basis for lotions.

Oleum Amygdalæ (Almond Oil).

The pale yellow, almost inodorous, fixed oil, expressed from *bitter* or *sweet* almonds.

Demulcent and Emollient.

Used in the preparation of spermaceti and rose water ointments, in phosphorated oil, and liniment of ammonia.

This harmless oil, which is commonly called almond oil, should not be confounded with the oil *distilled* from the bitter almond, which is known as the oil of bitter almonds, and which is a deadly poison, being four times the strength of dilute hydrocyanic acid. It is not, however, in the Pharmacopœia.

AMYL NITRIS (Amyl Nitrite) $C_5H_{11}NO_2$

An ethereal, yellowish liquid, with a fragrant odour, prepared by the interaction of nitrous acid and amylic alcohol that has been distilled between 262° and $270^\circ F$. It consists chiefly of iso-amyl nitrite, but contains other nitrites.

Acts powerfully on arterial spasm.

Dose for inhalation—The vapour of 2 to 5 minims. It may be swallowed in the form of capsule, in doses of $\frac{1}{2}$ to 1 min.

AMYLUM (Starch)—From Graminaceæ.

Starch procured from the grains of common wheat (*Triticum sativum*); maize (*Zea Mays*); and rice (*Oryza sativa*), in white powder or in columnar masses.

Dietetic and Demulcent. Antidote in poisoning by iodine.

In addition to the following, it enters into Compound Tragacanth Powder.

F.A. **Glycerinum Amyli** 1 to 8. 1 in 10 $\frac{1}{4}$ by weight.

A translucent jelly, prepared by heating 1 oz. starch, 6 $\frac{1}{2}$ ozs. glycerin, and 1 $\frac{1}{2}$ ozs. distilled water.

An Emollient application for external use.

Preparations of iodine should not be ordered with starch.

ANETHI FRUCTUS (Dill Fruit)—Umbelliferæ.

The oval, flat, brown, dried, ripe fruit, $\frac{1}{8}$ th of an inch long, with an aromatic odour, of *Peucedanum graveolens*.

Carminative.

Aqua Anethi 1 lb. to 1 gallon.

A colourless liquid, prepared by distilling 1 gallon from 1 lb. dill fruit and 2 gals. water.

Dose— $\frac{1}{2}$ to 2 ozs. for adults. A favourite drug in the colic of infants. 1 to 2 drs. for a child 1 year old.

Oleum Anethi

The pale yellow oil, distilled from Dill fruit.

Antispasmodic and Carminative. Dose— $\frac{1}{2}$ to 3 minims.

ANISI FRUCTUS (Anise Fruit)—Umbelliferæ.

The dried fruit of *Pimpinella Anisum*, $\frac{1}{3}$ th inch long, ovoid, greyish brown, and covered with hairs.

Antispasmodic and Carminative.

Conium fruit is distinguished from Anise by its consisting of single mericarps, which are smooth and grooved.

Aqua Anisi 1 lb. to 1 gallon.

A colourless water obtained by distilling 1 gallon from 2 gallons water and 1 lb. anise fruit.

Carminative and Antispasmodic.

Dose—1 to 2 drs. for a child 1 year old.

Oleum Anisi

The colourless or pale yellow oil distilled from anise fruit, or from the fruit of Star-anise, *Illicium verum*.

Antispasmodic and Carminative. Dose— $\frac{1}{2}$ to 3 minims.

IN—Tinct. Camphoræ Co., Tinct. Opii Ammon., and

Spiritus Anisi 1 in 10.

The colourless solution, prepared by mixing 1 oz. oil of anise with alcohol (90 per cent.) q.s. to make 10 ozs.

Carminative and Antispasmodic.

Dose—5 to 20 minims. For a child 1 year old, 3 minims.

ANTHEMIDIS FLORES (Chamomile Flowers)—Compositæ.

The dried expanded flower heads of *Anthemis nobilis*, resembling dried daisy heads from cultivated plants.

An Aromatic Stimulant and Bitter Tonic.

Extractum Anthemidis

A soft extract, prepared by evaporating a decoction of flowers, and adding 15 minims of oil of chamomile for every pound of flowers. ~~63~~ This is the only extract containing oil.

Dose—2 to 8 grs.

Oleum Anthemidis

The pale blue or greenish blue oil, which gradually becomes yellowish brown, distilled from chamomile flowers.

Used in making the extract.

Dose— $\frac{1}{2}$ to 3 minims, on sugar or in mucilage.

ANTIMONIUM NIGRUM PURIFICATUM (Antimonious Sulphide) Sb_2S_3

Purified black antimony, in the form of a greyish-black powder, being the native sulphide purified from siliceous matter by fusion, and, if necessary, from arsenic by maceration with solution of ammonia.

Used to make Antim. Sulphuratum.

Antimonii Oxidum Sb_2O_3

A greyish-white powder, prepared by pouring a solution of antimonious chloride into water, and decomposing the oxychloride thus formed with carbonate of sodium.

Diaphoretic and Emetic.

Dose—1 to 2 grs. For a child 1 year old, $\frac{1}{8}$ to $\frac{1}{4}$ gr.

Used in the preparation of Antimon. Tartaratum, and in

Pulvis Antimonialis (Antimonial Powder) 1 in 3.

A substitute for James's powder, consisting of oxide of antimony 1 oz. and calcium phosphate 2 ozs.

Acts like the Oxide, only weaker.

Dose—3 to 6 grs. For a child 1 year old, $\frac{1}{4}$ to $\frac{1}{2}$ gr.

Antimonium Sulphuratum $\text{Sb}_2\text{S}_3, \text{Sb}_2\text{O}_3, \text{Sb}_2\text{S}_3, \text{Sb}_4\text{O}_6$ and S.

An orange-red powder, known as sulphurated antimony, prepared by boiling antimonious sulphide with sublimed sulphur and caustic soda, adding diluted sulphuric acid and water to the solution before it cools, collecting, washing, and drying the precipitate.

Alterative, Emetic, and Diaphoretic. Dose—1 to 2 grs.

IN—Pilula Hydrargyri Subchloridi Composita—(1 in $4\frac{1}{2}$).

Antimonium Tartaratum $(\text{K}(\text{SbO})\text{C}_4\text{H}_4\text{O}_6)_2, \text{H}_2\text{O}$

(Tartarated Antimony). (Synonyms—Tartar Emetic ; Potassio-tartrate of Antimony.) In colourless, transparent crystals, with triangular facets ; soluble in water ; prepared by setting aside a mixture of antimonious oxide and acid potassium tartrate made

into a paste with a little water, until combination has taken place, and purifying by crystallisation.

Emetic, Cardiac Depressant, Expectorant.

Dose—As an Emetic, 1 to 2 grs. (For a child 1 year old, $\frac{1}{8}$ gr.) Diaphoretic, $\frac{1}{24}$ to $\frac{1}{8}$ gr. ; as an Expectorant, $\frac{1}{8}$ to $\frac{1}{4}$ gr. Given in solution in water.

Vinum Antimoniale (Antimonial Wine) 2 grs. in 1 oz.

Tartarated antimony, 40 grs., dissolved in boiling water 1 oz. and added to sherry q.s. to 1 pint ; making a pale, yellowish-brown liquid.

Dose—10 to 30 minims. As an Emetic, 2 to 4 drs. For a child 1 year old, 3 minims as an Expectorant ; and 15 minims as an Emetic.

APOMORPHINÆ HYDROCHLORIDUM $C_{17}H_{17}NO_2HCl$.

(Apomorphine Hydrochloride).

(Hydrochlorate of Apomorphine B.P. 85.) The hydrochloride of an alkaloid, obtained by heating morphine or codeine hydrochloride in sealed tubes with HCl ; in small, greyish-white acicular crystals, turning green on exposure to light and air, and soluble in 50 parts of water.

Powerfully Emetic and Expectorant.

Dose— $\frac{1}{20}$ to $\frac{1}{10}$ gr. hypodermically as an Emetic ; $\frac{1}{10}$ to $\frac{1}{4}$ gr. by the mouth as an Expectorant.

Injectio Apomorphinæ Hypodermica 1 gr. in 110 mins.

A recently-prepared solution of 1 gr. apomorphine hydrochloride in a mixture of 1 minim dilute HCl and 110 minims water which has been boiled and cooled. Product, 110 minims.

Dose—5 to 10 minims by subcutaneous injection.

AQUA DESTILLATA (Distilled Water) H_2O

Prepared from potable water.

ARAROA (Araroba) Leguminosæ.

(Synonyms—Goa Powder ; Crude Chrysarobin.)

A substance found in cavities in the trunk of Andira Araroba freed as much as possible from fragments of wood, dried and powdered, having a colour varying from brownish yellow to umber brown.

Used for production of chrysarobin, which is its active principle.

ARGENTI NITRAS (Synonym—Lunar Caustic). $AgNO_3$

In flat, colourless crystals, prepared by the interaction of nitric acid and silver. To make the rods commonly known as "Lunar Caustic," the fused crystals are poured into moulds.

Caustic, Astringent, and Nerve Tonic.

Dose— $\frac{1}{4}$ to $\frac{1}{2}$ gr. (in pill). Sometimes, 1 gr. in stomach affections.

As a strong caustic lotion for wounds, ulcers, &c., 1 dr. to 1 oz.
As a lotion for ophthalmia in infants, 8 grs. to 1 oz. As an injection for the urethra, 2 grs. to 1 oz.

All solutions of caustic should be made with distilled water, and should not contain any trace of organic matter. Sometimes, however, the salt is dissolved in Spt. Æther. Nit.

Argenti Nitras Induratus (Toughened Caustic)

In white or greyish-white cylindrical rods or cones, prepared by fusing together 475 grs. silver nitrate and 25 grs. potassium nitrate, and pouring the melted mass into moulds.

Used locally as a powerful Astringent and Caustic.

Argenti Nitras Mitigatus (Mitigated Caustic)

White or greyish-white cylindrical rods or cones, prepared by fusion of 1 oz. silver nitrate and 2 ozs. potassium nitrate.

Caustic.

Argenti Oxidum Ag_2O

The brown powder precipitated, on mixing solutions of silver nitrate and calcium hydroxide.

Tonic and Antispasmodic. Dose— $\frac{1}{2}$ to 2 grs., in pill. Pills containing this salt with organic matter, as extracts, alkaloids, &c., rapidly decompose and sometimes explode.

ARMORACIÆ RADIX (Horseradish Root)—Cruciferae.

The *fresh* root of Cochlearia Armoracia, from cultivated plants. It has often been unreasonably confounded with aconite. A comparison shows—

Aconite Root	Horseradish Root
To be smaller, distinctly tapering to a point, brown on the exterior, odourless, and leaving a tingling sensation on being chewed.	To be larger, much longer, more uniform in circumference, white or cream coloured externally, with strong odour, after being scraped, and with a characteristic taste.

Diuretic, Stimulant, and Sialagogue.

It contains a ferment which with water forms an oil almost identical with Volatile Oil of Mustard.

Spiritus Armoraciæ Compositus 1 in 8.

A colourless liquid, prepared by mixing 5 ozs. each of scraped horseradish root and bitter-orange peel, 55 grs. nutmeg, $1\frac{1}{4}$ pint alcohol (90 per cent.), and $1\frac{1}{2}$ pint water, and distilling 1 quart.

Stimulant and Diuretic. Dose—1 to 2 drachms.

ARNICÆ RHIZOMA (Arnica Rhizome)—Compositæ.

(Synonym—Arnica Radix). The dried rhizome and roots of *Arnica montana*, from 1 to 2 inches long, and $\frac{1}{8}$ to $\frac{1}{4}$ inch thick; curved, rough, and bearing amplexicaul leaf-scars; beset on under surface with numerous brittle, wiry rootlets, and usually

terminated by the hairy remains of the stem and leaves. Its peppery taste and peculiar odour distinguish it from Hydrastis, Senega, Serpentary, and Valerian, which it somewhat resembles.

Active principles—Arnecin and Inulin, also an Essential Oil.

Tinctura Arnicae 1 oz. to 1 pint.

A brandy-coloured liquid, obtained by percolation of 1 oz. arnica rhizome with alcohol (70 per cent.), to 1 pint.

Chiefly used as a lotion for bruises, 1 oz. to 40 ozs. water, but should be used with caution.

Arsenic (*Vide* Acid. Arseniosum).

ASAFETIDA (Asafetida)—Umbelliferæ.

The fetid gum-resin, in irregular softish masses or tears, of a dull yellow colour, which darken by keeping, obtained by incisions from the root of *Ferula foetida*, and probably other species.

Active principle is an ethereal oil—Allyl Sulphide.

Stimulant and Antispasmodic. Dose—5 to 15 grs.

IN—Pil. Galbani Co.

Pilula Aloes et Asafetida 1 in 4.

Socotrine aloes, asafetida, hard soap, and confection of roses, of each 1 oz., well beaten together.

Cathartic and Antispasmodic. Dose—4 to 8 grs.

Spiritus Ammoniae Fetidus 33 grs. Asafetida in 1 oz.

A clear, faintly-yellow liquid, prepared by distilling a mixture of asafetida 1½ ozs. and alcohol (90 per cent.) 15 ozs., and adding to the distilled spirit 2 ozs. strong solution of ammonia, with as much alcohol (90 per cent.) as will make the product measure 20 ozs.

Dose—20 to 40 minims for repeated administration; 60 to 90 mins. for single dose, diluted with water.

Tinctura Asafetidae 1 in 5. (87½ grs. in 1 oz.)

A bright brown liquid, prepared by macerating 4 ozs. asafetida in alcohol (70 per cent.) to make 1 pint.

Dose—½ to 1 drachm.

ATROPINA (Atropine) $C_{17}H_{23}NO_3$

An alkaloid in colourless crystals, obtained from belladonna leaves or root.

Sedative, Local Anodyne and Mydriatic. Dose— $\frac{1}{200}$ to $\frac{1}{100}$ grain.

Unguentum Atropinae 1 in 50.

A white ointment, prepared by dissolving atropine 10 grs. in oleic acid 40 grs., and mixing with lard 450 grs.

A Local Anodyne.

Atropinæ Sulphas ($C_{17}H_{23}NO_3)_2H_2SO_4$.

A nearly colourless crystalline powder, obtained by neutralising atropine with dilute sulphuric acid.

Dose and action like atropine ; it is very soluble.

Lamellæ Atropinæ (Discs of Atropine).

Discs of gelatin with some glycerin, each weighing about $\frac{1}{50}$ gr. and containing $\frac{1}{5000}$ gr. atropine sulphate.

Liquor Atropinæ Sulphatis 1 gr. in 110 mins.

A colourless solution of $17\frac{1}{2}$ grs. atropine sulphate and 2 grs. salicylic acid in water, which has been boiled and cooled, to make 4 ozs. Containing no spirit, its introduction into the eye does not cause pain.

Dose— $\frac{1}{2}$ to 1 minim.

AURANTII CORTEX RECENS (Fresh Bitter-Orange Peel)—
Aurantiaceæ.**AURANTII CORTEX SICCATUS** (Dried Bitter-Orange Peel)—
Aurantiaceæ.

The fresh and dried outer part of the pericarp of *Citrus Aurantium var. Bigaradia*.

Active principles—Hesperidin and a volatile oil.

An Aromatic Bitter and Flavouring ingredient.

In addition to the preparations bearing its name, it enters into Infus. Gentianæ Co., Spirit. Armoraciæ Co., Tr. Cinchonæ Co., and Tr. Gentianæ Co.

Infusum Aurantii 1 oz. to 1 pint ($\frac{1}{4}$ hour).

Dried bitter-orange peel 1 oz. infused in boiling water 1 pint.

A mild Stomachic Tonic. Dose— $\frac{1}{2}$ to 1 oz.

Infusum Aurantii Compositum $\frac{1}{2}$ oz. to 1 pint ($\frac{1}{4}$ hour).

Prepared by infusing in 1 pint boiling water, $\frac{1}{2}$ oz. dried bitter-orange peel, $\frac{1}{4}$ oz. fresh lemon peel, and 55 grs. cloves.

Dose— $\frac{1}{2}$ to 1 oz.

Syrupus Aurantii 1 in 8.

1 oz. tincture of orange and 7 ozs. syrup, mixed.

Dose— $\frac{1}{4}$ to 1 dr.

Tinctura Aurantii 5 ozs. to 1 pint.

Prepared by macerating 5 ozs. fresh bitter-orange peel in 1 pint alcohol (90 per cent.).

An agreeable Bitter Tonic. Dose— $\frac{1}{2}$ to 1 dr.

IN—Conf. Sulphuris, Tinct. Quininæ, Syr. Aurant., Syr. Aromat., Syr. Cascariæ Aromat., Troch. Sulph.

Vinum Aurantii 10 to 12 per cent. of alcohol.

Wine of a golden sherry colour, made by the fermentation of a saccharine solution, to which the fresh peel of the bitter orange has been added.

An agreeable Bitter and Stimulating Tonic. Dose— $\frac{1}{2}$ to 2 ozs.

IN—Vinum Quininae and Vinum Ferri Citratis.

Aqua Aurantii Floris (Orange-Flower Water).

The nearly colourless fragrant water distilled from the flowers of the bitter-orange tree, as found in commerce. To be diluted, immediately before use in dispensing, with twice its bulk of water.

IN—Mist. Olei Ricini, and Syr. Calcii Lactophos.

Syrupus Aurantii Floris 1 in 6 $\frac{3}{4}$.

Prepared by dissolving 3 lbs. of sugar in 16 ozs. of distilled water, and adding 8 ozs. of orange flower water (undiluted) and making up to 4 $\frac{1}{2}$ lbs. with recently boiled water.

A sweet, colourless syrup, used for Flavouring.

Dose— $\frac{1}{2}$ to 1 dr.

BALSAMUM PERUVIANUM (Balsam of Peru)—Leguminosæ.

A dark viscid, liquid balsam, exuded from the trunk of Myroxylon Pereiræ, after the bark has been beaten and scorched.

Active ingredients—Cinnameine, Cinnamic and Benzoic Acids, and a Volatile Oil.

Expectorant. Externally—a Stimulant to ulcers.

Dose—5 to 15 minims, in mucilage or with beaten-up egg.

BALSAMUM TOLUTANUM (Balsam of Tolu) Leguminosæ.

A fragrant, soft, solid balsam, obtained from incisions in the trunk of Myroxylon Toluifera.

Expectorant. Dose—5 to 15 grs., with mucilage or egg.

Active ingredients—Volatile Oil, Cinnamic and Benzoic Acids.

IN—Tr. Benzoini Co. and

Syrupus Tolutanus 1 in 29.

A colourless syrup, prepared by boiling 1 $\frac{1}{4}$ ozs. balsam of tolu in 1 pint distilled water, filtering, and adding 2 lb. sugar. Product, 3 lbs.

Dose— $\frac{1}{2}$ to 1 dr. Chiefly used to sweeten cough mixtures.

Enters into Mist. Ammoniaci.

Tinctura Tolutana 2 ozs. to 1 pint.

A bright, reddish-brown liquid, prepared by dissolving 2 ozs. balsam of tolu in alcohol (90 per cent.) to make 1 pint.

A Stimulating Expectorant. Dose— $\frac{1}{2}$ to 1 dr.

IN—Tolu basis used in making 2 lozenges.

BELLADONNÆ FOLIA (Belladonna Leaves)—Solanaceæ.

The *fresh* ovate, acute, entire, glabrous leaves and branches of deadly nightshade (*Atropa Belladonna*), collected when the plant is in flower.

Active principles—Atropine and small percentage of Asparagin. Narcotic and Mydriatic. A powerful Poison.

May be used as a source of Atropine.

Extractum Belladonnæ Viride

A soft, dark-green extract, with a peculiar heavy odour, prepared from the juice of the fresh young leaves and branches of belladonna which is heated gradually to 130°F., and the green colouring matter separated by a calico filter and laid aside. The strained liquor is heated to 200°F. to coagulate the albumin and again filtered. The filtered liquor is evaporated on a water-bath to the consistence of a syrup, the green colouring (previously separated and passed through a hair sieve) added, and the evaporation continued under 140°F. till the consistence of a soft extract is reached.

Anodyne and Sedative. Dose— $\frac{1}{4}$ to 1 gr. in pill.

Succus Belladonnæ

The brownish juice of the fresh leaves and young branches of belladonna, with the addition of $\frac{1}{3}$ its bulk of alcohol (90 per cent.).

Action—Anodyne. Dose—5 to 15 minims. (Given in incontinence of urine and whooping-cough).

BELLADONNÆ RADIX (Belladonna Root)—Solanaceæ.

The branched greyish-brown root, $\frac{1}{2}$ to 1 foot long, of *Atropa Belladonna*; collected in autumn and dried.

Active principles—Atropine; also small quantities of Hyoscinine, Hyoscyamine, Atropamine, and Belladonnine.

In action resembles the leaves.

Used in preparing Atropine and the following—

Extractum Belladonnæ Liquidum ('75 per cent. alkaloids).

A dark brown liquid, prepared by percolation from belladonna root, and made to contain $\frac{3}{4}$ gr. alkaloids in 110 mins.

Extractum Belladonnæ Alcoholicum (1 per cent. alkaloids).

A dark semi-solid extract, prepared by evaporating the liquid extract, and adding sugar of milk, so that 15 ozs. of the extract may be obtained from 20 ozs. of liq. extract.

Dose— $\frac{1}{4}$ to 1 gr.

Emplastrum Belladonnæ ('5 per cent. alkaloids).

Prepared by evaporating 4 ozs. liquid extract of belladonna down to 1 oz., and adding 5 ozs. melted resin plaster.

A Local Anodyne.

J. Moulton
 B. A. H. Corps.
 leaves

Linimentum Belladonnæ ('38 per cent. alkaloids.)

A light yellowish-brown coloured liquid, prepared by mixing liq. ext. of belladonna 10 ozs., camphor 1 oz., water 2 ozs., and alcohol (90 per cent.), q.s. to make 20 ozs.

A powerful Anodyne.

Suppositoria Belladonnæ ($\frac{1}{80}$ gr. alkaloids each).

Prepared by rubbing 18 grs. alcoholic extract of belladonna with a little oil of theobroma and adding oil of theobroma q.s. for 12 suppositories of 15 grs. each.

A local Anodyne.

Tinctura Belladonnæ ('048 to '052 per cent. alkaloids.)

Prepared by mixing 2 ozs. liq. ext. of belladonna with alcohol (60 per cent.) q.s. to make 30 ozs.

Dose—5 to 15 minims. 1 min. for a child 1 year old.

Unguentum Belladonnæ ('6 per cent. alkaloids).

A brownish ointment, made by evaporating 2 ozs. of liquid extract of belladonna to $\frac{1}{4}$ oz., and mixing with it $2\frac{1}{4}$ ozs. benzoated lard.

A soothing application to Inflamed Piles.

BENZOINUM (Benzoin)—Styracææ.

The balsamic resin, in mottled masses or light-brown lumps, made up of tears obtained from *Styrax Benzoin*, and probably other species. Known as Siam and Sumatra Benzoin.

Active ingredient is benzoic acid; the Sumatra variety contains also cinnamic acid.

Diuretic and Expectorant, but seldom used internally.

IN—Adeps Benzoatus, Ungt. Cetacei, and the following:—

Tinctura Benzoini Composita 2 ozs. to 1 pint.

(Synonym—Friar's Balsam).

A dark, reddish-brown liquid, prepared by macerating (2 ozs. benzoin, $1\frac{1}{2}$ ozs. storax, $\frac{1}{2}$ oz. balsam of tolu) and (160 grs. Socotrine aloes) in q.s. alcohol (90 per cent.), to make 1 pint.

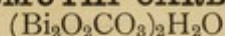
A Stimulating Expectorant. Used as a protective coating for fresh wounds.

Dose— $\frac{1}{2}$ to 1 dr. in emulsion. Water decomposes it.

Benzoic Acid and Preparations (See *Acidum Benzoicum*).**BENZOL**

A colourless volatile liquid, which is a mixture of homologous hydrocarbons obtained from light coal-tar oil. It contains about 70 per cent. benzene (C_6H_6), and 20 to 30 per cent. toluene ($C_6H_5CH_3$).

Used in making Liq. Caoutchouc and Charta Sinapis.

BISMUTHI CARBONAS (Bismuth Oxycarbonate)

A white powder, prepared by the interaction of bismuth nitrate and ammonium carbonate.

Antacid and Gastric Sedative. Dose—5 to 20 grs.

Liquor Bismuthi et Ammonii Citratis About 3 grs. Bi_2O_3 in 1 dr. (Synonym—Liquor Bismuthi.)

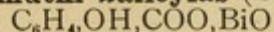
A colourless solution, prepared thus—Dissolve 613 grs. bismuth oxynitrate in 1 oz. nitric acid (diluted), add water until liquid becomes opalescent. Add 613 grs. potassium citrate and 175 grs. potassium carbonate dissolved in water; boil, cool, filter, and wash precipitate; dissolve it in solution of ammonia q.s. and make up to 1 pint with water.

Dose— $\frac{1}{2}$ to 1 dr., diluted.

Bismuthi Oxidum Bi_2O_3

A slightly brownish-yellow powder, prepared by boiling bismuth oxynitrate with solution of sodium hydroxide.

Action and dose same as Bismuthi Carbonas.

Bismuthi Salicylas (Bismuth Salicylate or Oxysalicylate)

A white, or nearly white, amorphous insoluble powder, prepared by the interaction of bismuth nitrate and sodium salicylate.

Dose—5 to 20 grs. Gastric Sedative.

Bismuthi Subnitrates (Bismuth Oxynitrate) $\text{BiONO}_3\text{H}_2\text{O}$

A heavy, white powder, prepared by the interaction of bismuth nitrate and water.

Action and dose same as Bismuthi Carbonas.

Trochiscus Bismuthi Compositus

Each composed of bismuth oxycarbonate 2 grs., heavy magnesium carbonate 2 grs., precipitated calcium carbonate 4 grs., and rose basis.

BORAX (Borax) $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$ (Sodium Pyroborate).

(Synonym—Biborate of Sodium.)

A native salt, in large, transparent, colourless crystals. Can be also obtained by neutralising native boric acid with sodium carbonate, or by boiling native calcium borate with solution of sodium carbonate.

Antiseptic, Emmenagogue, and Diuretic. Dose—5 to 20 grs.

Used in making Acid. Boric.

Glycerinum Boracis 1 to 6. (1 in $8\frac{1}{2}$ by weight.)

A colourless liquid, prepared by dissolving 1 oz. borax in 6 ozs. glycerin.

Used for its soothing action on diseased mucous surfaces.

Caffeinæ Citras Effervescens 1 in 25.

A granular effervescent powder, consisting of sodium bicarbonate 51 ozs., tartaric acid 27 ozs., citric acid 18 ozs., sugar 14 ozs., and caffeine citrate 4 ozs., heated and granulated.

Dose—60 to 120 grs.

CAJUPUTI OLEUM (Oil of Cajuput)—Myrtaceæ.

A bluish-green mobile oil, with strong camphoraceous odour, distilled from the leaves of *Melaleuca Leucadendron* (M. Cajuputi).

Diffusible Stimulant and Antispasmodic.

Dose— $\frac{1}{2}$ to 3 minims.

Resembles eucalyptus oil in composition, since it contains about 60 per cent. eucalyptol or cajuputol.

Spiritus Cajuputi 1 in 10.

Oil of cajuput 1 oz. mixed with alcohol (90 per cent.) to 10 ozs.

Dose—5 to 20 minims.

Ol. Cajuputi enters into Linimentum Crotonis.

CALCII CARBONAS PRÆCIPITATUS CaCO_3

(Precipitated Calcium Carbonate). (Synonym—Precipitated Chalk). A white micro-crystalline powder, prepared by interaction of sodium carbonate and calcium chloride.


Antacid and mildly Astringent. Dose—10 to 60 grs.

IN—Trochiscus Bismuthi Co., 4 grs. in each.

Calcii Chloridum (Calcium Chloride) $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$

In dry, white, very deliquescent masses, prepared by neutralising hydrochloric acid with calcium carbonate carefully desiccated at a temperature not exceeding 392°F .

Alterative in Scrofula and Phthisis. Dose—5 to 15 grs.

 Should not be confounded with the so-called chloride of lime.

Calcii Hypophosphis (Calcium Hypophosphite) $\text{Ca}(\text{PH}_2\text{O}_2)_2$

A white, pearly, crystalline salt, prepared by interaction of phosphorus, calcium hydroxide, and water.

Nervine Tonic. Dose—3 to 10 grs.

Calcii Phosphas (Calcium Phosphate) $\text{Ca}_3(\text{PO}_4)_2$

A light white amorphous powder, insoluble in water, prepared by dissolving bone ash in diluted hydrochloric acid and adding diluted solution of ammonia, washing and drying the precipitate at a temperature not exceeding 212°F ., or by the interaction of calcium chloride and sodium phosphate.

Nervine Tonic. Dose—5 to 15 grs.

IN—Pulv. Antimonialis and Ext. Euonymi Sic.

Syrupus Calcii Lactophosphatis (Syrup of Calcium Lactophosphate)

Prepared by dissolving precipitated calcium carbonate $2\frac{1}{2}$ ozs. in lactic acid 6 ozs., diluted with water 24 ozs., adding concentrated phosphoric acid 4 ozs. and 262 mins., triturating until the precipitate formed is dissolved, adding a little water, filtering, and adding orange-flower water, undiluted, $2\frac{1}{2}$ ozs., and dissolving, without heat, in the filtrate, sugar 70 ozs., and adding water to make 5 pints.

Dose— $\frac{1}{2}$ to 1 dr. Action similar to phosphate.

CALX (Lime) CaO

Calcium oxide in compact whitish masses, obtained by calcining chalk, limestone, or marble.

Caustic. Not used internally.

Calcii Hydras (Calcium Hydroxide) $\text{Ca}(\text{HO})_2$

(Synonym—Slaked Lime).

A white powder, recently prepared by the interaction of water and calcium oxide. It acts like Calx.

Used in the preparation of Liq. Ext. of Ipecacuanha, Chloroform, &c.

Liquor Calcis (Solution of Lime) $\frac{1}{2}$ gr. in 1 oz.

(Synonym—Lime Water). Prepared by washing slaked lime 2 ozs., adding water 1 gallon, and after standing for twelve hours, syphoning off the clear colourless liquid.

Antacid and Astringent.


Dose—1 to 4 ozs., in milk; $\frac{1}{2}$ to 1 dr. for a child 1 year old.

Used in the preparation of Argenti Oxid., Lotio Hydrarg. Flava, Lotio Hydrarg. Nigra.

Linimentum Calcis 1 in 2.

Lime water and olive oil, of each 2 ozs. (mixed), forming a thick, whitish emulsion, known as Carron Oil.

Sedative application to burns and scalds.

 The original Carron oil was made with Linseed oil.

Liquor Calcis Saccharatus 8 grs. in 1 oz.

(Saccharated Solution of Lime.) Prepared by adding calcium hydroxide 1 oz., and sugar 2 ozs., to water 1 pint, mixing and syphoning.

Same as Liquor Calcis in action. Dose—20 to 60 minims.

Calx Chlorinata

(Chlorinated Lime.) A dull white powder, obtained by exposing slaked lime to the action of chlorine gas until absorption ceases. It is known as bleaching powder and as chloride of lime. It has bleaching and disinfecting properties, and is astringent.

Used in the preparation of Chloroform.

Liquor Calcis Chlorinatæ 1 lb. to 1 gal.

A colourless filtered solution of chlorinated lime in water.
Antiseptic. Yields, when fresh, 3 per cent. Cl.
Chiefly used as a Deodoriser.

Calx Sulphurata (Sulphurated Lime)

A greyish-white, foul-smelling powder, containing not less than 50 per cent. of calcium sulphide (CaS) with calcium sulphate and carbon, prepared by reducing native calcium sulphate by carbon.
Antisuppurative. Dose— $\frac{1}{4}$ to 1 grain in pill.

CALUMBÆ RADIX (Calumba Root)—Menispermaceæ.

The dried transversely cut root (in round or oval irregular flat yellow slices, depressed towards the centre) of *Jateorhiza Columba*.

Active principles—Calumbin and Berberine.

A Bitter Tonic. Dose—5 to 20 grs. in powder.

Infusum Calumbæ 1 in 20 ($\frac{1}{2}$ hour).

1 oz. calumba root macerated in 1 pint of cold water.

Dose— $\frac{1}{2}$ to 1 oz.

Liquor Calumbæ Concentratus (Concentrated Solution of Calumba) 1 in 2.

It is prepared thus:—Macerate 10 ozs. calumba root for 24 hours in 10 ozs. water; press and again macerate for 24 hours in 10 ozs. water; press and mix the expressed liquids, and heat for 5 minutes to 180°F. When cold add 4½ ozs. alcohol (90 per cent.). Decant or filter after standing. Product, 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

Tinctura Calumbæ 1 in 10.

A greenish-brown liquid, prepared by macerating 2 ozs. calumba root in 1 pint alcohol (60 per cent.).

Dose— $\frac{1}{2}$ to 1 dr.

As calumba root and its preparations do not contain any tannin, they can, like quassia, be prescribed with all the preparations of iron. Cold water is used in making the infusion, lest any of the starch should be extracted.

CAMBOGIA (Gamboge)—Guttiferæ.

A gum-resin in reddish-yellow cylindrical pieces, obtained from *Garcinia Hanburii*.

Active ingredient—Cambogic Acid.

A Hydragogue Drastic Cathartic. Dose— $\frac{1}{4}$ to 2 grs. in pill.

Pilula Cambogiæ Composita 1 in 6.

Composed of gamboge, Barbados aloes, compound cinnamon powder, of each 1 oz.; hard soap, 2 ozs.; syrup of glucose, 1 oz.
Hydragogue Cathartic. Dose—4 to 8 grs.

CAMPHORA (Camphor)—Lauraceæ.

A stearoptene or volatile oil, in translucent, white, crystalline masses, obtained from *Cinnamomum Camphora*, purified by sublimation.

Stimulant and Antispasmodic. Dose—2 to 5 grs.

In addition to the preparations bearing the name, camphor enters into Ungt. Hydrarg. Co., and into 11 of the 15 liniments of the Pharmacopœia.

Aqua Camphoræ $\frac{1}{2}$ gr. in 1 oz.

Prepared by dissolving 70 grs. camphor in alcohol (90 per cent.) q.s. to make $\frac{1}{2}$ oz., and adding gradually to 1 gallon water.

Only a vehicle for more active remedies.

Linimentum Camphoræ 1 in 5 nearly.

(Synonym—Camphorated Oil.)

A yellow, oily liquid, prepared by dissolving 1 oz. camphor in 4 ozs. olive oil.

A Stimulating Application in chronic painful affections.

IN—Lin. Chlorof., Lin. Hydrarg., and Lin. Tereb. Acet.

Linimentum Camphoræ Ammoniatum 1 in 8.

(Synonym—Compound Liniment of Camphor).

A faintly-yellowish liquid, prepared by dissolving $2\frac{1}{2}$ ozs. camphor and 1 dr. oil of lavender in 12 ozs. alcohol (90 per cent.), and adding 5 ozs. strong solution of ammonia and sufficient alcohol (90 per cent.) to make 1 pint.

A safe and effectual Rubefacient and Counter-irritant.

In absence of other remedies, it may be used as a general diffusible stimulant in 20 minim doses, largely diluted.

Spiritus Camphoræ 1 in 10.

Prepared by dissolving 1 oz. camphor in alcohol (90 per cent.) to 10 ozs.

Dose—5 to 20 minims in emulsion.

Tinctura Camphoræ Composita $1\frac{1}{2}$ grs. camphor and the equivalent of 2 grs. opium in 1 oz.

(Synonyms—Paregoric ; Paregoric Elixir).

A sherry-coloured liquid, prepared by dissolving 585 minims tincture of opium, 40 grs. benzoic acid, 30 grs. camphor, and 30 minims oil of anise, in alcohol (60 per cent.) to make 1 pint.

Narcotic and Expectorant. Dose— $\frac{1}{2}$ to 1 dr.

CANNABIS INDICA (Indian Hemp)—Cannabinaceæ.

The dried flowering or fruiting tops of the female plant of *Cannabis sativa*, from which the resin has not been removed, grown in India ; in elongated compressed bundles of a dusky-green colour, in which may be recognised the flowers, young branches, smaller leaves, and the well-known fruits commonly called hemp seeds. (Known in India as Gunjah or Ganga).

Active principle—Cannabinol.

Anodyne and Narcotic.

Extractum Cannabis Indicæ

A rich green resinous extract, prepared from the tops by percolation with alcohol (90 per cent.), and evaporating the tincture thus formed.

Anodyne and Narcotic, like Opium. Dose— $\frac{1}{4}$ to 1 grain.

Tinctura Cannabis Indicæ 1 in 20.

A deep-green liquid, prepared by dissolving 1 oz. of the extract in alcohol (90 per cent.) q.s. to 1 pint.

Dose—5 to 15 minims, in mucilage or wine.

IN—Tr. Chlorof. et Morphinæ Co.

CANTHARIS (Cantharides)—Coleoptera.

The dried beetle *Cantharis vesicatoria*, about $\frac{3}{4}$ to 1 inch long, with bright metallic green wing covers; the powder is greyish-brown, with shining green particles.

Active principle—Cantharidin.

Vesicant, Counter-irritant, and Diuretic.

Acetum Cantharidis 1 in 10.

A dark-brown coloured liquid, prepared from 2 ozs. cantharides by percolation with equal parts water and glacial acetic acid, to produce 1 pint.

Epispastic. Not used internally.

Emplastrum Cantharidis 1 in 3 nearly.

A brownish substance, of the consistence of firm ointment, with dark-green shining particles, prepared by heating $3\frac{1}{2}$ ozs. cantharides (in powder), 2 ozs. each yellow beeswax, resin, and lard, and $\frac{1}{2}$ oz. soap plaster. Known as blistering plaster.

Vesicant. Generally blisters in from 6 to 9 hours.

Emplastrum Calefaciens 1 in 24. (Warming plaster).

Prepared by adding to a strong infusion of 4 ozs. of cantharides, 4 ozs. each yellow beeswax and resin, $3\frac{1}{4}$ lbs. resin plaster, and 2 lbs. soap plaster previously heated, mixing and making a firm plaster of a yellow colour.

A stimulating application, and known also as Warm Plaster.

Tinctura Cantharidis 1 in 80.

A pale straw-coloured liquid, prepared by macerating $\frac{1}{4}$ oz. cantharides in 1 pint alcohol (90 per cent.).

Diuretic and Stimulant to the genito-urinary organs.

Dose—5 to 15 minims; if frequently repeated, 2 to 5 minims.

Unguentum Cantharidis 1 to 10.

An ointment of a yellowish-brown colour, prepared by digesting at 120°F. for 12 hours 1 oz. cantharides in 10 ozs. benzoated lard and straining.

Rubefacient. Milder than Emplastrum Cantharidis.

Collodium Vesicans (Blistering Collodion).

A thick liquid, prepared by adding $\frac{1}{2}$ oz. pyroxylin to 20 ozs. blistering liquid.

Vesicant, like Emplastrum and the following :—

Liquor Epispasticus (Blistering Liquid) 1 in 2.

A bright greenish-brown, ethereal liquid, prepared by percolating 10 ozs. cantharides with acetic ether to make 1 pint.

CAOUTCHOUC (India-Rubber)—Euphorbiaceæ.

Elastic masses, of varying thickness, being the prepared milk juice of *Hevea brasiliensis* and probably other species. Known in commerce as pure Para rubber.

Liquor Caoutchouc 1 in 20.

A thickish liquid, made by dissolving India-rubber 1 oz. in a mixture of 10 ozs. each benzol and carbon bisulphide.

Used in making Charta Sinapis.

CAPSICI FRUCTUS (Capsicum)—Solanaceæ.

A small oblong orange-coloured pod, containing flat white seeds, the fruit of *Capsicum minimum*, known as Cayenne pepper.

Active principle—Capsaicin and Capsicine.

A powerful Stimulant and Rubefacient, without blistering.

Dose— $\frac{1}{2}$ to 1 gr. 30 grs. in Delirium Tremens.

Tinctura Capsici 1 in 20.

A brandy-coloured liquid, prepared by macerating 1 oz. capsicum fruit in 1 pint alcohol (70 per cent.).

Dose—5 to 15 minims diluted.

In—Tr. Chlorof. et Morphinæ Co.

Unguentum Capsici 1 to 4 nearly.

A reddish-coloured ointment, made by warming on a water-bath for 1 hour 120 grs. capsicum fruit with 60 grs. spermaceti and 1 oz. olive oil, and straining.

Rubefacient. Known as Chili paste.

CARBO LIGNI (Wood Charcoal).

A black powder free from grittiness, prepared by exposing wood to a red heat without access of air.

Deodoriser and Absorbent in fetid eructations.

Dose—60 to 120 grs. ; or, sprinkled over foul sores.

CARBONIS BISULPHIDUM (Carbon Bisulphide) CS_2

(Synonym—Carbon Bisulphide). A colourless, highly refractive, stinking liquid, prepared by combining carbon and sulphur at a high temperature, condensing and purifying.

Used in preparing Liquor Caoutchouc and Pil. Phosphori.

CARDAMOMI SEMINA (Cardamoms)—Zingiberaceæ.

The small, dried, ripe angular brown seeds of *Elettaria Cardamomum*, kept in their triangular pericarps till required.

Carminative and Antispasmodic. Dose—5 to 20 grs.

Tinctura Cardamomi Composita 1 in 80.

A deep red liquid, prepared by macerating $\frac{1}{4}$ oz. each cardamom seeds and caraway fruit, 2 ozs. raisins, $\frac{1}{2}$ oz. cinnamon, 55 grs. cochineal, in 1 pint alcohol (60 per cent.).

Carminative and colouring agent. Dose— $\frac{1}{2}$ to 1 dr.

In addition to the Tincture, cardamom seeds enter into the following :—
Ext. Col. Co., Pulv. Cinnam. Co., Pulv. Cretæ Arom., Tr. Gent. Co., Tr. Rhei Co.; and the Tincture itself enters into Dec. Aloes Co., and Mist. Sennæ Co.

CARUI FRUCTUS (Caraway Fruit)—Umbelliferæ.

The minute brown aromatic seed-like dried fruits of *Carum Carvi*, tapering at each end, and marked with five ridges.

Carminative, Stimulant, and Antispasmodic.

IN—Confect. Piperis, Pulv. Opii Co., Tr. Card. Co., and Tr. Sennæ Co.

Aqua Carui 1 lb. to 1 gallon.

A colourless water, prepared by distilling 1 gallon of water from 1 lb. of caraway fruit, and 2 gallons of water.

Oleum Carui

The faint-yellow oil distilled from caraway fruit.

Dose— $\frac{1}{2}$ to 3 minims, on sugar.

IN—Pilula Aloes Barb.

CARYOPHYLLUM (Cloves)—Myrtaceæ.

The dried unexpanded fragrant flower buds of *Eugenia caryophyllata*, with a cylindrical body, spherical head, and four teeth.

Carminative, Stimulating Aromatic, and Tonic.

IN—Infus. Aurant. Co. and Pulv. Cretæ Ar.

Infusum Caryophylli 1 in 40 ($\frac{1}{4}$ hour.)

Prepared by infusing $\frac{1}{2}$ oz. cloves in 1 pint boiling water.

Dose— $\frac{1}{2}$ to 1 oz.

Oleum Caryophylli

The clear colourless or yellowish oil distilled from cloves.

Antispasmodic, Stimulant, and powerfully Antiseptic.

Dose— $\frac{1}{2}$ to 3 minims, on sugar. Active principle is Eugenol.

IN—Pil. Col. Co., and Pil. Col. et Hyos.

CASCARA SAGRADA (Cascara Sagrada)—Rhamnaceæ.

(Synonyms—Rhamni Purshiani Cortex; Sacred Bark).

The nearly smooth, dark purplish-brown, quilled, channelled or

nearly flat, transversely marked dried bark of *Rhamnus purshianus*. It is usually more or less covered with silvery-grey lichen.

Cathartic and Stimulant to the entire intestinal glandular apparatus. The remedy for *habitual* constipation.

Extractum Cascaræ Sagradæ (Synonym—*Extractum Rhamni Purshiani*).

A dry extract, prepared by exhausting cascara sagrada by percolating with water, and evaporating the resulting liquid to dryness.

Dose—2 to 8 grs., in pill.

Extractum Cascaræ Sagradæ Liquidum 1 in 1.

(Synonym—*Extractum Rhamni Purshiani Liquidum*.) An almost black liquid, prepared by exhausting 20 ozs. of cascara sagrada by percolation with distilled water, evaporating the percolate to 12 ozs., and adding 4 ozs. alcohol (90 per cent.) and water q.s. to 1 pint.

Cathartic, Tonic, and Cholagogue. Dose— $\frac{1}{2}$ to 1 dr.

Syrupus Cascaræ Aromaticus 1 in $2\frac{1}{2}$.

Made by mixing 8 ozs. liquid extract of cascara sagrada, 2 ozs. tincture of orange, 1 oz. alcohol (90 per cent.), 3 ozs. cinnamon water, and 6 ozs. syrup.

Stomachic Tonic and Laxative. Dose— $\frac{1}{2}$ to 2 drs.

CASCARILLA (*Cascarilla*)—*Euphorbiaceæ*.

The dried bark of *Croton Eluteria* in small, dull-brown quills (coated with lichens) covered with a brown separable corky layer, with a warm taste and aromatic odour.

Active principle—Cascarillin.

An Aromatic Bitter Tonic.

Infusum Cascarillæ 1 in 20 ($\frac{1}{4}$ hour).

Prepared by infusing 1 oz. cascarilla in 1 pint boiling water.

Dose— $\frac{1}{2}$ to 1 oz.

Tinctura Cascarillæ 1 in 5.

A dark brown liquid, prepared by percolating 4 ozs. of powdered cascarilla with 1 pint alcohol (70 per cent.).

Dose— $\frac{1}{2}$ to 1 dr. diluted.

CASSIÆ PULPA (*Cassia Pulp*)—*Leguminosæ*.

The soft, sweet, nearly black pulp obtained from the pods of *Cassia Fistula*. Pods are $1\frac{1}{2}$ to 2 feet long.

Laxative. Used as an addition to senna in *Confectio Sennæ*.

CATECHU (*Catechu*)—*Cinchonaceæ*. (Synonym—*Catechu Pallidum*.)

An extract of the leaves and young shoots of *Uncaria Gambier*

in variably sized masses, or hard cubes (1 inch each side), brown externally, yellow internally.

Active principles—Catechutannic Acid and Catechin.

A Tonic Astringent. Dose—5 to 15 grs., in powder.

Pulvis Catechu Compositus 1 in 2½.

A reddish-brown powder, consisting of catechu, 4 ozs.; kino and krameria root, of each 2 ozs.; cinnamon and nutmeg, of each 1 oz.

A Tonic Astringent in chronic diarrhœa.

Dose—10 to 40 grs.; for a child 1 year old, 2 to 5 grs.

Tinctura Catechu 1 in 5.

A rich coffee-brown liquid, prepared by macerating 4 ozs. of catechu and 1 oz. cinnamon in 1 pint alcohol (60 per cent.)

Dose—½ to 1 dr. 5 to 10 minims for a child 1 year old.

Trochiscus Catechu 1 gr. in each lozenge.

Brownish lozenges, consisting of catechu, with simple basis.

Local Astringent for relaxed throat.

CERA ALBA (White Beeswax).

Yellow beeswax bleached by exposure to moisture, air, and light; in nearly white translucent masses or cakes.

IN—Pil. Phosphori, Suppositoria Ac. Carbolici, Ungt. Cetacei, and Ungt. Aq. Rosæ.

CERA FLAVA (Yellow Beeswax)—Hymenoptera.

Prepared from the honey-comb of the Hive Bee, *Apis mellifica*, in firm, yellow masses; not unctuous to the touch, melts at 144.5° to 147°F.

Used chiefly as a basis for ointments and plasters.

It enters into 4 ointments and 4 plasters.

CERII OXALAS (Cerium Oxalate) $\text{Ce}_2(\text{C}_2\text{O}_4)_3 \cdot 9\text{H}_2\text{O}$

A white granular powder, obtained by the interaction of a soluble cerium salt and a soluble oxalate. It usually contains lanthanum and didymium oxalates.

A Gastric Sedative like bismuth; given in the vomiting of pregnancy. Dose—2 to 10 grs. in a pill, or as a powder.

CETACEUM (Spermaceti).

A concrete fatty substance, in pearly, lustrous masses, obtained, mixed with oil, from the head of the Sperm whale (*Physeter macrocephalus*), and separated from oil by filtration and pressure, and afterwards purified.

Internally, Demulcent; externally, Emollient.

IN—Ungt. Capsici, and Ungt. Aq. Rosæ.

Unguentum Cetacei 1 in 5.

A pearly-white ointment, prepared by heating for 2 hours 20 ozs. spermaceti, 8 ozs. white beeswax, 72 ozs. almond oil, and 2 ozs. benzoin, straining and stirring till cold.

An Emollient dressing for sores and blisters.

CHIRATA (Chiretta)—Gentianaceæ.

The dried plant, *Swertia Chirata*, collected when in flower. The unbranched root is 3 inches, and the stems are 3 feet long, about the size of goose quills, with opposite branches and paniced flowers.

Active principles—Ophelic Acid and Chiratin.

A pure bitter Tonic like gentian.

Infusum Chiratæ 1 in 20 ($\frac{1}{4}$ hour).

Prepared by infusing 1 oz. chiretta in 1 pint boiling water.

Dose— $\frac{1}{2}$ to 1 oz.

Liquor Chiratæ Concentratus (Concentrated Solution of Chiretta)
1 in 2.

Made by percolating 10 ozs. powdered chiretta with 25 ozs. alcohol (20 per cent.) to produce 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

Tinctura Chiratæ 1 in 10.

A tea-coloured liquid, prepared by percolating 2 ozs. chiretta with alcohol (60 per cent.) to 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

CHLORAL HYDRAS (Chloral Hydrate) $\text{CCl}_3\text{CH}(\text{OH})_2$

(Trichlorethylidene glycol). In colourless crystals, obtained by adding water to liquid chloral produced by the action of dry chlorine gas on ethylic alcohol.

Hypnotic and Sedative. Dose—5 to 20 grs.

Syrupus Chloral 10 grs. in 1 dr.

A colourless syrup, prepared by dissolving 1,600 grs. chloral hydrate in 30 drs. water, and adding syrup to 1 pint.

Dose— $\frac{1}{2}$ to 2 drs.

CHLOROFORMUM (Chloroform) CHCl_3

(Trichloromethane). A limpid, colourless liquid, prepared by heating ethylic alcohol, water, slaked lime, and chlorinated lime. Sufficient absolute alcohol is added to give S.G. 1.490 to 1.495.

Sedative, Anæsthetic, Anodyne, either swallowed or inhaled.

Dose—1 to 5 minims. Externally, Rubefacient and Anodyne.

Aqua Chloroformi 1 in 400.

A colourless solution of 30 minims chloroform in 25 ozs. of water.

Used chiefly as a vehicle. Dose— $\frac{1}{2}$ to 2 ozs.

Linimentum Chloroformi 1 in 2.

A pale-yellow liquid, prepared by mixing 2 ozs. each chloroform and liniment of camphor.

Rubefacient and Anodyne.

Spiritus Chloroformi (Spirit of Chloroform) 1 in 20.

(Synonyms—Chloric Ether ; Spirit of Chloric Ether).

1 oz. chloroform dissolved in alcohol (90 per cent.) to make 1 pint.

Dose—5 to 20 minims for repeated administration ; single dose 30 to 40 minims, in water.

Tinctura Chloroformi et Morphinæ Composita 1 in 13 $\frac{1}{2}$.

Contains $\frac{3}{4}$ min. of chloroform, $\frac{1}{11}$ gr. morphine hydrochloride, and $\frac{1}{2}$ minim diluted hydrocyanic acid in 10 minims. Introduced as a substitute for Chlorodyne, which it somewhat resembles. It consists of 1 $\frac{1}{2}$ ozs. chloroform, 87 $\frac{1}{2}$ grs. morphine hydrochloride, 1 oz. diluted hydrocyanic acid, $\frac{1}{2}$ oz. tincture of capsicum, 2 ozs. tincture of Indian hemp, 14 minims oil of peppermint, 5 ozs. glycerin, and alcohol (90 per cent.) q.s. to make 1 pint.

Narcotic and Antispasmodic. Dose—5 to 15 minims.

CHRYSAROBINUM (Chrysarobin)

A crystalline yellow powder, obtained from Araroba by extracting with hot chloroform, evaporating to dryness and powdering. Consists chiefly of a definite chemical substance also known as chrysarobin, but contains a varying proportion of chrysophanic acid.

Antiparasitic in skin diseases.

Unguentum Chrysarobini 1 in 25.

A yellowish ointment, prepared by dissolving with heat 20 grs. chrysarobin in 480 grs. benzoated lard.

Antiparasitic and Stimulating application in psoriasis.

CIMICIFUGÆ RHIZOMA (Cimicifuga)—Ranunculaceæ.

(Synonym—Actææ Racemosæ Radix). The dried, brownish-black, flattened cylindrical rhizome, and small, wiry, brittle branched rootlets of *Cimicifuga racemosa*.

Cardiac Tonic, Expectorant, and Antirheumatic.

Extractum Cimicifugæ Liquidum 1 in 1.

(Synonym—Liquid Extract of *Actæa Racemosa*.)

Prepared by exhausting by percolation 20 ozs. cimicifuga with alcohol (90 per cent.), and dissolving in the first 15 ozs. of percolate the extract obtained by evaporating the remainder, and making up to 1 pint with alcohol (90 per cent.).

Dose—5 to 30 minims.

Tinctura Cimicifugæ 1 in 10.

(Synonym—Tincture of *Actæa Racemosa*).

Prepared by percolating 2 ozs. cimicifuga (in No. 40 powder) with alcohol (60 per cent.) to make 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

CINCHONÆ RUBRÆ CORTEX (Red Cinchona Bark)—Cinchonaceæ.

The dried bark of the stem and branches of *cultivated* plants of *Cinchona succirubra*, in quills or incurved pieces, coated with periderm; bark itself $\frac{1}{10}$ to $\frac{1}{4}$ inch thick, outer surface roughened by fissures, cracks, and warts, and brownish-red; inner surface brick red. It should yield between 5 and 6 per cent. of total alkaloids, of which not less than half should consist of quinine and cinchonidine.

The bark contains 31 alkaloids, but only the following are used—Quinine, Quinidine, Cinchonine, and Cinchonidine.

Antiperiodic, Tonic, Antipyretic, and Astringent.

Extractum Cinchonæ Liquidum 5 per cent. alkaloids.

A brownish liquid, prepared by exhausting 20 ozs. red cinchona bark with hydrochloric acid, glycerin, and water, and evaporating to 1 pint, determining the alkaloidal strength of this and by evaporating further, or adding water and alcohol (90 per cent.), making the finished liquid contain 5 grs. of alkaloids in every 110 minims. 1 oz. will nearly represent 1 oz. bark.

Dose—5 to 15 minims.

Infusum Cinchonæ Acidum 1 in 20 (1 hour).

Prepared by infusing for one hour 1 oz. red bark (in No. 40 powder) and 2 drs. aromatic sulphuric acid in 1 pint boiling water.

Dose— $\frac{1}{2}$ to 1 oz.

Tinctura Cinchonæ 1 per cent. alkaloids.

A reddish-brown liquid, prepared by percolating 4 ozs. red bark (in No. 40 powder) with alcohol (70 per cent.) so that it will contain 1 per cent. alkaloids.

Dose— $\frac{1}{2}$ to 1 dr.

Tinctura Cinchonæ Composita 1 of tinct. in 2 = $\frac{1}{2}$ per cent. alkaloids.

A reddish liquid, prepared by macerating 1 oz. dried bitter orange peel, $\frac{1}{2}$ oz. serpentary rhizome, 55 grs. saffron, and 28 grs. cochineal in 10 ozs. alcohol (70 per cent.) and adding resulting tincture to 10 ozs. tincture of cinchona.

Tonic and Astringent. Dose— $\frac{1}{2}$ to 1 dr.

CINNAMOMI CORTEX (Cinnamon Bark)—Lauraceæ.

In light, yellowish-brown, closely-rolled, very thin, splintery quills, being the dried inner bark of shoots from the truncated

stocks of cultivated *Cinnamomum zeylanicum* from Ceylon, and known as Ceylon Cinnamon.

Carminative and Stomachic.

Aqua Cinnamomi 1 in 10.

A colourless water, prepared by distilling 1 gallon from 1 lb. cinnamon bark and 2 gallons water.

Dose—1 to 2 ozs.

IN—Mist. Cretæ, Mist. Guaiaci, Mist. Ol. Ricini, Mist. Spt. Vini Gallici, Syr. Aromat., and Syr. Cascaræ Aromat.

Oleum Cinnamomi

The oil distilled from cinnamon bark; yellowish when recent, but gradually becoming reddish. *It sinks in water.* Its chief constituents are cinnamic aldehyde and acid.

Dose— $\frac{1}{2}$ to 3 minims, on sugar or in mucilage.

Spiritus Cinnamomi 1 in 10.

1 oz. oil of cinnamon and alcohol (90 per cent.) to make 10 ozs.

Dose—5 to 20 mins.

IN—Acid. Sulphuric. Aromat.

Pulvis Cinnamomi Compositus 1 in 3.

(Synonym—Pulvis Aromaticus). A pale brown powder, consisting of cinnamon, cardamoms, and ginger—of each 1 oz.

Dose—10 to 40 grs.

IN—Pil. Aloes et Ferri and Pil. Cambogiæ Co.

Tinctura Cinnamomi 1 in 5.

A reddish-brown liquid, prepared by percolating 4 ozs. of cinnamon with alcohol (70 per cent.) to 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.; for a child 1 year old 5 minims on sugar.

Cinnamon also enters into Decoct. Hæmatoxyli, 3 compound powders—*i.e.*, catechu, kino, chalk, and 3 tinctures—*i.e.*, cardamoms, catechu, and lavender.

COCÆ FOLIA (Coca Leaves)—Erythroxylaceæ.

The smooth, dried, green, oval leaves of *Erythroxylum Coca* and its varieties, shortly stalked, and with faint tea-like odour. A line is almost always visible on either side of the midrib on the under surface of the leaf. Active principles—Cocaine and other allied alkaloids, and Hygrine.

Tonic and Restorative.

Extractum Cocæ Liquidum 1 in 1.

A brown liquid, prepared by exhausting 20 ozs. coca leaves with alcohol (60 per cent.), and proceeding as for Ext. Cimicif. Liq. to produce 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

Cocainæ (Cocaine) $C_{17}H_{21}NO_4$ (*i.e.*, methyl-benzoyl-ecgonine).

An alkaloid in colourless prisms, insoluble in water, soluble in alcohol, ether, chloroform, and olive oil, obtained from *Erythroxylum Coca* and its varieties.

Local Anæsthetic.

Unguentum Cocainæ 1 in 25.

A faintly yellow ointment, prepared by dissolving 20 grs. cocaine in 80 grs. oleic acid, and mixing with lard 400 grs.

Cocainæ Hydrochloridum (Cocaine Hydrochloride) — Hydrochlorate of Cocaine, B.P., 1885. $C_{17}H_{21}NO_4 \cdot HCl$

The hydrochloride of an alkaloid in colourless acicular crystals, obtained from *Erythroxylum Coca* and its varieties.

Local Anæsthetic. Dose— $\frac{1}{2}$ to $\frac{1}{2}$ gr.

Injectio Cocainæ Hypodermica (Hypodermic Injection of Cocaine) 10 grs. in 110 mins. (*i.e.*, 10 per cent.).

Made by dissolving 33 grs. cocaine hydrochloride in a solution of $\frac{1}{2}$ gr. salicylic acid in 6 drs. boiling distilled water which has been allowed to cool.

Dose—By subcutaneous injection 2 to 5 minims.

Lamellæ Cocainæ (Discs of Cocaine).

Discs of gelatin with some glycerin, each weighing about $\frac{1}{30}$ gr., and containing $\frac{1}{30}$ gr. of cocaine hydrochloride.

Trochiscus Kramerizæ et Cocainæ 1 gr. and $\frac{1}{10}$ gr. in each.

(Synonym—Rhatany and Cocaine Lozenge.) Made to contain extract of *krameria* 1 gr. and cocaine hydrochloride $\frac{1}{10}$ gr. with fruit basis.

Astringent and Anæsthetic.

COCCUS (Cochineal)—Hemiptera.

The wrinkled, oval, dried fecundated female insect, *Coccus Cacti*, reared on *Nopalea coccinellifera* and other species of *Nopalea*. Used as a rich, red, harmless, colouring agent.

IN—Tr. Card. Co., Tr. Cinch. Co., and

Tinctura Cocci 1 in 10.

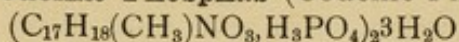
A carmine-coloured liquid, prepared by macerating 2 ozs. powdered cochineal in 1 pint alcohol (45 per cent.). Used for colouring mixtures.

Dose—5 to 15 minims.

CODEINA (Codeine) $C_{17}H_{19}(CH_3)NO_3 \cdot H_2O$

An alkaloid in colourless trimetric crystals, obtained from opium or morphine. (It is methyl-morphine.)

Hypnotic—given in Diabetes. Dose— $\frac{1}{4}$ to 2 grs.

Codeinæ Phosphas (Codeine Phosphate).

The phosphate of an alkaloid in white crystals, very soluble in water, obtained from opium or morphine.

Hypnotic. Dose— $\frac{1}{4}$ to 2 grs.

Syrupus Codeinæ (Syrup of Codeine) 1 in 240. $\frac{1}{4}$ gr. in dr.

A colourless syrup, obtained by dissolving 40 grs. codeine phosphate in $\frac{1}{4}$ oz. water and mixing with 19 $\frac{3}{4}$ ozs. syrup.

Dose— $\frac{1}{2}$ to 2 drs.

COLCHICI CORMUS (Colchicum Corm)—Melanthaceæ.

The *fresh* corm (about the size of a chestnut) of *Colchicum autumnale*—meadow saffron, and the same stripped of its coats, in thin, white, *dried*, kidney-shaped slices. Collected in early summer.

Active principles—Colchicine and Colchicineine.

Diuretic and Purgative—used in Gout. Dose—2 to 5 grs.

Extractum Colchici

A soft, brownish-black extract, prepared by heating the juice of the *fresh* corm to 212°, straining, and evaporating under 160°.

Dose— $\frac{1}{4}$ to 1 gr., in pill.

Vinum Colchici 1 in 5.

A slightly muddy, tea-coloured liquid, prepared by macerating 4 ozs. *dried* colchicum corm in 1 pint sherry.

Dose—10 to 30 minims.

COLCHICI SEMINA (Colchicum Seeds)—Melanthaceæ.

The small, hard, globular reddish-brown dried ripe seeds of *Colchicum autumnale*.

Active principles—Colchicine and Colchicineine.

Action like the corm.

Tinctura Colchici Seminum 1 in 5.

A brown, sherry-coloured liquid, prepared by percolating 4 ozs. colchicum seeds with alcohol (45 per cent.) to make 1 pint.

Dose—5 to 15 minims.

COLLODIUM (Collodion) 1 in 48.

A colourless syrupy liquid, consisting of a solution of 1 oz. pyroxilin in 36 ozs. ether and 12 ozs. alcohol (90 per cent.).

Protective to wounds.

Collodium Flexile (Flexible Collodion)

A colourless, syrupy liquid, prepared by mixing $\frac{1}{2}$ oz. Canada turpentine, $\frac{1}{4}$ oz. castor oil, and 12 ozs. collodion.

Acts like collodion, but less liable to crack on drying.

Collodium Vesicans (Blistering Collodion)

A thick liquid, consisting of $\frac{1}{2}$ oz. pyroxylin and 20 ozs. blistering liquid.

Acts like cantharides plaster.

COLOCYNTHIDIS PULPA (Colocynth Pulp)—Cucurbitaceæ.

The peeled, dried, spongy, light pulp of the fruit of *Citrullus Colocynthis*—the bitter apple—in broken white balls, the seeds (resembling apple pips) being rejected.

Active principle—Colocynthin (a glucoside).

A Drastic Cathartic.

Extractum Colocynthidis Compositum 1 in $4\frac{1}{2}$ (nearly).

A firm, blackish mass, prepared by exhausting 6 ozs. colocynth pulp with 1 gallon alcohol (60 per cent.), and, after the volatile alcohol is distilled from the resulting tincture, 12 ozs. extract of Barbados aloes, 4 ozs. resin of scammony, 4 ozs. curd soap, and 1 oz. cardamoms in fine powder, are added, and the evaporation continued till a pilular consistence is reached.

Purgative, like Pil. Col. Co. Dose—2 to 8 grs.

Pilula Colocynthidis Composita 1 in 6.

Prepared by beating together 1 oz. colocynth pulp, 2 ozs. each Barbados aloes and scammony resin, $\frac{1}{4}$ oz. potassium sulphate, and 2 drs. oil of cloves, with q.s. distilled water. Distinguished from the extract by the odour of cloves.

Dose—4 to 8 grs.

Pilula Colocynthidis et Hyoscyami 1 and 3 in 9.

1 oz. extract of hyoscyamus and 2 ozs. comp. colocynth pill

Dose—4 to 8 grs. Not so liable to gripe as Pil. Col. Co.

CONII FOLIA (Conium Leaves)—Umbelliferae.

The finely-divided, smooth, *fresh* leaves and young branches of the Spotted Hemlock, *Conium maculatum*. Gathered when the fruit begins to form. The stems are smooth and marked with purple spots.

Active principles—Coniine, Methyl-coniine, and Conhydrine.

Anodyne, Narcotic, Sedative.

Succus Conii

A brownish liquid, consisting of the juice of conium leaves and young branches, to which $\frac{1}{3}$ of alcohol (90 per cent.) is added.

Dose—1 to 2 drs.

Unguentum Conii 2 of juice in 1.

A yellow ointment, prepared by evaporating 2 ozs. conium juice under 140°F. to $\frac{1}{8}$ its bulk, and mixing with $\frac{3}{4}$ oz. hydrous wool fat.

Local Anodyne in painful conditions of the rectum and anus.

This is the ointment first introduced by the writer, and now sanctioned by the B.P.

CONII FRUCTUS (Conium Fruit)—Umbelliferæ.

The dried, full grown, unripe, small, seed-like, greyish fruits, consisting of separate mericarps, with 5 waved ridges, of *Conium maculatum*.

Active principles—as from leaves.

Action like the leaves.

Tinctura Conii 1 in 5.

A brownish liquid, prepared by percolating 4 ozs. of the recently comminuted fruit with alcohol (70 per cent.) to 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

COPAIBA (Copaiba)—Leguminosæ. (Synonym—Copaiva.)

The thick, yellow, fluid oleo-resin, obtained from the trunk of *Copaifera Lansdorfii* and other *Copaifera*.

Stimulant to urinary and other mucous surfaces.

Active ingredients—Ethereal Oil and Resin.

Dose— $\frac{1}{2}$ to 1 dr., in emulsion, capsules, or confection.

Oleum Copaibæ

The colourless or pale-yellow oil distilled from Copaiba.

Dose—5 to 20 minims, as above.

CORIANDRI FRUCTUS (Coriander Fruit)—Umbelliferæ.

The small, globular, ribbed, yellowish-brown, dried, ripe, seed-like fruit of *Coriandrum sativum*.

Antispasmodic and Carminative.

IN—Confect. Sennæ, Syr. Rhei, Tinct. Rhei Co., and Tinct. Sennæ Co.

Oleum Coriandri

The yellowish oil distilled from the fruit.

Dose— $\frac{1}{2}$ to 3 minims, on sugar or in emulsion.

IN—Syrupus Sennæ.

CREOSOTUM (Creosote).

A colourless or pale-yellow oily liquid, a product of the distillation of Wood Tar. It consists of a mixture of guaiacol, creosol, and other phenols.

Sedative, Astringent, and Antiseptic. Externally, Styptic.

Dose—1 to 5 minims, in pill or in capsules.

Mistura Creosoti 1 minim in 1 oz.

A nearly colourless mixture, consisting of creosote and spirit of juniper, of each 16 mins., syrup 1 oz., and distilled water 15 ozs.

Dose— $\frac{1}{2}$ to 1 oz.

Unguentum Creosoti 1 in 10.

A white ointment, prepared by melting together 1 oz. creosote, 4 ozs. hard paraffin, and 5 ozs. white soft paraffin, and stirring till cold.

CRETA PRÆPARATA (Prepared Chalk) CaCO_3

Native calcium carbonate in white friable masses or white powder, freed from its impurities by elutriation.

Antacid and Astringent. Dose—10 to 60 grs.

IN—Hydrarg. cum Creta 2 in 3, and in

Mistura Cretæ 1 in 32.

A white, milky mixture, prepared by rubbing up $\frac{1}{4}$ oz. prepared chalk, 15 grs. tragacanth, and $\frac{1}{2}$ oz. sugar in cinnamon water, q.s. to make 8 ozs.

Dose— $\frac{1}{2}$ to 1 oz. For a child 1 year old, 1 to 2 drs.

Pulvis Cretæ Aromaticus 1 in 4 (nearly).

A pale brown powder, consisting of cinnamon 4 ozs., nutmeg 3 ozs., cloves $1\frac{1}{2}$ ozs., cardamoms 1 oz., sugar 25 ozs., chalk 11 ozs.

Astringent. Dose—10 to 60 grs.

Pulvis Cretæ Aromaticus cum Opio 1 in 40 of opium.

A pale brown powder, prepared by mixing $9\frac{3}{4}$ ozs. of aromatic powder of chalk with $\frac{1}{4}$ oz. powdered opium.

Aromatic, Astringent, and Narcotic.

Dose—10 to 40 grs.; for a child 1 year old, 1 gr.

CROCUS (Saffron)—Iridaceæ.

The dried stigmas and tops of the styles of *Crocus sativus*, each terminating in three stigmas, and measuring about 1 inch.

Supposed Emmenagogue; only used for its colour.

IN—Decoct. Aloes Co. and Tinct. Cinch. Co.

Tinctura Croci 1 in 20.

A bright yellowish-brown liquid, prepared by macerating 1 oz. saffron in 1 pint alcohol (60 per cent.)

Dose—5 to 15 mins.

CROTONIS OLEUM (Croton Oil)—from Euphorbiaceæ.

The viscid, brownish-yellow oil, *expressed* from the seeds of *Croton Tiglium*.

Active principle—Crotonoleic Acid.

Hydragogue Cathartic, acts generally within one or two hours.

Dose— $\frac{1}{2}$ to 1 minim, in pill or on dry sugar.

Linimentum Crotonis 1 in 8.

A green liquid, consisting of croton oil 1 oz., oil of cajuput and alcohol (90 per cent.), of each $3\frac{1}{2}$ ozs.

Rubefacient and Counter-irritant.

CUBEBAE FRUCTUS (Cubebs)—Piperaceæ.

The globular, dried, full-grown, unripe fruit of *Piper Cubeba*, about the size and colour of black pepper, with a stalk attached to it; hence called tailed pepper.

Active ingredients—Ethereal Oil and Resinous Acids ; Cubebin is inert.

Diuretic and Expectorant.

Dose in gonorrhœa—30 to 60 grs.

Oleum Cubebæ

A pale greenish-yellow or colourless oil, distilled from Cubebs.

Dose—5 to 20 minims, in emulsion with mucilage.

Tinctura Cubebæ 1 in 5.

Prepared by percolating 4 ozs. cubebs with alcohol (90 per cent.) to make 1 pint.

Dose—½ to 1 dr.

CUPRI SULPHAS (Copper Sulphate)— $\text{CuSO}_4, 5\text{H}_2\text{O}$

(Synonym—Cupric Sulphate).

A blue crystalline salt in triclinic prisms, obtained by interaction of water, sulphuric acid, and copper or cupric oxide.

Astringent, Tonic, Emetic, and Caustic.

Dose—As an Astringent, ¼ gr. to 2 grs., in pill ; as an Emetic, 5 to 10 grs., in solution in water.

CUSPARIÆ CORTEX (Cusparia Bark)—Rutaceæ.

The straight incurved pieces or quills, bevelled at the edges, with an external corky layer and mottled brown epidermis of Cusparia febrifuga. Known also as Angostura Bark.

Active ingredients—Cusparine and Volatile Oil.

Bitter Tonic.

Infusum Cuspariæ 1 in 20 (¼ hour).

1 oz. cusparia bark infused in 1 pint boiling water.

Dose—1 to 2 ozs.

Liquor Cuspariæ Concentratus 1 in 2.

Prepared by percolating 1 pint of concentrated solution from 10 ozs. cusparia bark and 25 ozs. alcohol (20 per cent.)

Dose—½ to 1 dr.

CUSSO (Kousso)—Rosaceæ.

The dried panicles of the pistillate flowers of *Brayera anthelmintica* in compressed clusters or cylindrical rolls ; the flowers are reddish-brown on hairy stalks, with calyx five-parted.

Active principle—Kosotoxin.

Anthelmintic for *tænia solium*. Dose—¼ to ½ oz.

DIGITALIS FOLIA (Digitalis Leaves)—Scrophulariaceæ.

The large, wrinkled, downy, dried leaves, with bluntly serrated edges of *Digitalis purpurea* (Purple Foxglove). Collected from plants commencing to flower.

Active glucosides—Digitalin, Digitalein, Digitoxin, and Digitonin.

Diuretic and Cardiac Tonic. Dose—½ to 2 grs. in powder.

Infusum Digitalis 60 grs. to 1 pint ($\frac{1}{4}$ hour).

60 grs. digitalis leaf infused in 1 pint boiling distilled water.

Dose—2 to 4 drs.

Tinctura Digitalis 1 in 8.

A dark-brown liquid, prepared by percolating $2\frac{1}{2}$ ozs. digitalis leaf with alcohol (60 per cent.) q.s. to 1 pint.

Dose—5 to 15 mins. (2 to 4 drs. in Delirium Tremens).

ELATERIUM (Elaterium)—from Cucurbitaceæ.

A sediment in thin, friable, greenish-grey, curved cakes, obtained from the juice of the fruit of *Ecballium Elaterium*.

Hydragogue Cathartic. Dose— $\frac{1}{10}$ to $\frac{1}{2}$ gr.

ELATERINUM (Elaterin) $C_{20}H_{28}O_5$

A chemically neutral substance, being the active principle of elaterium, in small, hexagonal tables.

A Drastic Hydragogue Cathartic. Dose— $\frac{1}{40}$ to $\frac{1}{10}$ gr.

Pulvis Elaterini Compositus 1 in 40.

A white powder, consisting of elaterin 5 grs., rubbed up with milk sugar 195 grs.

Dose—1 to 4 grs., in pill or powder.

ERGOTA (Ergot)—Fungi and Graminaceæ.

Ergot is the spawn or sclerotium of *Claviceps purpurea*, originating in the ovary of *Secale cereale*; in long, dark, violet-black, cylindrical, brittle grains, pinkish-white internally.

Active ingredients—Cornutine, Ergotinic and Sphacelinic Acids, and Sphacelotoxin.

Emmenagogue. Acts on unstriated muscular fibre.

Dose—20 to 60 grs. Seldom, however, given in powder.

Extractum Ergotæ (Extract of Ergot)

(Synonym—Ergotin).

A soft extract, prepared by exhausting, by percolation, ergot with alcohol (60 per cent.). Water is added to the evaporated product, and, when cold, filtered. Diluted hydrochloric acid is added to the filtrate, and it is again filtered and treated with sodium carbonate, and evaporated to a soft extract.

Dose—2 to 8 grs.

Extractum Ergotæ Liquidum 1 in 1.

A deep coffee-brown liquid, obtained by exhausting 20 ozs. of ergot with $7\frac{1}{2}$ pints of water, evaporating this to 14 ozs., and adding $7\frac{1}{2}$ ozs. alcohol (90 per cent.)

Dose—10 to 30 minims, in water.

Infusum Ergotæ 1 in 20 ($\frac{1}{4}$ hour).

1 oz. crushed ergot infused in 1 pint boiling distilled water.

Dose—1 to 2 ozs.

Injectio Ergotæ Hypodermica 10 grs. in 33 mins.

(Synonym—Hypodermic Injection of Ergotin.)

100 grs. extract of ergot dissolved in a mixture of 3 grs. phenol and 220 minims distilled water which has been boiled and cooled. It should measure 330 minims, and should be freshly prepared.

Dose—By subcutaneous injection, 3 to 10 minims.

Tinctura Ergotæ Ammoniata 1 in 4.

A coffee-brown liquid, prepared by percolating 5 ozs. finely comminuted ergot with a mixture of 2 ozs. solution of ammonia and 18 ozs. alcohol (60 per cent.).

Dose— $\frac{1}{2}$ to 1 dr.

ETHER—(See under *Æther*).**ETHYL NITRITIS, LIQUOR** (Solution of Ethyl Nitrite).

A colourless, limpid solution in 95 per cent. absolute alcohol and 5 per cent. glycerin, of 3 per cent., by weight, of ethyl nitrite, which is obtained by interaction of alcohol (90 per cent.), sodium nitrite, and diluted sulphuric acid, at low temperature. Should be stored in small bottles.

Acts, like amyl nitrite, on arterial spasm.

Dose—20 to 60 minims.

EUCALYPTI GUMMI (*Eucalyptus Gum*)—Myrtaceæ.

The ruby-coloured exudation or so-called red gum from the bark of *Eucalyptus rostrata* and other species; from Australia.

Astringent like catechu. Dose—2 to 5 grs.

Trochiscus Eucalypti Gummi 1 gr. in each.

A lozenge, consisting of 1 gr. eucalyptus gum with fruit basis.

EUCALYPTI OLEUM (Oil of *Eucalyptus*)—Myrtaceæ.

The colourless or pale yellow oil distilled from the fresh leaves of *Eucalyptus Globulus* and other species. (Consists chiefly of a body called Cineol, Eucalyptol or Cajuputol.)

A powerful Antiseptic. Dose— $\frac{1}{2}$ to 3 minims.

Unguentum Eucalypti 1 in 10.

A white ointment, prepared by melting white soft paraffin 5 ozs. and hard paraffin 4 ozs., and adding eucalyptus oil 1 oz.

Antiseptic.

EUONYMI CORTEX (*Euonymus Bark*)—Celastraceæ.

The dried root-bark of *Euonymus atropurpureus* (Wahoo), in quilled or curved pieces ($\frac{1}{12}$ — $\frac{1}{8}$ inch thick), outer surface ash grey, and inner surface whitish.

Extractum Euonymi Siccum (Dry Extract of *Euonymus*).

A brownish powder, prepared by evaporating a tincture of the dried bark and adding 25 per cent. of calcium phosphate. Known as Euonymin.

Cholagogue and Cathartic. Dose—1 to 2 grs.

FEL BOVINUM PURIFICATUM (Purified Ox Bile).

A dark-green soft solid, prepared by evaporating fresh ox bile to $\frac{1}{4}$ its volume, adding twice its bulk of alcohol (90 per cent.), filtering, and continuing the evaporation.

Tonic, Aperient, and Antiseptic. Dose—5 to 15 grs., in pill.

FERRUM (Iron)—Fe.

Annealed iron wire (No. 35 gauge, about 0.005 inch in diameter) or wrought nails, free from oxide. The different preparations of this substance vary in their actions. Pure iron, for example, acts simply as a Tonic and Hæmatinic or blood improver, whilst the acid preparations are generally powerful Astringents as well. Iron forms a dark ink when ordered with any of the bitter infusions, except those of Quassia and Calumba. The same remark applies to all astringent vegetable tinctures. Iron, like arsenic, should be prescribed to be taken after meals.

Liquor Ferri Acetatis (Solution of Ferric Acetate) 9.5 per cent.

A deep-red fluid, prepared by dissolving ferric hydrate (formed by precipitating solution of ferric sulphate with ammonia) in glacial acetic acid and water.

Astringent, Tonic, and Diuretic. Dose—5 to 15 minims.

Ferri Arsenas (Iron Arsenate). Arseniate of Iron, B.P., 1885.

Ferrous Arsenate $\text{Fe}_3(\text{AsO}_4)_2 \cdot 6\text{H}_2\text{O}$, with ferric arsenate and some iron oxide. A green, amorphous powder, prepared by mixing a solution of sodium arsenate with one of ferrous sulphate, adding sodium bicarbonate in solution, and drying the precipitate at a low temperature.

Resembles arsenic in its action. Dose— $\frac{1}{16}$ to $\frac{1}{4}$ gr. in pill.

Ferri Carbonas Saccharatus

Saccharated Iron Carbonate. Ferrous oxycarbonate, $x \text{FeCO}_3$, $y \text{Fe}(\text{OH})_2$, more or less oxidised and mixed with sugar; the carbonate, FeCO_3 , forming about $\frac{1}{3}$ of the mixture. A greyish-brown powder, cohering in little lumps, prepared by mixing solutions of ammonium carbonate and ferrous sulphate, washing the resulting carbonate, rubbing it up with sugar, and drying.

Dose—10 to 30 grs.

Mistura Ferri Composita $2\frac{1}{2}$ grs. sulphate to 1 oz.

A muddy, green, changeable mixture, prepared by mixing myrrh and sugar, of each 60 grs., potassium carbonate 30 grs., spirit of nutmeg 50 mins., in rose water to 7 ozs., and adding ferrous sulphate 25 grs. dissolved in rose water 3 ozs. Commonly called Griffith's Mixture; it contains about 1 gr. carbonate of iron in each ounce.

Hæmatinic and Emmenagogue. Dose— $\frac{1}{2}$ to 1 oz.

Ferri et Ammonii Citratis

Iron and Ammonium Citrate in transparent ruby scales, prepared by mixing solutions of ferric sulphate and ammonia, and dissolving the freshly-precipitated ferric hydroxide thus formed in solution of citric acid, and, after the addition of ammonia, evaporating.

Dose—5 to 10 grs. ; a most agreeable tonic, in solution.

Vinum Ferri Citratis 8 grs. in 1 oz.

A brownish liquid, prepared by dissolving 160 grs. iron and ammonium citrate in orange wine to 1 pint.

Dose—1 to 4 drs.

Ferri et Quininæ Citras (Iron and Quinine Citrate). 1 gr. Quinine in 6.

In greenish-yellow scales, being a Citrate of Quinine, Iron and Ammonium, prepared by dissolving the ferric hydroxide (formed as in the last preparation) in citric acid, adding quinine (prepared by precipitating the sulphate by ammonia), neutralising with ammonia, and evaporating.

Hæmatinic, Tonic, Antiperiodic. Dose—5 to 10 grs.

Syrupus Ferri Iodidi 1 gr. in 11 mins.

A colourless syrup, prepared by heating $\frac{1}{2}$ oz. iron and 726 grs. iodine with $2\frac{1}{2}$ ozs. distilled water, and adding the filtered product to $16\frac{1}{2}$ ozs. sugar dissolved in 6 ozs. water, and making up to 1 pint with water.

Dose— $\frac{1}{2}$ to 1 dr. Dose for a child 1 year old, 2 mins.

Liquor Ferri Perchloridi Fortis 22·5 grs. in 110 mins.

A deep orange-brown liquid, prepared by boiling iron wire in hydrochloric acid and distilled water, and, after filtering, adding nitric acid and more hydrochloric, and concentrating by evaporation.

A powerful Astringent, Caustic, and Hæmostatic.

Liquor Ferri Perchloridi Solution of Ferric Chloride 1 in 4.

A brown liquid, prepared by mixing 5 ozs. strong solution of ferric chloride with distilled water to make 1 pint.

Dose—5 to 15 minims, freely diluted.

Tinctura Ferri Perchloridi 1 in 4.

A brown liquid, prepared by adding 5 ozs. strong solution of ferric chloride to 5 ozs. alcohol (90 per cent.) and distilled water to 1 pint.

Dose—5 to 15 minims, freely diluted.

Liquor Ferri Pernitratis 3·3 grs. in 110 mins.

A reddish-brown liquid, prepared by dissolving 1 oz. iron wire in $4\frac{1}{2}$ ozs. nitric acid and distilled water to 30 ozs.

Dose—5 to 15 minims, freely diluted.

Ferri Phosphas 47 per cent. hydrous ferrous phosphate ($\text{Fe}_2(\text{PO}_4)_2 \cdot 8\text{H}_2\text{O}$) with ferric phosphate and some iron oxide.

A slate-blue amorphous powder, prepared by mixing a solution of ferrous sulphate with one of sodium phosphate, and adding sodium bicarbonate, in solution, and drying the washed precipitate.

Dose—5 to 10 grs. in powder.

Syrupus Ferri Phosphatis 1 gr. $\text{Fe}_2(\text{PO}_4)_2$ in 1 dr.

A colourless syrup, prepared by dissolving by heat iron wire in concentrated phosphoric acid and distilled water, and filtering into syrup.

Dose— $\frac{1}{2}$ to 1 dr. diluted, in anæmic dyspepsia.

Syrupus Ferri Phosphatis cum Quinina et Strychnina 1 gr., $\frac{4}{5}$ gr., and $\frac{1}{32}$ gr. in 1 dr.

A clear fluorescent syrup, made by dissolving iron wire in concentrated phosphoric acid, and in this dissolving quinine sulphate and strychnine, and filtering into syrup and adding water, the whole containing 1 gr. anhydrous ferrous phosphate, $\frac{4}{5}$ gr. quinine sulphate, and $\frac{1}{32}$ gr. strychnine in 1 dr.

General and Nervine Tonic. Dose— $\frac{1}{2}$ to 1 dr.

Ferri Sulphas $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ (Ferrous Sulphate)

Pale, greenish-blue crystals, prepared by interaction of diluted sulphuric acid and iron.

Tonic, Astringent, and Emmenagogue. Dose—1 to 5 grs.

Ferri Sulphas Exsiccatus (Exsiccated Ferrous Sulphate)

$\text{FeSO}_4 \cdot \text{H}_2\text{O}$ Dried Sulphate of Iron, B.P., 1885.

A greyish powder, prepared by heating the last preparation at 212° till it loses 40 per cent. of its weight, and powdering the residue. $2\frac{1}{2}$ grs. = 4 grs. Ferri Sulphas.

Dose— $\frac{1}{2}$ to 3 grs. in pill.

IN—Pil. Aloes et Ferri, and

Pilula Ferri (Iron Pill) 1 gr. carbonate in 5.

Prepared by mixing 150 grs. exsiccated ferrous sulphate, 150 grs. syrup, 10 grs. glycerin, and 20 grs. water, and adding 95 grs. exsiccated sodium carbonate, and when reaction ceases adding 50 grs. gum acacia and 15 grs. tragacanth. Known as Blaud's Pill.

Tonic and Emmenagogue. Dose—5 to 15 grs.

Liquor Ferri Persulphatis (Solution of Ferric Sulphate) Fe_2SO_4 , 36 $\frac{1}{2}$ per cent.

A dense dark-red liquid, prepared by dissolving 8 ozs. ferrous sulphate in 6 drs. sulphuric acid and 10 ozs. distilled water, and adding 6 drs. nitric acid in 2 ozs. distilled water, and making up to 11 ozs. after converting all the sulphate into persulphate by boiling.

Styptic; used in making 4 preparations of iron.

Vinum Ferri 1 oz. to 1 pint.

A brown liquid, prepared by *partially immersing* 1 oz. iron wire in 1 pint of sherry for a month, with frequent agitation.

Dose—1 to 4 drs. ; contains a small amount of iron, chiefly as tartrates, malates, and citrates.

Ferrum Redactum (Reduced Iron) Fe and Fe_2O_3 .

A fine black powder, containing at least 75 per cent. of metallic iron and a variable amount of oxide, prepared by passing dry hydrogen over red-hot ferric hydroxide.

Tonic and Hæmatinic ; sometimes called Quevenne's iron.

Dose—1 to 5 grs. in pill.

Trochiscus Ferri Redacti 1 gr. in each.

A greyish-black lozenge, consisting of reduced iron 1 gr., mixed with simple basis.

Ferrum Tartaratum (Tartarated Iron) $\text{KFeOC}_4\text{H}_4\text{O}_6$.

In deep garnet scales, prepared by dissolving freshly precipitated ferric hydroxide (deposited from ferric sulphate solution by ammonia) with acid potassium tartrate in water, filtering and evaporating to a syrup, and drying on plates.

Dose—5 to 10 grs., in solution in water.

☞ The double salts of iron with potassium, quinine, and ammonium are known as the *scale* preparations of iron from their physical characteristics.

FICUS (Fig)—Urticaceæ, or Moraceæ.

The dried, fleshy receptacles of *Ficus Carica*.

Laxative ; used in making *Confectio Sennæ*.

FILIX MAS (Male Fern)—Filices.

The tufted, scaly, greenish-brown rhizome, with persistent bases of the foot-stalks, and root fibres of *Aspidium Filix-mas*. Collected late in the autumn, and divested of roots, leaves, and dead matter, and carefully dried. Should not be used if more than 1 year old.

Active principles—Filicic Acid and Fixed Oil.

Extractum Filicis Liquidum

A thick, dark-green, oily liquid, prepared by extracting the oleo-resinous matter from the male fern rhizome by percolating it with ether, and evaporating the ethereal tincture.

Anthelmintic—for *tænia solium*. Dose—45 to 90 minims, in emulsion.

FÆNICULI FRUCTUS (Fennel Fruit)—Umbelliferæ.

The dried, pale-brown, oblong, ribbed, seed-like, beaked, ripe fruit of cultivated plants of *Fœniculum capillaceum*.

Carminative, Antispasmodic, and Galactagogue.

IN—Pulvis Glycyrrhizæ Compositus.

Aqua Fœniculi 1 lb. to 1 gallon.

A colourless water, obtained by distilling one gallon from 2 gallons of water, and 1 pound fennel fruit.

Dose—1 to 3 ozs. For a child one year old, 1 dr.

GALBANUM (Galbanum)—Umbelliferæ.

A fetid, greenish-yellow gum resin, in small tears agglutinated into masses, derived from *Ferula galbaniflua*, and probably other species.

Antispasmodic and Expectorant. Dose—5 to 15 grs.

Pilula Galbani Composita 1 in 3½.

(Synonym—Compound Pill of Asafetida.)

Composed of asafetida, galbanum, and myrrh, of each 2 ozs., and syrup of glucose 1 oz., heated together.

Antispasmodic in hysteria. Dose—4 to 8 grs.

GALLA (Galls)—From Cupuliferæ.

A partially insect and partially vegetable production, growing as round, tuberculated excrescences on the oak, *Quercus infectoria*, and resulting from the puncture and deposition of an egg or eggs of *Cynips Gallæ tinctoriæ*.

Active ingredients—Gallic-tannic Acid and Gallic Acid.

Astringent. Generally given in the form of tannin.

Unguentum Gallæ 1 in 5.

A pale-brown ointment, prepared by rubbing 1 oz. powdered galls with 4 ozs. benzoated lard.

Astringent. Chiefly used for hæmorrhoids.

Unguentum Gallæ cum Opio 7½ per cent. opium.

A brown ointment, prepared by mixing 75 grs. powdered opium with 925 grs. ointment of galls.

A Local Anodyne and Astringent to painful hæmorrhoids.

Gallic and Tannic-Acids (See under Acidum).**GELATINUM** (Gelatin).

In translucent sheets or shreds, being the air-dried product of the action of boiling water on such animal tissues as skin, tendons, ligaments, and bones; used for making suppositoria glycerini.

GELSEMI RADIX (Gelsemium Root)—Loganiaceæ.

The dried yellowish-brown cylindrical rhizome marked with longitudinal purple lines and attached roots of *Gelsemium nitidum*.

Active principles—Gelseminine and Gelsemine.

Sedative in Neuralgia of 5th nerve.

Tinctura Gelsemii 1 in 10.

2 ozs. gelsemium root in No. 40 powder, percolated with alcohol (60 per cent.) to make 1 pint.

Dose—5 to 15 minims.

GENTIANÆ RADIX (Gentian Root)—Gentianaceæ.

The tough, wrinkled, or ringed brownish-yellow, dried rhizome and roots of *Gentiana lutea*, in cylindrical pieces or longitudinal slices.

Active principles—Gentiopicroin (a glucoside) and Gentisin.

Bitter Tonic, without astringency.

☞ This root is often confounded with *Belladonna* and *Pyrethrum*. From the former it is distinguished by its brownish-yellow colour, and by the close, transverse markings, which give it a ringed appearance. It differs from *pyrethrum* in its toughness, and in the absence of the black, shining points seen in the thick, brittle bark. Gentian is bitter, while *pyrethrum* causes a prickling sensation in the mouth.

Extractum Gentianæ

A brownish-black, soft extract, prepared by infusing and afterwards boiling the root in water and evaporating.

Dose—2 to 8 grs. A harmless excipient for pill masses.

Infusum Gentianæ Compositum 1 in 80 ($\frac{1}{4}$ hour).

$\frac{1}{4}$ oz. each gentian root and dried bitter-orange peel, and $\frac{1}{2}$ oz. fresh lemon peel, infused in 1 pint boiling water.

Dose— $\frac{1}{2}$ to 1 oz.

Tinctura Gentianæ Composita 1 in 10.

A golden-brown liquid, prepared by macerating in 1 pint alcohol (45 per cent.), 2 ozs. gentian root, $\frac{3}{4}$ oz. dried bitter-orange peel, and $\frac{1}{4}$ oz. cardamom seeds.

Dose— $\frac{1}{2}$ to 1 dr.

GLUCOSI SYRUPUS (Syrup of Glucose) 1 in 3.

Made by mixing and heating 1 oz. liquid glucose of commerce and 2 ozs. syrup.

Used as an excipient in 9 pills.

GLUSIDUM (Gluside) C_6H_4CO,SO_2,NH

(Synonym—Glucosimide).

Benzoyl sulphonimide; an intensely sweet, white crystalline powder, being an imide derived from toluene. Commonly called Saccharin.

Only used as a substitute for sugar.

☞ Soluble Saccharin is prepared by evaporating a neutral solution of gluside in bicarbonate of soda.

GLYCERINUM (Glycerin) $C_3H_5(OH)_3$

Glycerin or glycerol is a colourless, oily-looking, thick, sweet fluid, obtained from fats and fixed oils by interaction with

alkalies or superheated steam. It is a trihydric alcohol containing a small percentage of water.

Demulcent, Antiseptic, and Emollient. Dose—1 to 2 drs.

Suppositoria Glycerini 70 per cent.

Translucent cones, prepared by soaking gelatin $\frac{1}{2}$ oz. in a little water till it becomes soft, and then dissolving it in glycerin $2\frac{1}{2}$ ozs. and evaporating till the mixture weighs 1,563 grs., when it is poured into moulds capable of holding 30, 60, or 120 grs. or other capacity. Each suppository contains 70 per cent. of glycerin.

Used for inserting into the rectum in constipation.

In addition to entering into the 9 Glycerins, it enters into Lin. Pot. Iod. cum Sapone, Mel Boracis, Pil. Ferri, Pil. Quin. Sulph., Confect. Sulphuris, Ext. Cinch. Liq., Ext. Sarzæ Liq., Liq. Thyroidei, Liq. Ethyl Nitritis, Lotio Hyd. Nig., Syr. Pruni Virg., Tinct. Chlor. et Morph. Co., Tr. Kino, Tr. Rhei Co., Ung. Ac. Carbolici, Ung. Iodi, and Ung. Sulph. Iod.

Glycerinum Acidi Carbolici. &c. (See under Acidum Carbolicum, &c.; or the table upon page 156).


GLYCYRRHIZÆ RADIX (Liquorice Root)—Leguminosæ.

The pale-yellow, tough, fibrous peeled root and underground stem, in long cylindrical pieces, of *Glycyrrhiza glabra*, and other species.

Active principle—Glycyrrhizin.

Demulcent; but chiefly used for its sweetening qualities.

A mild Cathartic.

 This root is distinguished from others by its *yellow* and *fibrous* interior, and by its very sweet taste.

Extractum Glycyrrhizæ

A firm, black extract, prepared by maceration of the root in cold distilled water, boiling, straining, and subsequent evaporation.

Chiefly used as an Excipient.

IN—Confect. Sennæ and Dec. Aloes Co.

Extractum Glycyrrhizæ Liquidum

A dark liquid, prepared by boiling a cold infusion of the root, straining, and evaporating till the specific gravity of 1.20 is reached, and then adding $\frac{1}{4}$ its volume of alcohol (90 per cent.)

Dose— $\frac{1}{2}$ to 1 dr.

IN—Mist. Sennæ Co., and Tr. Aloes.

Pulvis Glycyrrhizæ Compositus 1 in 6.

A greenish powder, consisting of senna and liquorice, of each 2 ozs., fennel and sulphur, of each 1 oz., sugar 6 ozs.

A mild Cathartic. Dose—60 to 120 grs.

In addition to the above, liquorice root enters into Liq. Sarzæ Co. Conc., and Pil. Hydrarg.

GOSSYPIUM (Cotton)—Malvaceæ.

(Synonym—Cotton Wool).

White, soft filaments or hairs of the seed of *Gossypium barbadense*, and other species of *Gossypium*; freed from fatty matter.

Used in making Pyroxylin.

GRANATI CORTEX (Pomegranate Bark)—Myrtaceæ.

The greyish-yellow fragments of the dried bark of the stem and root of *Punica Granatum*.

Active Principles—Punicine or Pelletierine and Isopelletierine. Anthelmintic; used to destroy the tapeworm.

Decoctum Granati Corticis 1 in 5.

Prepared by taking 4 ozs. of the bark of pomegranate and 24 ozs. of water, and boiling down to 1 pint.

Dose— $\frac{1}{2}$ to 2 ozs. every 4 hours. It causes purging.

GUAIACI LIGNUM (Guaiacum Wood)—Zygophyllaceæ.

The dark greenish-brown heart-wood of *Guaiacum officinale*, or of *G. sanctum*. (Known as *Lignum Vitæ*.)

Diaphoretic and Alterative.

IN—Liq. Sarzæ Co. Conc.

GUAIACI RESINA (Guaiacum Resin).

The resin from the stem of *Guaiacum officinale*, or of *G. sanctum*, in large greenish-brown masses or oval tears.

Diaphoretic and Antisyphilitic. Dose—5 to 15 grs.

Mistura Guaiaci 11 grs. in 1 oz.

An emulsion, prepared by rubbing $\frac{1}{2}$ oz. each guaiacum resin and sugar, and 35 grs. tragacanth, with 1 pint cinnamon water.

Dose— $\frac{1}{2}$ to 1 oz.

Tinctura Guaiaci Ammoniata 1 in 5.

A dark-brown liquid, prepared by macerating 4 ozs. of guaiacum resin in 16 ozs. alcohol (90 per cent.) and $1\frac{1}{2}$ ozs. strong solution of ammonia, for 48 hours, filtering, and dissolving in the filtrate 30 minims oil of nutmeg, and 20 minims oil of lemon, and making up to 1 pint with alcohol (90 per cent.)

Stimulant and Diaphoretic. Dose— $\frac{1}{2}$ to 1 dr.

Trochiscus Guaiaci Resinæ 3 grs. in each.

Lozenges composed of fruit basis with 3 grs. guaiacum resin in each.

In addition to the above, the resin enters into Pil. Hydrarg. Subchlor. Co.

HÆMATOXYLI LIGNUM (Logwood)—Leguminosæ.

The dark-red logs or iridescent chips or raspings of the heart-wood of *Hæmatoxylon campechianum*.

Colouring principle—Hæmatoxylin.

Astringent principle—Kino-tannic Acid.

A pure Astringent.

Decoctum Hæmatoxyli 1 in 20.

Prepared by boiling 1 oz. logwood in 24 ozs. distilled water for 10 minutes, adding 70 grs. cinnamon near the end of the process, and making the strained product to measure 1 pint.

Dose— $\frac{1}{2}$ to 2 ozs.

HAMAMELIDIS CORTEX (Hamamelis Bark)—Hamamelidaceæ.

(Synonym—Witch Hazel Bark).

The dried bark of *Hamamelis virginiana* in quills or curved pieces 2 to 8 inches long; externally scaly, whitish, or silvery grey; internally cinnamon-brown and striated.

Tinctura Hamamelidis 1 in 10.

Prepared by percolating 2 ozs. witch hazel bark with 1 pint alcohol (45 per cent.)

Astringent. Dose— $\frac{1}{2}$ to 1 dr.

Hamamelidis Folia (Synonym—Witch Hazel Leaves).

The fresh and dried leaves of *Hamamelis virginiana* or witch hazel. Oval, 3 to 6 inches long, with an oblique, heart-shaped base.

Active principles—Tannin and Volatile Oil.

Extractum Hamamelidis Liquidum 1 in 1.

Prepared by a mixed process of maceration and percolation by exhausting the powdered leaves with alcohol (45 per cent.), reserving a portion of the resulting tincture, evaporating the remainder to the consistence of a soft extract, and dissolving it in the reserved portion.

Astringent. Dose—5 to 15 minims.

Liquor Hamamelidis 1 in 1.

Solution of hamamelis, prepared by macerating and distilling 55 ozs. from fresh hamamelis leaves 50 ozs., water 100 ozs., and alcohol (90 per cent.) 10 ozs.

Unguentum Hamamelidis 1 in 10.

Prepared by mixing $\frac{1}{4}$ oz. liquid extract of hamamelis with 2 $\frac{1}{4}$ ozs. hydrous wool fat.

An Astringent application for inflamed piles.

HEMIDESMI RADIX (Hemidesmus Root)—Asclepiadaceæ.

The brownish, cylindrical, tortuous dried root of *Hemidesmus indicus*, marked with annular cracks; sometimes called Indian Sarsaparilla. Supposed to possess the properties of Sarsaparilla. It contains Coumarin—an odorous substance.

Syrupus Hemidesmi 1 in 8 (by measure).

A syrup, prepared by dissolving 28 ozs. sugar in an infusion of 4 ozs. hemidesmus root in 1 pint boiling water.

Dose— $\frac{1}{2}$ to 1 dr. Used as a pleasant addition to cough mixtures.

HIRUDO (Leeches)—Class, Annelida.

Two leeches are official—the green leech (*Sanguisuga officinalis*) and the speckled leech (*S. medicinalis*), the former having an olive-green and the latter a greenish-yellow spotted belly. Both species have six rusty-red longitudinal stripes on the back, which distinguish them from the horse-leech and others.

HOMATROPINÆ HYDROBROMIDUM (Homatropine Hydrobromide) $C_{16}H_{21}NO_3, HBr$

Hydrobromate of Homatropine, B.P. Add., 1890.

The hydrobromide of an alkaloid, prepared from tropine, in minute colourless crystals.

Mydriatic and Anhidrotic. Dose $\frac{1}{10}$ to $\frac{1}{20}$ gr.

Lamellæ Homatropinæ (Discs of Homatropine) $\frac{1}{100}$ gr. in each.

Discs of gelatin, with some glycerin, each weighing about $\frac{1}{50}$ gr., and containing $\frac{1}{100}$ gr. of homatropine hydrobromide.

HYDRAGRYRUM (Mercury) Hg

A lustrous silver-white fluid metal $13\frac{1}{2}$ times heavier than water, obtained from native mercuric sulphide.

Hydrargyrum cum Creta 1 in 3.

(Synonym—Grey Powder).

A greyish-blue powder, prepared by rubbing 1 oz. mercury with 2 ozs. prepared chalk.

Alterative. Dose—1 to 5 grs. For a child 1 year old, 1 gr.

Emplastrum Hydrargyri 1 in 3.

A bluish solid, prepared by rubbing 3 ozs. mercury with a heated mixture of 56 grs. olive oil and 8 grs. sulphur, and adding 6 ozs. melted lead plaster (the sulphur aiding the division of the mercury).

Resolvent. This preparation sometimes affects the system.

Emplastrum Ammoniaci cum Hydrargyro 1 in 5 of Hg.

A dirty blue-coloured solid, composed of 3 ozs. mercury, 12. ozs. ammoniacum, 56 grs. olive oil, and 8 grs. sulphur.

Resolvent and Local Stimulant.

Linimentum Hydrargyri 1 in 3 of Ungt., 1 in 6 of Hg.

A thick lead-coloured liquid, composed of ointment of mercury 1 oz., strong solution of ammonia 160 mins., and camphor liniment to 3 ozs.

A Stimulant to chronic enlargements.

Pilula Hydrargyri 1 in 3. (Synonym—Blue Pill.)

Prepared by rubbing 2 ozs. (by weight) mercury with 3 ozs. confection of roses, and adding 1 oz. liquorice in fine powder.

Dose—4 to 8 grs.

Unguentum Hydrargyri 1 in 2.

Prepared by rubbing together 1 lb. of mercury, 1 lb. of lard, and 1 oz. suet. Called sometimes Blue ointment from its colour.

Used to introduce mercury into the system through the skin.

☞ There are 10 ointments bearing the name of mercury. (Page 174.)

Unguentum Hydrargyri Compositum 1 of Hg. in 5.

A bluish ointment, consisting of ointment of mercury 10 ozs., yellow beeswax and olive oil, of each 6 ozs., camphor 3 ozs.

This is a substitute for Scott's ointment, by which name it is also known.

Hydrargyri Iodidum Rubrum (Mercuric Iodide) HgI_2

(Synonym—Biniodide of Mercury).

A crystalline, vermilion powder, precipitated on mixing solutions of mercuric chloride and potassium iodide.

Irritant and Vesicant. Dose— $\frac{1}{32}$ to $\frac{1}{16}$ gr. in pill.

Unguentum Hydrargyri Iodidi Rubri 1 in 25.

(Synonym—Ointment of Red Iodide of Mercury.)

A brilliant red ointment, prepared by mixing 20 grs. mercuric iodide with 480 grs. benzoated lard.

Absorbent and Rubefacient.

Liq. Arsenii et Hydrargyri Iodidi

Donovan's Solution. (See Acid. Arsenios., page 178).

Liquor Hydrargyri Nitratis Acidus (Acid Solution of Mercuric Nitrate) 48 per cent.

A colourless solution of 4 ozs. mercury in 5 ozs. nitric acid and $1\frac{1}{2}$ ozs. distilled water.

Caustic ; not used internally.

Unguentum Hydrargyri Nitratis (Mercuric Nitrate Ointment) 1 in 16 nearly.

(Synonym—Ointment of Nitrate of Mercury). Prepared by adding a solution of 1 oz. mercury in 3 ozs. nitric acid to a hot mixture of 4 oz. lard and 7 ozs. olive oil. Known as Citrine Ointment from its pale lemon colour.

A local Alterative, Astringent, and Stimulant.

Unguentum Hydrargyri Nitratis Dilutum 1 in 5.

(Synonym—Diluted Ointment of Nitrate of Mercury).

1 oz. mercuric nitrate ointment and 4 ozs. soft paraffin (yellow).

Hydrargyri Oleas (Mercuric Oleate).

A light greyish-yellow unctuous substance, prepared by the interaction of mercuric chloride with sodium oleate made by mixing hard soap and oleic acid.

Action same as that of Ointment of Mercury.

Unguentum Hydrargyri Oleatis 1 in 4.

Prepared by mixing mercuric oleate 1 oz. with benzoated lard 3 ozs.

Hydrargyri Oxidum Flavum (Yellow Mercuric Oxide) HgO

A yellow powder, prepared by mixing solutions of mercuric chloride and sodium hydroxide.

It has the same composition as Hyd. Ox. Rub., only it exists in a state of more minute division.

Absorbent ; not taken internally.

Unguentum Hydrargyri Oxidi Flavi 1 in 50.

A yellow ointment, prepared by mixing 10 grs. yellow mercuric oxide, in very fine powder, with 490 grs. yellow soft paraffin.

Used in ophthalmia ; known as Pagenstecher's Ointment.

Hydrargyri Oxidum Rubrum (Red Mercuric Oxide) HgO

Called also Red Precipitate. An orange-red powder, prepared by heating mercurous nitrate until acid vapours cease to be evolved.

Unguentum Hydrargyri Oxidi Rubri 1 in 10.

(Synonym—Red Precipitate Ointment).

A red ointment, composed of red mercuric oxide $\frac{1}{4}$ oz., paraffin ointment (yellow) $2\frac{1}{4}$ ozs.

A local Stimulating Absorbent.

Hydrargyri Perchloridum (Mercuric Chloride) HgCl_2

(Synonyms—Corrosive Sublimate ; Bichloride of Mercury ; Perchloride of Mercury).

In heavy colourless masses of prismatic crystals, prepared by subliming a mixture of mercuric sulphate, sodium chloride, and a little black oxide of manganese.

Alterative, Antisyphilitic, and powerfully Antiseptic. In even small quantity an irritant poison.

Dose— $\frac{1}{32}$ to $\frac{1}{16}$ grain in plain solution.

Liquor Hydrargyri Perchloridi $\frac{1}{2}$ gr. in 1 oz.

A colourless solution of 10 grs. mercuric chloride in 1 pint distilled water.

Dose— $\frac{1}{2}$ to 1 drachm, diluted. Each drachm contains $\frac{1}{16}$ gr.

Lotio Hydrargyri Flava (Yellow Mercurial Lotion) 2 grs. in 1 oz.

(Synonym—Yellow Wash.)

Prepared by adding 20 grs. mercuric chloride to 10 ozs. solution of lime (the yellow oxide— HgO —falls as a precipitate).

Resembles the yellow and red oxides in action.

Hydrargyri Subchloridum (Mercurous Chloride) Hg_2Cl_2

(Synonyms—Hydrargyri Chloridum ; Calomel ; Subchloride of Mercury).

A dull-white heavy powder, prepared by subliming mercurous sulphate and sodium chloride.

Alterative, Purgative, and Diuretic.

Dose— $\frac{1}{2}$ to 5 grs. For a child 1 year old, 1 gr.

Lotio Hydrargyri Nigra (Black Mercurial Lotion) 3 grs. in 1 oz.

(Synonym—Black Wash.)

Prepared by triturating 30 grs. mercurous chloride with $\frac{1}{2}$ oz. glycerin and $1\frac{1}{4}$ oz. mucilage of tragacanth, and adding in portions solution of lime to make 10 ozs., the black precipitate which falls being Hg_2O .

A Stimulating Alterative to syphilitic sores.

Pilula Hydrargyri Subchloridi Composita 1 in $4\frac{1}{2}$.

(Synonyms—Compound Calomel Pill ; Plummer's Pill.)

An orange mass, prepared by beating together 1 oz. each mercurous chloride and sulphurated antimony, 2 ozs. guaiacum resin, 180 grs. castor oil, and 1 dr. alcohol (90 per cent.).

Dose—5 to 10 grs., as an Alterative and feeble Cathartic.

Unguentum Hydrargyri Subchloridi 1 in 10.

(Synonym—Calomel Ointment.)

A white ointment, prepared by mixing $\frac{1}{4}$ oz. mercurous chloride (calomel) and $2\frac{1}{4}$ ozs. benzoated lard.

Alterative and Resolvent, but seldom used.

Hydrargyrum Ammoniatum NH_2HgCl

(Synonyms—Ammonio-chloride of Mercury; White Precipitate; Mercuric-ammonium Chloride). A white powder, prepared by mixing solutions of mercuric chloride and of ammonia, and washing and drying the precipitate.

Used as an Insecticide, and never taken internally.

Unguentum Hydrargyri Ammoniaci 1 in 10.

(Synonym—White Precipitate Ointment.) 1 oz. ammoniated mercury, mixed with 9 ozs. paraffin ointment (white).

A Stimulant in chronic skin diseases, and to destroy pediculi.

HYDRASTIS RHIZOMA (Hydrastis Rhizome)—Ranunculaceæ.

The dried, twisted, and knotted yellowish-brown rhizome and roots of *Hydrastis canadensis*.

Active principles—Hydrastine, Berberine, and Canadine.

Tonic and Alterative to mucous membranes.

Extractum Hydrastis Liquidum 1 in 1.

Prepared by a mixed process of percolation and maceration by exhausting the rhizome with alcohol (45 per cent.), reserving a portion of the resulting tincture and evaporating the remainder to the consistence of a soft extract, and then dissolving this in the reserved portion.

Dose—5 to 15 minims.

Tinctura Hydrastis 1 in 10.

Prepared by percolating 2 ozs. hydrastis rhizome with alcohol (60 per cent.) to make 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

HYDROGENII PEROXIDI LIQUOR 10 vols. H_2O_2

An aqueous solution of hydrogen peroxide, prepared by interaction of water, barium peroxide, and a dilute mineral acid at a temp. below 50°F. Should yield 10 times its volume of oxygen.

Dose— $\frac{1}{2}$ to 2 drs. Antiseptic and Alterative.

HYOSCYAMI FOLIA (Hyoscyamus Leaves)—Solanaceæ.

(Synonym—Henbane Leaves.) The sinuated, hairy, *dried* leaves and flowering tops of *Hyoscyamus niger*, also the *fresh* leaves and flowers, with their branches—gathered from *biennial* flowering plants.

Active principles—Hyoscine and Hyoscyamine.

Narcotic, Anodyne, and Sedative.

Extractum Hyoscyami Viride

A dark, soft mass, prepared by the evaporation of the juice of the fresh leaves, flowering tops and young branches of henbane, by a process identical with that used for making the Green Extract of Belladonna.

Dose—2 to 8 grs.

Pil. Colocynthis et Hyoscyami (See Colocynth).**Succus Hyoscyami**

The juice of the fresh leaves, flowering tops and young branches of biennial plants, to which $\frac{1}{3}$ of its volume of alcohol (90 per cent.) is added.

Dose— $\frac{1}{2}$ to 1 dr.

Tinctura Hyoscyami 1 in 10.

A greenish-brown liquid, prepared by percolating 2 ozs. hyoscyamus leaves and flowering tops with alcohol (45 per cent.) to make 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

HYOSCINÆ HYDROBROMIDUM (Hyoscine Hydrobromide)
 $C_{17}H_{21}NO_4, HBr, 3H_2O$.

(Synonyms—Scopolamine Hydrobromide; Hydrobromate of Hyoscine.)

The hydrobromide of an alkaloid contained in hyoscyamus leaves, different species of Scopola, and other solanaceous plants. In colourless crystals, permanent in the air and very soluble in water.

Hypnotic. Dose— $\frac{1}{200}$ to $\frac{1}{100}$ gr.

HYOSCYAMINÆ SULPHAS (Hyoscyamine Sulphate)
 $(C_{17}H_{23}NO_3)_2, H_2SO_4, 2H_2O$.

A deliquescent crystalline powder, being the sulphate of an alkaloid contained in hyoscyamus leaves, and possibly other solanaceous plants.

Hypnotic. Dose— $\frac{1}{200}$ to $\frac{1}{100}$ gr.

IODOFORMUM (Iodoform or Tri-iodomethane) CHI_3

Shining lemon-yellow crystalline scales, produced by the action of iodine on ethylic alcohol and solution of potassium carbonate.

Antiseptic and Alterative. Dose— $\frac{1}{2}$ to 3 grs. in pill.

Suppositoria Iodoformi 3 grs. in each.

Iodoform 36 grs., oil of theobroma 144 grs., divided into 12 suppositories.

Unguentum Iodoformi 1 in 10.

Iodoform $\frac{1}{4}$ oz. mixed with paraffin ointment (yellow) $2\frac{1}{4}$ ozs. Disinfectant, Antiseptic, and Antisyphilitic.

IODUM (Iodine) I

A non-metallic element, in dark, lustrous, laminar crystals, obtained from the ashes of sea-weeds, and from native iodides and iodates.

Lymphatic Stimulant, Absorbent, Alterative, and Caustic.

Starch and free ammonia are incompatible with iodine preparations.

Liquor Iodi Fortis (Strong Solution of Iodine) 1 in 9.

Liniment of Iodine, B.P., 1885.

A dark, reddish-brown liquid, prepared by dissolving iodine $1\frac{1}{4}$ ozs., potassium iodide $\frac{3}{4}$ oz., in water $1\frac{1}{4}$ ozs., and adding alcohol (90 per cent.) 9 ozs. About $4\frac{1}{2}$ times the strength of the tincture.

Absorbent and Counter-irritant.

Tinctura Iodi 1 in 40

A deep-red liquid, prepared by dissolving iodine $\frac{1}{2}$ oz., potassium iodide $\frac{1}{2}$ oz., in water $\frac{1}{2}$ oz., and adding alcohol (90 per cent.) to make 1 pint.

Dose—2 to 5 minims, diluted.

Unguentum Iodi 1 in 25.

A brown ointment, prepared by rubbing iodine 20 grs., potassium iodide 20 grs., with glycerin 60 grs., and lard 400 grs.

Resolvent, Alterative, and Irritant.

Iodides of Sodium, Arsenic, Iron, Mercury, Potassium, Sulphur, and Lead, and their preparations, are given under the name of each metal.

IPECACUANHÆ RADIX (Ipecacuanha Root)—Cinchonaceæ.

The dried root of *Psychotria Ipecacuanha*, in small, annular, contorted, brown, worm-like pieces. Known also as Hippo.

Dose— $\frac{1}{4}$ to 2 grs. as an Expectorant, and 15 to 30 grs. as an Emetic. For a child 1 year old, as an Expectorant, $\frac{1}{12}$ to $\frac{1}{4}$ gr.; as an Emetic, 2 to 4 grs.

Active principles—Emetine and Cephæline.

Acetum Ipecacuanhæ

Prepared by mixing 1 oz. liquid extract of ipecacuanha, 2 ozs. alcohol (90 per cent.), and diluted acetic acid q.s. to 1 pint.

Dose—10 to 30 minims.

Extractum Ipecacuanhæ Liquidum 2 to $2\frac{1}{4}$ grs. alkaloids in 110 mins.

A dark brown liquid, obtained by macerating and percolating ipecacuanha root with alcohol (90 per cent.), mixing the marc with calcium hydroxide, and exhausting by further percolation. The first portion of percolate is reserved, and the alcohol recovered from the remainder. The resulting extract is dissolved in the reserved portion, and its alkaloidal strength having been tested, it is made to contain 2 to $2\frac{1}{4}$ grs. alkaloids in 110 mins.

Dose— $\frac{1}{2}$ to 2 minims as an Expectorant, 15 to 20 minims as an Emetic.

Pilula Ipecacuanhæ cum Scilla 1 in 20. 5 per cent. opium.

Composed of compound powder of ipecacuanha 3 ozs., squill and ammoniacum, of each 1 oz., syrup of glucose q.s., beaten into a mass.

Expectorant, Diaphoretic, Diuretic. Dose—4 to 8 grs.

Pulvis Ipecacuanhæ Compositus 1 in 10. 10 per cent. opium.

(Synonym—Dover's Powder). A fawn-coloured powder, composed of opium $\frac{1}{2}$ oz., ipecacuanha $\frac{1}{2}$ oz., sulphate of potassium 4 ozs.

Diaphoretic and Anodyne. Dose—5 to 15 grs.

Trochiscus Ipecacuanhæ $\frac{1}{4}$ gr. in each.

Each composed of ipecacuanha root $\frac{1}{4}$ gr. with fruit basis. Expectorant.

Trochiscus Morphinæ et Ipecacuanhæ $\frac{1}{32}$ and $\frac{1}{12}$ gr.

Each consists of morphine hydrochloride $\frac{1}{32}$ gr., ipecacuanha root $\frac{1}{12}$ gr., mixed with tolu basis.

Action similar to Dover's Powder.

Vinum Ipecacuanhæ 1 oz. liq. ext. in 1 pint.

A brownish liquid, prepared by mixing 1 oz. liquid extract of ipecacuanha and 19 ozs. sherry.

Dose—10 to 30 minims as an Expectorant; 4 to 6 drs. as an Emetic. Emetic dose for a child 1 year old, 1 dr.

JABORANDI FOLIA (Jaborandi Leaves)—Rutaceæ.

The dried, shortly-stalked, coriaceous, oblong leaflets of *Pilocarpus Jaborandi*, from 2½ to 4 inches in length.

Sialagogue, Diuretic, Diaphoretic, and Expectorant.

Pilocarpine (the active principle) is obtained from jaborandi leaves. They also contain Jaborine.

Extractum Jaborandi Liquidum 1 in 1.

A liquid extract, prepared by exhausting jaborandi leaves 20 ozs. by percolation with alcohol (45 per cent.) reserving the first 17 ozs. of percolate, and evaporating the remainder to a soft extract which is dissolved in the reserved portion, and making the whole up to 20 ozs. with alcohol (45 per cent.).

Dose—5 to 15 minims.

Tinctura Jaborandi 1 in 5.

Prepared by percolating 4 ozs. jaborandi leaves in No. 40 powder with alcohol (45 per cent.) to 1 pint.

Dose—½ to 1 dr.

JALAPA (Jalap)—Convolvulaceæ.

The dried tuberous root, in brown, wrinkled, dense, ovoid tubercles, from a pigeon's to a turkey's egg in size, of *Ipomœa Purga*.

Active principles—Convolvulin and Jalapin.

Drastic Purgative.

Dose—5 to 20 grs. 1 to 2 grs. for a child 1 year old.

Extractum Jalapæ

A dark-brown extract, obtained by evaporating a strong tincture of jalap root, and also by evaporating a cold infusion made from the marc of the tincture, mixing the two extracts thus obtained, and continuing the evaporation.

Dose—2 to 8 grs., in pill.

Pulvis Jalapæ Compositus 1 in 3.

A powder closely resembling Dover's in appearance, composed of jalap 5 ozs., acid potassium tartrate 9 ozs., and ginger 1 oz.

Hydragogue Cathartic. Dose—20 to 60 grs.

Tinctura Jalapæ 1½ per cent. resin.

A deep-brown liquid, prepared by percolating 4 ozs. jalap, in No. 40 powder, with alcohol (70 per cent.), and made to contain 1½ per cent. resin.

Dose—½ to 1 dr.

In addition to the above, Jalap enters into Pulv. Scammonii Co.

Jalapæ Resina

A dark-brown, shining solid, in opaque brittle fragments, prepared by exhausting jalap with spirit, evaporating and precipitating the resin from the resulting concentrated tincture by adding water, washing, and drying on a water bath.

More powerful than jalap. Dose—2 to 5 grs.

Enters into Pilula Scammonii Co.

JUNIPERI OLEUM (Oil of Juniper)—From Coniferæ.

The colourless or pale yellow oil distilled from the full-grown unripe green fruit of *Juniperus communis*.

A Stimulating Diuretic. Dose— $\frac{1}{2}$ to 3 minims.

Spiritus Juniperi 1 in 20.

Oil of juniper 1 oz. and alcohol (90 per cent.) to 1 pint.

If not clear shake with powdered talc, and filter.

Dose—20 to 60 minims.

IN—Mistura Creosoti.

KAOLINUM (Kaolin)

A soft white powder, obtained by elutriation of native aluminium silicate.

Emollient in eczema.

IN—Pil. Phosphori.

KINO (Kino)—From Leguminosæ.

The evaporated juice, in small angular, glistening, dark-red pieces, from incisions in the trunk of *Pterocarpus Marsupium*.

Astringent (contains about 80 per cent. of tannin).

Dose, in powder—5 to 20 grs. It should not be ordered with iron.

Active ingredients—Kino-tannic Acid and Pyrocatechin.

In addition to the following, Kino enters into Pulv. Catechu Co.

Pulvis Kino Compositus 3 in 4. 5 per cent. opium.

Composed of kino $3\frac{3}{4}$ ozs., opium $\frac{1}{4}$ oz., cinnamon 1 oz.

Astringent, Anodyne, and Narcotic. Dose—5 to 20 grs.

Tinctura Kino 1 in 10.

A reddish-brown liquid, prepared by dissolving kino, powdered, 2 ozs., in glycerin 3 ozs., distilled water 5 ozs., alcohol (90 per cent.) to 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

KRAMERIÆ RADIX (Krameria Root)—Polygalaceæ.

(Synonym—Rhatany Root.)

The dried root of *Krameria argentea* (Para rhatany) or *K. triandra* (Peruvian rhatany), in long cylindrical pieces, purplish-brown or reddish-brown in colour.

Astringent and Tonic. (Contains much Kino-tannic Acid.)

In addition to the following, krameria enters into Pulv. Catechu Co.

Extractum Krameriae

(Synonym—Extract of Rhatany).

A deep reddish-brown, *solid* extract, obtained by exhausting krameria root with water, and evaporating the liquid to *dryness*.

Dose—5 to 15 grs., in pill, or rubbed up with chalk mixture.

Infusum Krameriae 1 in 20 ($\frac{1}{4}$ hour).

(Synonym—Infusion of Rhatany).

Krameria root 1 oz. infused in boiling water 20 ozs.

Dose— $\frac{1}{2}$ to 1 oz.**Liquor Krameriae Concentratus** 1 in 2.

Obtained by percolating 10 ozs. krameria root with 25 ozs. alcohol (20 per cent.) to produce 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.**Tinctura Krameriae** 1 in 5.

(Synonym—Tincture of Rhatany).

A deep-red liquid, prepared by percolating krameria root in No. 40 powder 4 ozs., with alcohol (60 per cent.) q.s. to make 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.**Trochiscus Krameriae** 1 gr. in each.

(Synonym—Rhatany Lozenge.)

Prepared with extract of krameria and fruit basis.

Trochiscus Krameriae et Cocainae 1 gr. and $\frac{1}{10}$ gr. in each.

(Synonym—Rhatany and Cocaine Lozenge.)

Prepared with extract of krameria, cocaine hydrochloride, and fruit basis.

LAUROCERASI FOLIA (Cherry-Laurel Leaves)—Rosaceæ.The elliptical, smooth, shining, thick, deep-green, *fresh* leaves of *Prunus Laurocerasus*—the common or cherry-laurel.**Aqua Laurocerasi** 1 lb. to 1 pint. (.1 per cent. HCN.)A colourless liquid, prepared by distilling 1 pint from 1 lb. fresh cherry-laurel leaves and $2\frac{1}{2}$ pints water, and making its strength correspond to .1 per cent. real hydrocyanic acid.Sedative. Dose— $\frac{1}{2}$ to 2 drs.**LAVANDULÆ OLEUM** (Oil of Lavender)—Labiatae.The almost colourless oil distilled from the flowers of *Lavandula vera*.Carminative and Antispasmodic. Dose— $\frac{1}{2}$ to 3 mins.

IN—Linim. Camph. Ammon.

Spiritus Lavandulæ 1 in 10.

Oil of lavender 1 oz. and alcohol (90 per cent.) to 10 ozs.

Dose—5 to 20 mins.

Tinctura Lavandulæ Composita 45 minims to 1 pint.

A bright crimson liquid, prepared by macerating cinnamon and nutmeg, of each 75 grs., and red sanders wood 150 grs., in alcohol (90 per cent.) 1 pint, filtering, and adding oil of lavender 45 mins., and oil of rosemary 5 mins.

Dose— $\frac{1}{2}$ to 1 dr.

Used to colour Liquor Arsenicalis.

LIMONIS CORTEX (Lemon Peel)—Aurantiaceæ.

The *fresh* outer part of the pericarp of the fruit of *Citrus medica* var. B. Limonum.

Aromatic ; chiefly used for its flavour.

It enters into Inf. Aurant. Co. and Inf. Gent. Co. and the following :—

Oleum Limonis

The pale yellow, fragrant *volatile* oil, obtained from fresh lemon peel.

Dose— $\frac{1}{2}$ to 3 minims, but chiefly used for flavouring.

IN—Lin. Pot. Iod. cum Sapone, Spt. Ammon. Aromat., Tinct. Guaiaci Ammon., and Tinct. Valer. Ammon.

Succus Limonis 30 to 40 grs. citric acid in 1 oz.

The freshly expressed juice of the ripe fruit of *Citrus medica* var. B. Limonum. A slightly turbid yellowish liquid.

Refrigerant and Antiscorbutic Dose— $\frac{1}{2}$ to 2 ozs.

110 mins. of lemon juice are neutralised by about 11½ grs. KHCO_3 , or about 9½ grs. NaHCO_3 , or about 16½ grs. Na_2CO_3 .

Syrupus Limonis 1 of juice in 2.

A yellowish syrup, prepared by dissolving 38 ozs. sugar in 25 ozs. lemon juice which has been clarified by subsidence, and when cold adding 2 ozs. of a tincture of lemon peel, which has been made by macerating 1 oz. fresh lemon peel in 1½ ozs. alcohol (90 per cent.) for 7 days, and, after pressing and filtering, making up to 2 ozs. with the alcohol.

Dose— $\frac{1}{2}$ to 1 dr.

Tinctura Limonis 1 in 4.

A sherry-coloured liquid, prepared by macerating fresh lemon peel 5 ozs. in 1 pint alcohol (90 per cent.).

Dose— $\frac{1}{2}$ to 1 dr.

LINUM (Linseed)—Linaceæ.

The small, shining, oval, brown, pointed seeds of *Linum usitatissimum*—common flax.

Demulcent and Emollient (owing to the presence of mucilaginous substances resembling Arabin).

Linum Contusum (Crushed Linseed).

Linseed reduced to coarse powder ; it should be recently prepared, and contain not less than 30 per cent. of oil.

Used for making poultices.

J. Thos. B. P. C. A. No. 8.

Oleum Lini (Linseed Oil).

The viscid yellow oil expressed without heat from linseed.
Only used externally as an Emollient.

LITHII CARBONAS (Lithium Carbonate) Li_2CO_3

In a white powder, or in minute crystalline grains, obtained from native silicates of lithium.

Diuretic and Antacid. Dose—2 to 5 grs.

Lithii Citras (Lithium Citrate) $\text{C}_3\text{H}_4\text{OH}(\text{COOLi})_34\text{H}_2\text{O}$

A white crystalline deliquescent salt, prepared by saturating citric acid with lithium carbonate. Acts like the carbonate.

Dose—5 to 10 grs. in solution, freely diluted.

Lithii Citras Effervescens (Effervescent Lithium Citrate). 1 in 20.

A white granular powder, prepared by mixing lithium citrate 5 ozs., citric acid 21 ozs., tartaric acid 31 ozs., and sodium bicarbonate 58 ozs., all in powder, heating to between 200° and 220°F ., and stirring to cause granulation. The product should weigh 100 ozs.

Dose—60 to 120 grs.

LOBELIA (Lobelia)—Lobeliaceæ.

The dried flowering herb of *Lobelia inflata* (Indian Tobacco) in compressed rectangular parcels of angular stems, alternate toothed hairy leaves and inflated fruits.

Active principle, extracted with difficulty—Lobeline, a non-volatile alkaloid.

Tinctura Lobeliæ Ætherea 1 in 5.

A green liquid, prepared by percolating lobelia 4 ozs., in coarse powder, with spirit of ether to produce 1 pint.

Dose—5 to 15 minims.

LUPULUS (Hops)—Cannabinaceæ.

(Synonym—Humulus).

The dried, greenish-yellow strobiles of *Humulus Lupulus*, from cultivated plants.

A Bitter Tonic and feeble Narcotic.

Lupulinum (Lupulin).

A granular, brownish-yellow glandular powder, obtained from the dried strobiles of *Humulus Lupulus*. (Contains a volatile oil, bitter principle, and resin).

Tonic, Anodyne, and Hypnotic. Dose—2 to 5 grs.

Infusum Lupuli 1 in 20 ($\frac{1}{4}$ hour).

Prepared by infusing hops 1 oz. in boiling water 1 pint.

Dose—1 to 2 ozs.

Tinctura Lupuli 1 in 5.

A red liquid, prepared by macerating hops 4 ozs. with alcohol (60 per cent.) 1 pint. Dose— $\frac{1}{2}$ to 1 dr.

MAGNESIA PONDEROSA (Heavy Magnesia) MgO

(Synonyms—Heavy Calcined Magnesia; Heavy Magnesium Oxide).

A white insoluble powder, prepared by exposing heavy magnesium carbonate to a dull red heat.

Antacid, Laxative, and Antilithic.

Dose—5 to 30 grs. for repeated administration; single dose—30 to 60 grs. May be used in Pulvis Rhei Co.

Magnesia Levis (Light Magnesia) MgO

(Synonyms—Light Calcined Magnesia; Light Magnesium Oxide).

A bulky, white, insoluble powder, identical with the preceding, only lighter, bulk for bulk, in the ratio of $3\frac{1}{2}$ to 1. Prepared by calcining light magnesium carbonate.

Dose—5 to 30 grs. for repeated administration; single dose—30 to 60 grs. In—Pulvis Rhei Compositus.

Magnesii Carbonas Ponderosus ($MgCO_3$), $Mg(HO)_2 \cdot 4H_2O$

(Heavy Magnesium Carbonate).

A white granular powder, prepared by mixing *strong* hot solutions of magnesium sulphate and sodium carbonate, washing and drying the precipitate by a heat not exceeding 212° .

Antacid and Purgative.

Dose—5 to 30 grs. for repeated administration; single dose—30 to 60 grs.

IN—Liq. Magnes. Carb. and Troch. Bismuthi.

Magnesii Carbonas Levis ($MgCO_3$), $Mg(HO)_2 \cdot 4H_2O$

(Light Magnesium Carbonate).

A very light, partially amorphous powder, prepared by mixing *weak* cold solutions of magnesium sulphate and sodium carbonate, boiling, washing the precipitate, and drying by a heat not exceeding 212° .

Dose—5 to 30 grs. for repeated administration; single dose—30 to 60 grs.

Liquor Magnesii Carbonatis 10 grs. in 1 oz.

(Synonym—Fluid Magnesia).

A colourless liquid, prepared by mixing together a solution of magnesium sulphate 2 ozs. in water 10 ozs., heated to boiling point, and a solution of sodium carbonate $2\frac{1}{2}$ ozs. in water 10 ozs., boiling, washing carefully the precipitated magnesium carbonate,

mixing it with distilled water 1 pint, and passing pure carbonic acid gas, at three atmospheres pressure, through till it is dissolved.

Antacid. Dose—1 to 2 ozs. ; $\frac{1}{2}$ dr. for a child 1 year old.

Magnesii Sulphas $\text{MgSO}_4, 7\text{H}_2\text{O}$

(Synonym—Epsom Salt).

In minute, colourless, rhombic prisms, prepared by the interaction of native magnesium carbonates and diluted sulphuric acid ; or by purifying the native sulphate. 3 ozs. dissolve in 4 ozs. water.

Hydragogue Purgative.

Dose—30 to 120 grs. for repeated administration ; $\frac{1}{4}$ to $\frac{1}{2}$ oz. for single dose.

In addition to the following, it enters into Mist. Sennæ Co., 1 in $5\frac{1}{2}$.

Magnesii Sulphas Effervescens 1 in 2.

(Synonym—Effervescent Epsom Salt).

Prepared by drying 50 ozs. magnesium sulphate, and mixing it with 36 ozs. sodium bicarbonate, 19 ozs. tartaric acid, $12\frac{1}{2}$ ozs. citric acid, and $10\frac{1}{2}$ ozs. sugar, all in powder, heating between 200° and 220°F ., and stirring assiduously till the powder becomes granulated. The product should weigh 100 ozs.

Cathartic and Antacid. Dose—60 to 240 grs. for repeated administration ; $\frac{1}{2}$ to 1 oz. for single dose.

MEL DEPURATUM (Clarified Honey).

Honey strained, whilst hot, through wetted flannel.

Enters into Confection of Pepper, and

Mel Boracis (Borax Honey). 1 in $9\frac{1}{2}$

Prepared by rubbing borax 1 oz. with clarified honey 8 ozs., and glycerin $\frac{1}{2}$ oz.

Alterative to diseased mucous surfaces.

Oxymel (Oxymel) 4 in 5.

A thick syrupy liquid, composed of clarified honey (liquefied) 40 ozs., acetic acid 5 ozs., water about 5 ozs. S.G. 1.32.

Expectorant, but chiefly used as a vehicle. Dose—1 to 2 drs.

Oxymel Scillæ (Oxymel of Squill).

Prepared by macerating $2\frac{1}{2}$ ozs. squill in $2\frac{1}{2}$ ozs. acetic acid and 8 ozs. water ; mixing the filtrate (10 ozs.) with 27 fl. ozs. liquefied clarified honey, or q.s. to produce S.G. 1.32.

Expectorant. Dose— $\frac{1}{2}$ to 1 dr.

MENTHÆ PIPERITÆ OLEUM (Oil of Peppermint).

The colourless or pale yellow oil distilled from the fresh flowering herb of *Mentha piperita*.—(Labiatae).

Antispasmodic and Carminative. Dose— $\frac{1}{2}$ to 3 minims.

It enters into Pil. Rhei Co., Tr. Chlorof. et Morph. Co., and

Aqua Menthæ Piperitæ 1 in 1,000. *93 7/10 mint*

A colourless liquid, prepared by mixing oil of peppermint 77 mins. with water $1\frac{1}{2}$ gallons, and distilling 1 gallon.

Dose—1 to 2 ozs. ; 1 dr. for a child 1 year old.

Spiritus Menthæ Piperitæ 1 in 10.

Oil of peppermint 1 oz. and alcohol (90 per cent.) to 10 ozs.

Dose—5 to 20 mins.

☞ This is half the strength of the Essence B.P. '85.

MENTHÆ VIRIDIS OLEUM (Oil of Spearmint).

The colourless or pale-yellow oil distilled from the fresh flowering herb of *Mentha viridis*.—(Labiatae).

Action and dose similar to peppermint.

Aqua Menthæ Viridis 1 in 1,000.

A colourless liquid, obtained by mixing oil of spearmint 77 minims and water $1\frac{1}{2}$ gallons, and distilling 1 gallon.

Dose—1 to 2 ozs. ; 1 dr. for a child 1 year old.

MENTHOL (Menthol) $C_{10}H_{18}O$, CH_3 , C_3H_7 .

A stearoptene in colourless crystals, or in fused crystalline masses, obtained by cooling the oil distilled from the fresh herb of *Mentha arvensis*, vars. *piperascens* et *glabrata*, and of *M. piperita*.

Antiseptic and Antineuralgic.

Dose— $\frac{1}{2}$ to 2 grs. in pill ; or rubbed on the skin as a local Anæsthetic. Sometimes called Peppermint Camphor.

Emplastrum Menthol 1 in 6 $\frac{2}{3}$.

Prepared by melting together 1 oz. yellow beeswax and $7\frac{1}{2}$ ozs. resin, and stirring in $1\frac{1}{2}$ ozs. menthol.

Local Anodyne.

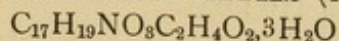
MEZEREI CORTEX (Mezereon Bark)—Thymelaceæ.

The dried bark, in tough brown strips or quilled pieces of various lengths, of *Daphne Mezereum*, of *D. Laureola*, or of *D. Gnidium*. (Active principle—Daphnin.)

Vesicant and Alterative.

Seldom used internally.

Enters into Liq. Sarsæ Co. Conc. 1 in 20.

MORPHINÆ ACETAS (Morphine Acetate).

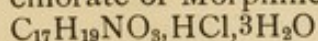
A white soluble powder, prepared by neutralising morphine with acetic acid.

Anodyne and Narcotic. Dose— $\frac{1}{8}$ to $\frac{1}{4}$ gr.

Liquor Morphinæ Acetatis 1 gr. in 110 mins. (1%).

An almost colourless liquid, prepared by dissolving morphine acetate $17\frac{1}{2}$ grs. in distilled water and alcohol (90 per cent.), of each 1 oz., and diluted acetic acid 38 mins., and making up to 4 ozs. with water.

Dose—10 to 60 minims.

Morphinæ Hydrochloridum (Morphine Hydrochloride)—Hydrochlorate of Morphine, B.P., 1885.

The hydrochloride of an alkaloid, in white, fine, silky prisms, obtained from opium.

Action, dose, and strength similar to morphine acetate.

Liquor Morphinæ Hydrochloridi 1 gr. in 110 mins. (1%).

A colourless liquid, prepared by dissolving morphine hydrochloride $17\frac{1}{2}$ grs. in distilled water and alcohol (90 per cent.), of each 1 oz. and diluted hydrochloric acid 38 mins., and adding water q.s. to make 4 ozs.

Dose—10 to 60 minims.

Suppositoria Morphinæ $\frac{1}{4}$ gr. in each.

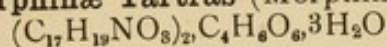
Composed of morphine hydrochloride 3 grs., and oil of theobroma 177 grs., in 12 conical suppositories.

Trochiscus Morphinæ $\frac{1}{38}$ gr. in each.

White lozenges, composed of morphine hydrochloride $\frac{1}{38}$ gr., with tolu basis.

Trochiscus Morphinæ et Ipecacuanhæ $\frac{1}{38}$ and $\frac{1}{12}$ gr.

White lozenges, each composed of morphine hydrochloride $\frac{1}{38}$ gr. and ipecacuanha root $\frac{1}{12}$ gr., with tolu basis.

Tinctura Chloroformi et Morphinæ Composita (See page 213).**Morphinæ Tartras** (Morphine Tartrate)

A white crystalline powder, obtained by combining morphine and tartaric acid in molecular proportions.

Dose— $\frac{1}{8}$ to $\frac{1}{2}$ gr. Acts like the hydrochloride and acetate.

Injectio Morphinæ Hypodermica 5 grs. in 110 mins.

Made by dissolving morphine tartrate 50 grs. in water which has been boiled and cooled, (to produce 1,100 minims. = $3\frac{1}{2}$ $\frac{1}{2}$ M10)

Dose, by subcutaneous injection—2 to 5 minims.

Liquor Morphinæ Tartratis 1 gr. in 110 mins.

A colourless liquid, prepared by dissolving morphine tartrate $17\frac{1}{2}$ grs. in distilled water and alcohol (90 per cent.), of each 1 oz., and making up to 4 ozs. with distilled water.

Action and dose same as hydrochloride and acetate solutions.

MORRHUÆ OLEUM (Cod-Liver Oil).

The pale-yellow oil extracted from the fresh liver of the cod—*Gadus Morrhua*—by a heat not exceeding 180°, and from which solid fat has been separated by filtration at about 23°F.

A Nutritive Tonic. Dose—1 to 4 drs., in emulsion, or in milk.

MOSCHUS (Musk).

The dried secretion from the preputial follicles of *Moschus moschiferus* (the musk deer of Thibet), in small, irregular, reddish-black grains.

Stimulant and Antispasmodic. Dose—5 to 10 grs.

MYRISTICA (Nutmeg)—*Myristicaceæ*.

The oval, furrowed, dried seed of *Myristica fragrans* divested of its testa; the transverse section has a marbled appearance.

Carminative and Narcotic.

In addition to the following, Nutmeg enters into the composition of *Pulv. Catechu Co.*, *Pulv. Cretæ Arom.*, *Spt. Armoraciæ Co.*, and *Tinct. Lavand. Co.*

Oleum Myristicæ (Oil of Nutmeg).

The pale-yellow oil distilled from nutmeg. (It contains Limonene, Pinene and Myristicol).

Dose—½ to 3 minims, on sugar.

Enters into *Pil. Aloes Socot.*, *Spt. Ammon. Aromat.*, *Tinct. Guaiaci Ammon.*, and *Tr. Valer. Ammon.*

Spiritus Myristicæ 1 in 10.

Oil of nutmeg 1 oz. and alcohol (90 per cent.) to 10 ozs. If not clear shake with talc, and filter.

Dose—5 to 20 mins.

Enters into *Mist. Ferri Comp.*

MYRRHA (Myrrh)—*Amyridaceæ*.

A gum-resinous exudation, in irregular brownish-yellow or red tears or masses, from the stem of *Balsamodendron Myrrha*, and probably other species. (Contains a Volatile Oil, Myrrhol, Myrrhin and a Gum.

Emmenagogue and Expectorant. It increases phagocytosis.

Enters into *Dec. Aloes Co.*, *Mist. Ferri Co.*, *Pil. Aloes et Myrrhæ*, *Pil. Galbani Co.*, and *Pil. Rhei Co.*

Tinctura Myrrhæ 1 in 5.

A pale-brown liquid, prepared by macerating myrrh 4 ozs. with alcohol (90 per cent.) to 1 pint.

Dose—½ to 1 dr., in sherry, or in emulsion.

NAPHTHOL (Beta-naphthol) $C_{10}H_7OH$

Beta-naphthol or beta-mono-hydroxy-naphthalene, occurring as a sparingly soluble, white crystalline solid, is usually prepared from naphthalene-sulphonic acid.

Intestinal Disinfectant and Stimulating Application in scaly skin affections.

Dose—3 to 10 grs.

NUX VOMICA (Nux Vomica)—Loganiaceæ.

The dried, ripe, circular, button-shaped seeds, about 1 inch in diameter, covered with short, satiny hairs, of *Strychnos Nuxvomica*.

Tonic, and Stimulant to the Spinal Cord.

Active principles—Strychnine and Brucine.

Dose—1 to 4 grs., in powder.

Extractum Nucis Vomiceæ Liquidum 1½ grs. Strychnine in 110 mins.

A brown liquid, obtained by exhausting powdered nux vomica by percolation with alcohol (70 per cent.). The first portion of percolate is reserved, and in this the soft extract obtained by evaporating the remainder is dissolved. The percentage of strychnine in the solution is estimated, and enough alcohol (70 per cent.) is added to make the resulting liquid extract contain 1½ gr. of the alkaloid—Strychnine—in 110 mins.

Dose—1 to 3 minims.

Extractum Nucis Vomiceæ 5 per cent. Strychnine.

A brown extract, prepared by evaporating 10 ozs. of the liquid extract to 3 ozs., an estimated amount of milk sugar having been previously added so as to make the firm extract contain 5 per cent. of the alkaloid.

Dose—¼ to 1 gr.

Tinctura Nucis Vomiceæ ¼ gr. Strychnine in 110 mins.

A sherry-coloured liquid, prepared by mixing 2 ozs. liquid extract of nux vomica, 3 ozs. water, and alcohol (90 per cent.) q.s. to make 12 ozs. It contains about ¼ gr. Strychnine in 1 dr.

Dose—5 to 15 minims.

OLIVÆ OLEUM (Olive Oil)—Oleaceæ.

The yellow oil expressed from the ripe fruit of *Olea Europæa*.

Dose—2 drs. to 1 oz. as a Laxative.

IN—4 plasters, 4 ointments, and 3 liniments.

OPIUM (Opium)—Papaveraceæ.

The juice inspissated by spontaneous evaporation obtained by incision, from the unripe capsules of the poppy, *Papaver somniferum*, in irregular lumps of from ½ to 2 lbs.; when fresh, tearing with an irregular, moist, brown surface; 100 grs. of the dry powder should yield about 10 grs. anhydrous morphine; but any opium is officially permitted as a source of alkaloids, and of tincture and extract of opium which are standardised.

Active principles—Morphine, Codeine, Narcotine, Thebaine, and Papaverine. Contains 13 other alkaloids. Anodyne and Narcotic. Dose— $\frac{1}{2}$ to 2 grs.

Pulvis Opii Opium in powder (of a rich brown colour).

☞ Although it is not recognised under a separate heading, it is inserted here to remind the student that opium cannot be powdered until it is first thoroughly dried, and that in drying it loses water, and in grinding there is a further loss of inert woody fibrous impurities, and the powder is stronger than the fresh opium by about $\frac{1}{8}$, 7 grains being equal to 8 of opium.

Emplastrum Opii 1 in 10.

A hard brown solid, prepared by heating resin plaster 9 ozs., and adding, by degrees, powdered opium 1 oz.

Extractum Opii 1 from 2. (20 per cent. Morphine.)

A dark-brown, tough extract, prepared by evaporating a cold infusion of 1 lb. opium, till the product weighs $\frac{1}{2}$ lb.

Dose— $\frac{1}{4}$ to 1 gr. It is much stronger than powdered opium, and is said to be less stimulating.

Extractum Opii Liquidum $\frac{3}{4}$ gr. morphine in 110 mins.

A dark-brown liquid, consisting of extract of opium $\frac{3}{4}$ oz., dissolved in distilled water 16 ozs., and alcohol (90 per cent.) 4 ozs.

Dose—5 to 30 mins.

☞ Though considerably weaker, this is regarded as the representative of Battley's Sedative Liquor.

Linimentum Opii 1 in 2.

An almost black liquid, consisting of equal parts laudanum and soap liniment.

Pilula Ipecacuanhæ cum Scilla 1 in 20, or 5 per cent. opium.

A brown mass, composed of Dover's powder 3 ozs., squill 1 oz., ammoniacum 1 oz., syrup of glucose q.s., beaten together.

Narcotic and Expectorant. Dose—4 to 8 grs.

Pilula Plumbi cum Opio 1 in 8, or 12 $\frac{1}{2}$ per cent. opium.

A brownish-black mass, composed of acetate of lead 36 grs., opium in powder 6 grs., and syrup of glucose 4 grs.

Astringent as well as Narcotic. (Should be made fresh.)

Dose—2 to 4 grs.

Pilula Saponis Composita 1 in 5, or 20 per cent. opium.

A light-brown mass, composed of opium in powder $\frac{1}{2}$ oz., hard soap 1 $\frac{1}{2}$ ozs., syrup of glucose $\frac{1}{2}$ oz. beaten together.

Dose—2 to 4 grs. The name Pil. Saponis Co. is used to disguise its composition.

Pulvis Cretæ Aromaticus cum Opio 1 in 40, or $2\frac{1}{2}$ per cent. opium.

A pale-brown powder, composed of opium $\frac{1}{4}$ oz., aromatic chalk powder $9\frac{3}{4}$ ozs.

Carminative and Anodyne ; well adapted for children.

Dose—10 to 40 grs. ; for a child 1 year old, $\frac{1}{2}$ to 1 gr.

Pulvis Ipecacuanhæ Compositus 1 in 10. 10 per cent. opium.
(Synonym—Dover's Powder).

A fawn-coloured powder, composed of ipecacuanha and opium of each $\frac{1}{2}$ oz., sulphate of potassium 4 ozs.

Diaphoretic and Anodyne. Dose—5 to 15 grs.

IN—Pilula Ipecacuanhæ cum Scilla.

Pulvis Kino Compositus 1 in 20. 5 per cent. opium.

A dark-red powder, composed of kino $3\frac{3}{4}$ ozs., opium $\frac{1}{4}$ oz. cinnamon 1 oz.

Astringent and Narcotic. Dose—5 to 20 grs.

Pulvis Opii Compositus 1 in 10. 10 per cent.

A brown powder, composed of opium $1\frac{1}{2}$ ozs., black pepper 2 ozs., ginger 5 ozs., caraway 6 ozs., tragacanth $\frac{1}{2}$ oz.

Carminative and Narcotic. Dose—2 to 10 grs.

Suppositoria Plumbi Composita 1 gr. of opium in each.

Composed of acetate of lead 3 grs., opium 1 gr., oil of theobroma 11 grs. in each.

Tinctura Camphoræ Composita $\frac{1}{4}$ gr. opium in 1 dr.

(Synonyms—Paregoric ; Paregoric Elixir).¹

A sherry-coloured liquid, composed of tincture of opium 585 mins., benzoic acid 40 grs., camphor 30 grs., oil of anise 30 mins., alcohol (60 per cent.) q.s. to make 1 pint.

Anodyne, Expectorant, and Stimulant.

Dose— $\frac{1}{2}$ to 1 dr. ; for a child 1 year old, 4 minims. This is the only safe liquid preparation of opium for infants.

Tinctura Opii 75 per cent. morphine, or 1 gr. opium in 15 mins.

(Synonym—Laudanum).

A dark reddish-brown liquid, prepared by infusing 3 ozs. opium in 10 ozs. water at 200°F. for 6 hours, adding 10 ozs. alcohol (90 per cent.), macerating for 24 hours, straining, and filtering after 24 hours. The percentage of morphine is calculated, and alcohol (90 per cent.) and water in equal parts are added to make the tincture contain 75 per cent.

Narcotic and Anodyne. Dose—5 to 15 mins. for repeated administration ; 20 to 30 mins. for single dose.

IN—Linimentum Opii, Tinct. Camph. Co., and

Tinctura Opii Ammoniata About $\frac{3}{8}$ gr. opium in 1 dr.

A dark-brown liquid, prepared by mixing tincture of opium 3 ozs., benzoic acid 180 grs., oil of anise 1 dr., solution of ammonia 4 ozs., and alcohol (90 per cent.) to 1 pint. Commonly known as Scotch Paregoric.

Anodyne and Expectorant. Dose— $\frac{1}{2}$ to 1 dr., freely diluted.

Unguentum Gallæ cum Opio $7\frac{1}{2}$ per cent. opium.

A brown ointment, prepared by rubbing up powdered opium 75 grs., with ointment of galls 925 grs.

A soothing Anodyne to painful hæmorrhoids.

The following preparations contain Opium, but under another name:—

<i>Pilula Ipecacuanhæ cum Scilla</i> ;	<i>Pulvis Kino Co.</i> ;
<i>Pilula Plumbi cum Opio</i> ;	<i>Suppositoria Plumbi Composita</i> ;
<i>Pilula Saponis Co.</i> ;	<i>Tinct. Camphoræ Co.</i> ;
<i>Pulvis Cretæ Aromat. cum Opio</i> ;	<i>Ungt. Gallæ cum Opio.</i>
<i>Pulvis Ipecacuanhæ Co.</i> ;	

OXYMEL and OXYMEL SCILLÆ (See under Mel and Scilla).

PANCREATIS LIQUOR (Pancreatic Solution).

A liquid, containing the digestive principles of the fresh pancreas of the pig; obtained by digesting in 20 ozs. of alcohol (20 per cent.) for 7 days 5 ozs. pancreas which has been freed from fat, and finely divided by aid of fine sand or powdered pumice stone. The preparation is most active when the animal has been fed shortly before being killed.

Used as a peptonising agent.

PAPAVERIS CAPSULÆ (Poppy Capsules)—*Papaveraceæ*.

The large, globular, crowned, dried, nearly ripe fruits of the white poppy, *Papaver somniferum*.

Anodyne and Narcotic, resembling opium.

PARAFFINUM DURUM (Hard Paraffin).

A colourless, translucent, waxy-looking substance, melting between 130° and 135°F. , being a mixture of several of the harder members of the paraffin series of hydrocarbons; obtained by distillation from shale, and purified after separation of the liquid oils by refrigeration.

Used as a basis for ointments, into 3 of which it enters.

PARAFFINUM LIQUIDUM (Liquid Paraffin).

A clear, colourless, odourless, non-fluorescent, oily liquid obtained from petroleum, after the more volatile portions have been removed by distillation.

Alterative and Sedative to inflamed mucous membranes.

PARAFFINUM MOLLE (Soft Paraffin).

A white or yellow, translucent, semi-solid mixture, containing soft members of the paraffin series of hydrocarbons; usually obtained by purifying the less volatile portions of petroleum. It is commonly known as Vaseline.

Emollient and Protective. Enters into 6 ointments.

Unguentum Paraffinum (Paraffin Ointment).

Obtained by melting together hard paraffin 3 ozs., and soft paraffin (white or yellow) 7 ozs.

Used as a basis for 11 ointments.

PARALDEHYDUM (Paraldehyde) $C_6H_{12}O_3$

A colourless liquid with a disagreeable ethereal odour and burning taste, being the product of the polymerisation of aldehyde by various acids and salts.

A true Hypnotic. Dose— $\frac{1}{2}$ to 2 drs.

PAIREIRÆ RADIX (Pareira Root)—Menispermaceæ.

The dried root of *Chondrodendron tomentosum*, in long, nearly cylindrical pieces, more or less twisted, from $\frac{3}{4}$ to 3 inches thick, showing on cross section medullary rays and concentric rings.

Active principle—Pelosine, which is identical with berberine and buxine.

Diurètic, and Anodyne to the mucous lining of the bladder.

Extractum Pareiræ Liquidum 25 per cent. of extractives.

A black liquid, prepared by exhausting, by maceration and percolation, pareira root with *boiling* water, evaporating till it contains $\frac{1}{3}$ of its weight of extractive matter, and adding alcohol (90 per cent.) so as to produce from 3 volumes of the evaporated liquid 4 volumes of liquid extract.

Dose— $\frac{1}{2}$ to 2 drs.

PEPSINUM (Pepsin).

A light, yellowish-brown enzyme, obtained from the mucous membrane of the fresh and healthy stomach of the pig, sheep, or calf. Should dissolve 2,500 times its weight of hard boiled white of egg.

Digestive. Dose—5 to 10 grs.

Glycerinum Pepsini (Glycerin of Pepsin). 5 grs. in 1 dr.

A clear liquid, obtained by macerating for a week, pepsin 800 grs., in a mixture of hydrochloric acid 110 mins., glycerin 12 ozs., and water 6 ozs., filtering, and adding water to produce 1 pint.

Dose—1 to 2 drs.

PHENACETINUM (Phenacetin) $C_2H_5O, C_6H_4, NHCOCH_3$

(Para-acet-phenetidin).

Colourless, tasteless, inodorous scaly crystals, produced by the

action of glacial acetic acid on para-phenetidin, a body obtained from para-nitro-phenol.

Antipyretic and Analgesic. Dose—5 to 10 grs.

PHENAZONUM (Phenazone).

(Phenyl-dimethyl-iso-pyrazolone) $C_6H_5(CH_3)_2C_8HN_2O$

Colourless, inodorous, bitter scaly crystals, very soluble in water; obtainable from phenyl-hydrazine by interaction with aceto-acetic ether, and the subsequent interaction of the resulting phenyl-methyl-iso-pyrazolone with methyl iodide. Commonly known as Antipyrine.

Antipyretic and Analgesic. Dose—5 to 20 grs.

PHOSPHORUS (Phosphorus) P

A semi-transparent, wax-like, solid, non-metallic element, obtained from calcium phosphate.

Tonic and Restorative.

Dose, in pill or solution— $\frac{1}{100}$ to $\frac{1}{20}$ gr.

Used in preparing Concentrated Phosphoric Acid.

Oleum Phosphoratum 1 per cent.

A clear, straw-coloured oil, phosphorescent in the dark, prepared by heating almond oil to 300° , filtering when cold, and dissolving 1 part by weight of dry phosphorus in 99 parts by weight of the oil, at a temperature of 180° .

Dose—1 to 5 minims—i.e., $\frac{1}{100}$ to $\frac{1}{20}$ gr. of phosphorus.

Pilula Phosphori 1 in 50.

Prepared by dissolving 10 grs. phosphorus in 33 mins. bisulphide of carbon, and carefully mixing with a melted mixture of 125 grs. each white beeswax and lard, cooled to the consistence of cream, adding 115 grs. kaolin and mixing till thoroughly incorporated. The mass should be kept immersed in cold water in a dark place, and 1 gr. gum acacia added to every 3 grs. of mass immediately before dispensing.

Dose—1 to 2 grs.—i.e., $\frac{1}{30}$ to $\frac{1}{15}$ gr. of phosphorus.

PHYSOSTIGMATIS SEMINA (Calabar Bean)—Leguminosæ.

The large kidney-shaped, brown, dried, ripe seed, with a furrow along its convex margin, of *Physostigma venenosum*.

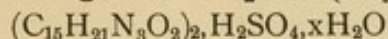
Active principle—Physostigmine (also contains calabarine and eseridine).

Local Myotic. Internally—Spinal Sedative.

Extractum Physostigmatis

A dark-brown firm extract, prepared by evaporating a strong tincture of Calabar bean made with alcohol (90 per cent.) to the consistence of a very soft extract, and mixing with 3 times its weight of milk sugar.

Dose— $\frac{1}{4}$ to 1 gr., in pill.

Physostigminæ Sulphas (Physostigmine Sulphate).

(Synonym—Eserine Sulphate).

The sulphate of an alkaloid, in pinkish or colourless crystals, obtained from Calabar bean.

A Myotic or pupil contractor. Dose— $\frac{1}{80}$ to $\frac{1}{20}$ gr.

Lamellæ Physostigminæ (Discs of Physostigmine).

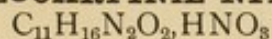
Discs of gelatin, with some glycerin, each weighing about $\frac{1}{30}$ gr., and containing $\frac{1}{1000}$ gr. physostigmine sulphate.

Used to cause contraction of the pupil.

PICROTOXINUM (Picrotoxin)—Menispermaceæ.

A neutral principle in colourless, inodorous, prismatic, bitter crystals, obtained from the seeds of *Anamirta paniculata*.

Anhidrotic. Dose— $\frac{1}{100}$ to $\frac{1}{25}$ gr.

PILOCARPINÆ NITRAS (Pilocarpine Nitrate)

The nitrate of an alkaloid, obtained from jaborandi leaves. In minute acicular crystals, or as a white powder.

Diaphoretic, Sialagogue, Expectorant. Dose— $\frac{1}{20}$ to $\frac{1}{2}$ gr.

PIMENTA (Pimento)—Myrtaceæ.

The small, round, rough, brown, dried, full-grown, unripe berries of the allspice tree—*Pimenta officinalis*.

Stimulant and Carminative.

Aqua Pimentæ 8 ozs. to 1 gallon.

A brownish unstable preparation, obtained by mixing pimento 8 ozs. with water 2 gallons, and distilling off 1 gallon.

Carminative. Dose—1 to 2 ozs.

Oleum Pimentæ

An oil (yellowish or yellowish-red when prepared, but soon becoming darker) distilled from pimento or allspice. *It sinks in water*, and consists chiefly of Eugenol.

Dose— $\frac{1}{2}$ to 3 minims, in pill, or on sugar, or in an emulsion.

PINI OLEUM (Oil of Pine)—Coniferæ.

The nearly colourless oil, with aromatic odour, distilled from the fresh leaves of *Pinus Pumilio*.

Rubefacient and Astringent like turpentine.

PIPER NIGRUM (Black Pepper)—Piperaceæ.

The small, round, wrinkled, brownish-black, dried, unripe fruit of *Piper nigrum*. (It contains a volatile oil, a resin, and an alkaloid—Piperidine.)

Carminative and Diuretic.

It enters into Pulv. Opii Co., and the following :—

Confectio Piperis 1 in 10.

An almost black paste, prepared by mixing black pepper 2 ozs., caraway fruit 3 ozs., with clarified honey 15 ozs. Resembles and is sometimes called Ward's paste, and is in repute as an internal remedy for hæmorrhoids.

Dose—60 to 120 grs.

PIX BURGUNDICA (Burgundy Pitch)—From Coniferæ.

A hard, brittle, yellow solid, being a resinous exudation from the stem of *Picea excelsa*, melted and strained. Seldom used except to impart solidity and rubefacient qualities to plasters.

Emplastrum Picis (Pitch Plaster) 1 in 2.

A yellow solid, composed of Burgundy pitch 26 ozs., frankincense 13 ozs., resin and yellow beeswax of each $4\frac{1}{2}$ ozs., olive oil and water of each 2 ozs., melted, and evaporated with constant stirring.

A Rubefacient and Stimulating Plaster.

PIX CARBONIS PRÆPARATA (Prepared Coal Tar).

Obtained by placing commercial coal tar in a shallow vessel, and maintaining it at a temperature of 120°F. for one hour, stirring frequently.

A Stimulating Application.

Liquor Picis Carbonis (Solution of Coal Tar) 1 in 6.

A dark brown transparent liquid, made by digesting at 120°F. for 2 days 4 ozs. prepared coal tar in 1 pint of a tincture of quillaia, obtained by percolating 2 ozs. quillaia bark with alcohol (90 per cent.) to make 1 pint.

PIX LIQUIDA (Tar)—From Coniferæ.

A blackish, viscid, bituminous liquid, obtained by destructive distillation from the wood of *Pinus sylvestris* and other pines. Known as Stockholm Tar.

Expectorant. A Stimulating Application (when diluted with wax, &c.) to chronic scaly skin affections.

Unguentum Picis Liquidæ 5 in 7.

A black ointment, prepared by melting yellow beeswax 2 ozs., and adding tar 5 ozs., and stirring whilst the mixture cools.

PLUMBI ACETAS (Lead Acetate) $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2, 3\text{H}_2\text{O}$

In white, crystalline, slightly efflorescent masses, obtained by dissolving lead oxide or lead carbonate in acetic acid. Known as "Sugar of lead."

Sedative and Astringent. Used in internal hæmorrhages.

Dose—1 to 5 grs., in solution or in pill.

As this salt forms insoluble precipitates, it should not be ordered with iodides, sulphates, or tannates.

Glycerinum Plumbi Subacetatis (Glycerin of Lead Subacetate)
1 in 6 by weight.

Prepared by boiling, filtering, and evaporating to $32\frac{3}{4}$ ozs. by weight, 5 ozs. lead acetate, $3\frac{1}{2}$ ozs. lead oxide, 20 ozs. glycerin, and 12 ozs. water.

Astringent and Local Sedative.

Unguentum Glycerini Plumbi Subacetatis

See table on page 259.

Pilula Plumbi cum Opio 3 of lead and $\frac{1}{2}$ of opium in 4.

Prepared by beating into a mass, lead acetate 36 grs., opium 6 grs., syrup of glucose 4 grs.

Sedative, Narcotic, and Astringent. Dose—2 to 4 grs.

Suppositoria Plumbi Composita 3 grs. in each.

Prepared by mixing lead acetate 36 grs., opium 12 grs., oil of theobroma 132 grs., and dividing into 12 cones.

Anodyne and Astringent. Each contains 1 gr. of opium.

Unguentum Plumbi Acetatis (See table on next page.)

Liquor Plumbi Subacetatis Fortis (Strong Solution of Lead Subacetate) 24 per cent. of $Pb_2O(C_2H_3O_2)_2$

(Synonym—Goulard's Extract.)

A colourless solution, becoming turbid on exposure to air, of lead subacetate in water, prepared by boiling lead acetate 5 ozs. with lead oxide $3\frac{1}{2}$ ozs. in distilled water q.s. to make 1 pint.

Powerfully Astringent, but only used diluted.

Liquor Plumbi Subacetatis Dilutus (Diluted Solution of Lead Subacetate) 2 drs. in 1 pint. (*Local Lotion*)

(Synonyms—Goulard's Lotion; Goulard Water.)

A colourless liquid, prepared by mixing strong solution of lead subacetate and alcohol (90 per cent.), of each 2 drs., with distilled water $19\frac{1}{2}$ ozs.

An Astringent and Local Sedative.

Plumbi Carbonas $2PbCO_3 \& Pb(HO)_2$

A soft, heavy, white powder, known as "White lead," prepared by interaction of lead, water, and carbonic anhydride in the presence of vapours of acetic acid. Not used internally; externally, mildly Astringent.

Unguentum Plumbi Carbonatis (See table on next page.)

Plumbi Iodidum PbI_2

A bright yellow powder, prepared by interaction of lead nitrate or acetate and potassium iodide.

Resolvent and Antiparasitic.

Emplastrum Plumbi Iodidi 1 in 10.

A bright yellow solid, composed of lead iodide 2 ozs., lead plaster 1 lb., and resin 2 ozs.

Alterative and Resolvent to chronic enlargements.

Unguentum Plumbi Iodidi (See table below.)

Plumbi Oxidum PbO (Synonym—Litharge).

In heavy, yellowish-red or brick-red scales, obtained by the action of air on melted lead.

Used in making Liq. Plumbi Subacetatis Fortis, Plumbi Acetas, Glycerinum Plumbi Subacetatis, and the following :—

Emplastrum Plumbi (Lead Plaster).

A pale-yellow solid, consisting of oleate, palmitate, and stearate of lead, and a little glycerin ; it is, chemically speaking, a *soap*. It is prepared by boiling in a steam-bath lead oxide 1 lb., olive oil 2 lbs., and water 16 ozs., for 4 or 5 hours, till a proper consistence is obtained. Known as Diachylon or Litharge Plaster.

A supporting Sedative and Protective application.

It enters into 9 plasters either as lead or resin plaster.

Of the 12 official plasters, 9 contain lead. The exceptions are—E. Ammon. c. Hydrarg., E. Picis, and E. Menthol.

The following 4 plasters are often grouped together as the "Lead Plasters"—Plumbi, Plumbi Iodidi, Resinæ, and Saponis.

The lead is in the form of oleate, palmitate, and stearate, but chiefly as oleate.

OINTMENTS OF LEAD.

UNGUENTUM.	COMPOSITION.	COLOUR AND STRENGTH.
Plumbi Acetatis .. $Pb(C_2H_3O_2)_2 \cdot 3H_2O$.	Acetate in fine powder 20 grs., paraffin ointment (white) 480 grs.	White, 1 in 25.
Plumbi Carbonatis .. $2PbCO_3$ & $Pb(HO)_2$.	Carbonate in fine powder $\frac{1}{2}$ oz., paraffin ointment (white) $2\frac{1}{2}$ ozs.	Cream, 1 in 10.
Plumbi Iodidi PbI_2 .	Iodide in fine powder $\frac{1}{2}$ oz., paraffin ointment (yellow) $2\frac{1}{2}$ ozs.	Yellow, 1 in 10.
Glycerini Plumbi Subacetatis $Pb_2O(C_2H_3O_2)_2$.	Glycerin of subacetate 1 oz., paraffin ointment (white) 5 ozs.	White, 1 in 6.

PODOPHYLLI RHIZOMA (Podophyllum Rhizome)—Ranunculaceæ.

(Synonym—Podophyllum Root).

The brown, wrinkled and knotted, dry rhizome and roots of Podophyllum peltatum. It is also known as Mayapple or Mandrake.

Hydragogue Cathartic and Hepatic Stimulant. Dose—10 to 20 grs.

Its active principle is :—

Podophylli Resina (Podophyllum Resin).

A pale greenish-brown powder, prepared by pouring a concentrated alcoholic tincture of podophyllum rhizome into water, when the resin is precipitated; it is afterwards washed and dried. It is commonly called Podophyllin.

Dose— $\frac{1}{4}$ to 1 gr. in pill; generally combined with aloes, &c.

Tinctura Podophylli 2 grs. in 1 dr.

Prepared by dissolving 320 grs. podophyllum resin in alcohol (90 per cent.) to 1 pint.

Dose—5 to 15 minims.

POTASSA CAUSTICA (Potassium Hydroxide) KHO

(Synonyms—Caustic Potash; Potassium Hydrate).

Hydrate of Potassium, B.P., 1885.

In hard, white, deliquescent pencils or cakes, containing not more than 10 per cent. of combined water and impurities; prepared by interaction of potassium carbonate with calcium hydroxide. Soluble in $\frac{1}{2}$ its weight of water.

Acts as a powerful Caustic.

Is contained in Liquor Potassæ, and is used in making the Permanganate.

Liquor Potassæ 27 grs. Caustic Potash in 1 oz.

A colourless aqueous solution, containing in 110 minims 6·22 grs., or in 1 oz. 27 grs., of potassium hydroxide.

Antacid. Dose—10 to 30 minims, freely diluted.

Used in making the Bromide and Iodide of Potassium.

Potassa Sulphurata (Sulphurated Potash).

(Synonym—Liver of Sulphur).

A mixture of salts of potassium, of which the chief are potassium sulphides, in dark-green or liver-coloured, hard, flat fragments, prepared by fusing together potassium carbonate and sublimed sulphur.

Antiparasitic and Narcotic. Only used externally.

Potassii Acetas CH₃COOK

White, foliaceous, satiny, deliquescent masses, or granular particles, prepared by neutralising potassium carbonate with acetic acid, and fusing. Soluble in $\frac{1}{2}$ its weight of water.

Diuretic and mildly Cathartic.

Dose—10 to 60 grs.; 1 to 3 grs. for a child 1 year old.

Potassii Bicarbonas KHCO₃

(Synonym—Potassium Hydrogen Carbonate).

Colourless, prismatic crystals, obtained by saturating a strong aqueous solution of potassium carbonate with carbonic anhydride. Soluble in four times its weight of water.

Antacid, Sedative, Diuretic, and Antilithic.

Dose—5 to 30 grs., in solution. 20 grs. are neutralised by 14 grs. citric or 15 grs. tartaric acid.

Potassii Bichromas (Potassium Bichromate) K_2CrO_4, CrO_3

(Synonyms—Red Chromate of Potassium ; Potassium Dichromate.)

In large, orange-red, transparent, triclinic crystals, obtained by roasting chrome ironstone with lime in presence of air, and treating the resulting chromate with a potassium salt, and subsequently with an acid.

Used in preparing Acid. Chromic.

Dose— $\frac{1}{10}$ to $\frac{1}{5}$ gr.

Potassii Bromidum KBr

Colourless, cubical crystals, obtained by adding bromine to a strong solution of potassium hydroxide, which forms a solution of bromide and bromate of potassium. This is evaporated to dryness, and the residue fused with charcoal, which converts the bromate into bromide ; the product is purified by crystallization.

Hypnotic, and Sedative to the nervous system and the larynx.

Dose—5 to 30 grs., in solution. Soluble—1 in 2 of water.

Potassii Carbonas K_2CO_3 with either 1 or 2 molecules of water of crystallization. (Synonym—Salt of Tartar.)

A white, crystalline, deliquescent powder, obtained from the ashes of wood, or by the interaction of crude potassium sulphate and crude calcium carbonate and carbon. It is soluble in an equal weight of water.

Action similar to the Bicarbonate.

Dose—5 to 20 grs.

It is used in the preparation of Decoct. Aloes Co., Liquor Arsenicalis, Potassa Caustica, Mist. Ferri Co., Potassa Sulphurata, Potassii Acetas, Potassii Bicarbonas, Potassii Citras, and Potassii Tartras.

Potassii Chloras $KClO_3$

In colourless crystals, prepared by passing chlorine into water holding lime or magnesia in suspension and treating the clarified liquid with potassium chloride, and crystallizing. Soluble in 16 parts of water.

Diuretic, and Alterative to diseased mucous surfaces.

Dose—5 to 15 grs., in solution.

It is used in the preparation of Potassii Permanganas, and

Trochiscus Potassii Chloratis 3 grs. in each.

A white lozenge, consisting of chlorate of potassium 3 grs., with rose basis.

Dose—1 to 6 lozenges.

Potassii Citras $C_3H_4OH, (COOK)_3$

A white, deliquescent powder, prepared by neutralising a solution of citric acid with potassium carbonate.

A pleasant Refrigerant, Diaphoretic, and mild Laxative.

Dose—10 to 40 grs. in water (in which it is very soluble).

Potassii Iodidum KI

Colourless, cubical crystals, prepared like the bromide, using iodine instead of bromine.

Alterative and Resolvent in syphilis and scrofula.

Dose—5 to 20 grs., in pill or solution. Soluble in less than its own weight of water.

The following preparations contain this salt in the following quantities per 1 oz. :—

Lin. Pot. Iod. cum Sapone 49 grs.
Liquor Iodi Fortis 26½ grs. nearly.
Tinctura Iodi 10 grs. nearly.

Unguent. Iodi 17½ grs.
Unguent. Potassii Iod. 43½ grs.

Linimentum Potassii Iodidi cum Sapone 1 in 10 by W.

A cream-like substance, prepared by dissolving 2 ozs. curd soap in 1 oz. glycerin and 10 ozs. water on a water bath, and triturating the solution with 1½ ozs. potassium iodide and adding 1 dr. oil of lemon.

Alterative and Resolvent, and does not stain the skin.

Unguentum Potassii Iodidi 1 in 10.

A white ointment, prepared by dissolving potassium iodide 50 grs. and potassium carbonate 3 grs. in distilled water 47 grs., and adding benzoated lard 400 grs.

Acts like the liniment.

Potassii Nitras KNO_3 (Synonyms—Nitre ; Saltpetre.)

In long, striated, prismatic crystals, or white crystalline masses, obtained by purifying the crude native nitre, or by the interaction of sodium nitrate and potassium chloride. Soluble 1 in 4 of water.

Diuretic and Diaphoretic. Dose—5 to 20 grs. in solution.

IN—Argenti Nitras Induratus and Argenti Nitras Mitigatus.

Potassii Permanganas $\text{K}_2\text{Mn}_2\text{O}_8$

Dark-purple, slender, prismatic crystals, prepared by interaction of potassium chlorate, potassium hydroxide, and manganese dioxide.

Antiseptic, Deodorant, and Emmenagogue.

Dose—1 to 3 grs.

As it destroys all organic substances and decomposes most inorganic, it should be given only in water or pill.

Liquor Potassii Permanganatis 1 gr. in 110 minims. (1 per cent.)

A deep-purple liquid, half the strength of Condy's fluid, prepared by dissolving potassium permanganate 87½ grs. in distilled water to 20 ozs.

Dose—2 to 4 drs., in distilled water.

Potassii Sulphas K_2SO_4

In colourless, very hard, rhombic prisms, terminated by six-sided pyramids. May be obtained by purifying the crude native salt, or by the interaction of sulphuric acid and potassium chloride or certain other potassium salts.

A mild Cathartic. Dose—10 to 40 grs.

IN—Pil. Colocynth. Co. and Pulv. Ipecac. Co., and their compounds.

Potassii Tartras $(CHOH)_2(COOK)_2H_2O$

Small, colourless, prismatic crystals, prepared from cream of tartar by neutralising it with potassium carbonate.

Hydragogue Cathartic and Diuretic. Dose—30 to 240 grs.

Potassii Tartras Acidus $(CHOH)_2COOH COOK$

(Synonyms—Bitartrate of Potassium; Purified Cream of Tartar).

A gritty, white powder, or fragments of cakes crystallised on one surface, obtained from the crude cream of tartar, which is deposited during the fermentation of grape juice and from the lees of wine.

A Hydragogue Cathartic and Diuretic.

Dose—20 to 60 grs. As a purgative, $\frac{1}{4}$ to $\frac{1}{2}$ oz. (1 pint of water only dissolves about 50 grs.) It is elegantly administered with twice its bulk of orange marmalade.

Used in preparing Tartaric Acid, Tartar Emetic, Confection and Lozenge of Sulphur, Compound Jalap Powder, Tartarated Iron, Potassium Tartrate, and Sodium Potassium Tartrate.

PRUNI VIRGINIANÆ CORTEX (Virginian Prune Bark)—
Rosaceæ.

The bark in irregular or incurved pieces of *Prunus serotina*, collected in autumn. Outer surface rough and brown; inner surface fissured. Contains Amygdalin and Emulsin which form HCN.

A Nerve Sedative and Tonic.

Syrupus Pruni Virginianæ 3 in 20.

Made by macerating and percolating 3 ozs. Virginian prune bark in No. 20 powder with water, collecting 9 ozs. of percolate, and dissolving in it, without heat, 15 ozs. sugar, and adding $1\frac{1}{4}$ oz. glycerin and water q.s. to make 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

Tinctura Pruni Virginianæ 1 in 5.

Prepared by macerating 4 ozs. Virginian prune bark in No. 20 powder in $7\frac{1}{2}$ ozs. distilled water for 24 hours, then continuing the maceration with $12\frac{1}{2}$ ozs. alcohol (90 per cent.)

Dose— $\frac{1}{2}$ to 1 dr.

PRUNUM (Prunes)—Rosaceæ.

The oblong, black, shrivelled, dried, ripe fruit of *Prunus domestica* *var.* *Juliana*.

A mild Laxative, entering into *Confectio Sennæ*.

PTEROCARPI LIGNUM (Red Sanders Wood)—Leguminosæ.

(Synonym—Red Sandal Wood).

Dense, heavy, dark reddish-brown billets (raspings or chips) of the heart-wood of *Pterocarpus santalinus*. The powder is blood-red.

Used only for colouring *Tinct. Lavandulæ Co.*

PYRETHRI RADIX (Pyrethrum Root)—Compositæ.

The dried root of *Anacyclus Pyrethrum*, in unbranched pieces about the size of the little finger, with brown bark studded with black points. Easily recognised by the prickling sensation when chewed. Known as Pellitory Root.

Powerful Sialagogue, greatly increasing the flow of saliva.

Active principles—Pyrethrine, Resin, and Volatile Oil.

Tinctura Pyrethri 1 in 5.

A dark, sherry-coloured liquid, prepared by percolating pyrethrum root 4 ozs. with alcohol (70 per cent.) to 1 pint.

Used locally to promote the flow of saliva.

PYROXYLINUM (Pyroxylin).

Resembling cotton wool in appearance, and prepared by mixing sulphuric and nitric acids, 5 ozs. each, and immersing cotton 1 oz. in the mixture for 3 minutes, transferring it to a vessel of water, in which it is to be thoroughly washed, and drying on a water-bath. Commonly called Gun-cotton.

Enters into *Collodium*, *Collodium Flexile*, and *Collodium Vesicans*.

QUASSIÆ LIGNUM (Quassia Wood)—Simarubaceæ.

The yellowish-white shavings, chips, or raspings, or large dense billets of *Picræna excelsa*.

Bitter Tonic without astringency; and, as it contains no tannin, it can be ordered with iron preparations.

Active principle—Quassin.

Infusum Quassiæ 88 grs. to 1 pint—cold ($\frac{1}{4}$ hour).

Prepared by infusing quassia wood, finely rasped, 88 grs. in cold distilled water 1 pint.

Dose— $\frac{1}{2}$ to 1 oz.

Liquor Quassiæ Concentratus 1 in 10.

Prepared by percolating 1 pint from quassia wood in No. 40 powder 2 ozs. with alcohol (20 per cent.) 22 ozs.

Dose— $\frac{1}{2}$ to 1 dr.

Tinctura Quassiae 1 in 10.

A straw-coloured liquid, prepared by macerating quassia wood, rasped, 2 ozs. in alcohol (45 per cent.) 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

QUILLAIAE CORTEX (Quillaia Bark)—Rosaceæ.

(Synonym—Panama Bark).

The inner bark, in large, brownish-white, flat pieces of Quillaja saponaria. Active principles—Sapotoxin, Quillaic Acid, and Saponin.

Expectorant, and emulsifying agent.

Used in making Liquor Picis Carbonis.

Tinctura Quillaie 1 in 20.

Obtained by percolating 1 oz. Quillaia bark with alcohol (60 per cent.) to produce 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

QUININÆ HYDROCHLORIDUM $C_{20}H_{24}N_2O_2HCl, 2H_2O$

(Hydrochlorate of Quinine, B.P., 1885).

The hydrochloride of an alkaloid, obtained from the bark of various species of cinchona and remijia, in crystals slightly larger than those of sulphate of quinine. Soluble in 35 parts of water.

Tonic, Antiperiodic, and Antipyretic. Dose—1 to 10 grs.

Tinctura Quininae 1 in 50.

Hydrochloride of Quinine 175 grs. dissolved in 1 pint tincture of orange.

Dose— $\frac{1}{2}$ to 1 dr.

Vinum Quininae 1 gr. in 1 oz.

A golden, sherry-coloured liquid, prepared by dissolving quinine hydrochloride 20 grs. in orange wine 1 pint.

Dose— $\frac{1}{2}$ to 1 oz.

QUININÆ HYDROCHLORIDUM ACIDUM

$C_{20}H_{24}N_2O_2, 2HCl, 3H_2O$

The acid hydrochloride of an alkaloid, from the same source as the hydrochloride, in the form of a white crystalline powder. Soluble in less than its own weight of water.

Action and dose same as the Hydrochloride.

QUININÆ SULPHAS $((C_{20}H_{24}N_2O_2)_2, H_2SO_4)_2, 15H_2O$

The sulphate of an alkaloid obtained from the same source as the hydrochloride. In filiform, silky, snow-white crystals, soluble in 800 parts of water; it should not contain more than 3 per cent. of crystals of impure cinchonidine.

Tonic, Antiperiodic, Antineuralgic, and Antipyretic.

Dose—1 to 10 grs. Used in making Syr. Ferri Phos. c. Quin. et Strych.

Pilula Quininæ Sulphatis 5 in 6.

Obtained by mixing 30 grs. quinine sulphate with 1 gr. tartaric acid, and making a mass with a mixture of 4 grs. glycerin and 1 gr. tragacanth.

Dose—2 to 8 grs.

Tinctura Quininæ Ammoniata 1 in 50.

A colourless liquid, prepared by dissolving quinine sulphate 175 grs. in solution of ammonia 2 ozs. and alcohol (60 per cent.) 18 ozs.

Dose— $\frac{1}{2}$ to 1 dr., freely diluted.

Ferri et Quininæ Citras 6 grs. contain 1 gr. quinine. (See under Ferrum, page 225).

RESINA (Resin)—From Coniferæ.

The residue left after the distillation of the oil of turpentine from the crude oleo-resin (turpentine) of various species of Pinus, in translucent, yellowish, brittle, shining masses.

Used chiefly for its adhesive qualities in 8 Plasters, and

Emplastrum Resinæ 1 in 9 $\frac{1}{2}$.

(Synonym—Adhesive Plaster).

A pale-yellow solid, prepared by melting together resin 4 ozs., lead plaster 32 ozs., and hard soap 2 ozs.

It enters into 3 Plasters.

Unguentum Resinæ 1 in 4 nearly.

A yellowish-brown, stiff ointment, prepared by melting together resin 8 ozs., yellow beeswax 8 ozs., olive oil 8 ozs., and lard 6 ozs. Often called Basilicon ointment.

A good Stimulating Application to indolent ulcers.

RHEI RADIX (Rhubarb Root)—Polygonaceæ.

The erect rhizome or so-called root, deprived of its bark and dried, of Rheum Palmatum and R. officinale, and probably other species, from China and Thibet. In hard, compact, yellow, irregularly rounded pieces bored with a hole, with a marbled fracture exhibiting starlike spots; odour peculiar and aromatic.

Its active principle is allied to Cathartic Acid. Also contains Rheo-tannic Acid, Chrysophanic Acid, and Emodin.

Stomachic, Tonic, and Cathartic.

Dose—3 to 10 grs. for repeated administration; 15 to 30 grs. for single dose; 3 grs. for a child 1 year old.

Extractum Rhei

A brown dry extract, prepared by exhausting rhubarb root with alcohol (60 per cent.), and evaporating the tincture so produced to dryness.

Dose—2 to 8 grs.

Infusum Rhei 1 in 20 ($\frac{1}{4}$ hour).

1 oz. rhubarb root sliced infused in 1 pint boiling water.

Dose— $\frac{1}{2}$ to 1 oz.

Liquor Rhei Concentratus 1 in 2.

A concentrated solution of rhubarb, prepared by macerating and percolating 10 ozs. coarsely-powdered rhubarb root with alcohol (20 per cent.) to produce 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

Pilula Rhei Composita 1 in 4 nearly.

Prepared by beating together rhubarb root 3 ozs., Socotrine aloes $2\frac{1}{4}$ ozs., myrrh and hard soap of each $1\frac{1}{2}$ ozs., oil of peppermint $1\frac{1}{2}$ drs., syrup of glucose $2\frac{3}{4}$ ozs.

Dose—4 to 8 grs.

Pulvis Rhei Compositus 1 in $4\frac{1}{2}$.

(Synonym—Gregory's Powder).

A pale-yellow powder, turning red when moistened, prepared by rubbing together rhubarb root 2 ozs., light or heavy magnesia 6 ozs., ginger 1 oz.

Antacid, Stomachic, and Cathartic.

Dose—20 to 60 grs., in milk. For a child 1 year old, 5 grs.

Syrupus Rhei 1 in 15

A brown thick liquid, prepared by exhausting 2 ozs. each rhubarb root and coriander fruit with distilled water 24 ozs. and alcohol (90 per cent.) 8 ozs., evaporating to 14 ozs., adding 24 ozs. sugar, and dissolving with gentle heat.

Dose— $\frac{1}{2}$ to 2 drs.; $\frac{1}{2}$ dr. for a child 1 year old.

Tinctura Rhei Composita 1 in 10.

A dark-brown liquid, prepared by percolating with alcohol (60 per cent.), rhubarb root 2 ozs., cardamoms, freed from their pericarps, and coriander, of each $\frac{1}{4}$ oz., till 18 ozs. are obtained, and mixing this with 2 ozs. glycerin.

Dose— $\frac{1}{2}$ to 1 dr. for repeated administration; 2 to 4 drs. for single dose.

RHÆADOS PETALA (Red Poppy Petals)—Papaveraceæ.

The fresh, scarlet-coloured petals of *Papaver Rhœas*; used as a colouring agent.

Syrupus Rhœados 1 in $3\frac{1}{2}$.

A rich red syrup, prepared by making an infusion of 13 ozs. fresh red poppy petals with distilled water 1 pint on a water-bath, and in this dissolving sugar $2\frac{1}{2}$ lbs., and adding alcohol (90 per cent.) $2\frac{1}{2}$ ozs. Product, 3 lbs. 10 ozs.

Dose— $\frac{1}{2}$ to 1 dr. (Used to colour mixtures).

RICINI OLEUM (Castor Oil) —From Euphorbiaceæ.

The viscid, almost odourless and colourless oil expressed from the seeds of *Ricinus communis*. The active principle is Ricinoleic Acid, which is formed on saponification of the oil.

Cathartic. Dose—1 to 8 drs. For a child 1 year old, 1 dr.

Enters into Collodium Flexile, Linimentum Sinapis Co., and Pil. Hydrarg. Subchlor. Co., and

Mistura Olei Ricini 3 drs. in 1 oz.

Prepared by mixing gradually and alternately castor oil 3 ozs. and a mixture of orange-flower water (undiluted) 1 oz. and cinnamon water 2½ ozs. with mucilage of gum acacia 1½ ozs.

Cathartic. Dose—As a draught, 1 to 2 ozs.

ROSÆ AQUA (Rose Water)—From Rosaceæ.

The rose water of commerce, prepared by distillation from the flowers of *Rosa damascena* (The Damask Rose). It is a saturated solution of the essential oil of the flowers, and is to be diluted, immediately before use, with twice its volume of water.

IN—Mist. Ferri Co., and Rose basis for lozenges.

Unguentum Aquæ Rosæ (Rose Water Ointment).

A white ointment, commonly known as "cold cream," made by melting together white beeswax and spermaceti, of each 1½ ozs., and almond oil 9 ozs., adding gradually rose water 7 ozs. (undiluted) and oil of rose 8 minims.

A fragrant Emollient.

ROSÆ OLEUM (Oil of Rose)—From Rosaceæ.

(Synonym—Otto of Rose).

The fragrant, pale-yellow, crystalline, semi-solid oil distilled from the fresh flowers of *Rosa damascena* (The Damask Rose).

A powerful Odorant—used in Ung. Aq. Rosæ.

ROSÆ GALLICÆ PETALA (Red-Rose Petals)—Rosaceæ.

The purplish-red, unexpanded, velvety petals, fresh and dried, of *Rosa gallica*. From cultivated plants.

Astringent ; chiefly used on account of their colouring.

Confectio Rosæ Gallicæ (Confection of Roses)—1 in 4.

A soft, violet-coloured mass, prepared by beating *fresh* red-rose petals 1 lb. with sugar 3 lbs.

Used as an Excipient for pill masses.

It enters into 3 pills bearing the name of Aloes, and into Pil. Hydrarg.

Infusum Rosæ Acidum 1 in 40 (¼ hour).

A bright red liquid, prepared by infusing *dried* red-rose petals ½ oz. in boiling distilled water 1 pint and diluted sulphuric acid 2 drs.

Astringent. Dose—½ to 1 oz.

Syrupus Rosæ 1 in 17.

A red syrup, prepared from 2 ozs. *dried* red-rose petals by making an infusion with 1 pint boiling distilled water (for 2 hours), squeezing through calico, heating to the boiling point, filtering, adding 30 ozs. sugar, and dissolving with gentle heat.

Dose— $\frac{1}{2}$ to 1 dr. Chiefly used for its bright red colour.

ROSMARINI OLEUM (Oil of Rosemary)—From Labiatae.

The colourless or pale-yellow oil distilled from the flowering tops of *Rosmarinus officinalis*.

Stimulant and Rubefacient. Dose— $\frac{1}{2}$ to 3 minims.

It enters into Liniment. Saponis and 1 r. Lavand. Co., and the following:—

Spiritus Rosmarini 1 in 10.

A colourless liquid, consisting of oil of rosemary 1 oz., dissolved in alcohol (90 per cent.) to 10 ozs.

SACCHARUM LACTIS (Milk Sugar) $C_{12}H_{22}O_{11}, H_2O$

(Synonym—Lactose). In white crystals or crystalline masses, obtained from the whey of milk.

Diuretic, and Sedative to the stomach, but generally used to dilute powders, as in Pulvis Elaterini Co.

SACCHARUM PURIFICATUM $C_{12}H_{22}O_{11}$

(Refined Sugar). (Synonym—Sucrose).

Colourless, inodorous, separate crystals, obtained from the juice of the sugar cane. Used for its sweetening properties.

It enters into all the syrups and lozenges, 3 of the confections, some mixtures, pills, and powders, into Liq. Calcis Sac., Sodii Citro-Tart. Effervescens, and Mag. Sulph. Effervescens.

Syrupus 2 of sugar and 1 of water, or 1 in $1\frac{1}{8}$.

A thick, colourless liquid, prepared by dissolving sugar 5 lbs. in distilled water $2\frac{1}{2}$ lbs. Its specific gravity is 1.330, which is about the average density of the syrups.

It enters into Creosote Mixture, Pill of Iron, 9 syrups, and Confection of Sulphur.

Syrupus Aromaticus (Aromatic Syrup).

Prepared by mixing tincture of orange and cinnamon water of each 5 ozs., shaking with powdered talc, filtering and adding syrup 10 ozs.

Used for Flavouring mixtures. Dose— $\frac{1}{2}$ to 1 dr.

SALICINUM (Salicin) $C_6H_{11}O_5OC_6H_4CH_2OH$ —Salicaceae.

A crystalline glucoside, in small, shining, colourless crystals, obtained from the bark of various species of *Salix* and of *Populus*.

Acts like Sodii Salicylas. Dose—5 to 20 grs.

SALOL (Salol) C_6H_4OH,COO,C_6H_5

Insoluble, colourless crystals of phenyl salicylate, prepared by the interaction of salicylic acid and phenol, or of their sodium salts with phosphoryl chloride or carbonyl chloride.

An Intestinal Antiseptic and Analgesic. Dose—5 to 15 grs.

SAMBUCI FLORES (Elder Flowers)—Caprifoliaceæ.

The small, white flowers of *Sambucus nigra*, separated from the stalks. Contain Volatile Oil, Valerianic Acid, and a Resin.

Seldom employed, except as a Cosmetic to remove freckles.

Aqua Sambuci 1 in 1.

A colourless water, prepared by mixing fresh elder flowers 10 lbs. with water 5 gallons, and distilling 1 gallon. May be made with an equivalent quantity of the preserved flowers.

A fragrant basis for skin lotions.

SANTALI OLEUM (Oil of Santal Wood)—Santalaceæ.

(Synonym—Oil of Santal Wood).

The thick, pale-yellow, aromatic oil distilled from the wood of *Santalum album*. It contains Santalol and Santalal.

Diuretic; like Copaiba. Dose—5 to 30 minims.

SANTONINUM (Santonin) $C_{15}H_{18}O_3$

The active principle of *santonica*—the dried, unexpanded flower-heads or capitula of *Artemisia Maritima*, var. *Stechmanniana*, in minute, colourless, flat, rhombic prisms, becoming yellow on exposure to light.

Anthelmintic—killing the round and thread worms.

Dose—For an adult, 2 to 5 grs.; for a child 1 year, $\frac{1}{2}$ to $\frac{3}{4}$ gr.; for a child 2 or 3 years old, 2 grs.; and above 4 yrs., 3 grs.

It should, if possible, always be given in a tea-spoonful of castor oil, which greatly increases its efficacy and safety.

Trochiscus Santonini 1 gr. in each.

A white or yellowish-white lozenge, composed of santonin, with simple basis.

SAPO ANIMALIS (Curd Soap).

The white or greyish-white, horny, and nearly inodorous brittle soap made with sodium hydroxide and a purified animal fat, consisting principally of stearin; contains 30 per cent. water.

Mildly Laxative, but chiefly used for its physical qualities.

IN—Ext. Col. Co., Lin. Pot. Iod. C. Sapone, and Pil. Scammonii Co.

Sapo Durus (Hard Soap).

The dry, greyish-white soap, in appearance resembling curd soap, but made with olive oil and sodium hydroxide. It is an oleate of soda.

Antacid and Laxative. Dose—5 to 15 grs., in pill.

Enters into 7 pill masses, Emp. Resinæ, Hydrarg. Oleas, and Ungt. Zinci Oleati.

Emplastrum Saponis 1 of soap in 7.

A white solid, prepared by melting hard soap 6 ozs., resin 1 oz., and lead plaster 2½ lbs., stirring and evaporating.

A useful strapping for swollen joints ; acts mechanically.

Enters into Empl. Calefaciens and Empl. Cantharidis.

Pilula Saponis Composita 1 gr. opium in 5.

Prepared by beating together powdered opium ½ oz., hard soap 1½ ozs., syrup of glucose ½ oz.

Narcotic. The name Pil. Saponis Co. is used to disguise its composition. Dose—2 to 4 grs.

Sapo Mollis (Soft Soap).

The yellowish-green, inodorous jelly, made with olive oil and potassium hydroxide, being an oleate of potassium.

Used in making Turpentine Liniment, and

Linimentum Saponis 1 in 12.

A clear, straw-coloured liquid, prepared by mixing and letting stand for 7 days soft soap 2 ozs., camphor 1 oz., and oil of rosemary 3 drs., in alcohol (90 per cent.) 16 ozs., diluted with distilled water 4 ozs.

A Stimulating Application to bruises and sprains ; sometimes called "Opodeldoc."

Enters into Linimentum Opii.

SARSÆ RADIX (Sarsaparilla)—Smilacææ.

The dried, long, slender, reddish-brown root, covered with rootlets, of Smilax ornata, imported from Costa Rica, and commonly known as Jamaica sarsaparilla. It contains Sarsaponin, Parillin, and Saponin.

An Alterative and Diaphoretic.

Extractum Sarsæ Liquidum 1 in 1.

A deep, coffee-brown liquid, prepared by exhausting 20 ozs. sarsaparilla in 3 portions with alcohol (20 per cent.), using the percolate from the first to exhaust the second, and that from the second to exhaust the third. The third percolate is to measure 18 ozs., and 2 ozs. glycerin should be added to it.

Dose—2 to 4 drs.

Liquor Sarsæ Compositus Concentratus 1 in 1.

A dark brown liquid, prepared by infusing sarsaparilla 20 ozs. in 3 successive portions (of 5 pints each) of water at 160°F. ; also boiling sassafras root, guaiacum wood, dried liquorice root, of each 2 ozs., and mezereon bark 1 oz. with water till exhausted, mixing the two liquids and evaporating to 16 ozs., and adding 4½ ozs. alcohol (90 per cent.).

Dose—2 to 8 drs.

J. J. Howard, Esq. S. B. A. G. C. 1778.

SASSAFRAS RADIX (Sassafras Root)—Lauraceæ.

The dried, brown root (in chips or shavings) of *Sassafras officinale*, in pieces covered with rusty brown bark. It contains two Volatile Oils and Sassafras Camphor.

Diaphoretic. Used only to flavour Liquor Sarsæ Co. Conc.

SCAMMONIÆ RADIX (Scammony Root)—Convolvulaceæ.

The dried, hard, tap-shaped roots, brownish-grey without, light or dark grey within, of *Convolvulus Scammonia*.

A griping Cathartic. (It contains the Resin and Gum Resin.)

Scammonia Resina (Scammony Resin).

The brownish, translucent, brittle, resinous solid, prepared by exhausting scammony root with alcohol (90 per cent.), adding water (which throws down the resin), and then distilling off the alcohol and washing and drying the residue. It may be similarly prepared from scammony. Composed chiefly of Jalapin.

Dose—3 to 8 grs., in pill or powder, or rubbed up with milk.

It enters into ²Pil. and ²Extract. Colocynth. Co. and the following :—

Pilula Scammonii Composita 1 in 3 nearly.

Prepared by dissolving resins of scammony and jalap of each 1 oz., curd soap 1 oz., in tincture of ginger 3 ozs., and evaporating to a proper consistence.

Cathartic. Dose—4 to 8 grs.

Pulvis Scammonii Compositus 1 in 2.

A brown powder, prepared by mixing and sifting scammony resin 4 ozs., jalap 3 ozs., and ginger 1 oz.

An active Hydragogue Cathartic.

Dose—10 to 20 grs. 1 to 2 grs. for a child 1 year old.

SCAMMONIUM (Scammony).

A gum resin, obtained by incising the *living* root of *Convolvulus Scammonia*, in ash-grey and rough, cinder-like irregular fragments, with a black, shining, splintery, resinous fracture. Known as Virgin Scammony, and used as a source of the Resin.

A powerful Cathartic. Dose—5 to 10 grs.

SCILLA (Squill)—Liliaceæ.

The dried, sliced, pear-shaped bulb of *Urginea Scilla*, divested of its outer scales; in dried, yellowish-white, tough, curved, dampish fragments or slices.

Active principles—Scillitoxin or Scillin and Scillipicrin.

Diuretic and Expectorant. Dose—1 to 3 grs.

Acetum Scillæ 1 in 8.

A pale straw-coloured liquid, prepared by macerating squill 2½ ozs. in dilute acetic acid 1 pint.

Dose—10 to 30 minims; generally given as Syr. Scillæ.

Oxymel Scillæ about 1 in 15.

A thick, opalescent, brownish liquid, prepared by macerating for 7 days squill $2\frac{1}{2}$ ozs. in acetic acid $2\frac{1}{2}$ ozs. and water 8 ozs. The product (about 10 ozs.) is mixed with liquefied clarified honey 27 ozs. or q.s. to give S.G. 1.32.

Dose—~~1 to 2~~ ^{1 to 2} drs., as an Expectorant.

Pilula Scillæ Composita 1 in 4 nearly.

Prepared by mixing and beating into a uniform mass squill $1\frac{1}{2}$ ozs., ginger, ammoniacum, hard soap (all in fine powder), and syrup of glucose, of each 1 oz.

Dose—4 to 8 grs., as an Expectorant or Diuretic.

Syrupus Scillæ about 1 of squill in 17.

A thick, straw-coloured liquid, prepared by dissolving sugar 38 ozs. in vinegar of squill 1 pint.

Dose— $\frac{1}{2}$ to 1 dr., as an Expectorant; 1 oz., as an Emetic.

For a child 1 year old., 5 minims; as an Emetic, $\frac{1}{2}$ to 1 dr.

As it contains acetic acid, it should not be ordered with alkalies. It is sometimes ordered by mistake with Spt. Ammon. Aromat.

Tinctura Scillæ 1 in 5.

A straw-coloured liquid, prepared by macerating bruised squill 4 ozs. in alcohol (60 per cent.) 1 pint.

Dose—5 to 15 minims.

Pilula Ipecacuanhæ cum Scilla (*Vide Ipecacuanha*).

It contains 1 part of opium, 1 of ipecacuanha, $3\frac{1}{2}$ of squill, and $3\frac{1}{2}$ of ammoniacum in 20 parts.

SCOPARII CACUMINA (Broom Tops)—Leguminosæ.

The fresh and dried tops, with their straight, angular, dark-green, smooth twigs, of *Cytisus scoparius*.

Active principles—Scoparin and Sparteine.

Diuretic; in large dose, Cathartic.

Infusum Scoparii 1 in 10 ($\frac{1}{4}$ hour).

Prepared by infusing bruised, dried broom tops 2 ozs. in boiling water 1 pint.

Dose—1 to 2 ozs.

Succus Scoparii

The brown juice obtained by bruising fresh broom tops in a stone mortar, and adding to every 3 measures of the fresh juice 1 measure of alcohol (90 per cent.), setting aside and filtering.

Dose—1 to 2 drs.

SENEGÆ RADIX (Senega Root)—Polygalaceæ.

The dried, yellowish-brown contorted root of *Polygala Senega*, from $\frac{1}{8}$ to $\frac{1}{2}$ inch in thickness, with a keel along its whole extent. (See under Valerian).

A Stimulating Expectorant.

Active principle—Senegin, which is identical with Saponin.

Infusum Senegæ 1 in 20 ($\frac{1}{2}$ hour).

Prepared by infusing senega root in No. 10 powder 1 oz. in boiling distilled water 1 pint.

Dose— $\frac{1}{2}$ to 1 oz. Used as a basis for cough mixtures.

Liquor Senegæ Concentratus 1 in 2.

A concentrated solution of senega, obtained by macerating and percolating 10 ozs. senega root with 25 ozs. of a mixture of 2 parts of alcohol (20 per cent.) and 1 part of alcohol (45 per cent.); the product to measure 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

Tinctura Senegæ 1 in 5.

A brown, sherry-coloured liquid, prepared by percolating senega root 4 ozs. in No. 40 powder with alcohol (60 per cent.) to produce 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

SENNÆ ALEXANDRINA (Alexandrian Senna)—Leguminosæ.

The greyish-green, lanceolate, acute leaflets, $\frac{3}{4}$ to 1 inch long, and unequally divided at the bases, of *Cassia acutifolia*. They are sometimes adulterated with Argel leaves, which are bitter, and have not an unequal oblique base.

Active principles—Cathartic Acid, Sennacrol, and Sennapicrin. Cathartic. Dose—10 to 30 grs.

SENNÆ INDICA (East Indian Senna)—Leguminosæ.

(Synonym—Tinnivelly Senna). The green, lanceolate, acute leaflets of *Cassia angustifolia*, from 1 to 2 inches long, with an unequal and oblique base. From plants cultivated in Southern India.

May be used instead of Alexandrian senna (which it resembles in dose and action) to make any of the following preparations:—

Confectio Sennæ 1 in 11.

A soft blackish mass, composed of powdered senna 7 ozs., powdered coriander 3 ozs., figs 12 ozs., tamarinds 9 ozs., cassia pulp 9 ozs., prunes 6 ozs., extract of liquorice 1 oz., sugar 30 ozs., distilled water 24 ozs. or q.s.; prepared by boiling the figs and prunes in the water, adding the tamarind and cassia, rubbing the pulp through a sieve, in this dissolving the sugar and extract of liquorice and adding the powders, making the weight up to 75 ozs. with distilled water. Called "Lenitive electuary."

Laxative and Cathartic. Dose—60 to 120 grs.

Infusum Sennæ 1 in 10 ($\frac{1}{4}$ hour).

Prepared by infusing senna 2 ozs. and ginger 55 grs. in boiling distilled water 1 pint.

Dose— $\frac{1}{2}$ to 1 oz. As a draught, 2 ozs.

Enters into Mist. Sennæ Co.

Liquor Sennæ Concentratus 1 in 1.

Concentrated solution of senna, prepared by macerating and percolating 20 ozs. senna in 3 portions with distilled water, using the percolate from the first portion to exhaust the second, and that from the second to exhaust the third. The percolate from the third is to measure 16 ozs., and to this is added tincture of ginger $2\frac{1}{2}$ ozs., and alcohol (90 per cent.) 2 ozs.

Dose— $\frac{1}{2}$ to 1 dr.

Mistura Sennæ Composita 1 of $MgSO_4$ in 4.

(Synonym—Black Draught.)

An almost black liquid, consisting of magnesium sulphate 5 ozs., liquid extract of liquorice 1 oz., aromatic spirit of ammonia 1 oz., compound tincture of cardamoms 2 ozs., infusion of senna to make 1 pint.

Hydragogue Cathartic. Dose—as a draught, 1 to 2 ozs.

Syrupus Sennæ 1 in 2.

A deep, brownish-black liquid, prepared by percolating and re-percolating 40 ozs. of senna in coarse powder with distilled water and alcohol (20 per cent.) and evaporating to produce 40 ozs. percolate, heating to $180^{\circ}F.$ for 10 minutes; cooling, filtering, and dissolving at a gentle heat in the filtrate 50 ozs. sugar, and finally, after cooling, adding 10 mins. oil of coriander dissolved in 40 mins. of alcohol (90 per cent.).

A mild Cathartic.

Dose— $\frac{1}{2}$ to 2 drs. A child 1 year old may get $\frac{1}{4}$ to $\frac{1}{2}$ dr.

Tinctura Sennæ Composita 1 in 5.

A dark liquid, prepared by macerating in 1 pint of alcohol (45 per cent.) the following :—Senna 4 ozs., raisins freed from seeds 2 ozs., caraway and coriander of each $\frac{1}{2}$ oz.

Dose— $\frac{1}{2}$ to 1 dr. for repeated administration; 2 to 4 drs. for single dose.

Pulvis Glycyrrhizæ Compositus 1 of senna in 6. (See Glycyrrhiza).**SERPENTARIÆ RHIZOMA** (Serpentary Rhizome)—Aristolochiaceæ.

The small, round, knotty, yellowish-white, dried rhizome, with numerous slender rootlets, of Aristolochia Serpentaria or of A. reticulata. The rhizome of the latter is a little thicker and the rootlets larger and less matted. (See under Valerian).

Diaphoretic.

It enters into Tinct. Cinchonæ Co., and the following :—

Infusum Serpentariæ 1 in 20 ($\frac{1}{4}$ hour).

Prepared by infusing serpentary rhizome 1 oz. in boiling distilled water 1 pint.

Dose— $\frac{1}{2}$ to 1 oz.

Liquor Serpentariæ Concentratus 1 in 2.

Prepared by macerating and percolating 10 ozs. serpentary rhizome with 25 ozs. alcohol (20 per cent.) to produce 1 pint.

Dose— $\frac{1}{2}$ to 2 drs.

Tinctura Sepentariæ 1 in 5.

A brown liquid, prepared by percolating serpentary in No. 40 powder 4 ozs. with alcohol (70 per cent.) to produce 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

SEVUM PRÆPARATUM (Prepared Suet).

The white, smooth, internal fat of the abdomen of the sheep—*Ovis Aries*—purified by melting and straining.

Used to give proper consistence to Ungt. Hydrarg.

SINAPIS (Mustard)—*Cruciferae*.

Black and white mustard seeds, powdered and mixed, forming a greenish-yellow acrid powder.

Active principle is essential Oil of Mustard, obtained by the action of a ferment (myrosin) present in the seeds upon the glucosides Sinalbin, and Sinigrin upon the addition of water.

Emetic and Stimulant. Externally—Rubefacient.

Sinapis Albæ Semina (White Mustard Seed).

The hard, round, pale-yellow, finely pitted, dried, ripe seeds (1 line in diameter) of *Brassica alba*.

Sinapis Nigræ Semina (Black Mustard Seed).

The dark, reddish-brown or greyish-brown, round, hard, dried, ripe seeds ($\frac{1}{2}$ a line in diameter) of *Brassica nigra*.

Charta Sinapis

Prepared by extracting the fixed oil from equal weights of bruised black and white mustard seeds with benzol, drying and powdering the residue, and mixing 75 grs. with 5 drs. solution of India-rubber, and coating over with the semi-fluid mixture one surface of strips of cartridge paper. Before being applied, they should be dipped for a few seconds into tepid water.

Counter-irritant and Rubefacient.

Oleum Sinapis Volatile

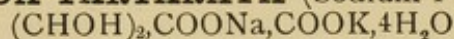
The pale-yellow pungent oil distilled from the seeds of *Black* mustard after maceration with water. *It sinks in water.*

A powerful Irritant, producing instant Vesication.

Linimentum Sinapis 1 in 27.

Prepared by adding oil of mustard 1 $\frac{1}{2}$ drs. to castor oil 5 drs., and adding the mixture to camphor 120 grs., dissolved in alcohol (90 per cent.) 4 ozs.

A Stimulating and Rubefacient Application.

SODA TARTARATA (Sodium Potassium Tartrate).

(Synonyms—Tartrate of Potassium and Sodium; Rochelle Salt; Tartarated Soda.)

Colourless transparent prisms, soluble in water; prepared by neutralising acid potassium tartrate with sodium carbonate.

A Hydragogue Cathartic.

Dose—120 to 240 grs. Lemonade makes an agreeable vehicle.

Pulvis Sodæ Tartaratæ Effervescens (Effervescent Tartarated Soda Powder). Commonly called Seidlitz Powder.

Consists of 120 grs. tartarated soda and 40 grs. sodium bicarbonate, in a blue paper, dissolved in nearly half a pint of cold or warm water, to be taken in effervescence with 38 grs. tartaric acid, in a white paper.

Sodii Arsenas (Sodium Arsenate) Na_2HAsO_4

(Arseniate of Sodium (hydrous), B.P., 1885). Di-sodium hydrogen arsenate—a white anhydrous powder, soluble in 6 parts of water, obtained by exposing to a temperature of 300°F . crystallised sodium arsenate, which may be prepared by treating with water the product of the fusion of arsenious anhydride with sodium nitrate and sodium carbonate.

Alterative and Tonic. Dose— $\frac{1}{10}$ to $\frac{1}{10}$ gr.

Liquor Sodii Arsenatis 1 gr. in 110 minims.

A colourless solution of sodium arsenate (rendered anhydrous by a heat under 300°) $17\frac{1}{2}$ grs. in distilled water 4 ozs.

Dose—2 to 8 minims, diluted, after meals.

Sodii Benzoas $\text{C}_6\text{H}_5\text{COONa}$

A white powder, inodorous or having a faint benzoic odour, obtained by neutralising benzoic acid with sodium carbonate.

Diuretic. Dose—5 to 30 grs.

Sodii Bicarbonas NaHCO_3

In white powder, or small opaque, white crystals, soluble in 11 times their weight of water, prepared by saturating sodium carbonate with carbonic anhydride; or by the reaction of sodium chloride and ammonium bicarbonate. Often called "Baking Soda."

Antacid. Dose—5 to 30 grs., in solution; 24 grs. make an effervescing draught with $\frac{1}{2}$ oz. lemon juice. (See Citric Acid).

20 parts are neutralised by 16.7 parts of citric acid or 17.8 of tartaric acid.

Enters into Sodii Citro-Tart. Efferves., Lithii Cit. Efferves., Pulv. Sodæ Tart. Efferves., Sodii Phosph. Efferves., Sodii Sulph. Efferves., Mag. Sulph. Efferves., and the following:—

Trochiscus Sodii Bicarbonatis 3 grs. in each.

White lozenges, composed of sodium bicarbonate and rose basis.

Sodii Bromidum NaBr

A granular, somewhat deliquescent, white powder, consisting of cubic crystals, obtained by adding bromine to sodium hydroxide till a permanent brown tint remains, evaporating to dryness, fusing with charcoal, dissolving out the bromide of sodium, and crystallising from warm solutions.

Antispasmodic. Sedative like KBr. Dose—5 to 30 grs.

Sodii Carbonas $\text{Na}_2\text{CO}_3, 10\text{H}_2\text{O}$

In large, transparent, colourless, rhombic crystals, soluble in twice their weight of water, obtained from sodium chloride, either by reaction with ammonium bicarbonate and ignition, or by conversion into sulphate, and adding carbon and calcium carbonate and heating. It is known as "Washing Soda."

Antacid. 20 grs. neutralise about 9·8 of citric acid ; or 10·5 of tartaric acid.

Dose—5 to 30 grs., in solution.

Used in making Ext. Ergotæ ; and from it all of the sodium salts can be artificially obtained.

Sodii Carbonas Exsiccatus (Exsiccated Sodium Carbonate)
 Na_2CO_3

(Dried Carbonate of Sodium, B.P., 1885.)

A white powder, obtained by strongly heating sodium carbonate until it loses 63 per cent. of its weight, and reducing the residue to powder. It only differs from the crystallised carbonate in being devoid of water of crystallisation, and is nearly three times stronger (3 grs. = 8 grs.).

Dose—3 to 10 grs., in pill or powder.

Sodæ Chlorinatæ Liquor 2½ per cent. Cl.

A colourless solution, prepared by dissolving 24 ozs. sodium carbonate in 40 ozs. water, and adding 16 ozs. chlorinated lime mixed with 6 pints water, and filtering.

Antiseptic and Disinfectant. Dose—10 to 20 minims, diluted. As a gargle, ½ dr. to 1 oz. water ; as a lotion, 1 dr. to 1 oz. water.

Sodii Chloridum NaCl

In small crystalline grains, or in transparent cubical crystals, generally obtained by purifying common salt.

Purgative, Emetic, and Anthelmintic.

Dose—½ to 1 oz.

Used in making Hydrochloric Acid, Calomel, and Corrosive Sublimate.

Sodii Citro-Tartras Effervescens

A mechanical mixture of sodium bicarbonate 51 ozs., tartaric acid 27 ozs., citric acid 18 ozs., sugar 15 ozs., all in powder,

heated between 200° and 220°F . until the particles begin to aggregate, and then assiduously stirred till they become granulated.

Dose—60 to 120 grs. as a Refrigerant and Laxative.

Sodii Ethylatis Liquor (18 per cent. $\text{NaC}_2\text{H}_5\text{O}$).

A colourless or brownish, syrupy liquid, prepared by dissolving 22 grs. pure metallic sodium in 1 oz. absolute alcohol. Should be recently prepared.

Caustic ; painted over nævoid and cancerous growths.

Sodii Hypophosphis NaPH_2O_2

A white, granular salt, soluble in its own weight of water, obtained by interaction of sodium carbonate and calcium hypophosphite.

Nervine Tonic and Restorative. Dose—3 to 10 grs.

Sodii Iodidum NaI

A white, crystalline powder, prepared like iodide of potassium by using sodium hydroxide instead of potassium hydroxide.

Alterative ; like KI. Dose—5 to 20 grs.

Sodii Nitris NaNO_2

A white, deliquescent, crystalline salt, very soluble in water obtained by fusing sodium nitrate with metallic lead.

Acts like Amyl Nitrite. Dose—1 to 2 grs.

Sodii Phosphas $\text{Na}_2\text{HPO}_4, 12\text{H}_2\text{O}$

In large, transparent, colourless, rhombic prisms, soluble in 6 times their weight of water, prepared by the interaction of sodium carbonate and a solution of acid calcium phosphate produced on mixing bone ash with sulphuric acid.

Purgative and Diuretic.

Dose—30 to 120 grs. for repeated administration ; for single dose, $\frac{1}{4}$ to $\frac{1}{2}$ oz.

Used in making Ferri Phosph., and

Sodii Phosphas Effervescens 1 in 2.

A granular powder, prepared by heating 50 ozs. sodium phosphate, and mixing it with 50 ozs. sodium bicarbonate, 27 ozs. tartaric acid, and 18 ozs. citric acid, heating between 200° and 220°F ., and stirring assiduously till granulation takes place. The product should weigh 100 ozs.

Aperient and Antacid.

Dose—60 to 120 grs. for repeated administration ; $\frac{1}{4}$ to $\frac{1}{2}$ oz. for single dose.

Sodii Salicylas $(\text{C}_6\text{H}_4, \text{OH}, \text{COONa})_2\text{H}_2\text{O}$

In small, colourless, very soluble crystalline scales, obtained by the action of salicylic acid on sodium carbonate or sodium hydroxide.

Antipyretic and Antirheumatic. Dose—10 to 30 grs.

Sodii Sulphas $\text{Na}_2\text{SO}_4, 10\text{H}_2\text{O}$

In large, transparent, monoclinic, efflorescent prisms, soluble in half their weight of water; may be obtained by interaction of sodium chloride and other sodium salts with sulphuric acid. Known as Glauber's Salt.

Hydragogue Cathartic.

Dose—30 to 120 grs. for repeated administration; $\frac{1}{4}$ to $\frac{1}{2}$ oz. for single dose.

Sodii Sulphas Effervescens 1 in 2.

A granular powder, prepared by heating 50 ozs. sodium sulphate, mixing it with 50 ozs. sodium bicarbonate, 27 ozs. tartaric acid, and 18 ozs. citric acid, heating between 200° and 220°F. , and stirring assiduously till granulation takes place. The product should weigh 100 ozs.

Aperient and Antacid.

Dose—60 to 120 grs. for repeated administration; $\frac{1}{4}$ to $\frac{1}{2}$ oz. for single dose.

Sodii Sulphis $\text{Na}_2\text{SO}_3, 7\text{H}_2\text{O}$

Colourless, transparent, monoclinic, efflorescent prisms, obtained by the action of sulphurous acid on sodium carbonate.

Antiseptic and Antiparasitic. Dose—5 to 20 grs.

Sodii Sulphocarbolas $\text{C}_6\text{H}_4\text{OH}, \text{SO}_2\text{ONa}, 2\text{H}_2\text{O}$

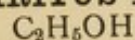
(Sodium Sulphocarbolate or Sodium Phenol-para-sulphonate).

Colourless, transparent, rhombic prisms, obtained by dissolving phenol in excess of sulphuric acid, and converting the phenol-sulphonic acid so obtained into a sodium salt.

Antipyretic and Antiseptic. Dose—5 to 15 grs.

Sodium Na

The soft metallic element sodium, as met with in commerce, introduced into the B.P. to make Liquor Sodii Ethylatis. It should be kept in stoppered bottles, under mineral naphtha.

SPIRITUS RECTIFICATUS (Alcohol (90 per cent.).)

(Synonym—Rectified Spirit).

The colourless, transparent, mobile liquid, consisting of ethyl hydroxide 90 per cent. by vol. with 10 per cent. of water, obtained by the distillation of fermented saccharine fluids. S.G., '834.

1 part to 3 of water makes "Spirit Lotion."

When alcohol and water are mixed, contraction of volume and rise of temperature take place. The cooled liquid is intended in the B.P.

The following four diluted alcohols are official:—

Alcohol (70 per cent.), prepared by mixing 100 ozs. alcohol (90 per cent.) and 31 (or exactly 31.05) ozs. water.

Alcohol (60 per cent.) = 100 ozs. alcohol (90 per cent.) and 53 $\frac{2}{3}$ (53.65) ozs. water.

Alcohol (45 per cent.) = 100 ozs. alcohol (90 per cent.) and $105\frac{1}{3}$ (105.34) ozs. water.

Alcohol (20 per cent.) = 100 ozs. alcohol (90 per cent.) and $355\frac{3}{4}$ (355.8) ozs. water.

SPIRITUS VINI GALLICI (Brandy).

Being the pale brown liquid, distilled from wine and matured by age, and generally containing not less than $43\frac{1}{2}$ per cent. by volume of alcohol.

Mistura Spiritus Vini Gallici

Often known as Egg-flip ; prepared by rubbing the yolks of two eggs with $\frac{1}{2}$ oz. sugar, and adding brandy and cinnamon water of each 4 ozs.

Nutritive, Restorative, and Narcotic.

Dose—As a draught, 1 to 2 ozs.

STAPHISAGRIÆ SEMINA (Stavesacre Seeds)—Ranunculaceæ.

The irregularly triangular, brown, dried, ripe seeds of Delphinium Staphisagria, with wrinkled and pitted testa.

Parasiticide. Active principles—Delphinine and Staphisagrine.

Unguentum Staphisagriæ 1 in 5.

Prepared by heating 2 ozs. crushed stavesacre seeds with $8\frac{1}{2}$ ozs. benzoated lard on a water-bath for two hours, and straining, and melting in it 1 oz. yellow beeswax.

Parasiticide, used to destroy pediculi.

STRAMONII FOLIA (Stramonium Leaves)—Solanaceæ.

The dried, greyish-green, ovate, petiolate, minutely wrinkled leaves of Datura Stramonium.

Active principle—Hyoscyamine, with some Atropine.

Narcotic and Antispasmodic ; chiefly used in asthma.

Tinctura Stramonii 1 in 5.

A brown liquid, prepared by percolating stramonium leaves (powdered) 4 ozs. with alcohol (45 per cent.) to produce 1 pint.

Dose—5 to 15 minims, diluted.

Stramonii Semina (Stramonium Seeds)—Solanaceæ.

The small, reniform, pitted and wrinkled, brownish-black, flattened, dried, ripe seeds of Datura Stramonium.

Narcotic and Antispasmodic ; chiefly used in asthma.

Active principle—Hyoscyamine, with some Atropine.

Extractum Stramonii

The firm, blackish extract, obtained by exhausting powdered stramonium seeds by percolation with alcohol (70 per cent.), distilling off most of the alcohol and evaporating to a firm extract.

Dose— $\frac{1}{4}$ to 1 gr., in pill.

STROPHANTHI SEMINA (Strophanthus Seeds)—Loganiaceæ.

The dried, ripe seeds of *Strophanthus Kombé*, freed from their awns. $\frac{3}{8}$ inch long and $\frac{1}{8}$ inch broad, greenish-fawn, and covered with silky hairs.

Active principle—Strophanthin. (See under Ouabain).

Cardiac Tonic like *Digitalis*.

Extractum Strophanthi 1 in 2.

Prepared by percolating 1 oz. strophanthus seeds (dried at 110°F.) with ether in order to remove oily matter, exhausting the marc with alcohol (90 per cent.), and evaporating the resulting tincture till it begins to thicken, and then adding milk sugar to produce 2 ozs.

Dose— $\frac{1}{4}$ to 1 gr.

Tinctura Strophanthi 1 in 40.

Prepared by macerating and percolating $\frac{1}{2}$ oz. powdered strophanthus seeds with alcohol (70 per cent.) to produce 10 ozs., filtering and making up to 1 pint with alcohol.

Dose—5 to 15 minims.

STRYCHNINA (Strychnine)— $C_{21}H_{22}N_2O_2$ —Loganiaceæ.

An alkaloid, in trimetric prisms, sparingly soluble in water, prepared from *S. Nux-Vomica* and other species of *Strychnos*.

Spinal Stimulant. Dose— $\frac{1}{60}$ to $\frac{1}{15}$ gr.

Strychninæ Hydrochloridum $C_{21}H_{22}N_2O_2HCl, 2H_2O$

(Hydrochlorate of Strychnine. B.P., 1885.)

The hydrochloride of an alkaloid, obtained from *S. Nux-Vomica* and other species of *Strychnos*, in small, colourless, trimetric prisms, which readily effloresce in the air. Soluble in 35 parts water.

Dose and action like Strychnine.

Liquor Strychninæ Hydrochloridi 1 gr. in 110 mins.

(Solution of Hydrochlorate of Strychnine, B.P., 1885.)

A colourless solution of strychnine hydrochloride $17\frac{1}{2}$ grs. in alcohol (90 per cent.) 1 oz., and distilled water q.s. to make 4 ozs.

Dose—2 to 8 minims, viz., $\frac{1}{55}$ to $\frac{1}{14}$ gr. of hydrochloride of strychnine.

STYRAX PRÆPARATUS (Prepared Storax).

Liquidambaraceæ.

A semi-transparent, brownish-yellow semi-fluid balsam, obtained from the trunk of *Liquidambar orientalis*, purified by solution in ethylic alcohol, filtration, and evaporation.

Expectorant, used in making Tinct. Benzoini Co.

It is a true balsam, containing Cinnamic Acid.

SULPHONAL $(\text{CH}_3)_2\text{C}(\text{SO}_2\text{C}_2\text{H}_5)_2$

Sulphonal or dimethyl-methane-diethylsulphone in colourless, inodorous, tasteless, insoluble crystals, is a product of the oxidation of mercaptol, obtained from acetone and mercaptan.

A pure Hypnotic. Dose—10 to 30 grs.

SULPHUR PRÆCIPITATUM (Precipitated Sulphur) S

(Synonym—Milk of Sulphur).

A greyish-yellow, soft powder, free from grittiness, prepared by dissolving sublimed sulphur by boiling in water with lime, and then precipitating with hydrochloric acid, washing and drying the precipitate.

Laxative. Dose—20 to 60 grs.

Sulphur Sublimatum (Sublimed Sulphur) S

(Synonym—Flowers of Sulphur).

A gritty greenish-yellow powder, prepared, more or less directly, from native sulphur or sulphides.

Laxative and Antiparasitic. Dose—20 to 60 grs.

In addition to Emp. Hydrarg., Emp. Ammon. cum Hydrarg., and Pulv. Glycyrrhizæ Co., it enters into the following :—

Confectio Sulphuris 1 in 2½

A soft, yellow paste, prepared by rubbing together sublimed sulphur 4 ozs., acid potassium tartrate 1 oz., tragacanth 18 grs., syrup 2 ozs., tincture of orange ½ oz., and glycerin 1½ ozs.

Dose—60 to 120 grs.

Trochiscus Sulphuris 5 grs. in each.

Lozenges containing precipitated sulphur, cream of tartar, sugar, gum, mucilage, and tincture of orange.

Dose—1 to 6 lozenges.

Unguentum Sulphuris 1 in 10.

A yellow ointment, prepared by rubbing sublimed sulphur 1 oz. with benzoated lard 9 ozs.

Antiparasitic ; used in itch, &c.

Sulphuris Iodidum SI

A greyish-black, shining solid, prepared by heating together in a flask, iodine 4 ozs. and sublimed sulphur 1 oz.

Counter-irritant and Antiparasitic.

Unguentum Sulphuris Iodidi 1 in 25.


A brown ointment, gradually becoming black, prepared by triturating in a warmed mortar sulphur iodide 20 grs. with glycerin 20 grs., and by degrees adding benzoated lard 460 grs.

An Antiparasitic and Stimulating Application.

SUMBUL RADIX (Sumbul Root)—Umbelliferae.

The dried, brown, spongy, transverse slices of the root of *Ferula Sumbul*. It contains a Volatile Oil, Resin, and Valerianic Acid.

Nervine Stimulant and Antispasmodic.

 Sumbul Root is distinguished from *Calumba*, which it slightly resembles, by its open spongy texture and strong musky odour.

Tinctura Sumbul 1 in 10.

A brown, sherry-coloured liquid, prepared by macerating Sumbul root bruised 2 ozs. in alcohol (70 per cent.) 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

Syrupus and Syrupus Aromaticus (See *Saccharum*).**TAMARINDUS** (Tamarind)—Leguminosae.

The sweet, brown, soft, fibrous pulp (containing brown, shining seeds), being the fruit of *Tamarindus Indica*, freed from the brittle outer part of the pericarp, and preserved with sugar.

Laxative and Refrigerant. Dose— $\frac{1}{2}$ to 1 oz. or more.

It enters into *Confectio Sennae*.

TARAXACI RADIX (Taraxacum Root)—Compositae.

The smooth, tapering, *fresh* tap root, or the brown, wrinkled, *dried* tap root of *Taraxacum officinale*, gathered in autumn.

Diuretic, Laxative, Tonic, and feeble Cholagogue.

Extractum Taraxaci

A rich brown "fresh or green" extract, prepared by evaporating the expressed juice of the fresh root, as in making *Ext. Colchici*.

Dose—5 to 15 grs., in solution in water, or in pill.

Extractum Taraxaci Liquidum 1 in 1 (*dried root*).

A dark liquid, prepared by exhausting 20 ozs. *dried* dandelion root with 2 pints alcohol (60 per cent.), pressing out 10 ozs., treating the marc with water and evaporating to 10 ozs., filtering, and mixing the liquids.

Dose— $\frac{1}{2}$ to 2 drs.

Succus Taraxaci

A brown liquid, prepared by pressing out the juice from *fresh* dandelion root, and adding to every three measures one measure of alcohol (90 per cent.).

Dose—1 to 2 drs.

TEREBENUM (Terebene).

An aromatic colourless liquid, consisting of a mixture of dipentene and other hydrocarbons, obtained by agitating oil of turpentine with sulphuric acid until it no longer rotates a ray of polarised light, and then distilling in a current of steam.

Antiseptic, Stimulating Expectorant. Dose—5 to 15 minims.

TEREBINTHINA CANADENSIS (Canada Turpentine)—
Coniferæ.

(Synonym—Canada Balsam).

The straw-coloured, ductile oleo-resin, or turpentine (as thick as honey), obtained from *Abies balsamea* (Balm of Gilead Fir).

A Stimulating Expectorant ; used for its adhesive qualities.

Dose—20 to 30 grs.

Enters into Collodium Flexile.

TEREBINTHINÆ OLEUM (Oil of Turpentine)—Coniferæ.

The limpid, colourless oil, distilled, usually by the aid of steam, from the oleo-resin (turpentine) obtained from *Pinus sylvestris* and other species of *Pinus*, rectified if necessary.

Stimulant, Diuretic, Anthelmintic, and Cathartic. Externally—
Rubefacient. The vapour is Astringent.

Dose—2 to 10 minims ; as an Anthelmintic, 3 to 4 drs., on sugar, or in capsules, or emulsion, or rubbed up with twice its bulk of mucilage.

Linimentum Terebinthinæ 13 in 20.

A pale yellowish emulsion, prepared by dissolving camphor 1 oz. in oil of turpentine 13 ozs., adding it gradually to a mixture of soft soap 1½ ozs., and distilled water 2 ozs., and making up to 1 pint with water.

Counter-irritant and Rubefacient.

Linimentum Terebinthinæ Aceticum 4 in 9.

A mixture of 4 ozs. oil of turpentine, 1 oz. glacial acetic acid, and 4 ozs. liniment of camphor. A substitute for "St. John Long's Liniment," which was made with yolk of egg.

An excellent Rubefacient.

THEOBROMATIS OLEUM (Oil of Theobroma)—Sterculiaceæ.

(Synonym—Cacao Butter).

The yellowish, solid concrete oil, in cakes, expressed from the warm ground seeds of *Theobroma Cacao*.

Used in the preparation of all the Suppositories except Glycerin.

THUS AMERICANUM (Frankincense)—Coniferæ.

The yellow, opaque, tough, solid turpentine or oleo-resin scraped off the trunks of *Pinus palustris* and *Pinus Tæda*.

Externally—Stimulant.

Enters into Emp. Picis.

THYMOL (Thymol)— $C_{10}H_{13}HO$ —Labiatae and Umbelliferae.

A crystalline substance, in large, prismatic, odorous crystals, obtained from the volatile oils of *Thymus vulgaris*, *Monarda*

punctata, and Carum copticum. Purified by recrystallisation from alcohol.

Antiseptic and Deodorant. Dose— $\frac{1}{2}$ to 2 grs.

THYROIDEUM SICCUM (Dry Thyroid).

A light, dull brown powder, which is liable to become damp and to deteriorate by exposure to air; prepared from the fresh and healthy thyroid gland of the sheep. The glands are taken from the sheep immediately upon being killed, the external fat and connective tissue are removed, and the glands cut across. Any which are abnormal are rejected. The healthy are minced, dried at 90° to 100°F ., powdered, washed with petroleum spirit to remove all fat, and again dried.

Restorative in Myxœdema and Cretinism.

Dose—3 to 10 grs.

Liquor Thyroidei (Thyroid Solution) 100 mins. = 1 gland.

Prepared from the *fresh and healthy* bruised gland of the sheep, by adding 34 mins. each glycerin and solution of phenol (.5 per cent.), straining, pressing, and adding .5 per cent. solution of phenol to make 100 minims for each entire gland used; forming a pinkish turbid liquid free from putrescence.

Must be freshly prepared, and kept in well-stoppered bottles.

Dose—5 to 15 minims.

TRAGACANTHA (Tragacanth)—Leguminosæ.

A whitish, gummy exudation, in horny, curved plates (like the parings of corns), obtained by incising *Astragalus gummifer* and other species of *Astragalus*. Known as Syrian Tragacanth.

Used only for its property of swelling out when moistened with water, and forming a mucilage.

It enters into Pulv. Opii Co., Confect. Sulphuris, Mist. Cretæ, Mist. Guaiaci, and

Glycerinum Tragacanthæ 1 in $5\frac{1}{2}$ by weight.

A homogeneous, translucent jelly, prepared by mixing $\frac{1}{2}$ oz. tragacanth, in powder, with $1\frac{1}{2}$ ozs. glycerin and $\frac{1}{2}$ oz. water.

A good Pill Excipient.

Mucilago Tragacanthæ 60 grs. in 10 ozs.

A thick opaque liquid, prepared by mixing powdered tragacanth 60 grs. with alcohol (90 per cent.) 2 drs., and pouring in distilled water to make 10 ozs.

Enters into Lotio Hyd. Nig.

Pulvis Tragacanthæ Compositus 1 in 6.

A white powder, composed of tragacanth, gum acacia, and starch, of each 1 oz., and sugar 3 ozs.

Dose—As a Demulcent, 20 to 60 grs.

TRINITRINI TABELLÆ (Trinitrin Tablets).

(Synonym—Tablets of Nitroglycerin). Tablets of chocolate each weighing 5 grs., and containing $\frac{1}{100}$ gr. trinitroglycerin of commerce.

Dose—1 or 2 tablets. Acts like Amyl Nitrite, but more slowly.

Liquor Trinitrini 1 per cent. by weight, or 1 gr. in 110 mins.

(Synonym—Solution of Nitroglycerin.)

A colourless liquid, containing trinitroglycerin of commerce in alcohol (90 per cent.). Dose— $\frac{1}{2}$ to 2 mins.

TROCHISCUS BASES (See page 171.)**UVÆ URSI FOLIA** (Bearberry Leaves)—Ericaceæ.

The small, dried, yellowish-green, shining leathery leaves of *Arctostaphylos Uva-ursi*.

Active principle—Arbutin and Methyl-Arbutin.

Astringent, Diuretic, and Sedative to the bladder.

Infusum Uvæ Ursi 1 in 20 ($\frac{1}{4}$ hour).

Prepared by infusing bruised bearberry leaves 1 oz. in boiling distilled water 1 pint.

Dose— $\frac{1}{2}$ to 1 oz.


VALERIANÆ RHIZOMA (Valerian Rhizome)—Valerianaceæ.

(Synonym—Valerian Root).

The dried, yellowish-brown rhizome, with numerous bushy bundles of fibrous roots springing from it, of *Valeriana officinalis*. Collected in autumn.

Active ingredients—A Volatile Oil and Valerianic Acid.

Antispasmodic.

 Valerian, Serpentry, Arnica, and Senega are often confounded, and the student should remember a few of the distinguishing points. Thus Senega, which is very like Serpentry and Valerian, is recognised by its keel or ridge, which is not marked on the smaller rootlets, but which may be seen, like a little mesentery, at the bendings of the roots, which are of a pure *white* colour internally. The rootlets of Serpentry are smaller than those of Valerian, and are destitute of the strong, unpleasant odour of that drug. Arnica is distinguished by its dark-brown colour, aromatic odour, and peppery taste.

Tinctura Valerianæ Ammoniata 1 in 5.

A very dark, reddish-brown liquid, prepared by macerating valerian rhizome in No. 40 powder 4 ozs. in a mixture of oil of nutmeg 30 mins., oil of lemon 20 mins., 2 ozs. solution of ammonia, and 18 ozs. alcohol (60 per cent.).

Diffusible Stimulant. Dose— $\frac{1}{2}$ to 1 dr., freely diluted.

VERATRINA (Veratrine).

An alkaloid or mixture of alkaloids, in pale grey, amorphous masses, or in powder, obtained from Cevadilla, the dried, ripe seeds of *Schoenocaulon officinale* (Melanthaceæ), by adding a concentrated tincture of the seeds to water (which throws down albumin and resinous matters). The watery liquid, after filtration, throws down the alkaloid on the addition of ammonia. This is purified by solution in acidulated water and further precipitation by ammonia.

Should not be given internally.

Unguentum Veratrinæ 1 in 50.

A nearly white ointment, prepared by warming veratrine 10 grs. with oleic acid 40 grs., and adding benzoated lard 450 grs.

Local Anæsthetic. Used in neuralgia like Aconitine.

VINUM XERICUM (Sherry).

A pale yellowish-brown, Spanish wine, containing about 16 per cent. of alcohol; enters into all the wines but Aurantii, Quininæ, and Ferri Citratis—viz., into Antimoniale, Colchici, Ferri, and Ipecacuanhæ.

ZINCI ACETAS $\text{Zn}(\text{C}_2\text{H}_3\text{O}_2)_2 \cdot 3\text{H}_2\text{O}$

In thin, translucent, colourless, crystalline plates of a pearly lustre, soluble in $2\frac{1}{2}$ times their weight of water; prepared by neutralising acetic acid with zinc carbonate.

Dose—1 to 2 grs. as a Tonic; 15 to 20 grs. as an Emetic. Chiefly used as an injection in gonorrhœa (2 grs. to 1 oz.).

Zinci Carbonas $\text{ZnCO}_3(\text{ZnH}_2\text{O}_2)_2 \cdot \text{H}_2\text{O}$

Zinc hydroxycarbonate, a white insoluble powder, is prepared by interaction of zinc sulphate and sodium carbonate.

Mildly Astringent.

Employed in making the Oxide, Valerianate, and Acetate of Zinc.

Zinci Chloridum ZnCl_2

In opaque, white, deliquescent rods or tablets; soluble almost entirely in half their weight of water; prepared by interaction of zinc and hydrochloric acid.

Only used externally as a powerful Caustic, mixed with 1, 2, or 3 parts of flour or powdered starch.

Liquor Zinci Chloridi 366 grs. in 1 oz.

A heavy, colourless liquid, prepared by boiling 1 lb. of granulated zinc in 44 ozs. hydrochloric acid and 20 ozs. distilled water, and filtering. If iron or lead be present add chlorine solution and carbonate of zinc to precipitate the iron or lead impurities attacked by the chlorine, and evaporate the filtered liquid to the

bulk of 40 ozs. If no iron or lead be present the chlorine and carbonate of zinc need not be employed.

Antiseptic. Known as "Burnett's Fluid" (which is only half its strength).

Zinci Oxidum ZnO

A soft, nearly white, insoluble powder, prepared by exposing the carbonate to a dull red heat ; or from metallic zinc by combustion, and when thus prepared it is white.

A Tonic in spasmodic nervous disorders. Externally—A mild Astringent, and Absorbent in weeping skin affections.

Dose—3 to 10 grs. in pill ; often combined with belladonna in night sweating.

Used to prepare the sulphocarbonate.

Unguentum Zinci 1 in 6 $\frac{2}{3}$.

A white ointment, prepared by adding oxide of zinc 3 ozs. to melted benzoated lard 17 ozs., and stirring till cold.

Unguentum Zinci Oleatis 1 in 2.

Prepared by dissolving zinc sulphate 2 ozs., in water 4 ozs. ; and hard soap 4 ozs., in water 40 ozs. ; mixing, collecting, washing, and drying the precipitated oleate of zinc, and mixing with an equal weight of white soft paraffin.

Action similar to Ungt. Zinci.

Zinci Sulphas $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$

In small, colourless, prismatic crystals, obtained by interaction of diluted sulphuric acid and zinc.

Often known as White Vitriol, and distinguished from Epsom salt (which it *closely* resembles) by its powerfully styptic taste.

Dose—1 to 3 grs. as a Tonic ; 10 to 30 grs. as an Emetic ; 3 grs. as an Emetic for a child 1 year old. As an astringent in gonorrhœa 2 grs. to 1 oz., and in ophthalmia 1 gr. to 1 oz.

Employed in making the Carbonate and Valerianate, and Ungt. Zinci Oleatis.

Zinci Sulphocarbolas $\text{Zn}(\text{OH}, \text{C}_6\text{H}_4\text{SO}_3)_2 \cdot \text{H}_2\text{O}$

Zinc sulphocarbonate or phenol-para-sulphonate, in colourless tabular crystals, obtained by heating a mixture of phenol and sulphuric acid, and saturating the product with zinc oxide.

Antiseptic.

Zinci Valerianas $\text{Zn}(\text{C}_5\text{H}_9\text{O}_2)_2$

Zinc valerianate or iso-valerianate, in minute, brilliant, white, pearly, tabular crystals, with the odour of valerian, sparingly soluble in water ; prepared by saturating iso-valerianic acid with zinc carbonate, or by the interaction of zinc sulphate and sodium iso-valerianate.

Antispasmodic and Nervine Tonic. Dose—1 to 3 grs.

ZINGIBER (Ginger)—Zingiberaceæ.

The scraped and dried rhizome of *Zingiber officinale*, in irregular, lobed, yellowish-white, chalky pieces.

Active principles—A Volatile Oil, and Gingerin or Gingerol.

Carminative and Antispasmodic. Dose—10 to 20 grs.

Syrupus Zingiberis 1 in 40.

A straw-coloured, muddy syrup, prepared by adding 1 oz. of a strong tincture of ginger, obtained by percolating $\frac{1}{2}$ oz. ginger in fine powder with alcohol (90 per cent.), and adding it to syrup sufficient to produce 20 ozs.

Dose— $\frac{1}{2}$ to 1 dr.

Tinctura Zingiberis 1 in 10.

A sherry-coloured liquid, prepared by percolating ginger in powder 2 ozs. with alcohol (90 per cent.), to make 1 pint.

Dose— $\frac{1}{2}$ to 1 dr., diluted.

In addition to the above, Ginger and its compounds enter into 14 Pharmacopœial preparations, viz. :—

Infusion of Senna.

Compound Mixture of Senna.

" Pill of Squill.

" " Gamboge.

" " Scammony.

" Powder of Cinnamon.

" " of Jalap.

Compound Powder of Opium.

" " Rhubarb.

" " Scammony.

Aromatic Sulphuric Acid.

Pill of Aloes and Iron.

Acid Infusion of Cinchona.

Concentrated Solution of Senna.

PART IV.

THERAPEUTICS.

Acacia Gummi is the type of a pure demulcent, and possesses also feeble nutritive value, a portion of it being converted into sugar in the intestines before absorption. The remainder, unless retained in the bowel for a long time, may pass out with the fæces. It is chiefly used on account of its physical qualities for making emulsions and suspending insoluble powders in mixtures. It contains a diastatic ferment, and its solutions are prone to undergo changes which lead to the formation of irritating compounds, and in medicine only the freshly-prepared mucilage should be used.

It is administered in inflamed conditions of the *throat, gullet, and stomach*; as a basis for cough mixtures; and as a demulcent in the after-treatment of cases of irritant poisoning. It acts *mechanically* by covering over the affected surface and preventing the contact of foreign matter or irritating secretions, and in *intestinal catarrh* it may give relief when more soluble agents fail.

A piece chewed in the mouth often affords relief by acting as a Ciliary Excitant, aiding the expulsion of tough mucus probably by exciting the cilia to increased activity through reflex stimulation of the vagus, as will be more fully mentioned in speaking of the action of some expectorants.

In mild cases of *chronic bronchitis*, or where there is hypersecretion of the mucus from the larynx, trachea, and larger bronchi, oftentimes associated with winter-cough, it may be found of service, by its soothing or demulcent action upon the irritated endings of the nerves of the fauces and pharynx which, by reflex action, intensify the tracheal or bronchial cough.

Acetanilide or Antifebrin is supposed to be altered in the blood into acetic acid and aniline, which latter becomes oxidised into paramidophenol and may appear in the urine. In medicinal doses this drug has no effect upon the temperature of the body in health. In large amounts it alters the composition of the blood and changes its colour, the red cells are injured, and methæmoglobin is formed, and the urine is coloured by it, while the amount

of nitrogen is greatly increased. Small doses raise the blood pressure, but large ones lower it and cause serious depression or paralysis of the heart.

In febrile conditions the temperature is reduced with certainty and rapidity after one to two hours, and generally with perspiration, but the effects are transient, and sometimes followed by depression. It seems certain that the fall is caused by diminished heat production from the action of the drug upon the thermic centres, and though the sweating aids the reduction by the extraction of heat it takes place when the skin is dry under the administration of belladonna. Though its action in *typhus*, *typhoid*, and all *fevers*, in *pneumonia*, *acute rheumatism*, *phthisis*, and nearly every feverish state is most marked, it is nevertheless very questionable treatment to employ the drug as a routine antipyretic in these diseases, as its effects so rapidly pass off without producing permanent good, and in very high fever (hyperpyrexia) it is not to be relied upon. In the short fever of *influenza*, *catarrh*, and *sore throat*, it may be employed with benefit in doses of 3 or 4 grs., repeated every 3 or 4 hours.

As an analgesic the drug is of great value, and its power of relieving the pain of *migraine*, *neuralgia*, and other allied conditions is remarkable. It is liable to produce, even in the above-mentioned doses, symptoms of an alarming character of which cyanosis, rigors, gasping respiration, and formidable collapse are prominent, but these generally pass off soon after the administration of hot drinks and stimulants. Several deaths have been attributed to its use, though recovery followed a dose of 450 grs. It also acts as a local antiseptic, and excellent results follow its local application as a dusting powder or dressing to perineal and other wounds occurring during labour.

The drug is less soluble, but much less expensive than antipyrine, and may be used in tabloids, powders, or cachets in all conditions in which antipyrine is indicated. The verdict of late years seems to be that it is not so safe as phenacetin or antipyrine, and often skin eruptions follow the use of antifebrin. Untoward effects are lessened by combining it with caffeine, and the so-called Daisy Powders can be imitated by a mixture of antifebrin 7, caffeine 1, and soda bicarb. 2. (B.P.C.)

Acidum Aceticum is a refrigerant when administered in a very dilute form. It does not appreciably reduce temperature, but in fever it produces a grateful feeling of coolness by allaying thirst, through its increase of the secretion of the salivary and other glands distributed in the mucous membrane of the mouth and throat.

It is mildly astringent and diuretic. Notwithstanding its power of drying up the bronchial mucus, as stated by Rossbach, vinegar in small doses is a very popular remedy for loosening cough and increasing expectoration. Externally, acetic and glacial acetic

acids are caustics, and will produce redness, vesication, and sloughing, in proportion to the strength of the acid and the duration of its application. Both the acids dissolve epithelium, and are used to destroy *warty growths*; and they have been recommended as local remedies in *cancer*, with the intention of *dissolving* the cancer cells. A weak solution of acetic acid or vinegar sponged over the body in fevers is of use in lowering the temperature, probably by reflex action. When applied undiluted to *ringworm* it kills the parasite. Vinegar has some local astringent properties, and is used as a hæmostatic in *post-partum hæmorrhage*.

The vapour of the strong acid applied to the nostrils is used as a restorative in *cardiac depression*; it acts by reflexly stimulating the vaso-motor centre and raising the blood pressure throughout the body.

The prolonged use of this acid diminishes the number of the red blood corpuscles, causing anæmia and loss of weight, and it is improperly used to correct obesity. The acids in the undiluted state are powerful poisons.

Acidum Arseniosum is a powerful poison. Metallic arsenic is practically inert, and can only become active when changed into the oxide or other soluble compound. Large doses of arsenious acid cause in half an hour a burning sensation in the throat, stomach, and abdomen, rapidly followed by violent vomiting, colicky pains, diarrhœa, cramps, excessive thirst, exhaustion, and collapse—a group of symptoms not unlike English *cholera*. Death results from paralysis of the heart, and of the respiratory centre without cerebral excitement or mental symptoms, and the victim may succumb in 24 hours, or he may live for two to four days, or even longer. After death there are found swelling and redness, with occasional patches of softening of the gastro-enteric mucous membrane, and if the patient have survived long enough, fatty degeneration of the liver, kidneys, and cardiac muscle. These effects are observed whether the arsenic be taken by the mouth, or injected into a vein, or applied to an open absorbing surface. The poison is excreted in the urine, and in the evacuations, saliva, tears, serosity of a blister, and in the sweat; it can be readily detected in the parenchymatous tissues, and in the cord. Many instances of fatal results have been reported where no gastro-enteric symptoms have been present and no signs of such noticed after death, the patient having died in a few hours after profound coma and nerve symptoms.

Of the various theories intended to explain the poisonous action of arsenic two may be mentioned. Ringer explains it by classifying arsenic as a profound protoplasmic poison. Binz found that in the organism arsenious is converted into arsenic acid, and arsenic acid is converted into arsenious acid, and that

the transformation is effected inside and outside the body by means of living protoplasm, and that arsenic consequently must be regarded merely as a carrier of oxygen, the oxygen being the active agent. It acts on the compact tissue of bone somewhat after the same manner as phosphorus, and Stockman found that *it very markedly increased the growth of red marrow*, though there was no increase in the number of the red blood corpuscles.

Symptoms of poisoning with arsenic are not uncommonly observed in those working with arsenical pigments, or in those living in rooms whose walls are covered with paper containing arsenical pigments; and they may be produced by the free use of the drug, as a remedy for disease. There are œdema of the eyelids, especially of the lower one, irritability of the membranes covering the eye-ball, nose, pharynx, and trachea, short, dry cough, anorexia, vomiting, colic, diarrhœa and prostration. Sometimes nervous symptoms, as tremors, headache, and partial paralysis of the lower extremities, symptoms of peripheral neuritis, keratosis, and bronzing of the skin like Addison's disease are observed, especially in those cases where the poison has been absorbed through the respiratory tract. The late serious epidemic of arsenical paralysis produced by the drinking of impure beer was probably due to the combined action of alcohol and arsenic.

In small doses ($\frac{1}{30}$ gr.) it acts by its *local* influence on the gastric mucous membrane, as a stomachic, increasing the digestive powers and stimulating the appetite; it is valuable in *gastric neuralgia* and occasionally in *ulcer* and irritative *dyspepsia*, and in the vomiting of chronic *alcoholism*, and in *diarrhœa* coming on immediately after eating; in these cases 1 to 2 minims of Fowler's solution *before* food may be given with advantage. In larger doses ($\frac{1}{10}$ gr.) arsenic acts as a nerve tonic, rapidly gaining an entrance into the blood by absorption, it does not form albuminates like other metals in the stomach; it is carried to the nerve centres and alters their nutrition in some mysterious manner, thus it is found to possess antiperiodic properties second only to quinine, hence its value in *neuralgia*, *angina*, and *ague*.

In *chronic malarial conditions* which resist quinine, arsenic is most useful, and it is well in such cases to begin with a full dose, $\frac{1}{15}$ gr. It is said to act as a *prophylactic* against malaria.

In *asthma* it has been successful, especially in the form of cigarette combined with stramonium, and internally in combination with iodides.

In *chorea* its best effects are observed, but it must be given in full doses, and it may be necessary to push it till the well-known physiological effects are observed, viz.—redness of the conjunctiva, with smarting and swelling of the eyelids, especially the lower one; signs of irritation in the membrane of the nose, throat, and mouth, and indigestion, vomiting, and griping. The writer has

given 15 minims of Fowler's solution to children thrice daily without producing symptoms of irritation.

Arsenic should not be used in acute cutaneous affections. It is in *chronic*, scaly, and papular skin diseases that its great benefit is proved. In *psoriasis*, *lichen*, and even in chronic *eczema* and *acne*, it cures when all other remedies fail, but its action is slow. Its best effects are thus seen in those diseases which affect the superficial layers of the skin.

It has specific action in *pemphigus*, and it has been used successfully as a subcutaneous injection in *multiple sarcoma of the skin*. Large lymphomatous malignant tumours have disappeared under its internal and subcutaneous use, and it is the best remedy in Hodgkin's disease.

In *malignant anæmia* and in *chlorosis*, arsenic often rapidly tells, even after iron has failed, and it may be frequently combined with this drug advantageously.

It may be used with benefit in the early stages of *phthisis* and *catarrhal pneumonia*. Brunton believes that by increasing the tissue changes in the epithelial contents of the alveoli—(fatty degeneration of these cells is a constant result of chronic arsenical poisoning)—it assists in rapidly breaking up and removing effused inflammatory products, and so prevents the bacillus of tubercle finding a suitable nidus.

Some authorities administer the drug as a routine treatment in ordinary *phthisis*, and affirm that it reduces temperature and checks the disease. The marvellous reports of the success of cacodylic acid, or its soda salt, in the treatment of *phthisis* and other diseases, still continue to flow in. Doses, equivalent to 100 minims of Fowler's solution, have been given without untoward results, but it is still very doubtful if the new salt is more efficacious than the oxide, as the great bulk of it passes through the body unchanged. See under Acid. Cacodylic.

Externally, arsenic is a powerful caustic, causing the death of the tissue to which it is applied, chiefly by the profound inflammation which it induces. In *cancer*, *lupus*, and *epithelioma*, its use has been advocated; but it is dangerous, as enough may be absorbed to cause death, unless applied in a concentrated form and to a very limited extent of surface.

Skill and experience are necessary for the successful use of arsenic in the removal of small epithelial tumours, and it is rather to be regretted that surgeons now-a-days very seldom avail themselves of this remedy; and many have not only no experience of it, but strongly discountenance every treatment but the knife. The result too often is seen—especially in the case of epithelial cancer—that the patient shrinks from the knife, and absolutely refuses all operative interference till too late.

It is the chief remedy amongst the "cancer curers" in the North of Ireland. Some of them, no doubt, knowing nothing of the power of their weapon, cause great disfigurement, and even loss

of life ; but others with experience and skill contrive to produce marvellously good results, with no disfigurement and little suffering.

Sir Astley Cooper's ointment consists of 1 dr. arsenic, 1 dr. sulphur, and 1 oz. spermaceti ointment, applied for 24 hours.

Hebra's paste consisted of arsenious acid 5 parts, cinnabar 1 part, and simple ointment 8 parts.

Fowler's solution has been used to remove *warts* and *corns* ; Abernethy's lotion consisted of 2 drs. Fowler's solution to 1 oz. water.

Allen strongly recommends the use of a paste made of equal weights arsenious acid and orthoform and water, which is applied after scraping epitheliomata.

Arsenic, unless when given for its *local* action upon the stomach, should always be given soon after a meal, and its effects closely watched for a short time, as some are (though rarely met with) very susceptible to its action, and it is a good rule to begin always with 2 minims of Fowler's solution ($\frac{1}{30}$ gr. arsenic), which may be increased cautiously, till 10 or even 15 minims are reached. Children bear large doses. A choreic child 5 years old may commence with 2 or 3 minims, gradually increased to 10, or even more. It rests upon unquestionable authority that the natives of Styria habituate themselves to swallowing lethal doses with impunity.

The iodide is given in skin diseases in the form of pills containing $\frac{1}{30}$ to $\frac{1}{15}$ gr., and Donovan's solution is a remedy of great value in the *tertiary* forms of syphilis. Asiatic Pills contain $\frac{1}{8}$ gr. arsenious acid with $\frac{3}{4}$ gr. pip. nig. and gum acacia in each.


R.

Liquor. Arsenicalis ℥iss.

Tinct. Ferri Perchlor. ℥ii.

Aquam Camphoræ ad ℥iv. *Misce.*

— *Fiat mistura. Capiat* ℥j. *mensura ter in die post cibos, ex aqua.*

 For the treatment of poisoning by arsenic see Index of Poisons at the end of the book.

Acid. Benzoicum possesses antiseptic properties superior to those of carbolic and salicylic acids. When taken in moderate doses (15 grs.) it remains unaltered as benzoic acid in the blood, but it unites in the kidneys with glycocoll, and is excreted as hippuric acid, rendering the urine acid. It thus acts as a diuretic, and, on reaching the bladder, it exercises an alterative and antiseptic action on its lining membrane in mild *chronic cystitis*, with high smelling, alkaline urine depending upon obstructed flow. It is indicated also in *pyelitis*, and is sometimes found useful in intractable *urethral* affections, accompanied by smarting pain on

micturition. It does not interfere with the elimination of uric acid. Though possessed of expectorant properties, it is inferior in this respect to the gum from which it is extracted.

Benzoic acid possesses all the antipyretic properties of salicylic acid, and may be used in *acute rheumatism* in preference to that drug. It may be given in doses of 30 grs., and the soda salt may be used as a substitute for sodium salicylate.

Acid. Boricum is an antiseptic without any irritating qualities, causing the destruction of low organisms without endangering in any way the vitality of the living tissues. Hence its great value in surgery as a dressing, either in the form of the official ointment or as a lotion (5 per cent.), or as Boracic Lint, prepared by soaking lint in a hot saturated solution of the acid, and drying. According to Kurz it checks suppuration when applied locally, by paralysing the white blood corpuscles as they emerge through the vascular walls.

Boroglyceride—a transparent solid (prepared by Barff by heating boracic acid 62 parts and glycerin 92 parts)—can be used as a lotion in the same way as boracic acid. It has a powerful effect in preserving milk and food against putrefaction. A powder consisting of equal parts of boric acid and borax is known as Antipyonin or Glacialine, and possesses the advantage of being more soluble.

Stockings dipped in a hot solution of the acid, and dried, check effectually *fetid perspiration* of the feet. It was supposed to have anodyne properties, hence its old name of Homberg's Sedative Salt. 10 grains to 1 oz. water make a good injection for *gonorrhœa*, *purulent ophthalmia*, and *otorrhœa*, and in this latter affection it may be loosely packed into the meatus. Packing the vagina with the dry acid and absorbent wool gives splendid results in bad *leucorrhœa*. Perez used it internally in *bladder* affections associated with decomposing urine. 10 to 15 grs. three times a day in two ozs. water will often, after a few doses, cause clear, odourless urine to flow where foul and putrid secretion had existed for months. It acts as an antiseptic on its elimination at the various outlets of the body, and in *diarrhœa* and *fermentative* states of the contents of the stomach its use may be tried.

The writer tried its effects in *typhoid fever*, but found that the stomach was upset by doses sufficient to saturate the system. He often saw excellent results from small doses.

2 or 3 grs. blown into each nostril every 4 hours by an insufflator have yielded good results in *pertussis*. Made into an ointment with lanoline it speedily relieves the *eczema* of children. A strong solution may be used for washing out the bladder where the internal use of the acid cannot be tolerated.

Where the kidney is extensively diseased the acid is always badly borne by the stomach. *Dermatitis* not seldom follows its administration.

Acid. Carbolicum is a powerful antiseptic, destroying minute forms of animal and vegetable life, rapidly arresting fermentation, and precipitating albumin. It destroys in very dilute solution the organised, and in stronger solution the unorganised, ferments, at the same time *deodorising* their foul smelling and poisonous products. It is useful in chronic *gastric* complaints, accompanied with offensive eructations, acting like creosote; it destroys *sarcinæ*, and stops fermentation in the stomach, where, by its local action, it often allays sickness and vomiting, and stops diarrhœa. The sulphocarbolates of sodium and potassium act in a similar way, and have been used in *typhoid* and other *fevers*, and with success in *ulcerative endocarditis*.

Carbolic acid inhaled, as vapour or atomised spray, acts very effectually in checking expectoration of *chronic bronchitis*, is invaluable in *gangrene of the lung*, and has the power of cutting short *influenza*. Used as a gargle (1 in 150), or as a spray (1 in 100), or as a lozenge in various pharyngeal affections, it causes anæsthesia of the mucous membrane, diminishing the reflex irritability in the palatal and other muscles, thus effectually preventing distressing attempts at swallowing, and by this means cutting short the course of *acute tonsillitis*, and relieving follicular *pharyngitis*. The spray affords the best local routine treatment in *diphtheria*.

Applied to the skin it acts as a painless caustic, causing the death of a very superficial film, and in a similar way it may be painted over exuberant granulations. The lotion (1 oz. to 1 quart) is a good dressing for fresh wounds, and effectually destroys the foul smell of *sores* and *ulcers*, exciting in them healthy action, and hastening the healing process.

Carbolic acid, when applied to the skin or wounds, in concentrated solution acts as a local anæsthetic, diminishing sensibility, and if the cork of the carbolic acid bottle be laid against the skin so as to affect a small area with the acid, the hypodermic or aspirator needle can be almost painlessly inserted. Its anæsthetic effect when applied to carious teeth is often marked, for this purpose it is best mixed with collodion (1 to 3). It is used successfully as an application to various *parasitic skin diseases*, and the pure acid is the best caustic we possess for *uterine ulcerations*. A strong solution applied to an extensive raw surface may cause gangrene of a limb, or it may be absorbed, and produce the same poisonous effects as a large internal dose, causing violent *gastro-intestinal irritation*, *syncope*, *disturbance of respiration*, *muscular weakness*, *coma*, with contracted pupils, and sometimes *convulsions* by its action on the vaso-motor centre, medulla, and cord; hence, when *extensively* employed, its effects should be watched, the urine through which it is eliminated often turning almost black. V. Bruns has shown that there is no danger if the pure acid be applied to infected wounds and wiped off with alcohol; the danger is in working with solutions. Even when

given internally one-third of the lethal dose of the pure acid will cause death if it be diluted freely.

A portion of the acid appears in the urine free; a portion is burnt up in the body, and is eliminated as hydroquinone; and a portion is eliminated as sulphocarboic and glyco-uronic acids, in the form of double or ether sulphates. Poisonous doses at first cause a rise in the blood pressure, which soon gives place to a great fall; as paralysis of the nerve centres, respiration, and heart occurs, the blood becomes dark and loses its coagulability.

Deep hypodermic injections of $\frac{1}{2}$ gr. of the acid in 20 minims of water have been found most successful in deep-seated inflammations, glandular and joint swellings, erysipelas, poisoned wounds, and as a means of aborting boils and carbuncles, &c. $\frac{1}{2}$ gr. in 5 mins. of water injected into piles causes their rapid disappearance.

Sir A. Clark treated hay-asthma by applying the following with a brush to the pharynx through the nares—Glycerin of Carbolic Acid 1 oz., Hydrochloride of Quinine 1 dr., Corrosive Sublimate $\frac{1}{2}$ grain.

The acid is best administered in the form of a pill; for external application, 1 in 40 of water is the strength of the "Lotion" used for all ordinary purposes. "Carbolic Oil" composed of 1 part acid and 10 parts olive oil is practically useless as a germ destroyer.

R. *Acidi Carbolici* $\mathfrak{z}\text{i}$.
 Aquæ Rosæ $\mathfrak{z}\text{xii}$. *Misce*.

Fiat solutio. Signa—"To be used as a spray for the throat every two hours."

Acid. Chromicum possesses the power of killing all low organisms, oxidising organic matter, coagulating albumin and destroying the tissues with which it comes in contact. It is thus an antiseptic, disinfectant, and caustic, and is chiefly used in the concentrated form (the deliquesced crystals) to destroy *condylomata*, warty, and other superficial growths, which it does effectually. A lotion of 10 grs. to 1 oz. has a decided effect upon syphilitic and gouty diseases of the tongue and throat. A 3 per cent. solution brushed over the feet checks sweating of the parts, but if abrasions be present dangerous irritation may result. Death has resulted several times from the absorption of the acid when too freely applied externally.

Acid. Citricum and Succus Limonis, identical in action with tartaric acid, are grateful refrigerants, a small quantity sucked in the parched mouth producing a refreshing moisture by stimulating the salivary glands, and probably also all the glands of the mucous membrane down to the stomach. When administered in

health, the urine becomes acid under their use, but in *fevers* they do not increase the acidity of the urine. The neutral salts of the vegetable acids act as refrigerants, but they differ from the acids in increasing the alkalinity of the blood, being oxidised and converted into carbonates, in which state they pass out in the urine, increasing its alkalinity or rendering it alkaline if acid. Citric and tartaric acids are largely used in medicine to make effervescing draughts, which, on being swallowed whilst the carbonic acid is being given off, act as sedatives to the mucous membrane of the stomach, the gas having a soothing influence upon the terminal filaments of the nerves of this organ. Upon page 180 will be found a useful table of the requisite proportions of different alkalies to make an effervescing mixture, and below is the formula for one of these. Lemon juice acts like citric acid, but is found to be more efficacious in *scurvy*, acting in some way as a blood restorative, and, in addition to being a specific in this disease, it is a prophylactic. It has been administered in *acute rheumatism*. A decoction of *fresh* lemon is believed to possess antiperiodic powers in *intermittent fever*, and Blanc insists upon the value of lemons and other acid fruits in *gout* with the view of "diminishing the production of uric acid, and of increasing urinary alkalinity." A solution of citric acid is largely used as a substitute for lemon juice. It has feeble antiseptic properties.

R. *Potassii Bicarbonatis* ℥vj.
 Aquæ Destillatæ ℥xij.

Solve, capiat cochlearia duo ampla cum succi limonis recentis cochleare amplo in effervescentia ter in die.

Acid. Gallicum and Acid. Tannicum are vegetable astringents. Tannic acid coagulates albumin, gelatin, and mucus, but gallic does not. The way in which these substances produce their astringent effect cannot, however, be explained upon merely chemical principles. They were generally supposed to act by "tanning" or "condensing" the skin, tissues, and membranes with which they came in contact, and it was believed that when taken internally they acted directly upon the muscular tissue in the arterial coats and lessened the calibre of the small vessels. Experiments, however, prove that the vessels are dilated, though there may be a previous short period of contraction, and that the partly chemical and partly vital action of these acids is yet to be explained.

Gallic acid has no local astringent action. Tannic acid, when administered, is changed to gallic in the stomach and intestines, and as such passes into the fæces and urine, hence gallic acid is selected for internal administration, whilst tannic acid is selected when a local effect is desired. Stockman found that when pure

tannin was given by the mouth, gallic acid appeared in the urine along with *traces* of tannin, but when tannate of soda was given large quantities of tannin with a little gallic acid appeared in the urine, the uncombined tannin being at once changed into a tannate of albumin in the stomach, which, being slow of absorption, has time in the intestines to be almost entirely converted into gallic acid. Tannate of soda, on the other hand, being rapidly absorbed by the stomach, passes out in the urine without change. As remote astringents these acids must be considered valueless save in the faint action they possess in common with all acids in diminishing the alkalinity of the blood and thus increasing its coagulability. Nevertheless they are still used by many in *internal hæmorrhages*, in *excessive secretions* from different parts of the body, and for cutting short *local inflammations*, as in various forms of *sore throats*, *nasal catarrh*, and *gonorrhœa*. By their action the secretion of the bowels is lessened, and the contents become more solid, owing to the *local* action of the drug as it passes down the tube before absorption, and hence its value in *diarrhœa*. It has been found useless in *albuminuria* and *phthisis*. Either acid may be given in 5 to 10 gr. doses, dissolved in water, or made into a pill with a little glycerin. The gall and opium ointment is an astringent remedy for painful *hæmorrhoids*, and the glycerin of tannin for *enlarged tonsils* and relaxed conditions of the throat. Tannic acid may be applied directly to bleeding surfaces as a styptic to stop hæmorrhage.

Tannic acid is used as an antidote in *poisoning by the alkaloids* to form tannates which are only partially soluble.

There cannot be a doubt of the value of the newer compounds of tannin in *intestinal catarrhs*. (See under Tannalbin).

Acid. Hydrobromicum has sedative properties much weaker than the bromides. (See under Bromum.) It is a good solvent for the quinine salts, and is administered with the view of preventing their unpleasant effects.

Acid. Hydrochloricum, Nitricum, and Sulphuricum when applied externally, act as powerful corrosives and escharotics when undiluted, and when administered internally in their strength they act similarly, destroying the tissue of the digestive tract, and producing the well-known effects of corrosive poisons. In both these cases their action may be regarded as *chemical*, as they in like manner act upon dead tissues. These results are explained by their action on albumin and by their great affinity for water, which they abstract so rapidly as to cause the death of the tissue containing it. Nitric acid is the one selected when we wish to avail ourselves of this property, and it is used in *phagedænic ulceration* and *sloughing* by applying the strong acid with a stick. It destroys all unhealthy tissue, at the same time altering the condition of the surrounding living parts so that

diseased action is stopped, and a new healthy action set up. It is likewise used to destroy *warty growths* and to stimulate *sluggish ulcers*, and it is useful when applied to the interior of the *uterus* in chronically inflamed conditions. Its action is very superficial, because it cannot redissolve the albumin which it precipitates and which thus limits its penetration into the tissue.

Strong hydrochloric acid, diluted with an equal weight of honey (making a linctus), is used to destroy the false membrane in *diphtheria* and *ulcerations of the throat*.

Strong sulphuric acid is used as an application to *carious bone*, to the interior of *disorganised joints*, *cancer* and *chancres*, and phosphoric acid also acts as a powerful caustic. Diluted with from 200 to 300 times their bulk of water, they form good astringent lotions for *sluggish sores*, or gargles for relaxed conditions of the *throat*. Roberts recommends an injection of weak nitric acid to dissolve phosphatic stones in the bladder.

Internally, the mineral acids stimulate the alkaline secretions of the body and, according to Ringer, check the acid ones; thus the saliva, bile, and intestinal juice are increased, and the secretion of acid gastric juice lessened. This gives us an explanation of the value of these acids in *dyspepsia*. Hydrochloric acid, which is a constituent of the gastric juice, is used in chronic *gastric* complaints, a dose administered *before* a meal checking the excessive irritating acid secretion and stimulating the appetite; whilst *after* a meal, in a different class of cases, the digestion is accelerated by supplying the deficiency of acid, as pepsin refuses to dissolve proteids unless free acid is present, but the value of hydrochloric acid in the treatment of atonic dyspepsia is, in the writer's opinion, exaggerated. It is the exception to find marked benefit from its exhibition. In the dilute solution existing in a full stomach its *antiseptic* properties are useless. The acid under normal conditions in the stomach is in combination with the pepsin as it is excreted.

R. *Acid. Hydrochlor. Dil.* ℥iv.
 Tinct. Calumbæ ℥iv.
 Tinct. Nucis Vom. ℥iiss.
 Inf. Aurantii ad ℥viiij. *Misce.*

Fiat mistura, cujus capiat cochleare amplum ter in die ex aqua ante cibos.

The mineral acids are rapidly absorbed, having great diffusive power, and on entering the blood they combine with bases, freeing weaker acids from their salts, and thus rendering the blood less alkaline. Whilst passing through the liver they probably influence the tissue changes which take place between the blood and the hepatic cells, as their administration diminishes

the amount of urea secreted. They are thus cholagogues. They appear in the urine as salts of urea. The dilute or aromatic sulphuric acid, in 20 minim doses, freely diluted, is said to check hæmorrhages and sweating.

As regards the astringency of the mineral acids, sulphuric is the strongest and hydrochloric the weakest, and their effect upon the bowel is probably local.

In *chronic diarrhœa* excellent results are sometimes obtainable by full doses of hydrochloric acid given immediately before food.

The free administration of the diluted mineral acids renders the urine slightly more acid than the normal condition, and hence their indication in the *oxalic* and *phosphatic diatheses*, but they do not cause the already alkaline urine to become acid.

In *fevers*, the administration of the diluted mineral acids (the Swedish treatment) is followed by good results. They make up for the deficiency of acid in the gastric juice, which is a feature in fever; they increase the saliva and remove the parched condition of the throat and tongue; they help to neutralise the excessive alkalinity of the blood, and to correct the acrid alkaline motions of *typhoid fever*.

Acid. Hydrocyanici is the most rapid poison known, killing, if administered in a concentrated form, in less than a minute, by acting as a profound nerve and cardiac sedative, and paralysing the brain, cord, and motor nerves. After a large dose the patient falls, his respiration becomes convulsive, pupils dilated, and face congested, death ensuing by rapid asphyxia, succeeding convulsions and coma, though the blood in a quickly fatal case may be florid in the veins; the tissues lose the power of absorbing oxygen, owing to the action of the poison on the protoplasm. If life be prolonged the blood becomes dark.

It is used in medicine chiefly on account of its sedative action when applied to the peripheral extremities of irritated or painful nerves; hence its use in painful *gastric* disorders, accompanied by *vomiting*, 3 minim doses in *gastric ulcer* or *cancer* often giving much relief, and, by blunting the sensibility of the nerves, it is useful in the reflex vomiting of *pregnancy*, for the cough of *phthisis*, and externally for allaying the itch of *urticaria*, *lichen*, &c., when applied in those latter cases as a lotion of 1 in 40, care being taken that the skin is not broken.

The preparations of bismuth may be ordered with great advantage with Prussic acid in stomach affections.

☞ For Poisoning see Index of Poisons at the end of the book.

R. *Acidi Hydrocyanici Dil.* m. lx.
 Bismuthi Carb. gr. lxxx.
 Mucilaginis Recentis ℥iiss.
 Aquam ad ℥iv. Misce.

Fiat mist. cujus capiat ℥j. *ter in die, ante cibos p.p.a.*

Acid. Lactic. possesses properties similar to those of the mineral acids as described under Hydrochloric. The dilute acid has a solvent action when applied in *diphtheria*. Internally it is a valuable aid in *atonic dyspepsia*, and a grateful refrigerant which has done good service in *diabetes* and *vesical catarrh*. Sour buttermilk will be found superior in most respects to lactic acid for internal use. This the writer has often proved, especially in the vomiting of *chronic Bright's disease*, and in the *phosphatic diathesis*. The writer has used the strong syrupy acid with success in *lupus*; it only attacks the diseased tissue, and is not very painful, and it leaves a good scar. See "Dictionary of Treatment," page 538. A 50 per cent. solution in *pharyngeal* tubercle has given good results, and recently a 33 per cent. solution has been applied with friction to the scalp as a remedy for baldness.

Acid. Nitric.—See Acid. Hydrochloric., under which head its chief uses are mentioned.

Acid. Nitro-Hydrochlor. Dil. is a valuable cholagogue. (See under Acid. Hydrochlor.) As a restorative in prostration and loss of appetite, following prolonged mental labour, combined with a vegetable bitter, in 15 to 20 minim doses, it will be found a most satisfactory and efficient tonic. It should be *recently prepared*. Used in the form of a bath in *chronic congestion of the liver*, by mixing 1 oz. strong nitric and 2 ozs. hydrochloric acids with 2 gallons water at 98°, it will be often found useful.

Acid. Oleic. and Oleates.—The B.P. oleates are used as substitutes for mercurial and zinc ointments, whose actions they closely resemble. Recently Oleic acid in the *pure* state has been successfully used as a substitute for the large doses of olive oil given for *gall stones*. It is administered in capsules in doses of 15 mins.; in half this dose *ter die* it is a prophylactic. (See Eunatrol.)

Acid. Phosphoric. has no properties beyond those possessed by the mineral acids, as described under Acid. Hydrochloric. It is refrigerant and tonic, and is supposed by some to have the power of dissolving phosphatic deposits and bony tumours. It makes an agreeable drink in *diabetes*, but has none of the therapeutical virtue of free phosphorus. The concentrated acid is a strong caustic, and Grossich advocates the use of a 10 per cent. solution as a dressing for *ulcers* and an injection into *scrofulous glands and joints*.

Acid. Salicylic. is a powerful antiseptic and antiferment. A 2 per cent. solution speedily kills bacteria and stops fermentation. It is used as a surgical dressing either in the form of "lint" or "wadding," or "ointment" (1 to 27), or "lotion" (acid 10 parts, borax 20, water 100). Whilst the power and certainty of its action as an antiseptic, together with its mildness, combine to make it so valuable, it has the great disadvantage of being *non-volatile*. It has been used with benefit as a local antiseptic appli-

cation in *diphtheria*, and a solution in collodion (1 to 2) speedily destroys *corns* and *lupus*, acting only on the *diseased* cells. The soda salt has less lethal effect upon germs; a solution has been used as a local application to the joints in *acute rheumatism*, in itching from *eczema* and various causes, and to check fetid perspirations in the feet and armpits.

Salicylic acid, in doses of about 15 to 20 grs. every 2 or 3 hours, soon produces effects in the healthy individual like quinine—fulness in the head, buzzing in the ears, disturbances of vision, and if the dose be very considerably increased in frequency and amount, other more alarming symptoms supervene, as deafness, squinting, sighing respiration, restless delirium, with dark albuminous urine, involuntary evacuations, and convulsions (it does not reduce the temperature in health). These symptoms may terminate fatally by its paralyzing action upon the respiration, though it probably requires an enormous dose of the pure acid or its salts to bring about such an issue.

Charteris' researches proved that these symptoms were mainly owing to the presence of cresotic acid.

Salicylic acid is excreted by the saliva and perspiration, and appears in the urine soon after administration, mostly as salicyluric acid, a substance analogous to hippuric acid. The green coloration sometimes noticed is owing to the presence of indican or pyrocatechin. In the blood it exists as alkaline salicylates. The amount of uric acid in the urine is greatly augmented, and Haig has pointed out the utility of salicylates in preventing the accumulation of uric acid in uric acid diseases, and thus explains their value in *migraine* and *epilepsy* and in *gout*, especially in preventing attacks of *gout*. It is eliminated from the blood by the synovial membranes according to Gaglio.

It is in *acute rheumatism* that this drug and its soda salt give best results; the temperature is reduced generally within 24 hours. Often pain and temperature are most markedly diminished in 12 hours.

20 grs. of salicylic acid, or salicylate of sodium, in half an oz. of any infusion or in water every two hours for 3, 4, or 6 doses, as the severity of the pain and height of the fever heat indicate, will be found the best practice to adopt. Profuse sweating will generally follow after each dose. The maximum daily dose should not exceed 2 drachms.

Often patients express relief after the first or second dose, and it is not unusual to have a fall of 3 to 5 degrees at the end of 24 or 48 hours, or a total cessation of *all* the symptoms of the disease. The writer has seen equally satisfactory results follow $\frac{1}{2}$ oz. doses in the horse. The drug acts upon the thermic centres, and the fall in the fever heat is not merely the result of the sweating, but is owing to diminished metabolism and to its power in destroying the material poison which produces the fever.

It is affirmed that the chances of *heart* complications are lessened, and that the course of the disease is cut short by this treatment. Pain and fever return if it be withheld, but will yield again on its administration, and the drug must be given in diminished doses for at least ten days after the fever has disappeared. Latham holds that it is decidedly curative, but he insists upon the use of the pure acid obtained from the winter-green, and points to the absence of the physiological effects of the drug as long as the rheumatic poison circulates in the blood, even when large doses are being administered.

In the *hyperpyrexia* of acute rheumatism it is not safe to trust to the antipyretic virtues of either salicylic acid or quinine; the cold bath should be employed. MacLagan found the cerebral symptoms produced by large doses of salicylic acid to disappear on the substitution of salicin for the acid.

For the high temperature in other diseases (typhoid fever, scarlatina, pneumonia, &c.), this remedy has been found useful, but in no other affection save in rheumatism does it supersede quinine.

It is a cholagogue, and increases the amount and fluidity of the bile, and may be given in cases of *gall-stone*.

It is recommended in small doses to relieve *headache*, and in larger doses in *phlegmasia dolens*, *neuralgia*, and *lumbago*. Ringer finds it the best remedy for *sciatica*. It has emmenagogue properties, and it may excite abortion.

Acid. Sulphuric.—For the astringent, tonic, and caustic properties of this remedy, see under Acid. Hydrochloricum. It should be remembered that it is valuable as an astringent only in bleeding from *mucous* surfaces. It is also used as a prophylactic and curative agent in *lead poisoning*.

Acid. Sulphurosum destroys the lower forms of life, both animal and vegetable. Hence it is useful in *parasitic skin diseases*, applied diluted with an equal bulk of glycerin; and internally in *pyrosis* and *fermentative conditions* of the *stomach*, depending upon the existence of dilatation or of *sarcinæ*. It has been occasionally vaunted as a remedy in *zymotic diseases*. It should be given in doses of $\frac{1}{2}$ to 1 dr. freely diluted. It has been used as a spray in *laryngeal phthisis*.

Acid. Tannicum is fully discussed under Acid. Gallicum.

Acid. Tartaricum is identical in therapeutic action with Acid. Citric. (which see).

Aconite produces paralysis of the sensory terminals, and causes death by paralysing the respiratory centre or depressing the heart without affecting the cerebral faculties. Before this event takes place various alterations in the sensory and motor apparatus occur. A feeling of tingling occurs throughout the body, beginning in the most sensitive parts, as the tongue, throat, and finger tips, and extending gradually to the least sensitive, and

the terminations of the motor as well as sensory nerves appear to be irritated and then paralysed. There is great depression of the entire nervous system with diminished sensibility and loss of power of all the nerves of the spine and medulla. The pupils oscillate between contraction and dilatation, finally remaining widely dilated. The temperature and blood pressure fall, vomiting and convulsions generally appearing before death, which results from cessation of respiration. The muscles do not lose their excitability.

It is chiefly on account of its distinct sedative action on the heart that aconite is useful, moderate doses, as pointed out by Ringer, reducing the pulse to 40 beats in the minute, and lowering the respiration. Recent researches prove that the slowing of the heart, following medicinal doses, is mainly caused by the stimulation of the vagus centre by the drug. Following the reduction of the pulse and arterial tension in febrile conditions, the heat of the body falls steadily, and the skin keeps moist, and the urine is increased, aconite acting as a diaphoretic and diuretic, though the sweating does not account for the reduction of temperature.

These effects produced by aconite have led to its administration in the treatment of inflammations—as *pneumonia*, *peritonitis*, *pleuritis*, *rheumatism*, and *erysipelas*—some authorities going so far as believing that if the remedy is administered sufficiently early, the inflammation or fever is often prevented. It seems to be especially useful in *acute throat affections*. It should be given in small doses—2 minims of the tincture every 15 minutes for six or eight doses, then every two or three hours, and kept up while the thermometer registers above 100°F. Aconite is found very useful in *neuralgia* of the fifth nerve, and it increases the efficacy of quinine in most neuralgic conditions. Success has followed its administration in the vomiting of *pregnancy*. Externally it paralyses the sensory nerves, causing tingling when applied to the skin or tongue, and thus it often relieves *pain*, especially when rubbed in, in the form of unguentum aconitinæ, over the course of the affected nerve, or used as a liniment in *rheumatism*, *sciatica*, *lumbago*, &c. The A. B. C. Liniment consists of equal parts of the liniments of aconite, belladonna, and chloroform.

Cash and Dunstan have demonstrated the partial antagonism between aconitine and the other alkaloids contained in the root, and they advise that the pure aconitine should take the place of the indefinite mixture of physiologically antagonistic alkaloids contained in the B.P. preparations. (See under *Aconitum Ferox*.)

Adeps, Adeps Benzoatus, and Adeps Lanæ are used solely as external emollient applications, affording a uniformly soft and unirritating base for the preparation of ointments containing more active substances. The benzoin is added to resist the putrefactive changes to which lard is so liable. Lanoline is readily absorbed by the skin, but it is doubtful if it materially assists the

absorption of alkaloids or other active drugs. It forms an excellent basis for ointments, and possesses the property of absorbing water to a surprising extent; it is stable, bland, unirritating, and antiseptic. Its stickiness is overcome by mixing a little lard or vaseline with it.

Æther is used in medicine with three different intentions—
1. As a *local anæsthetic*, thrown in the form of spray upon the skin or gum, when the reduction of temperature caused by its rapid evaporation becomes so great as to freeze the part, depriving it of all sensibility, relieving superficial neuralgia, and permitting the performance of minor cutting operations or the extraction of teeth, and easing the lightning pains of *ataxia*. The ether used for this purpose is the official "*Æther Purificatus*," or Absolute Ether (Methylated) S.G. '718. 2. It is administered *internally* in moderate doses; when it reaches the stomach it stimulates its movements, increases the gastric secretion, expels flatus, and acts as a powerful diffusible stimulant and narcotic, like alcohol; it was consumed largely in some parts of Ireland as a substitute for whiskey. It is antispasmodic, and is useful in *bronchitic asthma*, in doses of $\frac{1}{4}$ to 1 dr. In emergencies, as in *syncope*, *hæmorrhage*, *angina*, *internal gout*, &c., and in *uræmic dyspnoea*, where a rapid stimulant is demanded, it may be injected hypodermically. Durande's remedy for the solution of gall-stones was a mixture of turpentine and ether. 3. It is *inhaled* to produce general anæsthesia, affecting first the cerebrum, then the sensory, and next the motor centres of the cord, next the sensory, and finally the motor centres in the medulla. It is about four times safer than chloroform, having a stimulating action on the heart and vaso-motor centre; when death occurs, which is rare, it is owing to the paralysis of the respiratory apparatus. It is, on the other hand more disagreeable and more tedious, and sometimes produces bronchial irritation, and is more liable to be followed by vomiting.

Pure anhydrous washed ether S.G. '720 is best for inhalation; rectified methylated ether S.G. '720 answers, however, perfectly well. It may be given, poured upon a sponge, in any form of inhaler which fits the face, 1 oz. being poured on at first, and kept up till symptoms of insensibility show themselves. The vapour should be administered in as concentrated a form as possible. If the sponge be warmed, by wringing thoroughly out of hot water, the effect is sooner produced. The writer has used a pint and a half in one instance before insensibility supervened. It can be administered in conjunction with nitrous oxide, which may be used to produce insensibility, which can afterwards be kept up for a considerable time with ether, or it may be mixed with chloroform as in the A.C.E. Mixture. The temperature of the body falls considerably in prolonged etherization. The danger of the vapour catching fire must never be forgotten.

Vedd injects 5-10 minims of pure ether into *wens* frequently, and in a fortnight finds their contents liquid ; he then makes an incision, after which they shrivel up ; and Meierhof successfully uses ether to remove *plugs of cerumen* in the auditory meatus.

Æther Acetic resembles ether in action, only it is more agreeable and milder, and acts as a mild antispasmodic and diaphoretic in doses of half a tea-spoonful in sweetened water or sherry. Hoffman's Anodyne possesses similar qualities.

Æther Nitrous—as found in the Spirit. Æther. Nitrosi—is a very efficient and agreeable diaphoretic or diuretic, especially useful in *dropsies* in the debilitated. It possesses powerful narcotic properties like ether, when given in large doses.

As first pointed out by Leech, it is a powerful vaso-dilator, acting like the other nitrites, but it rapidly loses this property when mixed with water in mixtures unless an alkali or acetate of ammonia be present.

It is invaluable in all *febrile affections of childhood* characterised by a hot skin ; and in full doses, 12 or 15 minims for a child one year old, it soothes the irritation of *delayed dentition* better than any other safe remedy. For a child 1 year old—

R. Spirit. Æther. Nit. ℥iiss.
 Aquæ Ammon. Acet. ℥iv.
 Syr. Aurantii Fl. ℥iv.
 Aquam Anethi ad ℥iii. Misce.

Ft. mistura. Capiat ℥j. secundis horis.

Alcohol Absolutum is ethyl hydroxide with not more than 1 per cent. of water. Though the various alcoholic liquids are introduced into the B.P. for pharmaceutical operations chiefly, and not for their therapeutical properties, still the student must have a clear knowledge of the action of alcohol.

The popular term of "Stimulants," as applied to the various preparations containing alcohol, is very apt to mislead. In full doses alcohol should be regarded as a true narcotic, like chloroform, ether, or, in some respects, opium. Narcotics at first cause a period of stimulation or excitement, afterwards followed by sleep and coma ; and alcohol differs from the substances just mentioned only in degree, its period of excitement being longer. Shmiedeberg, however, maintains that there is no initial stimulating stage, but that the apparent excitement is caused by a paralytic action upon the inhibitory functions. In his opinion there is a depressant action from the first upon all parts of the nervous system.

Small doses increase the flow of saliva and gastric juice, improving the appetite and digestion, augment the force of the heart, dilate the capillaries of the skin, and increase the mental

activity—probably by dilating the cerebral vessels. Poisonous doses at first stimulate and then paralyse the nerve centres in the inverse order of their development, beginning with the higher mental or emotional centres, and proceeding in order to the lowest, soon destroying reflex action, producing profound coma, dilated pupils, pallor of the skin, feeble pulse, a reduced temperature, embarrassed respiration, and, finally, death from paralysis of the respiratory or cardiac centres.

Poisonous doses reduce the temperature from 5 to 10 or more degrees F., and often small doses cause it to fall half a degree ; this effect of small doses is not constant, and is not met with in those having become accustomed to its prolonged or intemperate use. Brunton has clearly shown that the early symptoms are owing to the action of the alcohol upon the vascular system by causing dilatation of the superficial vessels, and allowing the great sheet of cutaneous capillaries to cool the blood by transmission and radiation. When the surrounding air is *very cold*, these vessels, which ordinarily contract and prevent reduction of temperature, dilate to such an extent under alcohol as to cause the patient's death speedily by loss of heat in the arctic climate. When given in small doses it seems certain that a considerable amount disappears in the system, and is used up as a food like sugar, producing vital energy and heat. Binz states that alcohol, with the exception of a minute fraction, is completely oxidised in the organism, acting as a fuel ; the principal result being a great saving of albumin. It certainly saves carbohydrate metabolism.

Alcohol is given very freely by many in *fevers* and in *acute diseases*, some believing in its value as a true stimulant to the vascular and nervous systems ; others maintain that by lessening oxidation it retards metabolism and saves tissue waste, others believing only in its value as an easily assimilated food and in its powers of reducing temperature. Elaborate directions are given for its exhibition in such cases, some authorities relying upon signs of failure in the heart and general circulation, others looking for indications from the exhausted nervous system. (See the Author's "Dictionary of Treatment," page 977, for the rules of its exhibition in fevers). Most authorities would probably agree (1) that alcohol is not necessary at all in the *majority* of cases ; (2) that often unpromising cases pull through without it ; (3) that in severe cases it cannot be safely withheld from those habituated to it ; (4) that occasionally, by the use of alcohol, life may be saved which would otherwise be lost ; and (5) that it is rarely needed in the very large doses prescribed by some ; 8 to 10 ozs. whiskey may be regarded as representing a liberal daily allowance.

When given to combat the symptoms of *shock* and *collapse* it should be only slightly diluted as some of its effect is owing to its irritating action upon the mucous membrane.

One large dose of alcohol at bed-time is a good narcotic in very many diseases, if the patient has been a stranger to the drug. In sleeplessness from overwork, neuralgia, &c., its value is apparent; and, moreover, the danger of the patient becoming the victim of intemperance (a danger never to be lost sight of) is reduced to a minimum when given in one large dose, like a draught of laudanum or chloral, after his retiring to bed. It should be given made into punch; and whiskey is the best form of alcohol for this purpose (Ziiss). In many inflammatory diseases the addition of 30 grs. of nitre is an improvement. The effects are not always in proportion to the percentage of alcohol contained in wines and spirits, since the subtle ænanthic ethers which develop as the liquid becomes aged, produce characteristic effects, and the impurities often present play an important part.

Brandy, Whiskey, Gin, and Rum contain about 50 per cent. of alcohol; Port Wine, 16 to 17; Sherry, 15 to 16; Madeira, 14 to 15; Claret, 5 to 7; Porter (bottled) and Ale (bottled), 5 to 6.

Alcohol must be administered with great caution where the kidneys are diseased, and in all cases of chronic functional nervous disease, as in hysteria.

Externally, spirit is used as a dressing. The ordinary "spirit lotion" is made by adding 1 part of the official Spt. Rect. to 3 of water, or equal parts of whiskey and water, and so constituted may be used as an evaporating lotion, when applied to any part on lint, and the vapour permitted to escape freely. It thus cools the part, and by directly abstracting heat it modifies inflammatory action. When spirit lotion is applied on lint, and covered in with oiled silk, so that its vapour cannot escape, then it acts like a mild, stimulating poultice, possessing *antiseptic* properties. Strong solutions harden the skin and tissues, and are useful in preventing *bed-sores*.

Aloe Barbadosis and **Aloe Socotrina** are cathartic, chiefly acting on the large intestine, especially on its lower half, producing—in doses of 2 to 4 grs., after about 12 hours—copious softened evacuations, generally accompanied by some griping. It produces its effects when sprinkled over a blistered surface, or injected into the blood, probably by being eliminated by the mucous membrane of the colon, which it stimulates to increased action. It has a decided stimulating effect upon the liver, and increases the quantity of bile, at the same time acting upon the duodenum, but it only acts as a purgative when bile is present in the duodenum or intestines. Very large doses cause watery motions by increasing the intestinal secretion. Very small doses, as $\frac{1}{8}$ to $\frac{1}{4}$ gr., increase the appetite and give tone to the stomach, acting like other vegetable bitters.

The effect of this drug depends more upon the state of the bowels than upon its dose. 2 or 3 grains will be found enough for ordinary results, and, if followed in about 10 hours by a mild saline, will prove a very effective cathartic.

It is in *chronic constipation* that aloes is most used, and 1 gr. in a dinner pill, or $\frac{1}{2}$ gr. with nux vomica, will give good results. Spender's pill consists of 1 gr. watery extract with 2 grs. sulphate of iron. The use of aloes is not followed by constipation, nor is there much necessity for the dose being gradually increased as with other cathartics. It is of value in *amenorrhœa*, being supposed to excite the uterus from its proximity to the rectum, but for this purpose it should be ordered with iron about the expected time of the delayed menstrual appearance. In small doses it relieves, but often large doses aggravate *hæmorrhoids*, and should not be given in pregnancy or inflammatory conditions of the rectum or pelvic organs. The watery extract of aloes is the best form for administration, and it is of it that the above doses are given; its effects are increased by the addition of a bitter.

Aloin should be given in about half the above doses. Sir Andrew Clark's pill for *chronic constipation*, which should be taken before the last meal of the day, consists of $\frac{1}{2}$ gr. each Aloin, Ext. Nux Vomica, Sulphate of Iron, Myrrh, and Soap. Aloin may be combined with extract of cascara advantageously. Aloin is probably inert until changed in the bowel by the intestinal secretion to an amorphous substance.

The Compound Decoction of Aloes gives good results in many intestinal complaints, and the writer has found surprising effects from it in obstinate *diarrhœa* in children and adults; cases having been observed to resist all treatment, both astringent and eliminatory, have yielded to a few 1 to 2 oz. doses, which seem to possess some alterative action on the mucous membrane, often causing in 6 hours a soft solid motion where watery evacuations have been the rule for many days. It is, however, a most unreliable purgative—1 oz. occasionally purging at one time and constipating the next. The powder known as Hiera Picra, containing aloes and white canella bark, is a popular emmenagogue.

Alum is an astringent, causing coagulation of albumin and gelatin, and condensation of tissue and diminution of the calibre of the vessels. Externally it is powerfully styptic, and the *dried powder* is an escharotic, destroying *granulations* and *warty growths*. It is now generally believed that the astringent action of alum is a purely local one, and that it has little effect in distant hæmorrhages, but it will check gastric bleeding and the hæmorrhage of typhoid fever. In large repeated doses (of 1 dr.) it is emetic, and combined with opium, it *purges* gently in *painter's colic*, and is a remedy of great value in the treatment of *lead poisoning*, and it has been vaunted as one of the myriad specifics for *pertussis*.

4 to 8 grs. in 1 oz. water cure purulent *ophthalmia* of infants, when poured into the eye every hour, unless it is of gonorrhœal origin; but owing to alum possessing a solvent action on the corneal cement it may cause perforation, and should be used with

caution, and it should not be used if there is a breach of surface ; $\frac{1}{2}$ oz. to 20 makes a valuable gargle for *relaxed throat*, a lotion for secreting *wounds*, and an injection in *gonorrhœa* and *leucorrhœa*. It has been found beneficial in membranous *croup*, and insufflation of the powder is useful in *chronic catarrh* and *nasal discharge*. The glycerin is a valuable local application to *enlarged tonsils*, but is said to injure the teeth.

R. *Glycerini Aluminis* ʒj.
 Glycerini Acid. Carbol. ʒiii. *Misce.*

Fiat applicatio. Signa—"To be brushed twice a day over the enlarged tonsils."

2 drs. Tinct. Iodi may be substituted for the carbolic glycerin.

Ammoniacum is a stimulating expectorant which has fallen into disuse, but which is of great value in assisting the *aged* and *emphysematous* in getting up with greater ease the tough, viscid secretion of the chronically inflamed mucous membrane. Some of its constituents are excreted by the membrane, depriving the secretion of its adhesiveness. Long experience of its effects in a large infirmary of *aged* invalids convinces the writer that in some way it greatly facilitates expectoration, and assists *wheezing*, in doses of 10 grs. to $\frac{1}{2}$ dr., rubbed into an emulsion with warm water. Larger doses act as a purgative ; and externally it is a mild irritant, the plaster often bringing out an eruption on the skin.

Ammonia, when applied externally, is a rubefacient or vesicant. A small blister may be produced in a few minutes by laying a piece of lint, soaked in the strong solution, on the skin, and rapidly covering it with a watch-glass. Its vapour, applied to the nasal membrane and respiratory tract, acts as a powerful irritant and stimulant, by reflex action raising the blood pressure throughout the body, and is useful in *syncope* and conditions arising from *shock*. Internally, free ammonia, or its carbonate, acts as a powerful, diffusible stimulant, directly exciting the heart, and adding temporary tone to the circulatory and nervous systems ; hence, in cases of *sudden depression* in *chloroform poisoning* and in *desperate exhaustion*, a drachm of the dilute liquid, mixed with twice its bulk of water, should be injected into a vein. Its action being the same when thrown into a vein or swallowed, shows that it is not likely that it is neutralised before absorption (perhaps owing to its high diffusive power), and it probably acts directly on the cardiac nerves, and afterwards on the entire nervous system, and is partly eliminated by the bronchial mucous membrane, thinning its viscid secretion. It is converted into urea in the blood, and some of it may be oxidised and appear as nitric acid in the urine.

Roszbach found that a *very weak* solution of ammonia painted over the mucous membrane of the trachea in a living animal, caused a decided and large injection of the entire surface, and resulted in an increase of the mucous secretion. Strong solutions caused excessive hyperæmia and secretion, and finally a croupous exudation on the surface. Other alkalies produced very different results.

It is also alkaline or antacid, neutralising in the stomach any excessive quantity of acid or irritating gastric juice. It slightly increases but does not diminish the acidity of the urine, and differs from the alkalies—potassium, sodium, and lithium—by first markedly *stimulating the spinal cord* (in poisonous doses) and causing tetanic convulsions. The ammonia salts act as muscle poisons.

It should be injected where there is strong reason for supposing that a *clot of blood* has formed in the heart or any of the great vessels, as it aids its solution.

Carbonate of Ammonium acts like the free gas. It is emetic and purgative in large doses; and in quantities of about 8 grs., diluted freely, acts as a most efficient stimulating expectorant, and general diffusible stimulant in all prostrating febrile conditions, its administration in *measles* and *scarlatina* being followed sometimes by most satisfactory results, even reducing the temperature. It is just possible it acts by destroying the morbid poison in these cases, as it does in *wasp stings* and *insect bites* when applied locally. It is not admissible in typhoid states with ammoniacal breath. The utility of its injection in *snake bites* is doubtful.

Acetate of Ammonium Solution, or Spirit of Mindererus, acts, after absorption, upon the skin, causing diffuse diaphoresis, and is especially useful in all the *feverish conditions* of childhood. Its action will concentrate upon the kidneys if the patient's skin be kept cool. It possesses the curious power, in wine-glassful doses, of counteracting the immediate effects of *drunkenness*, or, in emergency, a tea-spoonful of the carbonate in a glass of vinegar acts equally well.

A mixture containing 2 ozs. of acetate of ammonium solution, 2 drs. of acetate of potassium, 4 drs. of spirit of nitre and camphor water, with a little syrup, to 8 ozs., affords the most satisfactory and harmless diaphoretic, or febrifuge combination, in passing *febrile conditions*, or while awaiting a definite diagnosis in the more serious feverish states. The solution of the citrate has the same action. (See R. on page 309).

Benzoate of Ammonium is a diuretic, acting like benzoic acid and, like it, passing out as hippuric acid in the urine. It is more active than the acid. Dose—10 to 20 grs. in water.

Bromide of Ammonium resembles the corresponding potassium salt in action. (See under Bromum). It is useful in *whooping-cough*, adding to its antispasmodic an expectorant action, and

possessing sedative influence over the mucous membrane of the pharynx and larynx. The writer has found it in hospital practice the best routine remedy for this disorder in children, combined with expectorants, like hippo and squill. It must, however, be given freely; a child one year old may get 3 grs., or in bad cases it may be pushed till drowsiness and marked sedative effects are produced.

Chloride of Ammonium is a useful expectorant when taken internally, and is most valuable when sucked in the mouth in small pieces, or, more elegantly, in tablets, one of which, placed in the hollow above the last upper molar between the cheek and the gum, where it will take above an hour sometimes to dissolve, will be followed by a free, painless, and often silent expectoration of mucus and checking of the cough. It often permits the subjects of *bronchial irritation* to freely expose themselves to the cold, damp, and even foggy atmosphere of a severe winter.

The writer proposes the term *Ciliary Excitants* for remedies which appear to have this effect upon the expectoration.

In *catarrh*, after the acute stage, they will be found very useful, and they run no risk of upsetting the digestion. It becomes a difficult question as to the way in which these substances act. One thing, however, is certain, that it is not by absorption, since the same effect, though in a *much less* degree, may sometimes be produced by sucking substances absolutely insoluble, as bits of glass, rubber, &c., and some of the soluble remedies produce no effect when swallowed in mixtures even in large doses, so that one is forced to the conclusion that they act by reflex action. Two conditions appear necessary to produce a *decided* effect upon the secretion, viz.—the substance should be *soluble* in the fluids of the mouth, and should produce an impression upon the nerves of taste different from that continually being caused by food. Sugar, for instance, will not affect the secretion, but, if flavoured with an essential oil, it appears to possess some power.

The impression produced upon the terminal filaments of the glosso-pharyngeal, or the lingual branch of the fifth nerve, is conveyed to the centre in the medulla, whence it probably is communicated by branches of the vagus, or through the sympathetic system, to the mucous membrane, or bronchus, in which it may effect nutritive, secretory, or motor changes.

As will be explained in speaking of some expectorants, the probability of any remedy acting as an expectorant and increasing the quantity of bronchial secretion without influencing the cilia is slight. The cilia are parts of the same cell, the office of which is to secrete the mucus, and it is hardly in keeping with our present knowledge to suppose that the functional activity of the cells would be increased without influencing their prolongations—the cilia—even though the process of secretion should end in the death of the cell.

Chloride of Ammonium was found by Anstie to be useful in

neuralgia, and to cut short the course of *migraine* attacks, in doses of 20 grains. It is useful in *chronic hepatic congestion*; in 20 gr. doses it always induces free diaphoresis, increases the flow of urine, diminishes portal congestion by depleting the congested abdominal viscera, and relieves hepatic pain. It relieves the vomiting in malignant disease of the stomach, and is an alterative in chronic *rheumatism* and *sciatica*.

Various forms of Chloride of Ammonium inhalers, in which the nascent salt is brought into contact with the diseased spot, are used in throat affections.

Phosphate of Ammonium is a diuretic, and is said to decompose the insoluble urate of sodium in the blood, forming urate of ammonium and phosphate of sodium, and is recommended in cases of *uric acid diathesis*.

Spirit of Ammonia (Aromatic) and *Liquor Ammoniae* afford, the former especially, agreeable methods of administering ammonia. They should be always freely diluted.

Ammonia acts as a caustic or irritant poison when swallowed, the free gas causing serious laryngeal trouble (possibly requiring tracheotomy), and violent gastric irritation, forbidding the use of the stomach-pump.

Amygdala—the sweet almond—is sometimes used in medicine on account of its mild, demulcent effect when directly applied to irritated mucous membranes, but it is, however, chiefly employed as an agreeable vehicle for more potent remedies, or made into bread as a food for *diabetics*. The oil *expressed* from either variety is a bland, soothing application in *inflammatory skin affections*.

Bitter almonds are more active, containing, in addition to emulsin, which is also found in the sweet variety, a principle called amygdalin. These two substances, when brought together in presence of water, act upon each other, the amygdalin splitting into two new bodies—Prussic acid and volatile oil of almonds—the former of which, being a deadly poison, accounts for deaths after eating bitter almonds; and it explains the action of a lotion of bitter almond emulsion in stopping the itch of various skin affections.

Amyl Nitris—After the inhalation of 5 minims of this drug, the pulse is quickened, or sometimes doubled, the arteries dilate, the carotid throbs, the face flushes, there is a strange sensation of fulness in the head, and there is great general relaxation of the arterial walls, with diminished blood pressure. If a poisonous dose be administered to an animal, the quickened heart and respiration become slower, and may finally cease from paralysis; tetanic cerebral convulsions occasionally arise, the temperature falls, and the blood pressure becomes *nil*; the blood assumes a *characteristic chocolate colour* from the formation of methæmoglobin, which is deoxidised with greater difficulty than hæmoglobin itself. The dilatation of the arterioles is caused by the

direct action of the drug on their muscular coats, or possibly also on the local vaso-motor ganglia.

Brunton *anticipated* its efficacy in *angina pectoris*, in which disease it has proved a blessing, lessening, when a few drops are inhaled, the arterial spasm, and in the great majority of cases producing relief from the agony of the attack. The capsules introduced and prepared by Martindale, and covered with wool, into which the amyl escapes when the capsule is broken between the thumb and fingers, afford the safest, most elegant, and rapid means for the administration of the drug. It is a safe remedy, and may be inhaled directly out of a phial, or sprinkled on a handkerchief, or swallowed on sugar.

It has been used sometimes with success in *epilepsy* while the attack is coming on, in *asthma*, *neuralgia*, *eclampsia*, *migraine*, and *sea-sickness*. It has been (generally with doubtful result) used to combat the heart failure in impending death under the influence of chloroform. It is, however, valuable in relieving the *dyspnœa* common in chronic valvular ailments, and in dilatation of the heart, and in *pneumonia*.

It increases the elimination of uric acid in the urine, and has been used in *gout* with benefit.

Ringer directs attention to the extreme susceptibility of some patients to its action, and the writer knows a healthy man who has several times been inconvenienced by passing a building where the drug is frequently used in a varnish for pictures and show-cards. Isobutyl Amyl has identical action, and is obtainable in capsules.

Amylum—Starch—is nutritious; but it is for its bland, unirritating qualities, when applied externally or in enema, that it has been used in medicine. The powder dusted over *erysipelatous* or *excoriated surfaces* acts as a soothing coating, shielding the part from the action of the air or irritating secretions. Occasionally the preparation with glycerin irritates the skin. Starch is an antidote for iodine.

Anethum and Anisum—Dill, Anise, Coriander, Fennel, and Caraway are identical in action. They are powerful antiseptics. They are in large doses general stimulants, and are used in medicine as carminatives to relieve the *gripping of purgatives*, and the pain of *colic* and *flatus* in children, for which purpose anise is most used. They probably act in these latter cases as anti-spasmodics by reflex action; in small doses they increase the secretion of gastric juice, and probably also that of the pancreatic fluid, and all possess feeble expectorant powers by stimulating the respiratory membrane during elimination by the breath. In full doses they have weak narcotic powers, but if injected directly into the circulation they are powerful cardiac depressants.

Anthemidis Flores—Chamomile is a stomachic bitter, improving the appetite, and indirectly aiding digestion by increasing

the vascularity of the gastric mucous membrane ; in larger doses, especially if warm, the infusion is *emetic*. Its chief use is in *atonic dyspepsia*. Externally, a warm fomentation is a popular remedy in the early stage of inflammations and sprains. The oil is a general stimulant and antispasmodic in 5 minim doses. It diminishes reflex excitability, and has been found useful in *sick headache*.

Dutt has obtained striking results in *diarrhœa infantum* with the tincture of German Chamomile (*C. Matricaria*) U.S.P.

Antimonium—The tartrate is the salt generally used in medicine on account of its greater solubility and activity.

Externally, it reddens the skin, and brings out an eruption of pustules somewhat like *smallpox* ; each pustule commences at the minute opening of a hair follicle or sweat gland. Its counter-irritant action is uncertain, and liable to be followed by scars.

In large doses it is a violent irritant poison, producing vomiting, inflammation of the digestive tract, finally great prostration and paralysis of the motor and sensory nerves from its direct action on the *cord*. The heart is paralysed, the arterial pressure falls finally to *nil*, and the respirations become reduced.

In medicinal doses its action varies with the quantity administered. In $\frac{1}{8}$ gr. doses it slightly reduces the force of the pulse by its direct effect upon the heart, and acts as a diaphoretic, causing free perspiration, probably by affecting the nerve supply of the sweat glands, and it increases the secretion of the bronchial mucus. The latter effect is one of the most important of the drug, and places it in the first rank of true expectorants. It would appear that the same change occurs in the mucous membrane, as is seen in the skin, and this is especially likely, as we know that the gastric and intestinal mucous secretions are likewise increased. It may thus be said to cause the bronchial surface to sweat. In slightly larger doses— $\frac{1}{4}$ to $\frac{1}{2}$ gr.—nausea is excited, and the heart's action is diminished, antimony acting as a cardiac sedative ; the pulse gets soft and weak, arterial tension is lowered, and general relaxation of all muscular structures supervenes ; and if the dose is repeated, or 1 dose of 1 to 3 grs. is given, active vomiting takes place, with great depression and intensification of the former mentioned effects.

Its emetic action follows either after it is swallowed or injected into a vein, and experiment shows that it acts by *directly* influencing the vomiting centre, and also by irritating the *terminal filaments* of the pneumogastric and exciting *reflex action*. If introduced into the stomach, a much *smaller* dose of the drug will produce vomiting than if injected into a vein, and the smaller dose by the mouth will act *quicker* than the larger dose by the veins ; this goes to prove that its local action is more important in emesis than its effects upon the vomiting centre, notwithstanding that Majendie induced vomiting by injecting it into an

animal after the removal of the stomach. It weakens the heart by affecting the ganglia, nerves, and muscle. It is eliminated by the glands of the stomach, intestines, and bronchi, and the urine and bile, and affects the cells in the skin like arsenic when given in poisonous doses to frogs, only its action extends deeper than that of arsenic.

Such, then, being the *physiological* action of tartar emetic, its *therapeutic action*, or the effects which it produces in diseased conditions, can be for the most part anticipated from this. Thus, in febrile conditions, with a hot, dry skin, its diaphoretic action will be called to our aid; in bronchial affections, with tenacious adhesive secretion, it produces great benefit; whilst in acute inflammations like *pneumonia* and *pleuritis*, with high, bounding pulse, great fever, and vascular excitement, it is invaluable from its cardiac sedative action.

In acute inflammatory affections of the respiratory tract, especially in *croup* and *laryngeal spasmodic diseases*, it is our sheet anchor, allaying spasm, reducing fever, and directly cutting short the progress of the disease.

The following may be given in spasmodic croup to a child 1 year old :—

R. *Antim. Tart.* gr. i.
 Vini Ipecac. ʒiv.
 Syrupi Simp. ʒj.
 Aquam ad ʒiii. *Misce.*

Signa—"A tea-spoonful every fifteen minutes till vomiting is produced; then every 1, 2, or 3 hours as required."

It should be given with great caution in *diphtheria*. It is called an antiphlogistic from its power of combating *acute inflammations* of a sthenic type, and it is probable that its action in such cases is only what can be accounted for by its effects upon the heart's force and frequency, and the diminution in the respiratory movements and vascular tension.

In the violent delirium of *fevers*, Graves employed it in $\frac{1}{4}$ gr. doses, combined with as much opium, every hour or two. In *delirium tremens*, when opium failed totally to produce any sleep, the writer has seen it speedily act when $\frac{1}{4}$ to $\frac{1}{2}$ gr. of this salt was added.

In the *acute bronchial affections of childhood*, antimony continues to be the best remedy we possess. Combined with hippo, or given alone, in the form of the wine, $\frac{1}{2}$ to 1 tea-spoonful is an emetic for a child 1 year old, and 5 minims every hour afterwards keep up the expectorant effect; but the dose can be easily regulated by keeping the little patient on the border-land of

vomiting. Owing to the slowness of its action and the great prostration which follows, it is not indicated in poisoning.

Tartar emetic was formerly employed to produce muscular relaxation in *dislocations* and *hernia*, a practice which has melted away before the advance of chloroform. It is still used in *rigidity of the os*, and is valuable in *acute synovitis*. Great tolerance of the drug may be observed in feverish conditions, probably owing to the toxic effect of the poison (causing the *fever*) on the nerve centres.

Antimonial or James's Powder, the active principle of which is oxide of antimony, possesses most of the properties of the tartrate in a feeble degree. It is used in 5 gr. doses in febrile conditions for its mild diaphoretic qualities.

Chloride of Antimony is a powerful caustic and corrosive liquid, only used externally. It has ceased to be official.

Sulphurated Antimony possesses all the powers of the tartrate, only in a less degree. It has *alterative* properties, which have gained for it some reputation in *syphilis*, when given with calomel in Plummer's pill. It is most uncertain in action on account of its insolubility.

Apomorphine possesses none of the narcotic properties of morphine, though recently the statement is made that small doses which do not cause vomiting ($\frac{1}{32}$ gr.) are hypnotic. The writer has never noticed this effect when giving the drug as an expectorant though often large doses $\frac{1}{2}$ gr. did not cause vomiting. When given by mouth or injected hypodermically it produces vomiting, and very *much less* is required by this latter method than if administered by the mouth. It acts *directly* upon the vomiting centre, and is much more rapid than tartar emetic, and its action is not followed by nausea or prostration, hence it is the most efficacious emetic known in cases of poisoning, especially in cases of narcotic poisoning when the power of swallowing is lost; the dose hypodermically *should never exceed* $\frac{1}{10}$ grain. It has little, if any, effect upon the peripheral nerves in the stomach. It stimulates and then paralyzes the motor, cardiac, and respiratory centres and muscular fibre, without affecting motor or sensory nerves.

Apomorphine is invaluable as an expectorant. Rossbach, by exposing the interior of the trachea in a living animal, and watching the effect of various substances, studied the action of expectorant remedies from an entirely original point of view. He found that *emetine*, *apomorphine*, and *pilocarpine* produced a rapid and profuse pouring out of the mucous secretion, which, especially in the case of the latter drug, was most abundant and liquid, and filled the tubes almost to suffocation. He demonstrated that, contrary to the accepted opinion, this great *hypersecretion* was not preceded or accompanied by *hyperæmia* of the membrane; these drugs were proved by a severance of all the laryngeal

nerves, and by a ligaturing of the trachea itself, to act in no *centric* or *indirect* way, but to exert their influence by *acting directly upon the peripheral endings* of the gland-nerves, the gland cells, or the minute ganglia, to which they were carried by the blood stream.

Apomorphine was found to give rather better results than *emetine*, while the constitutional effects of *pilocarpine* prevented its use as an expectorant.

Roszbach states that these drugs are the prototype for expectorating patients, especially in *chronic inflammations* accompanied with dryness of the mucous membrane, wrongly called *catarrhs*, and also in *acute catarrhs* attended with very *viscid secretion*.

In the *bronchitis* and *croup* of children he convinced himself of the excellent and life-saving action of apomorphine.

He says that "it is only since I learned the excellent effects of apomorphine that I can say I really like to treat catarrhs, even of the most obstinate kind, and no longer, as before, approach the case with a sense of therapeutic powerlessness."

The writer has now used it very extensively since 1881, and can speak of it quite as strongly as the above. He has used it alone and also combined with morphia, and finds it the only drug of real value in dealing with some forms of *bronchial irritation*, caused by the inhalation of flax-dust, in operatives employed in the manufacture of linen, whilst it afforded the best results in ordinary *dry catarrhs*, and in *bronchial asthma*. It must be, however, used with caution, from its risk of depressing the heart and possibly causing oedema of the lung. $\frac{1}{8}$ gr. every 3 or 4 hours in camphor water, with or without morphia or ipecacuanha, may be given. Murrell has given 1 gr. 3 or 4 times daily without nausea resulting.

A 1 per cent. solution freely dropped into the eye will cause anæsthesia like cocaine.

Aqua—A few of the therapeutic effects of water may be mentioned, though its place in the B.P. is entirely owing to its pharmaceutical properties.

Water is of great use in fever, in the form of ice, a bit of which sucked in the mouth allays thirst by reflex action. It also, probably by reflex action, stimulates feebly the cerebral circulation; and it may increase the quantity of gastric juice before being swallowed. In *ulcers* and *irritable conditions of the stomach* it soothes by diminishing sensation, while it checks hæmorrhage by contracting the muscular tissue of the ulcerated artery.

In $\frac{1}{2}$ to 1 pint doses, cold water before food in the morning acts as a mild cathartic, by adding water to the fæces, which it probably does by being alternately absorbed and eliminated again as it passes down the canal, stimulating the intestinal glands. The writer has seen perforation occur in gastric ulcer very soon

after the administration of *very hot water*, a practice which has become popular in the treatment of constipation and dyspepsia, and which he believes to be dangerous, and liable to produce ulceration. Introduced into the rectum as an enema, water washes out the colon, and is the safest remedy in impacted accumulations ; but to be administered properly, it should be given at about 98°, slowly injected, with the patient lying on the left side. From 3 to 8 pints can be used with safety, if not jerked up ; and benefit will be found by turning the patient over gently on his right side, or on his hands and knees, or by raising the pelvis, so that the fluid gravitates along the colon to the valve, the operator pausing from time to time to allow the temporary pain or spasm to subside.

Of a different class are enemata of cold water, or of water containing castor oil, turpentine, soap, &c. Here the intention is to excite reflex contraction, which one endeavours to avoid in the former case, and a pint will be enough. Still more different are nutrient enemata, which are intended to be absorbed. They should not be more than the bulk of a few ounces, and should be of the consistence of thin arrowroot. The addition of a little laudanum assists in their retention till digestion and absorption occur.

Water, when taken in large quantity, acts as a diuretic, by washing out the kidneys and bladder, and copious draughts of warm water are emetic.

Externally, water is largely used in medicine, and its mode of action depends upon its temperature and the method of application. Bartholow stated that on immersing one hand in cold water a corresponding reduction of temperature occurred in the other hand, and inferred that changes in a similar way occurred internally.

On immersing the body in cold or tepid water, refrigeration, especially in feverish conditions, occurs from the actual loss of animal heat, water acting as a good conductor ; there is probably also diminished thermogenesis. The vessels of the skin are caused to contract, and in the warm bath they relax. The hot bath at first acts as a powerful stimulant, but, if indulged in for too long a period, the heat of the body causes cardiac weakness, and prostration and fainting follow. The hot and warm baths, acting so thoroughly on the skin and increasing its secretion, are used to cause excretion of water and urea in *dropsies*.

Ice is largely used in surgical practice as an application to inflamed parts, as in *orchitis*, *hernia*, *head affections*, &c., acting as a sedative, diminishing the amount of blood in the part, both by direct and reflex action ; and water, iced, tepid, and cold, is used for dressing and irrigating wounds.

The following are the most common forms in which water is used externally as a remedial measure :—

The *Cold Bath*, which is water about the temperature of the

air, or on an average of between 45° and 66°F. , is used in *fevers*, and as a powerful tonic in various diseases of the nervous system. The tonic effects of the cold sea bath are most marked, and are, generally speaking, in proportion to the shortness of the immersion, as seen in the amount of stimulation and healthy reaction.

The *Tepid Bath* is water about 85° to 95° , also used in fevers. It is sometimes called the *Indifferent Bath*.

The *Warm Bath* is water about 98° to 100° , and the *Hot bath* is water at 103° to 108° , used in *dropsies*, *kidney diseases*, *catarrh*, attacks of *renal* and *hepatic colic*, &c., while in the *Turkish Bath* various apartments are heated from 100° to 200°F. It is used in *secondary syphilis*, *rheumatism*, &c.

The *Sitz* resembles the *hip bath*, being a vessel in which the pelvis and hips can be immersed in water at any temperature, the remainder of the body being free. It is used in the sitting posture for *uterine ailments*, *amenorrhœa*, &c.

The *Sponge Bath* is a shallow vessel, generally of cold water, in which the patient sits or stands while the surface of the body is sponged freely over.

The *Douche* is a sudden application with force, of a stream of water (generally cold) to the surface of the body; an invaluable remedy in the *coma of alcohol*, *sunstroke*, *delirium*, *insomnia*, &c. It differs from the *shower bath*, which is the impaction of a multitude of drops, or minute streams, from a height, and from *cold affusion*, which is the pouring of a liberal volume of cold water over the surface of the body, as in *fevers*, *alcoholism*, and *laryngismus*.

The *Wet-Pack*, so much used in hydropathy, consists in enveloping the naked body in a four-ply sheet wrung out of cold water, and spread flat upon a hard mattress, upon which the patient reclines, the ends of the sheet being carefully tucked in on each side, and the feet completely covered, after which several blankets are placed upon the top of the sheet; after 10 minutes the sheet is changed. The pack lasts half an hour or more, and is followed up by friction with dry towels.

The *Hot Wet-Pack* is managed in a similar way with hot water, and resembles the various *steam* baths used in dropsies, and which may be made by boiling water with a spirit lamp under a cane-bottomed chair, upon which the patient sits, surrounded completely, except the head, by a blanket.

The *Mustard Pack* is managed like the *Hot pack* by infusing a handful of powdered mustard in the hot water in which the sheet is immersed.

Sir J. Simpson's poor man's bath is made by filling 6 or 8 soda water bottles with hot water, drawing over each a stocking squeezed out of hot water, and placing them alongside the patient under the bed-clothes. They make a good bath in about 30 minutes.

The *Hot-air Bath* is made in a similar manner by burning a spirit lamp under a chair, or by introducing under the bed-clothes any of the spirit lamps made for the purpose. These latter are invaluable in *Bright's disease*.

Fomentations are merely local baths, or circumscribed hot packs, in which medicinal substances are generally introduced.

Cataplasms are similar applications of a semi-solid consistence, composed of various medicated ingredients.

It is in the treatment of *hyperpyrexia* where the temperature of the body rises to 106° or 108° and remains so, death being almost certain in such cases if let alone, that the judicious application of cold water saves life—as in *typhus*, and more especially in *rheumatic fever*. The patient is placed in a bath of about 98° , and cold water or ice is added till the bath cools to 70° or 60°F. , watching the temperature of the patient, as indicated in the rectum. When a fall occurs of 3 to 5 or more degrees, he is removed, wiped dry, and put to bed, where the temperature continues to fall for half an hour or more. The time in the bath varies from 5 minutes to 1 hour, and it may be repeated every 2, 3, or 4 hours (if necessary) when the case is severe. The routine use of the cold or tepid bath in *typhoid fever*, when the temperature rises above 102° , has greatly reduced the mortality of this disease, *cold sponging* may be substituted in mild cases, or *iced compresses* may be applied.

Water at a temperature of 112° effectually checks *uterine hæmorrhage*, when injected into that organ.

Aquapuncture, or the injection of water by the ordinary hypodermic needle under the skin, or into the substance of muscles, is often followed by surprising results. Its action depends upon its nutritive effect on the nerves of the part, for pain in a superficial nerve is often at once alleviated, and it will produce this effect without causing any irritation around the puncture. Bartholow derived good results from the injection of water into the substance of paralysed muscles.

For superficial pain 30 minims should be injected at the pained spot and frequently repeated—5 times within an hour if necessary.

Araroba (See Chrysarobin).

Argenti Nitras precipitates albumin, and is a powerful corrosive poison, and when applied externally, either in the form of solid stick or mitigated caustic, it destroys the tissues, and is used to paint over exuberant granulations, its destructive effects being followed soon by an *altered action* of the parts, a result which is utilised in many chronic unhealthy inflammations, as in *cystitis* and *gonorrhæa* (1 gr. to 1 oz.), *conjunctivitis* (10 grs. to 1 oz.), *ulcers* (30 grs. to 1 oz.), and *relaxed pharyngeal catarrhs* and *tubercular* and other *ulcerations* of the *larynx*, *pruritus*, &c. (10 grs. to 1 oz.). It destroys *tinea*, *warts*, and *chancres*; and the *poisons of rabid animals and snakes*, if applied in time. As a caustic for rabid bites the nitrate of silver is the most painful, and, according to the

opinion of Roux, as expressed to the writer, one of the least reliable. Owing to its precipitation by albumin, the drug is unable to penetrate for any depth ; hence the introduction of the organic salts. (See under Argentamine, &c.)

Carter, in *ophthalmia*, introduces a cocaine disc into the eye, and in 10 minutes applies with a *fine* camel's-hair pencil a small quantity of a (5 to 10 grs. to 1 oz.) solution of the nitrate, confining its action, if necessary, to the region of the ulcers. With a larger brush *ophthalmia neonatorum* may be painlessly treated. Cr  de's method of preventing this latter disease is to drop in a 2 per cent. solution after birth.

Internally, nitrate of silver acts in large doses as other corrosive poisons, causing inflammation and destruction of the gastrointestinal mucous membrane. In addition, however, it causes marked *nervous* symptoms, as *paralysis*, *spinal convulsions*, *dyspn  a*, &c., from its action upon the centres. It has been successfully used in large doses ($\frac{1}{4}$ to 2 grs.) in *ulcer of the stomach*, with the view to cauterise or alter the character of the process going on in and around the ulcer, its use being not free from danger. In solution it has been recommended as an injection in *rectal ulceration* and *dysentery*. In *dyspepsia* and *vomiting of yeasty fluid* it often acts most beneficially. As it coagulates albumin, it possesses astringent qualities, and hence is used in *diarrh  a* depending upon ulceration ; and its effect upon the gastric nerves, in doses of 1 gr., in bread-crumbs pills, is sedative. It has been given in *chronic affections of the spinal cord*, in *paraplegia*, and *locomotor ataxy*, and in *epilepsy* when bromides fail, but the great barrier to its use in such diseases is the permanent dark discolouration of the skin (*argyria*) which it produces. When it reaches the stomach it is precipitated by the chlorides abounding in the gastric juice, and likewise when applied to a moist surface it whitens it, owing to a film of the chloride being formed, which is afterwards changed into the black oxide. Cushny believes that none of the drug is eliminated ; the small portion absorbed remains imbedded in the tissues, whilst the unabsorbed portion passes out in the f  ces. It seems to have some influence on the blood in *purpura*.

R. *Argenti Nitratis* gr. iv.

Mic   Panis (sine Sodii Chlor.) gr. xxx.

Misce.

Fiat massula et divide in pilulas xvi. St. i. ter in die, ante cibos.

Argenti Oxidum resembles closely the nitrate, except in its external effects. It is less irritating, and has been used in 1 gr. doses in *gastrodynia* and for its astringent properties in *h  morrhages*, especially *menorrhagia*, and for its alterative effects upon the nerve centres, in *epilepsy*, *ataxia*, &c.

Armoracia—Horse-radish root—when chewed, acts as a stimulant to the salivary glands, increasing their secretion—hence it is a Sialagogue. When swallowed, it increases the gastric secretion, acting as a stomachic, and after absorption it is thrown out by the kidneys, stimulating these organs in its passage—thus it is a true Diuretic. The secretion of the skin is also increased. When applied externally it is a Rubefacient, causing redness, like mustard, only less in degree. The volatile oil of mustard is formed when horse-radish root is mixed with water.

Arnica—Externally applied, preparations of the root or flowers cause irritation of the skin, which may take on serious or even fatal inflammatory action, extending to distant parts, and simulating erysipelas or gout. Its use is contra-indicated whenever the skin is broken. $\frac{1}{2}$ oz. of the tincture to 1 pint water is strong enough for ordinary use. Diluted, these preparations are said to act in such a way as to cause absorption of extravasated blood, by their effect on the absorbents of the skin, hence they are applied to *sprains* and *bruises*; most of the benefit, however, may be justly ascribed to the spirit generally used along with them. Internally, arnica has been credited with many fancied virtues. It acts as an irritant to the stomach and gullet, and produces diarrhoea, and in large doses diminishes, like aconite, the respiratory and circulatory functions; it has been recommended in *fevers* and in *delirium tremens*. It produces in poisonous doses marked nervous prostration, muscular weakness, spasmodic movements of the limbs, and collapse. It is at best an uncertain and often a dangerous remedy, and is justly falling into disuse, and should have been omitted from the new B.P.

Arsenic (See Acid. Arseniosum).

Asafetida, after absorption, acts as a stimulating expectorant, closely resembling the onion in its power of increasing the secretion of mucus from the air passages, probably during its excretion by this channel; and it either blunts the sensibility of the respiratory centre, diminishing the breathlessness of *emphysema*, or, by diminishing the flatus in the digestive tube, it gives more room to the easily-overburdened lungs. It is, however, in *hysterical* ailments that it is chiefly employed, controlling the irregular and erratic nervous phenomena seen in that disease, as some suppose by the moral influence of its disgusting and intolerable odour.

It acts as a mild purgative, and is very beneficial as an enema in *flatulent colic*. The best preparation is the Fetid Spirit of Ammonia, in $\frac{1}{2}$ dr. doses.

Atropine and Belladonna when applied locally act as anodynes by lessening the sensibility of the sensory nerves. Small doses cause dryness and redness of the throat and mouth, dilated pupils and disordered vision, and sometimes a peculiar scarlet eruption. By stimulating the nerve centres, a large dose produces active

brain excitement, with pleasing delirium, hallucinations, illusions, a feeling of lassitude, and eventually sleep, whilst at the same time there is paralysis of the peripheral motor nerves. The heart becomes excited and the vascular system stimulated (standing several feet from a patient the writer has heard the heart sounds); this stimulation is probably caused by the action of the atropine upon the inhibitory fibres in the heart. Ultimately the heart muscle is paralysed, the small vessels contract, and the arterial tension is at first raised and afterwards diminished, the secretion of gastric juice, milk, saliva, bronchial mucus, and sweat are stopped, owing to paralysis of the nerve endings in the glands. At first there is forcible expulsion of urine, but soon the bladder becomes partially paralysed, and swallowing is difficult. The movements of the stomach, intestinal tube, uterus, spleen, bronchi, and all organs containing unstriated muscular fibres are diminished owing to depression of the nerve endings. The pupils are widely dilated; the voluntary muscles are not directly affected. The temperature is raised by large doses. The drug is excreted in the urine.

The respiratory and vaso-motor centres are stimulated by full doses, but paralysed by poisonous doses.

When dropped into the eye atropine causes marked dilatation of the pupil by paralysing the filaments of the third nerve supplying the sphincter muscle of the iris. *The action is entirely a local one.* If pain be present it is at once relieved. There is also marked loss of accommodation, resulting from paralysis of the ciliary muscle, which fails by loss of tension to act upon the suspensory ligament, so as to cause the lens to become more spherical; the eye is consequently focussed for distant objects, and the intraocular tension is increased, hence its contra-indication in glaucoma.

Atropine causes mydriasis when given internally, by being carried in the blood to the eye itself, and there acting precisely as when applied locally. The pupil of an excised eye dilates on the application of atropine. It has been advocated in various acute *inflammations* and in *spinal diseases* on the theory that it contracts the small blood vessels. From its power of stopping the secretion of milk, it is of the greatest use in checking congestion and inflammation of the breast after weaning. Moreover, as it tends to prevent suppuration by its action on the white blood corpuscles, like quinine, a local application to the breast is of great value; it may be given internally at the same time. In *small* doses it increases the action of purgatives by weakening spasm of the muscular fibres. It is recommended on this account in *constipation*, *obstruction of the bowels*, *impacted gall-stones*, *renal calculi*, and *asthma*. Harley recommends it in *kidney affections*. Both internally and locally it checks *sweating*, and is a favourite remedy in the *night sweats of phthisis*. (Ext. Bellad. Vir. gr. $\frac{1}{4}$, Zinci Oxidi gr. iii.) This pill will remove *urticaria* and *acne*.

It diminishes the bronchial secretion, and has been given for the *profuse expectoration of bronchitis*. In the hands of some physicians it has been found to relieve cough and spasm of the bronchial tubes. This has not been the writer's experience, nor has he found it of benefit combined with digitalis in cardiac weakness. Old people are affected sometimes by most minute doses. From its anodyne action it is beneficial in *neuralgia*, and Anstie advocated its use in *lumbago*, *sciatica*, and *neuralgia of the pelvic organs*. Pushed almost to the extent of showing its poisonous effects, it is curative in *whooping-cough*, and children bear very large doses. It is by far the best remedy in *incontinence of urine* in children, probably by its partially paralysing the muscular coat of the bladder. According to Hausmann the hypodermic injection of $\frac{1}{150}$ gr. atropine will control *hæmoptysis* when ergot and all other remedies fail.

Belladonna and atropine are used as antidotes in opium poisoning, but the dose must be small and only such as shall stimulate and not depress the respiratory centre. The addition of $\frac{1}{2}$ or 1 minim of atropine solution to each hypodermic dose of morphia is a wise routine practice.

For nocturnal incontinence in a child 5 years old :—

R. *Tincturæ Belladonnæ* ℥iv.
 Syrupi Limonis ℥iv.
 Aquæ (or Aquam) ad ℥vi. *Misce.*

Fiat mistura, cujus capiat ℥j. ter in die et hora somni.

Externally, it is used on account of its anodyne properties to relieve pain in *neuralgia* or to arrest the *suppurative process* in boils; and the plaster, in addition to relieving pain, acts by putting the region to which it is applied to some degree on the same footing as an *internal part*, hence its value as a strapping for *enlarged glands* and *superficial joint affections*. It is useful in the form of plaster when worn over an irritable and pained heart. It should be remembered that belladonna is freely absorbed by the unbroken skin. The best application to the inflamed breast is 1 oz. green extract of belladonna, 1 dr. hot water, and 7 drs. glycerin.

Squire's Chloroform of Belladonna made by percolating the root with chloroform (1 in 1) is a powerful anodyne application.

Aurantii Cortex is a mild bitter tonic, acting on the stomach in such a way as to give it increased tone, and it feebly stimulates the appetite. It is for its flavour, which is aromatic and pleasant, that it is used in medicine.

Aurantii Flores, in the form of Aqua, are only used for their agreeable perfume and flavour, though supposed to possess hypnotic qualities.

Balsams of Peru and Tolu—These substances are of little therapeutic power; they act as stimulating expectorants, probably because they are eliminated to some extent by the bronchial mucous membrane, and, to a still less extent, by the other mucous surfaces, to which they act as feeble stimulants. Externally, the Peruvian balsam is a mild stimulating application to *sluggish ulcers, bed sores, and cracked nipples*, in which cases it is often mixed with castor oil in equal quantity. In a similar way it is a valuable parasiticide, and is a good remedy for the *itch* and for *pediculi*.

Baths (See under Aqua).

Belladonna (See Atropine).

Benzoinum—A stimulating expectorant, acting, probably, on the relaxed bronchial mucous membrane, by which some of its volatile constituents are eliminated. It possesses all the properties of its active principle, Acid. Benzoic. (which see). The compound tincture, or friar's balsam, is an invaluable antiseptic stimulating application to *ulcers and sores*, and is the best remedy for healing *tortuous sinuses* and *sinuous scrofulous tracts*, and injected (undiluted) with a fine syringe, it decomposes *fetid* secretions, and establishes healthy action in these troublesome affections. A piece of lint saturated with it is a valuable hæmostatic when applied to fresh *wounds*.

Containing benzoin, storax, and tolu, it is highly spoken of by Yeo, who has found it of great service in lessening the secretion and cough in *chronic bronchitis*; it may be prescribed with mucilage or tragacanth. (See page 31.)

The vapour of the tincture has been found to cut short attacks of *catarrh* and *influenza* in a surprising way, it is said, even when inhaled directly from the bottle containing it, or if inhaled as a fine spray from the atomiser.

Benzol is only introduced into the B.P. as a solvent for india-rubber for the preparation of Charta Sinapis.

Bismuthum—The preparations of bismuth act, when swallowed, as direct sedatives, by coming in contact with the excoriated or irritated filaments of the nerves supplied to the mucous membrane of the stomach. The insoluble salts were held to pass through the alimentary canal, but Wood has demonstrated that bismuth can be easily detected in the urine shortly after their administration, and there is not a doubt but some portion is absorbed. The residue blackens the motions like iron. Whether the sedative action on the gastric nerves is owing to mere mechanical shielding of them from irritating secretion, or to some vital change in the nerve ending, induced by contact with the bismuth, or to the antiseptic power of the drug we do not know; but ample clinical experience has proved the great value of these salts in all *painful gastric* affections, and in the cure of *dyspepsia, ulcer of the stomach*,

and vomiting from various causes. They are used also in *diarrhœa* in larger doses (1 dr.), and sometimes as a cosmetic, and as a soothing application to *eczema*, *intertrigo*, *burns*, &c., and have been used as an injection in *gonorrhœa*, and in *ulceration of the rectum*. The carbonate is the most useful preparation, being antacid, and may be safely combined with opium or morphine. It is also credited with astringent properties, and it is antiseptic; poisoning has been reported from the absorption of the insoluble salts when applied in quantity as a dressing to granulating wounds, by which it is readily absorbed, the symptoms being salivation, ulceration of the tongue and mouth, and gangrene of the palate. The writer never employs the liquor, having seen it so often aggravate all the symptoms for which it was prescribed. The recently introduced Salicylate is a valuable gastric sedative, and is frequently given in *typhoid fever*.

The peculiar phosphorus-like odour of the breath observed during a course of bismuth has been shown to be caused by the metal tellurium found in impure preparations.

As an application in irritable conditions of the nasal membrane, "Ferrier's Snuff" is valuable; it consists of Subnitrate of Bismuth 3vj., Morphine Hydrochloride 2 grs., and Powdered Acacia Gum 3ii. (See the R. on page 303 containing bismuth.) By the addition of a little morphia it may be used in any painful gastric disease with great benefit.

Borax acts like boric acid in most respects. When swallowed it is absorbed, and acts in the blood like an alkali or antacid, and passes through the kidneys, which it stimulates, acting thus as a diuretic. It also affects the uterus, which it causes to contract and expel its contents; hence it has been used to *produce abortion* and to expel a *retained placenta*. Its *emmenagogue* properties, however, are uncertain, and it is for its local action that borax is generally used. Applied to a diseased *mucous membrane* it soothes pain and diminishes congestion, altering the action of the part. Its action has been in this case described as astringent, but, with our present knowledge, it seems better to confess ignorance, and call it a *local alterative*. Recently, good results have been reported in *epilepsy*, after doses of 10 to 20 grs. thrice daily.

Borax possesses antiseptic properties, but Boracic Acid is selected when we wish to get this effect of borax. These substances in the ordinary solutions employed in surgery appear to be only capable of *inhibiting* the growth of germs which may flourish if removed from the action of the solution after remaining dormant for long periods when in contact with it. Of all the remedies we possess, none equal it for the painful *aphthous condition of the tongue and mouth* so often seen in childhood and infancy, and the glycerin of borax is decidedly superior to the preparation with honey as a basis. A little should be brushed

over the child's mouth or smeared on by the nurse's finger several times a day. It is equally useful in *fissures of the tongue* in adults.

It is an invaluable remedy for *ulcerated nipples*, and possesses the advantage of keeping the infant's mouth healthy at the same time. A warm saturated solution applied to the scalp raises a lather like soap, and partially dissolves and effectually removes the dead epithelial scales. A solution of 1 dr. to 4 ozs. water makes a useful lotion in *itching* of the labium or anus, and a table-spoonful of the powder, or twice as much of the glycerin in one quart of water, proves valuable in *leucorrhœa* and *abrasions* or unhealthy states of the vagina or os uteri. It is recommended in *mercurial salivation* as a local application. The glycerin is a splendid lubricant for the rubber catheter.

Bromum is very seldom employed in medicine except in combination. It has been recommended as a deodoriser and antiseptic, and a weak solution is useful when applied to *sloughing sores*. It is a powerful caustic, and has been used as such in *ulcerations of the neck of the uterus*, but possesses no advantage over other more agreeable and better known remedies. It is an irritant poison, and is no longer official.

Bromide of Potassium is a sedative to the nervous system; it is diffusible, and after being like the other bromides changed into the soda salt in the intestinal tube or stomach, enters the blood, whence it is carried to the brain and spinal system of nerves, producing drowsiness and sleep by diminishing the quantity of blood in the cerebrum and lessening reflex excitability in the cord and cortical motor centres. It produces partial loss of sensation, and diminished reflex irritability in the back of the throat, which may be freely swept round with the finger (after a course of bromide) without exciting efforts to swallow or vomit. The diminished sensibility in the pharynx has been considered to be owing to the local effect of the salt, as it is being eliminated by the mucous membrane of the part. The same effect is produced by the application of a watery solution to the part, but better results are obtained by cocaine.

Bromism is the name given to a group of varying symptoms following the prolonged use of the bromides, anæmia, mental dulness, unsteady gait, muscular weakness and prostration, dyspnœa on exertion, loss of sexual power, sleepiness, fetor and sometimes a smell of bromine from the breath, general diminished tactile sensibility, and eruptions of acne spots about the face and shoulders. Bromide of Potassium is eliminated through the skin, breath, urine, and fæces, appearing as bromide of soda. The bromides of potassium, sodium, and ammonium are almost identical in action, and may be combined, only the latter is of more use in *whooping-cough* and *respiratory spasmodic affections*.

The soda salt, though not so active as the potash one, should always be selected for chronic cases, as the base soda is less depressing to the heart and circulation.

Therapeutical action.—Bromide of potassium has been used in various *nervous* affections associated with convulsive movements, as in *epilepsy*; it is of greatest value in the worst forms, for the minor epilepsy or *petit mal* is often unaffected by it. In these cases the dose should be large—20 to 40 grs. three times a day—and animal food should be diminished or stopped during the use of the bromide, which should be continued for 2 or 3 years after all trace of the disease has disappeared. 60 grs. a day of the soda salt may be administered for very long periods. 100 to 200 grs. may be given by the rectum in the *status epilepticus*. The drug is supposed by Gowers to enter into chemical combination with the protoplasm of the finely divided grey matter at the extremity of the dendrons. In similar doses it is the safest treatment for *sea-sickness*, *Laryngismus*, *whooping-cough*, *asthma*, *delirium tremens* in its first stage, *acute mania*, *migraine*, *vaso-motor changes* (so common at the cessation of menstruation), *menorrhagia*, *dysmenorrhœa*, *nocturnal seminal emissions*, and *priapism*, are all decidedly benefited by the bromides. Its utility in these conditions is to a large extent explained by its power of diminishing reflex action. It appears to have more curative power with the vigorous than in the anæmic; this is particularly true in *neuralgia*.

In *sleeplessness*, arising from prolonged mental labour or worry, the bromide is invaluable. A full dose of 40 grs. at bed-time, repeated in 1 or 2 hours if necessary, produces refreshing sleep so different from that of any other narcotic as to lead one to believe it acts on the brain like natural sleep, which is characterised by anæmia; hence one explanation of its action in *mania* and affections accompanied by symptoms of *congestion of the head*. It sometimes relieves *cerebral vomiting*, and the *vomiting of pregnancy* when other remedies fail, and it stops the *convulsions* of several diseases, as *acute hydrocephalus*, &c., without in any way curing the maladies. Occasionally it has produced good results in some forms of *diabetes*.

It has been used in *tetanus* and *strychnine poisoning* in doses of 1 to 4 drs. Acne follows its use very often, and when it attacks the face is a barrier to its exhibition. This is largely prevented by adding a little arsenic, as in the following formula. The writer has often seen severe erythema nodosum follow its administration, and a host of cutaneous ailments have been attributed to it.

It should not be given in anæmic conditions, and it is worth remembering that it greatly increases the hypnotic effects of chloral, opium, and hyoscyamus. Recently large doses of bromides have been successfully given (2 drs. every two hours) with the view of causing prolonged sleep or coma, in the treatment of the *opium habit*, and it is reported that the patient

awakes cured and free from opium craving. The mixed bromides are often preferred in epilepsy.

(For Epilepsy in an adult.)

R. Potassii Bromidi ℥vj.
Sodii Bromidi ℥vj.
Liquoris Arsenicalis ℥ij.
Syrupi Aurantii ℥ij.
Aquam Chloroformi ad ℥xx. Misce.

Fiat mistura. Capiat semi-unciam ter in die post cibos.

Buchu when administered soon finds its way into the blood ; the volatile oil, of which it contains $1\frac{1}{2}$ per cent., circulates in that fluid, and on reaching the kidneys is thrown out, acting in its elimination as a stimulating diuretic. As it comes in contact with the genito-urinary mucous membrane in *chronic cystitis* it acts upon it, either by its own stimulating powers or by altering the previously unhealthy urine, which then becomes a tonic to the relaxed membrane. It is best administered with pareira and uva ursi. It has feeble action on the bronchial membrane in *bronchitis*.

Butyl-Chloral Hydras possesses properties similar to Chloral Hydrate from which, however, it differs, in being a weaker hypnotic, in producing somewhat less cardiac depression, and in having a specific anæsthetic action upon the branches of the fifth nerve.

Liebreich believed that its action on the heart in even fairly large doses was not dangerous, and that the life of a poisoned animal could be saved by artificial respiration after the respiratory muscles had ceased acting, but its administration cannot be conducted with much less caution than that of chloral hydrate, and as an hypnotic it is of little value,

As regards its power of relieving pain, short of producing sleep, its action is very weak, except in the case of *neuralgia of the fifth nerve*. Ringer finds it very valuable in nearly all neuralgic conditions of the face, occiput, neck, and in *migraine*.

In *neuralgia* the writer begins with 10 grs. for the first dose and 5 grs. every two hours for three or four more doses, and then 5 grs. 3 or 4 times daily, combined with $\frac{1}{4}$ gr. doses of extract of gelsemium.

It has but slight power when applied locally to the carious cavity of a painful tooth, and appears to be of very little use in ordinary toothache. It is best given in form of pill, which can be made to contain 5 grs. of the salt if a *little* mucilage be added. It can also be given in solution in water, with glycerin. The pills should be made fresh.

Cadinum Oleum—Oil of Cade is a local stimulant in scaly skin diseases, acting like tar. It is chiefly used in the chronic stages of inveterate *eczemas* and in *psoriasis*. It may be prescribed as an ointment mixed in all proportions with any firm cerate, or as a liquid combined with an equal amount of soft soap dissolved in alcohol (1 dr. to 1 oz.). Balzer uses the drug in the form of a bath prepared from an emulsion added to water.

Caffeine in moderately small doses (2 to 3 grains) produces a state of mental activity, wakefulness, and restlessness, by acting as a stimulant to the brain and increasing *all* its functions. If the dose be repeated or increased, flashes of light before the eyes, noises and singing in the ears are experienced, and micturition becomes more frequent, and a state of muscular irritability supervenes, and the temperature *rises*; in still larger doses, convulsions like those produced by strychnine may be produced and mild delirium may supervene.

The vaso-motor and respiratory centres are stimulated by medicinal doses, as seen by the increased pulse rate and the rise of blood pressure. It acts on the cardiac muscle, and its contractions are rendered stronger and quicker, and, if previously faltering and irregular, become steady and firm by medicinal doses, while *large doses* may cause the healthy heart to act irregularly. It is a diuretic, often acting with *promptness*, and may be given in large doses in cardiac dropsy where digitalis fails; it probably stimulates the renal cells as well as raises the blood pressure in the kidney. In heart disease it is inferior to digitalis, but it may often be advantageously combined with it.

The writer has employed it in *chronic Bright's disease* with advantage, diminishing the albumin and anasarca, and increasing the quantity of urine; but the most careful and painstaking experiments, conducted on three such cases, over a prolonged period, failed to show any constant effect upon the daily elimination of urea. The diet was carefully regulated, the patients kept in bed, and the urine scrupulously collected, and the amount of urea daily calculated for some months. There was apparently a marked gain in weight in each case, and in one the albumin entirely disappeared. Probably the diseased condition of the renal epithelium explains the negative result as regards the excretion of urea. The drug is excreted in small amount in the urine, but most of it is changed into xanthine in the body, and appears finally as urea.

By its stimulating effect on the respiratory centre it is valuable as an antidote in *opium* and *alcohol poisoning*.

Caffeine in 2 to 5 gr. doses is often efficacious in *migraine* and *unilateral* headaches, in which case the effervescing caffeine citrate is a valuable and grateful preparation.

The following is the best treatment for migraine :—

R. *Caffeinæ Cit.* gr. v.
 Phenazoni gr. viij. *Misce.*

Fiat pulvis. Mitte tales x. St. i. ex. aq. cephalalgia urgente.

Cajuputi Oleum is a powerful diffusible stimulant, and gives better and more definite results than any of the other essential oils. In addition to its antispasmodic powers it has a slight narcotic and anodyne action, a large dose (10 minims) diluted in an emulsion with mucilage and sugar, producing effects not unlike those following the exhibition of musk. It will be found useful in the *prostration of low fevers, neuralgia, and hysteria.*

20 minim doses of the spirit of cajuput may be given every hour in a little sherry. A full dose gives great and speedy relief in *colic*, probably stimulating the bowel by direct contact. Externally it is a rubefacient, and may be applied to *painful and diseased joints* where there is much muscular spasm, and it has been used with success in *eczema, psoriasis, and acne rosacea.*

Calcium—In most of its forms, in minute doses, lime is a restorative, supplying to the blood an element found in the normal tissues. Its free use, however, like the alkalies, will be found to increase waste by quickening the retrograde metamorphosis of many constituents of the blood and tissues.

Chloride of Calcium is recommended in *scrofula* and *tubercle* in 10 gr. doses. It acts as a restorative, and has been used, but generally without effect, in *rickets* and ailments of defective nutrition, and under its use large glandular tumours have been said to disappear. It markedly increases for a time the coagulability of the blood, and Wright has administered it in doses of 15 to 30 grs., with the view of causing coagulation of the blood in aneurysmal sacs. In one case treated at Netley for abdominal aneurism by this method, and afterwards, at Dr. Wright's suggestion, treated upon the same plan by the writer, great improvement occurred; and when the patient was discharged from hospital, pulsation had almost entirely disappeared, and the tumour had very markedly diminished in size. In all *internal hæmorrhages, and hæmophilia* the drug is most valuable. 1 dr. may be injected into the rectum in the hæmorrhage of *typhoid fever.*

Urticaria and *erythema* are often speedily relieved, and even the itching of jaundice is removed. In these cases it acts by checking exudation.

Carbonate of Calcium and *Chalk or Creta Præparata* are valuable antacids, possessing unirritating astringent powers. They are given when we wish to reach the *intestinal surface* with an alkaline preparation of calcium. Unless the dose is very small the chalk will find its way through the duodenum, the greater part still remaining as carbonate, and passing along the

intestines it will neutralise any free acid which it meets with, forming a chloride or lactate ; it thus diminishes the free secretion of the bowel, so that costive, hard, or dry motions are the result. We can easily see from this its value in the *diarrhœa* accompanied by acid, acrid evacuations, especially seen in children, generally in hot weather. It is very useful in various *stomach* derangements with acidity, but the liquor calcis is better where we want to reach the first part of the digestive tract, and it is a good rule to order these different remedies in the systematic way—*chalk* for the *intestines* and *lime water* for the *stomach*. The lime preparations being absorbed in a very slight degree, only minute doses of them need be ordered ; but where local antacid action is required these salts may be freely administered, though not for a very long period, as they, like magnesia, are liable to form concretions in the bowel. Externally, chalk or the precipitated carbonate is useful, on account of its mild astringent or desiccant properties, when applied to *weeping skin diseases*, especially *intertrigo* about the groins or buttocks of infants, and both are valuable antidotes in *poisoning by the mineral acids*. Duckworth recommends an ointment of equal parts chalk and benzoated lard in *erysipelas*.

Calx, Calcis Hydras, and Liquor Calcis—Lime from its great avidity for water, acts when applied to moist tissues as a powerful caustic, though its eschar is very superficial. It is not often used alone, but mixed with potash and moistened before application with a little alcohol, it forms the well-known Vienna Paste used in *uterine ulcerations and cancerous growths*. Slaked lime (lime to which half its weight of water is added) is not used in medicine except to make lime water. When this reaches the stomach it is decomposed into the chloride or lactate, and, as such, some of it finds its way into the blood. It neutralises and checks the excessive activity of the gastric juice, when administered while digestion is going on.

It thus is a valuable antacid, and the residue, if the dose be large, acts as a mild astringent upon the *intestinal mucous membrane* ; and, eventually, if the administration be continued the urine becomes alkaline, and it may thus be useful in *uric acid gravel* and to dissolve *calculi*. This is the probable explanation of the value of Contrexeville water. It is best given in milk as its taste cannot be detected in that liquid. 2 or 3 ozs., mixed with three times as much milk, often soothe the stomach in painful *dyspepsia, cancer, and gastrodynia*, and stop the vomiting in these ailments. The addition of 1 oz. to one pint of cow's milk prevents the formation of curdy masses, and stops *infantile vomiting* depending on this cause. Lime water makes a good injection in *leucorrhœa, otorrhœa, and gonorrhœa*.

Applied externally, lime water is a mild astringent to moist *eczema, &c.* ; mixed with equal parts of olive oil it forms a rich creamy emulsion, or with linseed oil it makes the popular Carron oil, so soothing to *burns and scalds*, and which may be improved

greatly by the addition of 1 or 2 per cent. of carbolic acid ; and is useful when applied to *cracked nipples*.

The saccharated solution of lime possesses the same properties as lime water, only it is about 14 times stronger.

Calcii Phosphas is of importance as a food and constituent of the body. Its use in *rickets* and *mollities ossium* is generally useless, as in these cases the urine may be loaded with lime salts, but it is a valuable restorative in *pregnancy* and *lactation*.

Its administration has been found to hasten the *repair of fractures*, and the withdrawal of lime salts from the food of animals renders the bones soft and spongy. The premature decay of the teeth in Americans is probably owing to the absence of lime salts, caused by the perfection of their machinery, which too effectually removes the external portion of the grain in the manufacture of flour.

In the stomach lime undergoes changes, and enters the blood as a different salt. *Anæmia* pure and simple is sometimes benefited by a course of phosphate of lime, as are also *scrofulous adenitis*, *phthisis*, and *chronic diarrhœa*.

Kolischer treats *tuberculous joints* by the injection of a solution of acid calcium phosphate.

Parrish's Syrup is an elegant and useful form in which to administer the Phosphates of Calcium and Iron.

Calcii Hypophosphis, in common with other Hypophosphites, has been strongly recommended in *phthisis*. In their action they resemble phosphate of lime, and, like it, they possess none of the properties of free phosphorus. Some have fancied that under the use of these remedies the tubercular or scrofulous deposits are more prone to the calcareous degeneration. In *chronic bronchitis*, with much expectoration in young subjects, accompanied with loss of flesh and sweating, the hypophosphites will often give better results than any other remedy. Probably in these cases they act as nervine tonics to the respiratory and other centres.

Fellow's Syrup affords an agreeable method of administering these remedies, and seems to supply every want, combining with the lime the tonic properties of quinine, iron, and strychnine, but the writer has found that it very often is not tolerated by the stomach.

The new B.P. Syr. *Calcii Lactophosphatis* is an excellent method of administering lime salts.

Calx Chlorinata (Chlorinated lime) is valuable, not on account of the lime, but because it gives off hypochlorous acid, a powerful oxidising agent, which destroys any organic matter with which it comes in contact. This acid, being itself unstable, gives off chlorine, which splits up any remaining matter by seizing on its hydrogen, and setting oxygen free. This double action makes this substance invaluable as a deodoriser. Plates covered with chlorinated lime, and moistened with water, placed

in different corners of the sick room, give off, through the agency of the carbonic acid of the room, as much chlorine as keeps down effluvia. If more rapid deodorisation is required, the room is treated in a different way : the patient having been removed, the salt is placed in a deep basin, and diluted sulphuric acid poured on it, and the room closed up for 24 hours ; in this way all the chlorine is liberated, and seizes upon the hydrogen, splitting up the ammonia, sulphuretted hydrogen, &c., with which it comes in contact.

By destroying the germs which cause putrefaction it acts as an antiseptic, and it destroys odours much better than carbolic acid, which has little power in this way, though this latter is a better antiseptic.

It is used with advantage when applied in solution to parasitic skin diseases and *foul sloughing wounds, ozæna, &c.* $\frac{1}{2}$ dr. of the solution added to 1 oz. water makes a good gargle in *malignant scarlatina* or *diphtheria* with fetid ulceration. Zeuner recently reports striking success in the treatment of *chronic ulcers* of the leg by dressing them with a 1 per cent. solution of hypochlorite of calcium under oiled silk.

Internally, this salt has been recommended in *putrid fevers*, and may be given in the form of the solution, in 20 minim doses in peppermint water.

Calx Sulphurata is administered for the sake of an action which it is believed to possess over *suppuration*. It is regarded as an Antisuppurative, aborting the process if in its early stage ; and benefit has followed its use in *boils, abscesses, and acne*. In large doses it is an irritant poison, and even small doses often nauseate seriously. It is best given ($\frac{1}{2}$ gr.) in pills.

Calumbæ Radix is one of the most popular pure bitter tonics, and, possessing no tannin, is devoid of astringency, and may be freely given with iron. Chiretta, Quassia, and Gentian closely resemble Calumba in their effects upon the stomach. By the impression which they make upon the peripheral filaments of the nerves of the tongue and mouth, they increase the saliva and the gastric juice probably even before being swallowed. The gastric juice is further increased when they reach the stomach, and probably the vascularity of the organ is somewhat augmented, since these remedies in large doses cause irritation, and, when long continued, a low form of gastritis, apparently by overstimulation. The gastric secretion being thus more freely poured out, the supply regulates the demand, and the appetite is improved. Changes of a similar nature probably occur further down the intestinal tube, and the digestion beyond the duodenum is possibly improved.

These bitters are used in *dyspepsia* and in the *debility attending convalescence from acute diseases*, where they are sometimes invaluable in stimulating the appetite and digestion. They are

contra-indicated in all inflammatory states of the gastro-enteric tract. To get the full benefit of a vegetable bitter it is advisable to order its various preparations in combination.

R. *Acid. Hydrochlor. Dil.* ℥iv.
 Tinct. Calumbæ ℥j.
 Infus. Calumbæ ad ℥xij. *Misce.*

Fiat mist. cujus capiat cochlearia duo ampla ter in die ante cibos ex paululo aquæ.

Cambogia—Gamboge is a hydragogue cathartic ; when swallowed in large doses it acts as an irritant to the mucous membrane of the digestive tract, exciting the various glands to pour out increased secretion, and thus augmenting considerably the watery element in the motions, which, after a full dose, become liquid. The vermicular contractions are greatly intensified, and the contents are swept rapidly down the canal.

Its action is severe, and the griping pains caused by it are very annoying, so that it is seldom now used alone, though it is an excellent addition to many purgative pills. In small doses it is diuretic, and the colouring matter has been said to stain the urine. The compound pill may be given in 5 grain doses every 8 hours in *dropsies* and *obstinate constipation*. The action of gamboge is more marked on the small intestine than on the colon. In large doses severe inflammation of the alimentary tract results, and death supervenes, unless, as is nearly always the case, active vomiting expels the drug early. In poisonous doses, Orfila found that it often only produced vomiting ; owing to the violence of its action on the intestines their movements became paralysed. It has no action on the liver, though the presence of bile and fat seem necessary for its absorption.

Camphora is very uncertain in its action, and the effects produced by small doses are so variable that it is not often employed internally save as a flavouring ingredient. In large doses (20 grs.) it is a diffusible stimulant, directly causing a flow of blood to the gastro-intestinal membrane, and may produce vomiting ; by stimulating the nerve centres it produces a comforting and exhilarating effect, occasionally going the length of gay delirium and convulsions, which ultimately pass into stupor. Stockman has shown that the convulsions depend upon its stimulating effect on the cortex of the brain. The action of camphor upon the heart, blood pressure, respiration and genital functions is very variable, and reports are most contradictory. The drug acts as a strong carminative, and possessing antiseptic action, it has been useful in *diarrhæa* and *cholera*. The vapour is reputed to possess marked effects upon *catarrhal affections of the respiratory membrane*, and 5 grs. added to each dose of expectorant

mixture are useful in the *chronic bronchitis* of the aged, and 5 to 10 gr. doses, repeated every six hours, benefit *hysteria*, *dysmenorrhæa*, and other *spasmodic affections*. It is still, with some practitioners of the old school, a favourite stimulant to the heart in low fevers, and it is believed to control delirium and reduce temperature. It has marked antigalactagogue action, and should be applied to the breasts at the same time that it is given in 3 gr. doses.

Externally, it is a stimulating application, used in *chilblains*, and its mild rubefacient properties render it a popular ingredient in most liniments for *rheumatic troubles*. The Ammoniated Camphor Liniment is a powerful counter-irritant, and may be made to cause vesication. $\frac{1}{2}$ dr. camphor to 1 oz. of zinc ointment allays the itching of *eczema* about the genitals.

Milk dissolves camphor readily, 1 oz. taking up nearly 1 dr. of it, and it is the best method of administering the remedy, especially in *low fevers*, where a tea-spoonful of the milky solution may be given every three hours.

Rubini's solution consists of a solution of 1 oz. camphor in 1 oz. (by weight) absolute alcohol. Dose—3 to 8 minims.

Cannabis Indica is a true narcotic, like alcohol or opium, producing first a period of excitement, or intoxication, followed afterwards by sleep and coma. Its exciting stage, however, is better marked than that of these remedies, and is much *longer* than that of opium. It is freely indulged in, in India under the name of Hashish. The intoxication, often lasting a couple of hours, is characterised by delirium of a pleasant or boisterous kind, with surprising mental confusion and distorted mental ideas of the patient's individuality and position, alternating with fits of prostration bordering on catalepsy, and followed eventually by sleep, in which pleasant or mirthful dreams generally run riot. The stomach is not affected, and the appetite may be increased. It is a powerful aphrodisiac. Binz describes the dominant sensation experienced when smoking Indian hemp as a pleasing indifference to all external impressions, a sort of *bien-être*, the imaginative Oriental enjoying the bliss of paradise, and the sober Teuton passing into the land of dreams and visions.

The sensibility is diminished, cutaneous anæsthesia and blunting of the muscular sense being observed. The pupil is dilated, constipation does not follow, and sweating is never great; hence its use as an anodyne in *neuralgia* and in *migraine*, a hypnotic in *sleeplessness*, *delirium tremens*, and especially in *mania*; an *anti-spasmodic* in destroying spasm and pain, as in *asthma*, *hepatic* and *renal colic*, &c. It is far less reliable as an hypnotic than opium. The region in which the plant is grown, the time of collection, temperature, soil, and other conditions, produce great variations in its action and threaten to lead to its complete disuse in this country.

Stephen Mackenzie has found that full doses, morning and night, relieve dull *continuous headache* when other remedies fail. The writer has obtained best results in chronic or continuous migrainous headaches with the following :—

R. *Ext. Cannab. Ind.* gr. $\frac{1}{3}$

Butyl-Chloral Hyd. gr. iv. *Misce.*

Fl. pil. *Mitte tales* xxiv. *St. i. ter in die.*

It is stated to act as a direct stimulant to the uterus in *menorrhagia*, and it allays ovarian irritation. It has been reported as useful in *tetanus*, and *hematuria* has disappeared after its administration, and sometimes it acts as a diuretic.

10 to 20 minims of the tincture should be given in sherry, or in a tea-spoonful of brandy, on account of its decomposition, when added to water; but 1 oz. of mucilage emulsifies 1 dr. of tincture. The *fresh* extract made into a pill will be found the most reliable form, in doses of $\frac{1}{2}$ to 1 gr.

In the section on Non-Official Remedies the reader will see noticed a preparation under Cannabin Tannas and Cannabinol.

Cantharides is not often administered internally, though it produces definite results, acting as a powerful irritant to the stomach and genito-urinary organs, causing in over-doses frequent, painful, bloody micturition, with priapism, bloody, painful stools, salivation, and symptoms of violent irritant poisoning, followed by convulsions, delirium, and asphyxia.

In small doses it is diuretic, aphrodisiac, and emmenagogue. The cantharides is absorbed, and circulating in the blood, reaches the urinary organs, which it irritates as it is being eliminated. The effect of cantharides upon the kidneys begins as a genuine inflammation within the glomeruli, which gradually spreads among the cells of the tubules until all the tubes become affected, producing albuminuria and hæmaturia. The mouth, stomach, and intestines are affected by direct contact with it after being swallowed, and its action on the genital organs and uterus is generally explained by the sympathy that exists between these parts and the urinary tract.

It has been advocated in various *kidney diseases*, after the acute stage, as a diuretic, and in *bladder* cases which are characterised by want of power in the sphincter, especially in women. Its administration in these cases may be followed by serious aggravation of the condition, and as an emmenagogue and aphrodisiac it should seldom be resorted to. 1 to 3 minims of the tincture will be found enough for an ordinary dose, freely diluted with barley water.

Liebreich advocated Cantharidinate of Potash as a remedy for *tuberculosis* in hypodermic doses of $\frac{1}{1500}$ — $\frac{1}{324}$ grain. He claimed for it that it caused the exudation of serum from the capillaries

round the tubercular nodules, which ultimately destroyed the growth, but the treatment even in the case of lupus and laryngeal tubercle is now practically abandoned.

Externally, cantharides is used diluted in various ways as a rubefacient, as in *stimulating applications to the scalp*, where the object is to keep up a constant excessive supply of blood for the nourishment of the hair bulbs, but it is for producing vesication that the Spanish fly maintains its importance in medicine. It acts by causing a rapid local inflammation of the skin, beginning with tingling pain, heat, redness, and eventually swelling; serum appears in from 4 to 12 hours.

The peripheral extremities of the nerves supplying the skin of the affected part conduct the stimulus of the blister to centres from which it may be radiated, transferred, or reflected to centrifugal or trophic nerves, which may effect various changes in the areas to which they are supplied.

In this, the most probable explanation, it is easy to see (1) the effect which blisters may produce upon distant parts; (2) they also affect parts in the immediate neighbourhood by extracting the blood from them, though this must be to a small extent; (3) they may affect neighbouring parts by direct spread of the irritation originally produced, as the peritoneum and pleura have been seen inflamed from the application of a blister to the abdomen or chest; and the writer believes that he has seen pericarditis produced in this way in thin subjects. Brunton points out that the skin and tissues immediately underneath the blister are congested, whilst the deeper layers of tissue have their vessels contracted. Through thick parietes a blister would not likely cause congestion of the pleura.

When *absorption* is the result desired, Brunton advises that the blister should be applied directly over the part, but if reduction of congestion or inflammation is aimed at it should be applied at a little distance, as in pericarditis it might, if applied directly over the inflamed sac, increase the mischief.

Robin has recently shown that blisters promote phagocytosis, and cause so much extra air to pass through the lungs that the absorbed oxygen may be doubled.

In *neuralgia*, blisters applied over the seat of pain intensify the suffering, they should be applied close to the spine—over the posterior branch of the spinal nerve trunk—from which the painful nerves issue; *sciatica* is often benefited by a small blister placed over the course of the nerve.

Various *eye inflammations* are modified or checked by counter-irritation behind the ear, and though the usefulness of blisters is doubted in *acute pleuritis* and *pneumonia*, there can be little question of their value in causing the absorption of long-standing pleural effusions, in which cases great good is derived from *flying blisters*—that is, a series of very small blisters (each not larger than a crown) kept on for a short time—say two hours.

Indeed, it may be laid down as a rule that any benefit to be had from a blister is obtained during the first five hours of its application, all of which time it keeps up a stimulating effect upon the general system; after this, much depression often results, which cannot be accounted for, as some suppose, by the mere loss of serum; if vesication does not occur in this time a poultice generally determines it. In applying flying blisters in *pleuritis* or *sciatica* a small blister may be applied for one or two hours, then removed and applied a few inches further away where it may be left for two or three hours, after which time the same blister may be applied for three or four hours to another spot a few inches further from the site of the second one.

In *acute rheumatism*, blisters to the affected joints have been long advocated; but Harkin has pointed out surprising results obtained by a large blister over the heart, early in the disease, and the writer has seen it reduce temperature and pain in a most decided way. See reference to Caton's results in the "Dictionary of Treatment," page 272, fourth edition. Graves recommended blisters in various *feverish states* with much *prostration*; counter-irritation over the nape of the neck controls many forms of *headache*.

Harkin obtained good results in *diarrhœa* and *cholera* by blistering the skin over the course of the vagus in the neck. Petit and M. Verneuil have corroborated his views about the successful treatment of hæmorrhages like epistaxis and rebellious bleeding from piles, &c., by revulsion over the liver region.

The recent observations of Head show that in diseased conditions of certain organs there is a tender point to be found constantly in some skin area, and these areas in the main correspond to the regions where blistering has in the old empiric way been found useful in diseased states of the liver, stomach, pleura, &c.

For all purposes the emplastrum cantharidis is the most manageable preparation—the liquid or collodion acts much more quickly.* Unless the bleb is large it may be let alone, the blistered surface being covered with greased lint or cotton wool. Sometimes cantharides affects the urinary organs after a blister, by being absorbed through the skin; free diluent drinks, with a few grains of camphor internally, and a morphine suppository, generally remedy this.

Blisters should not be applied or kept long on the old or infirm, or on paralysed parts, or over bony prominences, or on the very young, or in acute kidney diseases.

Caoutchouc is now introduced into the B.P. for its physical properties in making a protective covering like the old gutta-

* Under the name Anodyne Vesicant a preparation is in use consisting of 3 parts chloral hydrate, 2 parts camphor and 10 of cantharides, heated and strained under pressure.

percha solution or Traumaticine, which acted like collodion in some *skin diseases*.

Capsicum when taken into the mouth increases the secretion of the salivary glands ; when swallowed it acts as a stimulant to the mucous membrane of the stomach, and increases its secretion, its internal local action being probably like its external rubefacient effect, so that it might be called an internal rubefacient. In repeated doses it produces a slight narcotic effect, and it increases the functional activity of the genital organs. In large doses it causes gastro-intestinal irritation or inflammation. It may act as a diuretic.

The stomachic effects of cayenne are seen in its free use as a condiment and appetiser in warm climates, and it is useful in *dyspepsia*, and invaluable as a tonic in *dipsomania*, in which 10 to 20 minims of the tincture may be given every two hours before meals. In *delirium tremens* large doses (30 grs.) sometimes produce sleep. Locally, it is useful in the form of a gargle for *relaxed throats*. 1 dr. tincture with 1 dr. tannin, and 10 ozs. acid infusion of roses, make a splendid gargle. Concentrated preparations will redden the skin almost to vesication, but with much pain and burning, and are said to remove the discolouration of *bruises*; a paste composed of capsicum, and known as "Chili paste," is used as a popular rubefacient, its official representative is the new Ungt. Capsici. Buck obtains rapid relief from *lumbago*, *acute torticollis*, and *muscular rheumatism* by applying an infusion on lint covered in under oiled silk.

R. Tr. Capsici ʒiij.
 Spt. Ammon. Aromat. ʒi.
 Tr. Cinchonæ ʒj.
 Tr. Card. Co. ʒvj.
 Aquam ad ʒviiij. Misce.

Fiat mistura. Signa—"A table-spoonful with the same quantity of water every two hours, or when the craving for drink comes on."

Carbo Ligni is an antidote in poisoning by phosphorus and by the alkaloids morphine, strychnine, &c., with which, if given immediately afterwards, it combines, and renders their action harmless.— $\frac{1}{2}$ oz. neutralising 1 gr.—but its administration should not interfere with the use of the stomach-pump, emetics, and purgatives, which should follow.

Internally, wood charcoal is administered in *flatulent conditions of the stomach and intestines* as an absorbent and deodoriser ; it occasionally checks vomiting and the formation of gas, and stops fermentation and purges mildly. Jenner used charcoal in 1 dr.

doses as an enteric disinfectant in *typhoid*, but it is possible that it might cause irritation of the ulcers in the bowel. The writer always orders the freshly-dried charcoal to be swallowed wrapped up in wafer paper, but even when mixed with water charcoal possesses considerable oxidising power.

Externally, charcoal acts as a powerful deodoriser, and, as such, may be freely applied to *putrid sores* and *gangrenous limbs*, or it may be spread on plates to sweeten the air of the sick room. These properties depend upon its power of absorbing and condensing in its pores gases like oxygen, which destroy the gaseous products of putrefaction by coming into direct contact with them. A charcoal poultice is an excellent application to *foul ulcers*. Animal charcoal (now excluded from the B.P.) may be given like the wood preparation, in tea-spoonful doses in water. It should be freshly-prepared or reheated before use, and administered *dry* in wafer paper.

The action of charcoal has been studied by Wilde, who concludes that, though incapable of destroying living organisms, it may act by oxidising the chemical substances formed during abnormal decomposition, or the toxins produced by pathogenic organisms.

Carbon. Bisulphidum, though an active poison, is only introduced now into the B.P. as a solvent for India-rubber and phosphorus.

In solution of the strength of 4 minims in 1 pint of water it is a powerful antiseptic, destroying all bacterial life. It has been found useful as a dressing to *foul sores*, and as a spray in *diphtheria*, and as an inhalation in *cholera* and *typhoid fever* when given internally at the same time. When the vapour is inhaled it produces *anæsthesia*, like chloroform, only the insensibility is shorter. The spray produces local anæsthesia like ether. Its disgusting odour is a serious drawback to its use, and, moreover, it is a powerful poison.

Cardamomum acts as a warm stomachic and carminative, like ginger, increasing the gastric secretion and improving the appetite. Its local stimulating influence increases by reflex action the peristaltic movements of the intestines, and thus flatus is expelled. It makes a good corrective addition to purgative medicines, and, as the tincture is of a bright red colour, compatible with most drugs (iron excepted), it is a prized flavouring and colouring ingredient, and medicine containing it has a better chance of remaining in an irritable stomach than if given alone.

Carui Fructus—Its action is explained under *Anethum*, with which it is practically identical.

Caryophyllum—Cloves, when administered, act as a stomachic. This remedy resembles the previous two in its tonic, carminative,

and stimulating effects. The essential oil is powerfully antiseptic; when applied to the terminal filaments of a painful and irritated nerve it acts as an efficient anodyne; hence its use in *toothache* and in some cases of *superficial neuralgia*. Five drops on a little sugar speedily remove pain caused by accumulations of air in the bowel, by exciting reflex muscular contractions, driving the air forwards or backwards, relieving over-distention, and acting as a local anodyne to the irritated nerves of the part. The experiments of Brunton and Carl show that carminatives, like cloves, do not cause absorption of the gases in the bowel. They found that oil of cloves markedly increased the secretion of the intestine.

Recently a thin aqueous extract of cloves has been successfully employed locally for the cure of corneal opacities.

Cascara Sagrada is, in large doses, an irritant to the gastrointestinal membrane; in moderate doses ($\frac{1}{2}$ dr. liquid extract) it acts as a stimulant to the entire glandular apparatus of the alimentary canal, increasing slightly the *secretion* and markedly the *peristaltic action* of the intestine by stimulating the muscular fibres, and producing healthy copious evacuations. Smaller doses (5 to 10 minims) have a decidedly tonic effect upon the stomach, like the vegetable bitters, increasing the appetite and mildly stimulating the liver. Cascara is the best remedy yet introduced for *chronic constipation*, and the dose can be so graduated that painless, soft natural motions are voided daily where constipation has been the rule for years. The dose can be gradually *diminished* while the good effects remain, and generally even in aggravated cases no augmentation of the dose is necessary. The liquid extract may be given in doses of $\frac{1}{2}$ to 1 dr. every evening. The main element in the successful treatment of constipation by cascara is to insist upon the patient so graduating the dose himself as to produce one morning motion *without purgation*, and this must be kept up for at least two months. The solid extract may be likewise employed in pills alone or with aloes. After a time the drug can be entirely withdrawn.

R. *Extracti Cascaræ S. Liquidi* ℥ii.

Tr. Nucis Vomicae ℥iii.

Glycerinum ad ℥iv. *Misce.*

Fiat mistura, cujus capiat ℥i. mane nocteque ad quatuor vicem deinde omni nocte.

Cascarilla is an agreeable tonic, acting like Calumba, only it possesses decided aromatic qualities. It has feeble febrifuge properties, like cinchona, and the volatile principle which it

contains may possibly act upon the respiratory mucous membrane. It is useful in *dyspepsia*, where a stimulating tonic is indicated, and when smoked in a pipe it is valuable as a *substitute for tobacco* when we wish to wean heavy smokers from their vice. W. G. Smith gives the following in convalescence from fevers:—

R. *Acid. Nit.-Mur. Dil.* ℥ij.
 Tinct. Cinch. Co. ℥j.
 Infus. Cascarillæ ad ℥viii. *Misce.*

Capiat ℥ss. *vel.* ℥i. *ter in die.*

Cassia Pulpa—This preparation is very seldom used in medicine except as an ingredient in senna confection. It is a mild laxative, like manna, and it probably acts by stimulating the peristaltic movements of the intestines.

Catechu is a valuable astringent, acting exactly like tannic acid (which see). It is given in *passive diarrhæas* and *hæmorrhages*, and is well suited for the treatment of such cases in children. It may be chewed before food in *pyrosis*.

(*For Diarrhæa in a child 1 year old.*)

R. *Tinct. Catechu* ℥iij.
 Spt. Chloroformi ℥i.
 Mist. Cretæ ad ℥iv. *Misce.*

Fiat mist. cujus capiat coch. i. min. post singulas dejectiones liquidas.

Cera Alba, Cera Flava, and Cetaceum are seldom employed internally. When swallowed they act as protectives or demulcents, by covering over the gastro-intestinal surface from irritating secretions, and externally they are largely employed as emollients. Possessing bland, unirritating qualities, they are valuable in making the groundwork or basis of more active ointments or cerates. *Spermaceti* formerly was much employed as an expectorant, but it most probably is devoid of such virtue. It may be given beaten up with egg and warm milk.

Cerii Oxalas is a gastric sedative, acting probably like bismuth, in doses of 5 to 10 grs. It was introduced as a remedy for the *vomiting of pregnancy*, but it is falling into disrepute, and should have been omitted from the new B.P.

Chirata is a pure bitter tonic, exciting very gently the secretion of the gastric juice, like calumba, gentian, and quassia,

aiding digestion and improving the appetite. Its effects are best seen in the *atonic state of the stomach of drunkards* after a prolonged course of drinking, and it may be combined with bismuth or a mineral acid, the former if *nausea or vomiting*, the latter if a *furred* state of the tongue exist.

Chloral Hydras induces sleep identical in every respect with sound, natural, refreshing slumber, lasting 5, 6, or 8 hours, devoid of dreams, and free from stupor and narcotism, and not followed by gastric or other trouble. It does *not* act, as Liebreich—its introducer—supposed, by being decomposed in the blood into chloroform on meeting the alkali of the circulating fluid, since this is too weak to decompose it, and the odour of chloral and not of chloroform is perceived from the breath; and chloroform is not found in the blood.

The drug appears in the urine, and if this secretion be alkaline it may change the chloral into chloroform. Urochloralic acid also is found in the urine.

It does not markedly relieve pain, nor influence the nerves of sensation, in safe doses; hence if severe pain be present, chloral unlike opium, will not relieve it, unless in doses just short of affecting reflex action, and if the pain continue, probably no sleep will supervene. Reflex action is weakened and destroyed by large doses, the blood pressure falls from the vascular dilatation caused by paralysis of the vaso-motor centre and the cardiac ganglia; the pulse and respiration are slowed; and if a still larger quantity is administered, loss of sensation and deep coma occur. The drug profoundly depresses the entire central nervous system. Death results from paralysis of the respiratory centre, the heart soon ceasing to beat from the paralysis caused by its action on the muscular tissue and ganglia. The motor nerves or muscles are not directly affected, but the pupil is *contracted*. The *temperature falls markedly*, and Brunton found that this fall was so great as to alone cause death. The temperature falls from $\frac{1}{2}^{\circ}$ to $1\frac{1}{2}^{\circ}$ F. after ordinary hypnotic doses.

Chloral is used as an hypnotic in *sleeplessness, caused by over-work or worry*, but *delirium tremens* is the affection in which its virtues have been most prized, given in 20 to 30 gr. doses. After the delirium has lasted several days, the writer believes chloral to be a dangerous remedy, which must be used with great caution, if employed at all, the heart at this time being especially susceptible to its action. He believes that the use of chloral raises the mortality in this disease. In the administration of chloral as an hypnotic, it is more than probable that it is answerable for more deaths than all the other hypnotics together, and as an hypnotic in delirium tremens the writer has ceased to use it.

It is powerfully antispasmodic, and has been used with benefit in *infantile* and *puerperal convulsions*, *chorea*, *asthma*, *sea-sickness*, and *acute mania*; and it is highly beneficial, and occasionally curative, in *tetanus*. Excellent results are obtained in *whooping-cough*—a child 2 years old may get 1 to 2 grs. every 3 hours. It relieves the early *pains of labour*, without directly hindering the uterine contractions.

Chloral should be given with great caution to patients with fatty hearts or atheromatous vessels, and its prolonged administration will cause the healthy cardiac muscle to rapidly become fatty. Its hypnotic effects come on in a very short time (less than 30 minutes), and pass off as rapidly, it should, therefore, be repeated inside an hour or two if the result is not produced, and the patient should always be in bed before swallowing the first dose. Externally, it is a good antiseptic, and a lotion of 8 grs. to 1 oz. is a painless stimulant to *unhealthy ulcers*, and often cures *eczema*.

Powdered chloral sprinkled over adhesive plaster, gently warmed and laid on the skin, makes a painless, speedy, and effective blister, superior to cantharides (Fauntleroy).

Chloral Camphor is a liquid consisting of equal quantities of chloral and camphor rubbed together; it dissolves morphia and other alkaloids, and is an elegant application in superficial *neuralgias*. Chloral Menthol is prepared in the same way.

Chloral is used as an antidote to strychnine and Calabar bean. In addition to its treacherous action upon the heart, chloral is very liable to induce a chloral habit upon those who use it often, and as the victim goes on increasing the dose so as to induce sleep, without any warning he may take a dose which stops his respiration or heart. (See under Poisoning).

Chlorine, when inspired, acts as a powerful irritant, causing death from spasm of the glottis or inflammation of the air passages; greatly diluted with air it is a stimulating expectorant.

Externally applied it is a rubefacient, but it is only used in medicine for its powerful deodorising properties. (See Calx Chlorinata.) Internally, a solution of chlorine has been recommended in *fevers* as a germ destroyer, but in doses sufficient for this purpose it would destroy life. Yeo's Chlorine treatment of *typhoid fever* has not proved satisfactory in the writer's hands. The mixture is made by shaking up 30 grs. chlorate of potash with 1 dr. strong hydrochloric acid in a 12 oz. bottle, and adding water gradually with continual shaking of the corked bottle; 24–36 grs. of quinine are then added, and 1 oz. given every 1 to 4 hours.

Chloroform is used in medicine as an inhalation to produce general insensibility, and is swallowed or applied externally as a remedy for various complaints. The vapour, when inhaled, gives rise at first to symptoms often differing widely in different

individuals, and depending upon some peculiarity of the patient. The action resembles in the main that of alcohol, the higher cerebral centres being at first stimulated and afterwards paralysed. Cushny describes the action as a descending depression and paralysis of the central nervous system affecting the medullary centres last of all, the sensory and receptive functions being sooner affected than the motor, the preliminary exciting action being, as in the case of alcohol, doubtful.

The "Preliminary Stage" begins with some cough or suffocative feeling, stimulation of the cerebral convolutions and higher centres, exhilaration of spirits, sounds in the head, mental confusion with congestion of the eyes and face, and symptoms resembling mild alcoholic intoxication. The sensibility is blunted.

Often there now succeeds what has been known as the "Struggling Stage," with marked mental or motor excitement and intoxication, acceleration of the pulse (from excitement), lividity of the face, greatly diminished sensibility, and dilatation of the pupils :

Rapidly passing into

The "Anæsthetic Stage," or state of complete narcosis, characterised by *depression* of the nerve centres which were previously *stimulated*, when there is total insensibility and muscular relaxation, with suspension of the cerebral functions, and more or less paralysis of the lower or organic life centres, loss of reflex action, diminution in the force and frequency of the pulse, and contracted pupils.

The operator recognises this stage by holding up a limb and it falls perfectly flaccid ; by touching the conjunctiva, when no attempt at winking occurs ; by exposing the iris suddenly to light after having the lids closed, and no further contraction follows ; by pinching strongly the skin of a sensitive place, and not the slightest wincing is noticed.

If the inhalation is pushed further, death may occur. (1) The *respiration* is interfered with, so that death occurs through apnoea from the stoppage of the breathing, through paralysis of the respiratory centre, or on account of the tongue falling back, or vomited matter getting into the trachea. (2) By the *heart* becoming *directly* paralysed, through the influence of the chloroform on the cardiac ganglia ; and this may happen at any stage, and without warning. (3) Both respiration and heart may suddenly fail at any stage. Much controversy has taken place over the manner in which the drug kills—*i.e.*, whether the death is caused by cardiac or respiratory failure, and the question cannot be said to be settled, as very often heart and respiration seem to stop almost at the same time.

☞ Respiration must be carefully watched and its irregularity or failure met by the instant removal of the inhaler ; and if there be asphyxia, the chin should be forcibly drawn away from the

sternum, or the tongue drawn forward, or artificial respiration, which is the best remedy to rely upon, may be performed; the cold douche may be used at the same time. When the heart stops, the patient's head should be placed lower than his body, artificial respiration should be kept up, and ammonia inhalation, and galvanism may be tried. Hypodermic injection of ammonia appears to be the most promising treatment. The pupil gives important indications; as long as it remains contracted there is, as a rule, little danger. The first sign of vomiting often is a slight dilatation. If the drug is now pushed this may pass off, but full dilatation of the pupil always means grave danger.

Brunton believes that death may be often the result of *shock*, and may be caused by too little instead of too much chloroform. He explains how death has so often followed the performance of trivial operations where deep narcosis is generally considered unnecessary. When no chloroform is administered, the stimulus to the sensory nerves produced by an operation causes reflex contraction of the vessels and raised blood pressure which overcomes the depressing effect at the same time always produced upon the heart by reflex action, and all goes well; but when partial anæsthesia has been produced, reflex contraction of the vessels may be lost whilst the depressing reflex effect of the operation upon the heart may still remain, death from the shock of the operation following. When the narcosis is *deep*, both the reflex depression upon the heart and the reflex contraction of the vessels are absent, and the stimulus of cutting sensory nerves does not affect the heart one way or other. The operation should, therefore, never be commenced till full narcosis has been produced.

Various inhalers are used. Junker's, which prevents the vapour reaching the lung in a more concentrated form than four or five per cent., is the best; but the open sponge or towel, with the chloroform dropped on it, answers every purpose, and one dr. will be enough to begin with. The skilful anæsthetist can regulate the concentration of the vapour by holding the towel close to the face when the respiration is shallow and removing it some distance when the patient begins to breathe very deeply. No food should be allowed for five hours previously, but the plan of starving for a longer period than this is to be condemned, as it leaves patients in a bad condition to resist the effects of hæmorrhage or shock, especially those with vigorous digestive powers, who are accustomed to the stimulus of food every four or five hours.

Chloroform should always be administered with great caution, and if there be fatty or other disease of the heart the caution should, if possible, be increased. There is hardly any state of the system in which the drug may not be used, and it may be administered at all ages, children, as a rule, bearing it well. The vomiting so often following its use may be to a great extent

prevented by a previous hypodermic injection of morphine to which a little atropine has been added, or it may be relieved by inhaling the vapour of vinegar.

The report of the Hyderabad Commission is strongly in favour of chloroform as against ether, but this decision has been rejected by most authorities. It states "that safety is ensured by simply keeping the breathing absolutely regular all through the inhalation, and to watch the pulse is both wrong and dangerous." The study of large numbers of cases proves that chloroform is about four times more deadly than ether. 1 in 3,000 inhalations represents the death rate in chloroform, whilst about 1 in 12,000 represents the mortality in ether inhalation.

With many, the A.C.E. mixture is a favourite remedy for producing anæsthesia; it consists of 1 part of absolute alcohol, 2 parts of chloroform, and 3 of ether (S.G. '720). Schleich recommends the admixture of chloroform and ether with petroleum ether or benzine.

Chloroform inhalation is employed for surgical operations, *puerperal* and *uræmic convulsions*, during the colic of *gall stones* and *renal calculi*, and largely in *obstetric practice*, in which it is most decidedly freer from danger than in any other class of cases, and the third stage of its action should never be experienced in labour unless where a difficult instrumental delivery is about to take place. The patient can be kept just upon the border of dream-land, without producing insensibility. In a host of spasmodic ailments, as *laryngismus*, *pertussis*, and *asthma*, the vapour of chloroform is highly beneficial, and it is of great benefit to the physician in carrying out the *diagnosis of phantom and uterine tumours*, and to the surgeon in *reducing dislocations*.

Internally, chloroform in small doses acts as a gastric stimulant, rapidly followed by sedative effects, probably by affecting the peripheral nerves in the same way as a pure narcotic affects the great centres. It acts in this way when given in 1 minim doses, properly diluted, and relieves *gastralgia*, *vomiting*, *sea-sickness*, and *reflex headache*. From 10 to 20 minims affect the system, causing, after absorption, marked narcotic effects, and, if repeated, symptoms resembling those following its inhalation; administered in large quantities, undiluted, it acts as an irritant poison. From its effects upon the centres of sensation it is useful as an anodyne, relieving pain, inducing sleep, and preventing spasm, and its influence is intensified when opium is combined with it, as for the relief of cough and hiccough. Large doses kill *tape worm*.

Externally, chloroform applied on lint to the skin and quickly covered with oiled silk acts as an irritant, occasionally producing vesication. If uncovered or if diluted before being applied, it acts as a local anæsthetic by its influence over the endings of the sensory nerves, and hence it is useful in *neuralgia*, *odontalgia* and *urticaria*.

Waller showed that it greatly assists the absorption of alkaloids through the skin, the chloroform rapidly penetrating and carrying with it the dissolved substance.

Bartholow injected 10 minims or more of chloroform through the hypodermic needle thrust deeply into the tissues surrounding the affected nerve for the relief of *neuralgia*.

Chrysarobin, the active principle of Goa Powder or Araroba, is a powerful destroyer of vegetable micro-organisms, and is also much used in chronic *psoriasis*. An ointment (of from $\frac{1}{3}$ to 1 dr. mixed *intimately* with 1 oz. of heated lard or vaseline) rubbed twice daily into the scaly patches of this disease rapidly cause their disappearance. It frequently produces a painful erythematous inflammation and purple staining of the surrounding healthy skin, which prevents its use in some patients. The writer after considerable experience of chrysarobin, is satisfied that this need never occur if the application be confined exclusively to the diseased islands *and not permitted to touch the healthy skin*. This little point he believes to be the secret of the success of the treatment. Dr. Fox has advised application of chrysarobin made into a paste with water, smeared over the spots, and covered with collodion. Traumaticine will be found even more satisfactory. Brooke's salve sticks are better still. The writer, however, finds that the best of all ways is to cover the patch with a strong stiff ointment or paste of the drug, and place upon the top of it a larger piece of rubber plaster.

It acts both locally and constitutionally. Its local action may be seen by rubbing the ointment into the diseased spots on one side of the body of a patient affected with *psoriasis*. In a week or ten days the skin on the side so treated shows decided signs of improvement not in the least apparent on the opposite, and as the diseased patches begin to disappear under the direct application of the remedy, those regions to which it has not been applied eventually begin to show signs of improvement also; and the writer found, by persistently continuing the application to the spots originally so treated, the entire surface of the body cleared up. This is probably caused by its absorption into the system and its conveyance to all the diseased areas. The drug is found in the urine. The application cannot be too long continued, because an ointment which causes no irritation whatever for a few weeks, so long as the spot to which it is applied remains scaly and diseased, soon acts as a powerful irritant to the same spot as it becomes resolved and healthy.

Success has followed the internal use of chrysarobin in *psoriasis*, *eczema*, *acne*, &c., but it often produces violent griping, purging, vomiting, anorexia, and malaise sometimes after doses as small as $\frac{1}{8}$ gr. in a pill. Chrysarobin is a powerful parasiticide, and has proved efficacious in *ringworm*, *tinea*, &c. (30 grs. to 1 oz.)

The deep purplish discolorations which it produces on the skin

and bed linen are barriers to its use, and great care must be exercised in applying the ointment to the face, as it causes œdema of the eyelids, with discoloration, though it can be applied to the scalp (15 grs. to 1 oz.) with benefit. The discoloration can be partially removed by weak vegetable acids or solution of chlorine.

Cimicifuga enjoys some reputation as a remedy in *acute* and *chronic rheumatism*; it often is of use in cases of *muscular rheumatism*, *lumbago*, *sciatica*, &c., and has been used as a stimulating *expectorant* and in *chorea*. The drug in this country has fallen in estimation—the writer believes on account of its being kept too long, as it soon deteriorates. Large doses cause vomiting, vertigo, tremors, exudation from the bronchial mucous membrane, and a marked *diminution in the frequency of the pulse*. Small doses act like the bitter tonics, and are credited with cardiac tonic powers, while large doses powerfully depress the heart, like aconite.

It acts powerfully on the uterus, like ergot, and $\frac{1}{2}$ dr. doses of the tincture every two hours are recommended in *congestive dysmenorrhœa* and *retained placenta*.

Cinchona and Quinine—Cinchona differs from quinine in being more astringent, 30 times more bulky, more apt to irritate the stomach, and more difficult of absorption. Quinine possesses great power as a destroyer of the life of minute organisms. Less than 1 grain dissolved in 1 ounce of water will cause the instant death of active infusoria and fungi, and double this strength prevents or checks the alcoholic fermentation and destroys putrefactive decomposition. Binz found that 1 in 20,000 (1 gr. in 46 ozs.) killed the paramecia in hay infusions in two hours, and he states that this lethal action on the lowest forms of life is peculiar to quinine. 1 gr. in 4 ozs. will destroy the white corpuscles of fresh human blood, and will also prevent diapedesis in the frog's mesentery. It has little or no action on the red cells.

Single large doses of quinine, or moderate doses of 2 to 5 grs., frequently repeated, give rise to a group of unpleasant symptoms, called "cinchonism"—viz., ringing noises in the ears, or deafness more or less complete, partial blindness, headache, and delirium, with nausea and insomnia. These effects are produced by the direct action of quinine upon the nerve cells. Large doses frequently repeated cause an intensification of all these symptoms, with giddiness, dilated pupils, embarrassed respiration, convulsions, paralysis, stupor, and collapse. There is diminution of blood pressure from weakness of the heart muscle and paralysis of the vaso-motor centre; through its use tissue change and oxidation are distinctly lessened, and the urea and waste products are diminished, and the respiratory centre becomes paralysed. Some patients show marked susceptibility, amounting to true idiosyncrasy.

In febrile conditions large doses are tolerated without causing unpleasant effects. The sulphate of quinine is often administered

in fevers in 40 gr. doses. As much as 1 oz. has been taken without any serious results, but death has been recorded in typhoid from 60 grs.

In small doses, quinine may be taken as the type of a tonic, increasing at first the activity of the process of secretion in the stomach, but after a time checking it; and if continued too long, or if the dose be increased, the digestion and appetite becomes somewhat impaired, and an irritable condition of the gastric mucous membrane results.

Small doses have *no* effect on the pulse; moderately large doses (10 to 20 grs.) increase the number of pulsations, whilst slightly diminishing their power; and very large doses (40 to 80 grs.) cause cardiac depression, with fall in the number of pulsations and in the tension.

In health, quinine appears (short of serious doses) to possess no influence over the body heat. In disease, however, full doses of the drug cause a steady diminution in the temperature when this is considerably above the normal standard, though great difficulty exists in demonstrating how the drug produces the fall.

Thus quinine ranks as an antipyretic; it is still the best and safest of all the antipyretics, and various ideas prevail as to how it acts in these *febrile* affections. Its influence over the circulation does not account for it, and it is not probable that it exercises its beneficial effects by its action on the heat centres. Its power to diminish fever heat is partly due to its effect in *retarding oxidation* and tissue waste; thus Binz believes that quinine in *febrile diseases* "acts by directly combating the efficient cause of the disorder, and by checking the abnormal metabolism going on in the body, the nervous system taking no part, or only a secondary part, in the operation. It is possible that quinine prevents the growth of the organisms which exist in the blood, and which are the direct cause of the febrile condition in most cases, as has been demonstrated in malaria.

The red corpuscles are increased in size, but are prevented from exercising their oxygen-carrying functions by large doses of this drug, and increase is observed in the quantity of nitrogen in the urine in fevers. Wilde found that full doses completely paralyse contractile tissues, larger doses still, cause the tissues to pass into a state of rigor mortis, the cardiac muscle being extremely contracted.

Large doses (20 grs.) cause contraction of the gravid uterus.

In *intermittent fever* quinine cures the disease, and also affords marked but not always certain protection to those healthy subjects exposed to the malarial poison when given in doses of 2 or 3 grs. *ter in die*. From the lethal action of quinine on *amœbæ*, Binz suspected that *malaria* was produced by similar lowly organisms, because it was cured by quinine. It has been demonstrated that this is the case, and we know more about the action

of this drug in the blood in disease than we know of almost any other remedy.

The parasite, or protozoon, causing the disease grows upon the red blood disc till it increases and occupies it entirely, rapidly forming spores, which are shed in enormous numbers free into the circulating fluid, each in its turn to seize upon a blood disc and go through the same cycle over again. It is found by administering quinine, and examining drops of blood at short intervals, that the action of the remedy can be demonstrated. (See "Dictionary of Treatment"—Whitla—4th Edition, Page 473.) In the milder malarial fevers it is found that the best results are obtained if the drug be administered in a full dose (15 to 20 grs.) about three hours before the expected paroxysm, which then comes on as before, but the new generation of young spores do not develop, and there may never be another attack. The spores are most susceptible to the action of quinine, and next come the large amœboid forms. In the severe Roman fevers, which are often rapidly fatal, no time must be lost, but 15 grs. of the hydrochloride should be given as soon as the patient is seen, the hypodermic plan being selected. Bacelli gives this dose by the veins. Upon the whole it is not a material point at what stage the drug be given. It will cure all forms of the disease, and in smaller doses 3 or 5 grs. *ter in die* it should be continued after the cessation of symptoms. Laveran advises an *interrupted* plan, by which 15 grs. daily are given for 3 days, then a rest for 4 days, after which the drug is given in lessened doses for 3 or 4 days more, with alternating rests till the 21st day.

In *remittent fever* quinine may be given in moderate doses during the remission, but it is advisable to give one full dose (10 to 15 grs.) at once without waiting for the remission.

Besides its use as an antipyretic remedy in *typhoid*, *typhus*, *variola*, *pneumonia*, and *acute rheumatism*, it has been employed with marked benefit in *various septic states*, and in *pyæmia* and all exhausting suppurative conditions. It has marked effect in cutting short the duration of *whooping-cough*, probably, as Binz believed, by killing the microbe, and in a similar way it shortens the attack of *influenza*. Weak solutions locally applied have been used in *hay fever*, *sore throat*, *whooping-cough*, and *diphtheritic ophthalmia*.

Quinine has been proved to be valuable in various forms of *neuralgia*, especially in those with well marked periodic exacerbations of pain, and in the *anæmic*, and in those suffering from prolonged worry and mental overwork. It should be given in 5 to 10 gr. doses at bed-time with a full opiate.

It has been recommended in *chronic suppurative bronchitis*, but the writer has found it often to increase the difficulty in coughing up the expectoration. It is probable that it exercises some toxic effect upon the cilia in these cases, muscles and bronchial tubes discharging the duty often silently performed by the cilia; at the

same time the secretion is diminished in amount and increased in viscosity.

Quinine is used successfully in the treatment of Menière's disease in daily dosage of 12 to 15 grs.

The greater part of the quinine administered passes out of the body in the urine, the elimination lasting several days ; some probably remains in the system ; traces of the alkaloid have been found in the secretions of the skin, salivary glands, bile, and intestines. Iodide of potassium solution holding free iodine affords an easy method of showing its presence in the urine by causing a brown precipitate ; the reaction may be demonstrated within 40 minutes after the quinine has been swallowed.

The *infusion* is by far the best form in which to administer cinchona elegantly and cheaply. It contains a higher percentage of alkaloids in proportion to the amount of bark used. The *official liquid extract* is a valuable preparation ; it has been lauded in *dipsomania*.

Quinine may be given in powder, pill, cachet, mixture, or hypodermically. When a large dose (say 10 to 20 grs.) is to be given, by far the best way is for the physician to order it to be taken in wafer-paper ; 20 grs. may be folded up in a disc of moistened wafer-paper, and swallowed like a spoonful of soft food, without the least inconvenience. Honey and tannin cover the taste of this drug.

The very soluble acid hydrochloride is a great improvement upon the sulphate, which should pass out of use entirely.

The combination of bark with a mineral acid cannot be more effectively produced than in the following excellent tonic :—

R. *Tinct. Cinchonæ* ℥iss.
 Spt. Chloroformi ℥iv.
 Acid. Nitro-Hydrochlor. Dil. ℥iv.
 Syrup. Aurantii ad ℥iv. *Misce.*

Fiat mistura, cujus, capiat cochlear i. minim. ex paululo aquæ ante cibos.

Cinnamomum is a warm aromatic, acting as a true stomachic by a gentle stimulating action on the gastric membrane, increasing its secretion and assisting digestion ; hence its use as a condiment. It contains a small quantity of tannin, which renders it useful in *diarrhœa*, and it is recommended in *pulmonary* and *uterine hæmorrhage* : also some principle grateful to the stomach, which often assists it in overcoming *nausea*, or even *sea-sickness*. Drummond has obtained good results in *dysentery* from a decoction of the drug. Owing to the action of the drug in increasing the number of the white blood cells it has been highly recommended in *tuberculosis*. Cinnamic Acid, obtained by oxidising the

oil, is the form used for this purpose. (See under Acid. Cinnamic.) The essential oil is a stimulant, and 4 minim doses will relieve *flatulent distention*, and a smaller quantity corrects the *gripping of purgatives*.

Coca and Cocaine—The action of coca leaves, or their alkaloid, when taken internally in small quantity, is stimulating like caffeine, brightening the intellectual faculties, lessening fatigue, and greatly increasing the power of the voluntary muscles, quickening the pulse, and raising the body heat by its action on the heat centres. In larger doses a group of symptoms like cinchonism is seen, with loss of mental controlling power, giddiness, and unsteady gait; and in most subjects a soothing or narcotic effect is produced, resembling that following small doses of morphia. In larger doses the hemispheres, medulla, and cord, at first stimulated, are weakened and finally paralysed. The *sensory columns of the cord* suffering, whilst the motor escape, the blood pressure falls, the temperature rises, and death results from paralysis of the respiration.

Direct application of cocaine to the psychomotor centres of the dog produces a fall of their excitability, and when painted over the cerebral cortex prevents epileptic fits and diminishes electric excitability. Large doses, by affecting the semicircular canals, cause peculiar motor disturbances.

Kochs has demonstrated its power of preventing the transmission of sensory stimuli by directly applying it to the sciatic nerve of the frog. After repeated applications the *motor* fibres in the nerve were also finally paralysed.

A few drops of a 4 per cent. solution deprive the conjunctiva of all sensibility, so that squint, cataract, iridectomy, and even the operation of removing the eyeball can be painlessly performed; the range of accommodation is shortened, and the *pupil dilates*.

The same effect is produced when applied to the mucous membranes of the nose, mouth, palate, pharynx, larynx, vagina, os uteri, anus, and rectum. Solutions of various strengths have been used, 4 per cent. for the eye, and 5 per cent. for the nose, mouth, and larynx. Murrell has obtained good results by an inunction of 20 per cent. in oil of cloves over the course of neuralgic nerves. Owen, by mixing an 8 per cent. solution with the official atropine solution, obtains an effective remedy for all *painful and inflamed conditions* of the *conjunctiva* and *cornea*, and Dr. Bradford finds by adding $\frac{1}{2}$ gr. of pilocarpine to 1 dr. of a 4 per cent. solution of cocaine that all the anæsthetic effect is produced without affecting in the slightest degree the accommodation. The hypodermic injection at several spots of $\frac{1}{2}$ to 1 gr. relieves and sometimes cures *neuralgia*, and enables the surgeon to perform minor operations painlessly. Schleich's method of producing local anæsthesia for large areas consists in injecting a very weak solution of cocaine, morphine, and sodium chloride into

the derma at various spots, the injection being made from time to time into the deeper tissues during the progress of the operation. For Bier's method of cocainising the spinal cord, see under Eucaïne in the Non-Official Remedies. Bardet uses Cocaine 4 per cent. in ethyl chloride spray.

For *hay fever*, *pruritus* of the *anus* and *labia*, *vaginismus*, *fissure* and *ulcer* of the *anus*, its use has been followed by relief, and it gives good results in aural practice also. Its local application (10 per cent. solution) in rigidity of the os has been found to cause complete relaxation.

Many alarming symptoms have followed the injection of even small quantities of the drug, and 3 grs. have proved fatal, but enormous doses are swallowed with impunity by those addicted to its use. It is a powerful protoplasmic poison, destroying amœbæ and growing cells.

The liquid extract of the leaves is a valuable tonic, stimulant, and restorative in various forms of *nerve exhaustion*, *neurasthenia*, and *melancholia*, and small doses of the alkaloid are valuable in relieving the pain of *gastric ulcer* and *persistent hiccough*.

A condition known as cocainomania results from the prolonged administration of the drug—there is emaciation, quick pulse, and a sensation as if foreign bodies, like pebbles, worms, &c., were under the skin; loss of memory, sleeplessness, and delusions, for which nux vomica and strong coffee have been recommended.

Coccus—The cochineal insect and its preparations are simply colouring agents, there being no reason to think that tincture of cochineal has any effect whatever in *whooping-cough* or other *spasmodic affections*. Its beautiful carmine colour is turned purple by alkalies.

Codeina possesses feeble narcotic powers. It increases the irritability of the spinal and cerebral motor centres, having a tetanising action in large doses like thebaine. Owing to its power over the visceral nerves it has been found very useful in soothing the cough of *phthisis* and relieving *visceral neuralgias*, and in lessening materially the amount of sugar in the urine in *diabetes*, in which disease it acts like a weak morphine preparation, but it does not disturb digestion or produce constipation.

It has been given in *sleeplessness* caused by pain in some peripheral regions, and in nausea, where 1 to 2 grs. may be given every 4 or 6 hours till sleep is produced.

Colchicum, in small doses by the mouth or hypodermically, increases the secretions of the stomach, intestines, and liver. In large doses, vomiting, purging, tenesmus, and inflammation result, and death occurs from irritant poisoning—the cerebral functions not being interfered with. The heart is only influenced indirectly, but the respiration is paralysed.

As a diuretic its action is most uncertain, and as a purgative its effects are too severe. Well-marked sedative influence on the

heart and general circulation follows its administration, though this is largely reflex.

In *gout*, striking effects follow its administration, pain subsiding promptly, swelling disappearing, and the attack often vanishing after one or two doses. Some, however, believe that it is in no way curative, the relief being dearly bought, the pain returning with greater severity.

How it acts in these cases of *acute gout* it is not easy to explain, but we know it is not by exerting its purgative or questionable diuretic properties, since its good effects are constantly seen without either catharsis or diuresis being produced, though it acts better in conjunction with purgatives. It does *not* increase the amount of urea or uric acid in the urine.

Paris noticed that alkalies softened its action, while acids rendered the drug more irritating. Magnesia makes a favourite corrective. The wine of colchicum is the best preparation for ordinary administration.

It has been advocated in all the protean forms of gout, and in almost every disease occurring in gouty persons. 15 minims of the wine may be given every 4 or 6 hours. The same plan may be adopted in the acute variety of the disease, though a full dose, say 30 mins., of the wine may be given, and repeated in two, three, or four hours while pain lasts.

Colchicum, from its stimulating action upon the liver, may be given advantageously with other *purgatives*, and the addition of a few grains of blue pill and colocynth makes a very valuable purgative for gouty patients.

The following is a modification of Scudamore's mixture :—

R. *Vini Colchici* ℥iij.
 Magnesii Sulph. ℥x.
 Magnesii Carb. ℥ij.
 Aq. Menth. Pip. ad ℥xij. *Misce.*

Fiat mist., sumat cochlearia duo ampla quartis horis.

Collodium and Collodium Flexile are only intended as external applications. When a little is brushed or dropped upon the skin the ether evaporates, leaving behind a thin film impervious to moisture. This contracts as it becomes more solid, until it puckers up the surrounding skin, and, by its pressure, partly empties the vessels of the part. It is generally used as a protective coating for *fresh wounds*, excluding air and all external sources of irritation, putting the wound almost in the same condition as an internal part, thus hastening repair. It is, however, used for its contractile properties in the treatment of small *nævi*, *port-wine marks*, *entropion*, &c., where it both diminishes the blood in the cutaneous vessels and gives support. M'Keown paints it upon the *relaxed membrana tympani*.

It is found that a layer of collodion possesses *electrical* properties, and thus affords a method of producing feeble doses of static electricity—the film is *negatively* charged as soon as it dries, and it has been used to relieve *hemi-anæsthesia*.

The flexible collodion does not contract so much as the other, but is less liable to crack with the movements of the skin. It is an excellent application to *erysipelatos* surfaces. Corrigan recommended it as a remedy for *nocturnal incontinence of urine*, painted over the child's prepuce at bedtime; and it has been used to cover the face in *smallpox* to prevent pitting, and as an application to *fissured nipples*. It is the best treatment for *scalp wounds*—incised, lacerated, and contused. As it dries, by its contractility it draws the edges of the wound together, prevents the admission of air, and does away with the necessity of a bandage. Collodion has been recommended as an application to sprains, and especially where the sprain is complicated with an open wound. It may be used to paint over the painful joints in rheumatism.

Colocynthis is an active purgative, causing copious watery motions; it enters the blood, from which it is eliminated by the intestinal glands, which it stimulates, increasing their secretion, and hastening the vermicular contractions of the bowel, making them painful and irregular. In large doses it acts as a violent irritant to the canal, and may excite fatal inflammation or disturb the functions of the abdominal organs by reflex action, producing abortion, cystitis, &c. It is seldom given alone, but is a valuable addition to aloes and scammony. Colocynthin acts effectively when injected hypodermically or when given by the rectum.

Extract of hyoscyamus relieves the griping caused by colocynth, without detracting from its purgative properties. The compound pill is a valuable purgative in *constipation of long standing*. It acts like aloes on the colon and (in full doses) on the liver; it is markedly diuretic, but it cannot be used for this action owing to its griping qualities.

R. *Pil. Colocynth. Co.* gr. iv.
 Ext. Hyoscyami gr. $\frac{1}{2}$
 Ext. Belladonnæ Vir. gr. $\frac{1}{3}$
 Resinæ Podophylli gr. $\frac{1}{4}$ *Misce.*

Fiat pil. mitte tales xii. st. i. nocte, pro re nata.

Conium has an action upon the peripheral motor nerves resembling that produced by curare. The intellectual faculties are not affected.

The physiological effects begin to show themselves within half an hour after swallowing half an ounce or an ounce of the succus. Vision becomes a little affected by a paralyzing influence on the third nerve, which causes slight drooping of the lid, slight

dilatation of the pupil, and impaired movement of the eyeball, followed soon by general diminished motor power, as is seen in a wearied, unsteady gait, with languor and some listlessness, and even drowsiness. If a larger dose be now administered, the diminution of motor power is intensified, and the patient is unable to move, the knees bend on standing, the pupil may become more dilated, and the vision more confused, and fibrillary muscular twitchings or tremors may supervene.

Still larger doses produce complete paralysis of the *extremities of the motor nerves*, swallowing and phonation become impossible, and finally death occurs from asphyxia through paralysis of the respiratory apparatus, convulsions sometimes preceding death. Owing to the various amounts of coniine and methyl-coniine present in different samples of the drug its action is variable.

There is still much difference of opinion as to whether all the phenomena of conium poisoning can be explained upon the theory of a pure peripheral action; several authorities think that the drug has some effect upon the central nervous system, and Gubler believes that it influences the sensory nerves. Cash is of opinion that clinical observation favours this latter view, though the results are slight and uncertain.

Hemlock has been used in *mania*, *chorea*, and *paralysis agitans*, its value depending on its depressing influence over the extremities of the nerves distributed to the restless muscles. In *whooping-cough* it is also serviceable; in *tetanus* and *strychnine poisoning* its value is very doubtful.

In spasmodic affections, like *laryngismus* and *convulsions* occurring during *dentition*, hemlock may be useful, but it must be administered very freely. The only reliable preparation is the succus, which should be given in doses of 2 to 4 drs. every 3 or 4 hours, and little benefit may be expected till the physiological effects of the drug are noticeable—a slight disturbance of vision and gait. Ringer gave 7 drs. hourly to a choreic child, and children can bear large doses well as a rule. A child one year old should get more conium in proportion than an adult; 10 minims to begin with is a maximum dose of the succus. It should, however, be rapidly increased, watching the effects. When any difficulty of swallowing is observed, the use of the drug should be suspended.

Hemlock is said to cause the absorption of *effused inflammatory* products; and formerly it was classed on this account as a *solvent*, *deobstruent*, or *absorbent*. It is now seldom given internally.

Externally, conium is a sedative. The writer, after repeated failures with cocaine and a host of local anæsthetics for the relief of rectal pain and itching, caused by *anal fissures*, found that an ointment of conium always gave relief, 10 grs. of the persulphate of iron may be added to each ounce in suitable cases, as recommended by Cripps. The B.P. authorities having accepted the author's formula, the ointment is now official. It paralyzes

the endings of the *motor* nerves distributed to the fine muscular layer under the surface of the mucous membrane ; the reflex twitchings of this layer keep up the perpetual pain and uneasiness in diseases of the rectum and anus associated with abrasions, ulcerations, or fissures. At the same time the sensory terminals certainly seem to be depressed, and this constant and reliable action of conium in painful anal troubles convinces the writer that there are many important points in the pharmacology of the drug still awaiting demonstration.

The ointment will be found by far the best remedy for the pain of *fissures* and *ulcerated hæmorrhoids*, and the writer has seen anal fissures heal under its use. It should be inserted well up into the bowel. It speedily relieves all forms of *anal pruritus*, and it may be prescribed of double the B.P. strength. The following is a valuable formula :—

R. *Liq. Picis Carb.* *min. xxx.*
 Unguenti Conii *ʒj. Misce.*

Copaiba acts as a mild irritant to the stomach, and in large doses excites nausea, vomiting, griping, purging, and sometimes strangury, with bloody urine. It acts on mucous membranes chiefly, and it is mainly for its effect upon the urethra that it is used in medicine.

Given in *gonorrhæa*, it at first slightly increases the flow, and afterwards controls it. It should not be given in the early or acute stages. It should not be given in larger doses than 30 minims, and often this dose upsets the stomach. It may act by destroying the specific poison which causes the inflammation. It is eliminated by the kidneys in combination with glycuronic acid, which gives a precipitate with nitric acid, which is soluble by heat ; and it is eliminated also by the bronchial membrane and skin—all of which excretory organs are stimulated by it. It increases the watery element in the urine, and is used sometimes as a diuretic in dropsies of hepatic origin, but it may produce albuminuria, and is very irritating.

It acts by direct contact in *gonorrhæa* and *gleet*, and the writer has found benefit from injecting it into the bladder in *inveterate cystitis* in the female. He dilutes it with its own bulk of warm castor oil, and injects 1 oz. of it, allowing it to remain until expelled.

In *chronic bronchitis*, with profuse expectoration, copaiba often acts splendidly, and will be found in such cases the most reliable of the oleo-resins. It is occasionally used in *leucorrhæa*, and has been known to remove *psoriasis* which resisted all remedies. Its administration sometimes brings out a profuse rash not unlike measles, or urticaria, and this probably gives some explanation of its use in *psoriasis*, acting as a stimulant to the skin. It may be

given alone, in water, or in the form of an emulsion with mucilage, egg, or liquor potassæ, or in a gelatin capsule, or better still, as a paste. (See under Cubebs).

(*Gonorrhœa Mixture.*)

R. *Copaibæ* ℥vj.
 Liq. Potassæ ℥iv.
 Mucilaginis ℥j.
 Spt. Æther. Nit. ℥iij.
 Aquam Cinnamomi ad ℥viiij. *Misce.*

Fiat mist. capiat cochlear. i. mag. ter in die, p. p. a.

Coriandrum—An aromatic carminative, identical in its effects with Anethum and Anisum. 4 minims of the oil may be given on sugar, for *colic*.

Creosotum possesses many properties in common with Acid. Carbolic. (which see); it is, however, much less toxic. It is speedily absorbed on entering the stomach, and does not undergo any marked change in the blood. It is eliminated by the bronchial mucous membrane, which it stimulates, thus becoming an expectorant especially valuable if there be any fœtor of the secretion, as in *chronic basilar cavity*. It is the best routine drug in ordinary *phthisis*. It may be given by the mouth, hypodermically in oil, by the rectum, applied with friction to the skin, or sprinkled on an inhaler; or in all these ways at once, constituting the so-called "intensive" method, and up to 30 minims daily may be administered. Harry Campbell states that he has given drachm doses *ter in die* without any inconvenience. (See also Guaiacol.) It also passes off in the urine, and is believed by some to be diuretic, and the writer has found it valuable where the urine is foul smelling. He has kept samples of urine exposed to the open air without change for 14 days from patients who had been taking creosote. In very large doses it is a violent irritant poison, resembling carbolic acid, only it does not produce convulsions, and does not render the blood less coagulable.

Small doses have a sedative action upon the terminal nerve filaments distributed to the gastric mucous membrane, and correct *nausea*, *gastralgia*, and *vomiting*, whether caused by local mischief or of a reflex character, as in *sea-sickness* or *pregnancy*. 2 or 3 minims frequently arrest *fermentative* and *putrefactive changes in the stomach*, for creosote, like carbolic acid, is a powerful antiseptic. It may be given in pill, or dissolved in cod liver oil, or in a mixture, and it is to be remembered that it explodes when combined with oxide of silver in the pilular form, unless it is previously diluted with some inert powder. But the gelatin capsule is by far the best form for its administration. In

tuberculosis the drug may be given in doses up to 15 minims per rectum, mixed with 2 or 4 ozs. emulsified cod liver oil. Splendid results have been reported from this plan in tubercular peritonitis. Externally, it acts like carbolic acid, and relieves the pain of an *exposed dental nerve* effectually; and in the form of the ointment it is useful in *ulcers* and the *scaly skin diseases* where tar is indicated, and it relieves the itch of *eczema*. As an inhalation in *chronic bronchitis* and *gangrene of the lung*, creosote is beneficial. In tuberculosis it probably combines with and neutralizes the poison produced by the bacilli. It has practically no effect upon the number of the bacilli in the sputum.

Creta and Creta Præparata are mild antacid remedies, useful where we wish to reach the *intestinal* surface with an alkali. (Their action is explained under Calcium Carbonate). The aromatic powder is a valuable remedy in the *diarrhœa of childhood*; it may be given as a powder or in a mixture.

(For a child 4 years old.)

R. *Pulv. Cretæ Aromat.* ℥ij.
 Syrupi Simplicis ℥j.
 Spt. Chloroformi ℥j.
 Aquam ad ℥iij. *Misce.*

Fiat mist. sumat cochlear. i. minim. tertiis vel quartis horis, p. p. a.

Crocus—Saffron may be said to be only used for its colour and flavour. It was much esteemed long ago as an emmenagogue, and was believed to possess the property of increasing the rash in the *exanthemata*.

Crotonis Oleum is a powerful drastic or irritant cathartic, causing copious watery motions often in less than one hour after a medicinal dose. It does not act entirely as a local irritant to the intestines, as was supposed, but a part of it may be absorbed, and entering the blood, circulates with it till it reaches the intestinal glands, which it stimulates to increased action, and it quickens the peristaltic movements. The same effects are sometimes said to follow its application to the skin with friction as are observed after swallowing it. In the intestine it is converted into glycerin and crotonoleic acid which causes the purgation; some samples of the oil contain this acid, which is a powerful irritant. In large doses it is a violent poison, acting as a local irritant, and causing inflammation of the digestive tract, or death from collapse. Its rapid action renders it a valuable purgative, where time is a consideration, as in *head injuries, acute mania, delirium tremens, and brain disease,*

and in very *obstinate constipation*, when we are sure the lower bowel is freed by enemata, It may be given in pill, 1 minim acting as an efficient cathartic; or in *apoplexy*, it may be dropped on the tongue, when power to swallow is blunted or lost. (This is not, however, to be recommended). It may, in such a case, be rubbed up with about 5 grs. of sugar, or a little butter, and placed on the root of the tongue.

Externally, croton oil is a strong irritant when applied to the skin, bringing out an eruption, at first papular, but soon passing into pustulation. It is not, however, as painful a counter-irritant as might be expected. The linimentum crotonis is an excellent rubefacient in *acute bronchitis*.

The application of croton oil to *ringworm of the scalp* has been successful, but it sometimes causes baldness.

Cubeba resembles Copaiba in its action, but possesses a milder stimulating and alterative influence over the genito-urinary mucous membrane and rectum. With caution it may be used in the early stage of *gonorrhœa*. Made into a paste with copaiba, and a little nitrate of potassium added, it can be bolted in wafer paper in doses the size of a hazel-nut. The same paste will often give relief in *bronchitis with profuse expectoration*, when other measures fail; and it is an excellent remedy for *piles*, if made into a paste with *glycerin*, and bolted in a similar way.

(Gonorrhœa Paste.)

R. Pulv. Cubebæ ℥ij.
 Pulv. Potassii Nit. ℥ij.
 Pulv. Doveri ℥ss.
 Copaibæ q.s. ut fiat

electuarius durum, ℥i. ter die sumendam post cibos.

Cupri Sulphas given in small doses ($\frac{1}{2}$ grain) acts somewhat like the lead and silver salts. It has nervine tonic properties, and has been given in *epilepsy*. It is a strong astringent, and is used in chronic *diarrhœa*. In larger doses (5 to 10 grs.) it is a speedy emetic, acting like sulphate of zinc, in formidable *poisoning* cases, especially in phosphorus poisoning, and in larger doses it is a powerful irritant poison, producing paralysis of the respiratory and cardiac centres.

Externally, it is a valuable astringent, appreciated in veterinary practice, and the solid salt rubbed over *sluggish sores* destroys unhealthy granulations, and it is a powerful local stimulant. 3 grs. to 1 oz. water make a lotion which may be applied to *chancres* and *ulcers*; or injected into the urethra in *gleet*; or into the vagina in *leucorrhœa*; or brushed over the lids in *ophthalmia*.

Its prolonged administration stains the gums or teeth with a

blue or green line like that seen in *lead poisoning*. It is eliminated by the skin, kidneys, mucous membranes of the gall bladder, stomach, and bowel, and is stored in the liver.

Cusparia is a tonic possessing aromatic and febrifuge qualities ; in large doses it causes vomiting and purging, but in medicinal doses (30 grs. of the powder) it is useful in *malaria* and the *fevers of the tropics* and in *dysentery*, though it is almost devoid of astringency.

Cusso, when taken in large doses, sometimes causes both vomiting and purging. It kills *tænia solium* and *bothriocephalus*, for in the doses usually given it does not often purge, but kills the parasite by direct contact.

2 to 4 drs. of cusso infused in 4 ozs. of boiling water, and swallowed without straining, are taken for one dose ; and, like all other vermicides, it acts more certainly if given when the stomach and intestines are empty, and if followed soon after by a mild purge ; the worm is expelled dead, and often in small fragments. The active principle—Kosotoxin is a powerful protoplasmic poison.

Digitalis is a true cardiac tonic. Small doses lengthen and strengthen the ventricular contractions by their direct action upon the cardiac muscular fibre, raise the blood pressure and slow the pulse by stimulating the vagus roots, and the peripheries of the cardiac nerves. Moderately large doses increase the frequency of the pulse by paralysing the vagus roots, the blood pressure still rising. Larger doses cause irregularity of the heart's action and pulse by their effect upon the heart itself, and if the doses be repeated the blood pressure falls and the heart becomes finally paralysed, the respiration previously having been also weakened, though the motor and sensory nerves, cord and cerebrum remain unaffected. These results may be summarised by adopting Schmiedeberg's method of dividing the action of digitalis into 4 stages, thus :—

1. Increase of cardiac pulsation, slowness of pulse, and rise of blood pressure.
2. Quickness of pulse (effect on cardiac vagus filaments), continued high blood pressure, and increase of urine.
3. Irregularity of heart and pulse (effect on cardiac muscular fibre).
4. Increased irregularity and weakness of heart and pulse, fall of blood pressure, failure of heart and respiration, and death.

In the main, the action of digitalis upon the frog's heart corresponds to its influence upon the mammalian heart ; it increases its tonic activity by its direct effect upon the muscular fibre, though in the frog the heart is arrested in systole, whilst in the mammal the organ stops in diastole.

In the treatment of disease the drug should not be pushed beyond the 1st stage, which is recognised as the *therapeutic* stage of digitalis action. It is now recognised that the main cause of the increased blood pressure is not to be accounted for by the increased action of the heart, but by the *contraction of the arterioles* throughout the body. It acts as a diuretic mainly by raising the blood pressure in this way ; its diuretic action is, however, slight in health but marked in heart disease.

Digitalis, on account of its strengthening action on the heart, may be given in all cases of *weakened contraction from valvular disease except one*. It acts in valvular disease by slowing the heart's movements, so that the overburdened ventricle or auricle gets longer time to contract, and thus more effectually drives the blood through a narrowed orifice. In the case of *mitral obstruction* the time during which the blood flows from the distended auricle into the ventricle is increased, and when the former contracts it has less to expel, and hence does its work better. The exception to its use is in the *early stage of aortic regurgitation*, where, after each contraction of the heart, the blood, which should be forced along the aorta, finds its way back into the wearied ventricle, breaking upon its repose. If the diastole is prolonged by the digitalis, the duration of this backflow is increased, the mischief is aggravated, and grave danger may result. Later on, however, when the pulmonary circulation is affected, and through it the right and left ventricles become implicated, digitalis is clearly indicated.

In simple aortic obstruction, as in any other valvular lesion without cardiac symptoms, the drug should not be given, and it is especially dangerous in atheromatous conditions of the vessels and in fatty degeneration of the cardiac muscle.

Ringer points out that "the irregularity of the pulse is the capital indication of the necessity of giving digitalis," and it is often valuable in palpitation and irregular action of the heart not depending upon valvular disease.

Sansom says : "Digitalis is *facile princeps* of drugs in the treatment of imperfect compensation. It so influences the cardiac ganglia as to induce a more perfect contraction of the ventricular muscle, and hence a more complete emptying of the ventricles ; whilst, at the same time, by an action on the vasomotor centres, it causes contraction of the arterioles and a heightened tension in the arterial system. It slows the heart by lengthening the diastolic pause ; so not only does it give rest to the wearied cardiac muscle, but as this muscle is nourished only during such diastolic pause by the blood which then enters through the coronary arteries it directly ministers to its nutrition."

Hare demonstrated that digitalis administered to young pigs for $4\frac{1}{2}$ months caused a genuine hypertrophy of the cardiac muscular fibre, and increased the weight of the heart, the increase corresponding to the extra growth in each fibre.

$\frac{1}{2}$ oz. doses of the tincture have been used in *delirium tremens*; this is not a method of treatment to be recommended. It reduces the temperature in *inflammatory conditions*, and as an antipyretic is still occasionally used on the Continent. In *pneumonia* the drug is valuable when combined with other treatment. Petresco gives from 60 to 120 grs. of the leaf in infusion in 24 hours, and states that he has never seen poisoning, and his mortality is only 1·22. Others insist upon the grave danger of such doses.

It is used in *internal hæmorrhages*, because of its influence in contracting the arterioles, but it is very uncertain, owing to the increase in the general blood pressure. It causes contraction of the *uterine muscular tissue*, and is useful in *menorrhagia*.

In disease, the diuretic effects of this drug are often astounding. Given to assist the *kidneys*, where many quarts, or even gallons, of fluid are shut up in the peritoneal cavity or cellular tissues, from an obstructed cardiac circulation, it has been seen to increase the scanty urine from several ounces to as many pints in 24 hours. In these cases it acts by striking at the cause of the dropsy, through its power of raising the blood pressure in the renal glomeruli.

After the disappearance of the dropsy it has very slight power of increasing the amount of water or urea eliminated. The most active of the glucosides is digitoxin, and it is only soluble in alcohol; the tincture is believed to be the most suitable Galenical preparation, but the infusion and powdered leaf are also very reliable. (See under Digitalin.)

Digitalis, when administered for some time, occasionally without warning, produces symptoms of poisoning as if a very large and dangerous dose had been taken. This is spoken of as the *cumulative* action of the drug, and it arises from its elimination by the urine being retarded. When the blood pressure rises very high the excretion of urine stops and the drug consequently accumulates rapidly in the blood. This may be prevented by keeping the patient strictly confined to the recumbent position, watching the urine, and stopping the administration when the secretion becomes scanty and the pulse very slow or the heart irregular.

Great benefit may be obtained by combining the vaso-dilator action of the nitrites with digitalis in cases where the blood pressure is high. It must not be forgotten, however, that the action of the digitalis is almost continuous, whilst that of the nitrite is very evanescent.

Externally, an infusion applied to any extensive surface is sometimes absorbed.

Baly's or Guy's pill, which usually is made to contain 1 gr. each of powdered digitalis, squill, and blue pill, is a favourite diuretic in *cardiac dropsy*.

Niemeyer's pill, much used in *phthisis*, contains $\frac{1}{2}$ gr. digitalis,

1 gr. quinine, and $\frac{1}{4}$ grain opium; and Heim's pill is the same with the addition of $\frac{1}{4}$ gr. ipecac. and the omission of the quinine.

Iron, though incompatible with the tannin of digitalis, is often prescribed with advantage; the following formula gives a clear elegant mixture:—

R. *Tincturæ Ferri Perchlor.* $\mathfrak{z}\text{ij}$.
 Tincturæ Digitalis $\mathfrak{z}\text{ij}$.
 Acidi Phosphorici Dil. $\mathfrak{z}\text{ij}$.
 Aquæ Destillatæ $\mathfrak{z}\text{vij}$. *Misce.*

Fiat mistura, sumat $\mathfrak{z}\text{ss}$. ter in die ex aqua post cibos.

Elaterin and Elaterium—The latter is only used to prepare elaterin, which is the most violent purgative known. Belonging to the hydragogue class, it produces profuse watery evacuations by its stimulating and irritating action on the liver and intestinal glands, by which it is eliminated. Externally, it is a strong irritant to moist surfaces.

In the treatment of desperate conditions—like *apoplexy*, &c.— $\frac{1}{10}$ grain will draw off as much water and serum from the blood as a copious blood-letting. The $\frac{1}{20}$ grain is a good average dose, and, owing to the discharge of water produced by it, it is useful in *dropsies*, or in accumulation of fluid from any cause, especially where the kidneys are congested or fail to do their office, and the heart is not too weak. Its great use lies in its application to cases of formidable and *sudden anasarca* threatening life by its rapidity, as in *œdema of the lung*.

5 grs. of the compound powder, put on the tongue and washed down with a spoonful of water, should purge in a few hours.

It requires bile for its purgative action; if injected under the skin, Brunton says it produces *dyspnœa* and *tetanus*. Other authorities state that it purges, but in any case it cannot be used in this way, as abscesses form at the seat of puncture. The student should note the dose of elaterin— $\frac{1}{20}$ grain—while elaterium may be given in 10 times this quantity. The writer has sometimes found elaterium to fail completely even in large doses. It is uncertain in its action, and must not be always relied upon.

Emplastra—The B.P. plasters are chiefly used for their physical quality of adhesiveness. By strapping so that a grip can be obtained on the surrounding elastic tissues, considerable pressure can be constantly kept up, and in this way *inflammatory products* may be absorbed, especially if of *syphilitic* origin, the ammoniacum and mercury, or the mercury plaster, answering this end very well. *Pain* may be relieved by the menthol, belladonna, or opium plasters, while feeble counter-irritation and active rubefaction may be produced by calefaciens and cantharides respectively.

With the exception of cantharides, all the plasters promote the absorption of superficial inflammatory deposits by protecting the part from variations of temperature. By checking evaporation the local temperature is increased, and the superficial part partakes somewhat of the benefits of an internal position, and glandular and lymphatic action becomes altered, as is seen in the resolution of *chronically inflamed glands and joints*.

Ergota, owing to the complex nature of the various active principles contained in ergot and the great difficulties in isolating them, experiments conducted with them have led to confusing and contradictory results. Cornutine has been demonstrated as producing convulsions from its action on the medulla and a slow prolonged contraction of voluntary muscle and of the uterus, with increased blood pressure. Sphacelinic acid has the remarkable power of producing dry gangrene of the arterial type, as may be seen in the comb of the cock, after large doses. It has been noticed that where ergot has been taken for any time in the rye-bread used by peasants, *gangrene* and *paralytic symptoms* have supervened, though these are rarely seen after the prolonged medicinal use of the drug. Large doses of ergot cause vomiting and purging, paralysis, inco-ordination, muscular spasms and convulsions, and death preceded by fall in body temperature.

In moderately large doses ergot causes contraction of the involuntary muscular fibre throughout the body, the arteries and veins diminish rapidly in calibre, and the vessels of the spinal cord are more especially contracted; there is a marked rise in blood pressure from stimulation of the vaso-motor centre. The contraction of the blood vessels is probably centric and not caused by the local action of the drug. The heart is little affected by moderate doses, though the pulse falls a little, but the uterus is powerfully influenced through its action upon the lower spinal centres.

In *internal hæmorrhages*, 20 minims of the liquid extract every three hours is given for the relief of *hæmoptysis*. In *urgent* cases the same amount may be injected under the skin every fifteen or thirty minutes. It is used in all *hæmorrhages*, but it is very doubtful if it has any action whatever in internal hæmorrhage (save in uterine bleeding) owing to the fact of the blood pressure being raised. It has been vaunted as a remedy in *aneurisms* and *goitres* when injected into the tissues surrounding the sac, also it has been tried in *enlarged spleen* and *spinal congestion*.

It is, however, in *obstetric practice* that the virtues of ergot are appreciated. By acting on the uterine fibres it produces powerful tetanic contraction, and assists to expel the contents of the organ. 30 grs., infused for ten minutes in boiling water, will often arouse the slumbering energies of the uterus within ten minutes, but its administration requires discrimination—thus, it should not be given if there be any impediment to the descent of the head, or if

the pains are already good ; and sometimes it exerts dangerous pressure upon the child by its tonic action on the uterus, and it may weaken the foetal heart. It may cause irregular action of the muscular tissue ending in retained placenta. Small doses increase the rhythmic or intermittent contractions, but large doses produce a tetanic prolonged contraction. It acts proportionately to the size of the uterus. In the early months of pregnancy it feebly affects the organ, but its power over it increases with every month of gestation. It is the best remedy we have for the relaxed condition, causing *post-partum* hæmorrhage, where it may be given in dr. doses, or 10 minims of the hypodermic injection may be injected *deeply* into a muscle or into the uterine walls in desperate cases. *Subcutaneous* injection is more likely to be followed by irritation and abscesses. The obstetric practitioner will find the fresh infusion the best preparation, and where he resides a long way from his patient, it is a good rule to never leave a recently-delivered case without previously giving ergot. Good results follow its use in *sub-involution* and *menorrhagia*, and various forms of *uterine fibroid tumours*. For *fibroids* Schucking injects ergotin into the lip of the os uteri. Most authorities agree that the abdominal wall must not be selected, and that the deep muscles of the buttock afford the best spot. The solution should be always freshly prepared.

Eserine (See under Physostigma.)

Ether (See under Æther.)

Ethyl Nitritis Liquor acts like sweet spirit of nitre and amyl nitrite. Under this latter drug the action of the nitrites as vasodilators is described. It is used in all cases where there is high arterial tension, as in *angina pectoris*, cardiac, renal, and pulmonary *dyspnœa*, *epilepsy*, *sea-sickness*, and various forms of *headache*. As pointed out by Prof. Leech, the liquor rapidly decomposes, and should not be prescribed in mixtures with water. One to two drachms should be mixed with 1 oz. water and swallowed immediately as a draught. Its action is much more prolonged than that of Amyl Nitrite.

Eucalyptus Oil is a powerful antiseptic, destroying minute organisms. In some respects its action resembles quinine, thus it arrests the movements of the white corpuscles and causes the spleen to contract. It is a diffusible stimulant like turpentine, stimulating and afterwards depressing the central nervous system and respiratory centre, and acting upon the kidneys. Externally it is a rubefacient, and if covered with oiled silk it will blister. It is given in feverish septic conditions, and good results have followed its use in *puerperal fevers*, *pyæmia*, and *septicæmia* in 5 minim doses. It reduces the temperature, and has proved curative in *ague*, and during its elimination by the bronchial mucous surface and the renal tract, it is a disinfecting remedy in

phthisis and *fetid bronchitis*, and in *cystitis* and *gonorrhœa*. It has been given hypodermically in liquid paraffin. Many physicians are now treating all the *exanthemata*, *pertussis*, and *diphtheria* by enveloping the patient in an atmosphere of eucalyptus vapour. In *influenza* this has become the popular practice. It affords the best routine treatment of *scarlatina*, used as an anointing oil (1 part to 3 of olive oil) from the beginning and all through the desquamative stage, where it thoroughly disinfects the shed epithelium.

Locally the vapour has been used as an inhalation in *gangrene of the lung*, *phthisis*, *ozæna*, *diphtheria*, and a dilute solution is employed to wash out cavities and irrigate foul wounds. Made into a pessary, it has been used in *cancer of the uterus and rectum*, and as a gauze it is used as an antiseptic surgical dressing.

Eucalyptus gum is an astringent acting like catechu and tannin in *diarrhœa*, *dysentery*, &c. It is used also for *relaxed throat* and in *hæmorrhoids*.

Euonymus and the dry extract known as Euonymin are cholagogues increasing materially the excretion of bile. It is a reliable cathartic, in some respects resembling podophyllin, but very much milder in its action. The experiments of Rutherford proved that it increased the amount of bile flowing into the intestine of dogs. Its chief indication is in *torpidity of the liver* in stout patients, who live too well. In the early stages of *cirrhosis* it is useful, and some cases of *chronic constipation* yield to 1 gr. doses twice a day. 3 grs. may be given as a brisk purge, followed, if necessary, by a saline.

Fel Bovinum is employed in medicine where there is reason to suspect that the natural secretion of bile is deficient; the bile is known to assist the emulsification of fats, to act as an antiseptic and purgative, and to facilitate the absorptive powers of the mucous membrane. It has been recommended by White as an addition to enemata in *fæcal accumulations*. It may be given in 15 gr. doses as a bolus, or wrapped in wafer-paper.

Ferrum—Iron must to some extent be considered as a food, though in medicinal doses in health it does not increase the number of the red corpuscles. It increases the appetite somewhat, and if the astringent preparations be administered, nausea and constipation may result; in any case the stools are black, and sometimes the bladder is irritated. None of these effects throw any light upon the action of the drug in disease. Stockman, to whose researches we owe so much, gives the amount of iron necessary for a healthy man daily as $\frac{1}{12}$ to $\frac{1}{8}$ gr., and the total amount in the body at about 40 grs., nearly all of which is in the hæmoglobin.

The various iron preparations are changed in the stomach into ferrous chloride, a trace of which is absorbed, a portion of the remainder being converted into carbonate and hydroxide in the

duodenum, but the great bulk of it passes down the bowel to be changed into sulphide before passing out unabsorbed in the fæces. The small amount absorbed finds its way through the epithelium of the villi, after which it is seized by the white corpuscles of the blood and carried into the general blood stream, where it can be identified in the form of minute granules in the protoplasm of the cells on their way to be stored up in the liver. From the liver it ultimately emerges as hæmoglobin.

It is excreted by the urine ($\frac{1}{8}$ gr. daily), but mainly passes out of the body by the fæces, after being eliminated by the mucous membrane of the bowel.

Iron is the type of a restorative, general tonic, or hæmatinic. It directly affects the blood in *anæmia*, increasing the red corpuscles, and thus enriching nearly all the tissues with an increased supply of oxygen. The brain and nervous system benefit by its ozonising properties; their tone rapidly improves, and hence its great value in *exhaustive mental overwork* and *neuralgia*, where iron is a tonic in the true sense of the word. In recovery from *fevers*, especially in cases where there has been *much brain activity* or *prolonged delirium*, the use of iron is often attended with the best results.

Bunge maintains that in *chlorosis* the inorganic iron administered does *not* go to form hæmoglobin, but simply protects the iron in the food from being converted into inert sulphide in the bowels. The vexed question of how iron acts may be said to be now settled by the able researches of Stockman and others, who have demonstrated that the metal is absorbed. Stockman obtained striking results in *chlorosis* by the hypodermic injection of small doses of the ammonio-citrate, and he has proved the fallacy of Bunge's theory by curing *anæmia* with the supposed inert sulphide. When the object is to saturate the system with iron the non-astringent preparations should be selected, as Bland's pill, reduced iron, or the dialysed liquor, though Ringer insists upon the superiority of astringent salts like the sulphate and perchloride in small and frequently repeated doses. Lepine strongly advocates the hypodermic use of $2\frac{1}{2}$ c. c. of a 4 per cent. solution of the citrate into the buttock. Iron should always be given after food.

It would occupy much space to mention the ailments for which iron is so highly praised, but many will be included by saying that in *anæmia*, from whatever cause, this drug may be freely given. It seems to possess specific power over *erysipelatous inflammations* when taken in large doses, and in *chlorosis* its effects are beyond doubt.

In *Bright's disease*, *heart affections*, and *scrofula* it is most valuable.

Externally, the perchloride is a powerful astringent, and the strong solution acts upon the blood-vessels, and hardens the tissues. It is a valuable last resource when injected into the uterus in *post-partum hæmorrhage*, if reduced to about the

strength of the diluted solution of the B.P. The solid crystalline mass obtained by evaporating the liquor can be easily carried in the obstetric bag, and on adding it to water (1 to 10) may be injected into the uterus.

The scale preparations are favourites, especially the citrate with quinine, which, however, cannot be ordered with alkaline carbonates.

R. *Ferri et Quininæ Cit.* ℥ij.
Spiritus Chloroformi ℥ii.
Inf. Calumbæ ad ℥x. *Misce.*

Fiat mist. st. coch. i. mag. ter in die.

The citrate may be given in effervescence, and makes a most elegant and palatable chalybeate mixture—the citric acid being prescribed along with it, whilst the alkaline solution is added just as the patient is about to swallow the dose.

Iodide of Iron will be found invaluable in *struma* and *syphilis*, and in the form of the syrup is well suited to the taste of children.

(For a child two years old.)

R. *Syrupi Ferri Iod.* ℥ij.
Olei Limonis gl. iv.
Syrup. Simp. ad ℥iv. *Misce.*

Fiat mist. capt. coch. i. min. ter in die.

Tinct. Ferri Perchlor. is, perhaps, the best and most used preparation of iron. It cannot be given with alkalies. If ordered with substances containing tannin, like digitalis and ergot, the mixture can be made bright by the addition of a little Acid. Phosph. Dil. When prescribed with Liq. Ammon. Acet. it forms Basham's mixture, containing acetate of iron in elegant form.

R. *Tr. Ferri Perchlor.* ℥iv.
Liq. Ammon. Acet. ℥ij.
Syrupi Simp. ℥j.
Aquam ad ℥viiij. *Misce.*

Ft. mistura, cpl. ℥ss. ex aqua ter in die.

Glycerin is the best corrective to order with the liquid iron preparations, and makes a much more agreeable mixture than if spirit of chloroform be used, though the latter prevents the iron from causing any gastric irritation, and is sometimes retained when the stomach rejects more elegant combinations.

The *dialysed iron solution* is the least irritating and objectionable of all the iron preparations, and its hæmatinic qualities are unmistakeable. It may be also used as an antidote to arsenic. It is to be regretted that it is now no longer official.

The *Syr. Ferri Phosph. Co.* (Parrish's) is not in the B.P. It is known as Chemical Food, and is about double the strength of the B.P.C. syrup.

The *Syrup of Phosphate of Iron* is useful in the dyspepsia of anæmic patients. It should be ordered by itself.

The *Mistura Ferri Co.* has long maintained its supremacy amongst the iron preparations as a remedy for *absent or scanty menstrual discharge*. If its position is well deserved, it is certainly by producing the maximum of good with the minimum of iron, as it is often in a decomposed condition before being swallowed by the patient.

The *Saccharated Carbonate* is a very agreeable form for giving iron.

The *Sulphate* is a good tonic and astringent, and is a valuable addition to purgatives. It enters into Blaud's Pill, but the iron becomes changed into carbonate, and it is now one of the most frequently ordered of all remedies for *amenorrhœa*. In this form it does not cause constipation; 9 pills may be given in the day.

Ferrum Redactum is a plain chalybeate without astringency.

R. *Ferri Redacti gr. v.*

Glycerin. Tragacanthæ q.s. ut fiat pil. Misce.

Mitte tales xxiv. st. i. ter in die post cibos.

Notwithstanding all that has been said in favour of the innumerable new organic salts of iron, they do not appear to possess any superiority over the older inorganic preparations.

Ficus—The fig is nutritious, and acts as a mild laxative. When taken in large quantities it causes griping, probably by the presence of the indigestible fruits, or so-called seeds, irritating the mucous membrane, and setting up irregular and painful contractions. Split open and heated, figs make a popular emollient poultice.

Filix Mas is used as a remedy for *tænia solium*, *t. mediocanellata* and *bothriocephalus*. It should be given to an adult in 60 minim doses, early in the morning, after a previous castor oil purge administered at bed-time, to insure the complete emptiness of the bowels; or it may be given at night, after fasting, and be followed by a purge next morning, though this is seldom necessary, a full dose of the liquid extract generally acting as an effective purge. Care should be taken to look for the head of the worm, for until this is obtained there is doubt of its destruction.

The fern seems to act as a direct poison to the parasite. It may be combined with turpentine, or given in capsules. It is not advisable to give more than 90 mins. in a single dose, death having been caused by less than three times this amount.

10 mins. tincture of senega will emulsify 1 drachm of the drug.

R. *Ext. Filicis Liq.* ℥j.
Spt. Terebinth. m. xxxv.
Ovi Vitelli i. *Misce et adde*
Aquæ et Syrupi q.s. ad ℥ij.

Fiat haustus, mane sumendus.

Fœniculi Fructus—Fennel acts like Anethum (which see). In addition to its aromatic qualities, it is supposed to have the power of increasing the flow of milk. The water is a favourite antispasmodic for infantile colic, in tea-spoonful doses.

Galbanum resembles asafetida in its action, only it is feebler, and should have been omitted from the new B.P.

Galla—Since the value of galls depends upon the tannic and gallic acids contained in them the reader is referred to Acid. Gallicum.

Gelatinum is only made official in order to obtain a basis for glycerin suppositories. Carnot has demonstrated the value of gelatin as a powerful hæmostatic and styptic, first discovered by Dastre; 5 per cent. solution may be applied on lint to wounds and in epistaxis. Recently a hypodermic dose of 30 or 40 grs., in absolutely sterile saline solution, has been proved a valuable hæmostatic in hæmoptysis and in typhoid and other internal hæmorrhages. Sterile solutions in glass tubes are now supplied by Martindale in a reliable and convenient form. It seems also probable that by the mouth the drug will act as a local hæmostatic if given in the form of jelly in all hæmorrhages from the digestive tract.

It has been given as an injection in cases of aneurism, and in purpura, kidney disease is a contra-indication to its use.

It has been proved of great value in uterine and post-partum hæmorrhage when injected (10 per cent. solution) into the uterus, or where this organ is packed with gelatin gauze.

See author's "Dictionary of Treatment," page 983.

Unna makes gelatin the basis of many valuable skin preparations.

Gelsemium—Full doses produce brow-ache, giddiness, staggering gait, double vision, squint, ptosis, dropping of the jaw, numbness of the fingers, and a peculiar expression of countenance, chiefly owing to loss of power of the ocular and facial muscles.

In poisonous doses the patient becomes unable to articulate or walk, a peculiar tremor of the head is noticed, sensibility

is but slightly impaired, the pulse becomes quick, the respiration is slow, the motor columns of the cord are depressed, and paralysis of all the muscles in the body follows, and the temperature falls. The writer found a patient clinging to a lamp-post in the street with most of these symptoms well marked after two doses of $1\frac{1}{2}$ gr. each of the old B.P. alcoholic extract. There are great differences in the susceptibility of different individuals to the drug. Convulsions precede death, which results from paralysis of the respiration.

Gelsemium has been found to possess power over *migraine* and *neuralgia*, and has relieved even when the cause was not removed, as in caries of the teeth and alveoli. The writer has seen benefit from it in severe *tic*. It often appears to exert most power over neuralgia of the branches of the 5th nerve supplying the lower jaw. The administration should be stopped after ptosis and staggering have been noticed. 10 minims of the tincture may be given every 3 or 4 hours.

Bartholow used it in *pleuritis and pneumonia* (where it appears to relieve as aconite does), and in *asthma, laryngitis*, and *spasmodic coughs*, of various kinds; but to be really beneficial in these cases it must be given in doses approaching the dangerous. It has been given in the *hæmoptysis* of *phthisis*, and to cause dilatation of the rigid os, and applied locally to the eye to cause dilatation of the pupil, though the pupil is often found to contract after full doses given internally, but it dilates before death when poisonous doses have been swallowed.

Gentianæ Radix is a simple bitter tonic. Its mode of acting on the system is the same as that of *Calumba* (which see). It has been supposed to exert some slight stimulating effect upon the liver. Few remedies will give such good results in the *vomiting of pregnancy* as the infusion, combined with a mineral acid; it will often stop retching when other remedies fail, and it is a feeble laxative.

R. *Inf. Gentianæ Co.* \bar{z} viiss.

Acid. Hydrochlor. Dil. \bar{z} iv. *Misce.*

Fiat mist. cpl. coch. i. mag. ter in die ex paululo aquæ.

Glucosi Syrupus finds its place in the B.P. owing to its valuable physical qualities as a pill-excipient. Commercial glucose is a mixture of maltose, dextrin, dextrose, and water, and is prepared from corn-flour. Murrell advocates its use as a most valuable food in wasting diseases in daily doses of 1 oz. It may be given by the rectum, and it has been recommended in sterile solution as a hypodermic injection.

Glusidum—Though this drug has had very extensive trials in various diseases, it has at length found its place in medicine as a mere sweetening agent in conditions such as *diabetes, obesity*,

dyspepsia, *cystitis*, *eczema*, &c., where sugar is contra-indicated. It has antiseptic powers but not in ordinary doses, and it passes out of the system by the urine unaltered.

Glycerinum is nutrient, and has been substituted for cod-liver oil; but there is no proof that it possesses any of the valuable properties of that drug. In large doses it causes red colouration of the urine, from transudation of the colouring matter of the blood. It may be used to sweeten the unsavoury food of *diabetics*; and in large doses it is laxative.

Externally, it is emollient when applied to the skin, but often when undiluted it acts as an irritant. By keeping the part to which it is applied continually soft it cures *fissures* and prevents *excoriations*; with borax it forms the most satisfactory application to *chapped nipples* and *stomatitis*, and can be used in the *aphthous* state so common about the *genitals* of badly-cared-for female children. It prevents *bed sores*. Applied on cotton-wool to the *os uteri*, and kept in contact, it causes a copious watery discharge, diminishing rapidly any congestion which may be present. Plugs inserted into the nostrils in a similar way may benefit *hay fever*.

Applied to the mouth and throat it relieves the distressing dryness of these parts in prolonged *feverish* states, and it relieves *reflex cough* and irritability of the fauces. It may be given for *hæmorrhoids*, in tea-spoonful doses, to which a little chiretta is added to destroy its intense sweetness. The injection of a drachm of glycerin into the rectum by a suitable syringe is now much used as a means of moving the bowels in chronic constipation; it is at best a temporary expedient, and aggravates the malady in the long run. The suppositories are a very convenient method of causing an evacuation. If piles be present they may be greatly irritated. Glycerin is a powerful antiseptic, a ten per cent. solution in water preserving animal substances from decay. It is useful in *dyspepsia*, especially in the fermentative variety. Squire recommends a solution of 15 grs. isinglass in 1 oz. glycerin for various skin diseases.

Glycyrrhiza has demulcent properties, and is used to relieve *cough* and promote *expectoration*. It is chiefly used for its pleasantly sweet taste. Fresh liquorice root is slightly laxative. The fluid extract covers the unpleasant taste of many nauseous drugs, and the compound powder is only of value on account of the senna it contains.

Gossypium is employed for its physical qualities—softness, elasticity, &c. It affords a protective covering for *burned* and *blistered* surfaces, and is used as a padding for splints, and in *rheumatic fever* as a covering for the inflamed joints. In *phlegmasia dolens*, applied in a *thick* layer over the entire limb, and most completely surrounded with Mackintosh, or oiled silk, and bandaged carefully so that the natural moisture cannot

evaporate, the writer has found it to be the best of all treatments. *Gouty inflamed joints* are best treated in the same manner.

Granati Cortex is a valuable astringent in the *dysentery* and *diarrhœa* of hot temperatures, owing to the large amount of tannin contained in it. In large doses it kills the *tape worm*, and 2 ozs. decoction every two hours for four doses, followed by a brisk purge, will prove a good remedy for this troublesome parasite. Many authorities maintain that it is the best of all remedies. The drug itself acts in large doses as a cathartic. Best results are obtained by using the tannate of pelletierine, which see in the Non-Official Section of this volume.

Guaiacum once held a high position as a remedy for *syphilis*. The only effect certainly known to follow its administration is that of a mild diaphoretic and emmenagogue. Sawyer gives 10 grs. of the resin before breakfast for *amenorrhœa*, and 1 dr. of the ammoniated tincture every 2 hours in *dysmenorrhœa*. It seems to have some power in relieving the wearying pains of *chronic rheumatism*, and it was an important constituent in the famous "Chelsea Pensioner"—an electuary consisting of the following, and found useful in the rheumatic and gouty complaints of old people:—

(*Chelsea Pensioner.*)

R. *Guaiaci Resinæ* ℥j.
 Sulphuris Sublimati ℥ij.
 Pulveris Rhei ℥ss.
 Pulveris Sinapis ℥ij.
 Potassii Nitratis ℥ss.
 Mellis vel Theriacæ q.s. *Misce.*

Fiat electuarius, st. ℥i. mane nocteque.

The ammoniated tincture of guaiacum has been strongly recommended as a gargle (1 in 60), and at the same time given internally, in *acute tonsillitis* in half-dr. doses in sherry. The mixture and powdered resin are better preparations.

Hæmatoxyli Lignum—Logwood is a valuable astringent and tonic, acting like tannin. The solid extract now omitted from the B.P. is a valuable astringent. No other drug is so efficacious in the *diarrhœa of tubercular ulceration* and the inveterate *diarrhœa of childhood*.

R. *Ext. Krameriaæ* ℥iss.
 Tincturæ Opii ℥lxxx.
 Pulv. Creta Arom. ℥iss.
 Decoct. Hæmatoxyli ad ℥iv. *Misce.*

Fiat mist. cpt. coch. ii. min. post singulas dejectiones liquidas.

Hamamelis has long been used by the Indians of North America as an astringent. In *epistaxis*, *hæmatemesis*, *hæmoptysis*, *hæmaturia*, *menorrhagia*, and especially in *hæmorrhage from piles*, it has checked bleeding. In what way it acts is by no means certain, as it is not very rich in the ordinary astringent principles—tannin, &c. It acts both locally and constitutionally, but it is chiefly for its local action that it is most used. 1 part of the tincture, with 10 of water makes a lotion for *wounds and ulcers*, or an injection for bleeding or ulcerated *piles*, which can be easily retained. It also is used in *gonorrhœa*, *leucorrhœa*, &c. In all cases it is well to administer it internally at the same time, in 5 minim doses of the liquid extract of the leaves, 3 or 4 times a day. *Hamamelis* is not toxic, and no very definite action upon the vascular system can be demonstrated by experiment. It seems to act upon the muscular fibres in the coats of the veins. It has been extolled as a remedy in *dysmenorrhœa*, relieving pain and languor and producing a comfortable feeling of exhilaration. Brunton found it in some cases of *hæmoptysis* to be more efficient than either ergot or digitalis. The writer has used it as a local application to varicoceles and varicose veins with apparent success in some cases, and as an enema (1 oz. hazeline, 2 ozs. water) in bleeding hæmorrhoids, or injected into the bladder in *hæmaturia* from villous growths.

Hemidesmus is supposed to act like sarsaparilla. It is a feeble stimulating diaphoretic, and is used as a remedy for *kidney diseases* and *syphilis* in India. Possibly the fresh plant has some power, for the dried herb seems to have none, and its retention is a blot on the new B.P.

Hirudo—Leeches are used to extract blood in local inflammations, and healthy specimens may be calculated to remove two drachms each. They should be applied when possible over such prominences as will permit of a gentle pressure being applied in case of excessive hæmorrhage from their bites. In applying leeches they should never be touched by the fingers of the nurse or attendant. The physician should order the dispenser to send them in a perfectly clean chip box, which should only be opened as the selected part is exposed, and the inversion of the box (which should be gently pressed against the skin till they fasten) is all that is generally necessary. The part should be very clean, and free from all traces of soap, mustard, &c., and if the leeches refuse to bite, which is seldom, a little sugar or cream, or, better still, the minute scratch of a needle, determines the point. They should not be pulled off after their feast, but should be allowed to drop; if, however, it is necessary at any time to remove them, a little salt sprinkled over their backs acts as a brisk emetic, and they drop off at once.

Should further bleeding from the bites be required, a hot poultice or fomentation may be applied, or a cupping-glass may

be put over the bites ; this latter is an excellent plan. A pad of wool or gentle pressure with the fingers will easily restrain the hæmorrhage ; but occasionally perchloride of iron must be used, or even a hare-lip needle, with a figure of 8 thread, may be required. Matico leaf or puff-ball will, however, answer all purposes.

In various local inflammations relief often follows the application of leeches, as in *ear troubles*, *pericarditis*, and *meningitis*.

The extraction of blood by leeches should not be recommended in extensive inflammations, for if the system is to be affected it can only be by opening a large aperture and *rapidly* removing a fair quantity of blood in a short time. By the *absolute* rejection of venesection, therapeutics loses a valuable remedy. The writer has twice seen life apparently flow in as the blood ebbed out. It is in cases of *engorgement of the pulmonary vessels*, following severe chest injury, and threatening imminent suffocation, that by boldly striking into a large vein life will be saved. He has followed this course in a hopeless case of *submersion*, where death was apparently rapidly approaching. The systemic veins and pulmonary circulation were engorged, and the burdened right ventricle threatened momentarily to cease its almost ineffectual contractions. By making a *free* incision into the median basilic the inspirations became gradually slower, and the heart, eased by the relief of the systemic circulation, commenced to beat strongly, the patient appeared to be suddenly snatched from death, and made a speedy recovery. In such a case death would probably have occurred from suffocation, even had the patient's body been covered with leeches.

Recent investigations, with an extract made from leeches, show that it prevents the coagulability of the blood, and prevents its putrefaction. It has been suggested to inject it in *clot* or *thrombosis*, or to add it to blood before transfusion. The extract also so stimulates the leucocytes and adds to their voracity that it has been seriously suggested as a means of producing immunity to various microbic diseases.

Homatropine acts like atropine and produces mydriatic effects, weaker, but preferable to those obtained by that drug. Discs or a few drops of a (4 grs. to 1 oz.) solution dilate the pupil and paralyse accommodation, the paralysis disappearing in 24 and the dilatation in 48 hours ; whilst the effects of atropine generally last for several days. It increases the intraocular tension, but not so markedly as atropine. Cocaine can be combined with it. It has been used internally in cases where atropine is indicated, as it is less poisonous.

Hydrargyrum was in its metallic state formerly employed in very large quantities to open the bowels in *constipation* and *obstruction* by mechanically driving the contents before it as it gravitated towards the anus.

Inhaled as a vapour, or used as a fumigation, the metallic mercury is active; swallowed, rubbed into the skin, or injected hypodermically, or applied endermically, mercury and its salts produce marked constitutional effects. If only a minute quantity be administered, and for a short time, there will be an increase in the number of the red blood corpuscles, a general improvement in the circulating fluid, and an increase of body weight. If the minute doses be indulged in for a longer period, or if the quantity be increased, the blood loses in fibrin and red corpuscles, and becomes charged with excess of waste products; a brassy taste is felt in the mouth; the gums swell, and are marked with a blue line; the teeth are tender; the salivary secretion is increased; and fetor of the breath is noticed. The spongy gums soon ulcerate; the salivary glands enlarge; and as the metal is eliminated, it stimulates all the glandular apparatus—cutaneous, salivary, intestinal, and renal—by which it is thrown out; nervous tremors and disorders of co-ordination appear; emaciation, prostration, and finally death will occur. These symptoms follow the prolonged administration of any mercurial preparation in small doses.

The *inhalation* of mercurial fumes, as seen amongst mirror makers and others, often produces symptoms confined to the nervous system. This form of chronic mercurialism is known as "Mercurial Palsy." There is tremor of the muscles of the extremities and head, not unlike *paralysis agitans*, and sometimes crethism and delirium have been noticed.

Calomel, mercurial chalk, or blue pill is the preparation administered when we wish to get the physiological effects of mercury; the red iodide and corrosive sublimate are also used, though they are violent irritants. The salts of mercury are dissolved in the stomach or intestines, and find their way into the blood as albuminates, where they are held in solution by the chloride of sodium and excess of proteids, and in their passage out exhibit their selective action, chiefly on the salivary glands, but it is thrown out by all the excretory organs, and appears in the urine and fæces, also in the milk, perspiration, and bile. While in the blood, the drug probably acts by destroying the micro-organism which produces syphilis.

Exaggerated ideas of the dangerous results of mercury upon the system have arisen, probably because in disease the use of the drug had been generally pushed too far. We know now that it is entirely unnecessary to produce the above effects in order to treat a disease by mercury, and it is evident to those who closely watch the effects of mercury upon children that they will improve and grow fat upon it even for a long time, if judiciously administered.

Internally, mercury has been generally given (1) to control acute inflammation, or (2) to cause the absorption of inflammatory products, or (3) to combat the poison of syphilis.

There are, moreover, various groups of symptoms for the dispersion of which mercurials are used. The *diarrhœa* and obstinate *vomiting of children* often yield to minute doses— $\frac{1}{10}$ gr. of calomel every hour. A group of symptoms, known popularly as *biliousness* in the adult, is frequently dispersed by a good dose of calomel or blue pill, which, by removing all sources of irritation in the intestines, relieves an over-loaded liver, or remedies a catarrhal condition of the bile ducts; calomel acts as a purgative—not by stimulating the liver to secrete more bile—but by irritating the duodenum, so that the bile is swept down the canal before time is allowed for its absorption. There is thus really less bile circulating with the blood after a dose of calomel (which causes free purgation) than there was before. The colour of the motions after calomel is explained by Cushny on the theory that the drug prevents the decomposition of the bile by the microbes always present in the intestines. Few now advocate the use of mercury in *acute inflammations*, excepting in the case of *iritis*, and it is seldom employed to cause the absorption of effused products, though it is strongly maintained by a few that it controls *meningitis*, and assists the absorption of fluid effused within the cranium. In *meningeal inflammations* of a tubercular nature, after effusion has occurred, if the system be *rapidly* brought under the influence of mercury, such improvement follows as to lead one to believe that a partial absorption of fluid had resulted. In *simple meningitis* the writer has been fortunate enough to witness unmistakeable results.

Calomel acts in 5 to 8 gr. doses as a powerful diuretic in *cardiac dropsy*. Leech saw 10 pints of urine passed in one day after its administration. Serious symptoms have, however, been noticed even after 3 grs. three times daily for two days.

In *typhoid fever*, large doses early in the disease are used by Continental physicians to curtail its course. The red iodide in minute doses is vaunted as a specific in *scarlatina*, *diphtheria*, and the perchloride in *cholera*.

Mercury in Syphilis—Mercury is a true vital antidote to the syphilitic poison, and Hutchinson believes that many cases of indurated *chancre* treated early by mercury never show any of the characteristic symptoms of the secondary stage, and when these do appear they are milder than in cases where the mercury had not been used. (See the Author's "Dictionary of Treatment," page 917—930.)

The recent researches of Justus have demonstrated that the drug is carried by the blood to the syphilitic lesion, and is stored in the plasma cells as albuminate. He has also proved that the drug forms a soluble compound with the hæmoglobin of the red discs injured by the syphilitic poison, and that the cells become disintegrated.

The administration of mercury is injurious in the soft spreading sore. In true indurated chancres, the mercurial should be com-

menced as soon as possible, and continued till thickening and induration melt away. Ptyalism and the other constitutional effects of the drug should never be produced, but small doses of the non-irritant preparations—calomel, as in Plummer's pill, or grey powder—should be steadily administered, and their use suspended upon the appearance of changes in the gums, or any increase of saliva being observed. One grain of calomel, with quarter this quantity of opium, or 2 grains of blue pill, or $\frac{1}{10}$ grain of corrosive sublimate twice a day; or 5 grs. Plummer's pill, or 1—2 grs. grey powder, three times daily, will be found enough. Milner contends that the green iodide is the best preparation, especially in light-haired and irregularly living patients.

Excellent results follow the method of *inunction*, even when the ordinary administration by the mouth has failed. The results obtained at Aix amply prove this, and the writer has satisfied himself that doses can be tolerated there which would produce disastrous effects at home. Patients at a place like Aix, going for a specific purpose, will regulate their life as they will not at home, and, moreover, there is the influence of climate which probably aids elimination of the metal. The German ointment (1 part of Hg. in 3) is decidedly superior to our stronger B.P. preparation. 38 grs. may be rubbed in twice daily. The inunction method in selected tertiary cases, as in eye affections and testicular enlargements, is the best treatment where the iodide of potassium fails, as it often will, in effecting a permanent cure.

The method of *fumigation* by a spirit lamp and calomel is troublesome and uncertain.

The *hypodermic* method is much used on the Continent— $\frac{1}{2}$ gr. of the bichloride in $\frac{1}{2}$ dr. of water. 30 injections in as many weeks into the gluteal muscles are said to effect a cure. 1 gr. of yellow oxide, or of calomel, suspended in vaseline oil or weak mucilage may be similarly employed. Grey Oil contains 40 per cent. mercury. It is made by mixing 39 parts of mercury, 2 of mercurial ointment, and 59 of vaseline oil: of this 1 to 2 grs. may be injected daily. All these preparations are liable to cause abscess, and the perchloride solutions always cause pain.

Mercury is seldom given by the *rectum* or *endermically* unless for its local effects.

Recently the *intravenous* injection of mercury has been carried out successfully by Lane and others. He injects 20 minims of a 1 per cent. cyanide of mercury solution into the most prominent vein below the elbow.

Mercurial treatment, as a rule, should be continued for at least one year, and at short intervals for another year, and it is a good general rule to prohibit marriage for three or four years. The administration should be discontinued for a time, or the dose materially lessened, on the appearance of the physiological effects of the drug.

In *congenital syphilis* there is no preparation equal to grey

powder, which may be given freely, as mercury in moderate doses seems almost incapable of doing harm whilst there is a large amount of the syphilitic poison for it to expend itself upon. Weak, emaciated infants bear larger doses when poisoned with syphilis than they can when afterwards apparently cured and fattened; but if, after a period of neglect, syphilitic symptoms come on markedly, then they bear very large doses again. A child half a year old may get $\frac{1}{2}$ grain of grey powder three times a day for three days, then $\frac{1}{2}$ grain every night, and this may be continued as long as the infant thrives. If no result seems to follow, a little of the ointment may be rubbed in occasionally.

The *corrosive sublimate* is the most poisonous of the mercurial compounds, causing violent purging, collapse, and death in a few hours when taken in large doses. It is the most powerful destroyer of germ life, and has been used with advantage internally and locally in a host of septic conditions. In *surgical* and *obstetric* practice, *diphtheria*, *gonorrhœa*, *linea*, and numerous other ailments, its local application, with or without its internal administration as well, is beneficial. Considering the infinitesimal quantity of this substance necessary to form a solution which will *hinder* the growth of anthrax bacilli—viz., 1 in 1,000,000 (while 1 gr. in 5 gallons of water will *entirely prevent* the growth), it is easy to realise the enormous benefit which may be obtained from its disinfecting qualities without endangering the system by the action of the drug. The introduction of solutions of corrosive sublimate for washing out the vagina and uterus in lying-in hospitals has been followed by the lowering of the death-rate; but its indiscriminate use has already led to many serious cases of poisoning. 1 in 5,000 is quite strong enough for ordinary solutions. It may be prescribed with iodides advantageously.

R. *Hydrarg. Perchloridi* gr. ij.
 Potassii Iodidi ʒij.
 Aquæ Destillatæ ʒxij. *Misce.*

Fiat mistura, st. ʒss. ter in die post cibos.

Externally, *Ungt. Hydrarg.* is used to produce the constitutional effects of mercury upon the system, by being rubbed into the skin. The following are a few of the uses of the different mercurial ointments which are applied for their local action:—

Ungt. Hyd. Subchlor. relieves the painful *itching* of various *eczematous* conditions about the genitals and anus; it is a valuable application to *all indolent syphilitic skin diseases*, and rarely causes salivation.

Ungt. Hyd. Ammon. acts as a poison to vermin, and readily destroys pediculi and their ova, and is used to kill the parasites which cause *linea*, &c.

Ungt. Hyd. Co. and *Liniment. Hyd.* are used as substitutes for Scott's dressing. Spread upon lint, and applied with pressure around *diseased joints* and *glandular enlargements*, they are useful by stimulating the lymphatics.

Ungt. Hyd. Iod. Rub. is an active rubefacient, seldom used in this country except in veterinary practice, where it produces absorption of bony outgrowths and tumours. It is a powerful remedy for *goitre* in India, when aided by the rays of the sun.

Ungt. Hyd. Nitratis Dil. acts as a stimulant to the scaly stage of *eczema*, and in some way alters the action in the diseased skin, often after every other remedy fails. It is invaluable in inveterate *ozæna*, when diluted with glycerin and brushed inside the nose. The undiluted ointment has been successfully used to abort *whitlows* and *boils* by thickly spreading it over the inflamed part and covering with plaster.

Ungt. Hyd. Ox. Rub., diluted with eight times its weight of lard, or, preferably, *Ungt. Hyd. Ox. Flav.*, is an invaluable stimulant and alterative in obstinate *conjunctivitis* and *eczema of the eyelids*, and is a substitute for the popular "Golden Ointment," but it must be most carefully triturated.

Ungt. Hyd. Oleat. is unstable and unsatisfactory.

Unguentum Metallorum is the name given to a mixture of equal parts of ointments of oxide of zinc, diluted nitrate of mercury, and acetate of lead, much used in *chronic eczema*.

Lotio Hyd. Nig. and *Flav.* are stimulating applications to various *chancroid* and other sores of a specific origin. Their efficacy leads one to suppose that they act by destroying the syphilitic poison as they come in contact with it.

Liq. Hyd. Nitratis is a powerful caustic, indicated in the treatment of *syphilitic warty growths* and *scrofuloderma*.

A solution of the perchloride (5 grs. to 1 oz.) is used to destroy the *parasites of various skin diseases*.

Hydrastis—The pharmacological investigation of the alkaloids of hydrastis cannot be said to have thrown much light upon its therapeutical action. Thus berberine, though causing motor paralysis in frogs and rabbits, merely acts as a bitter tonic in man. Hydrastine stimulates the spinal motor centres like strychnine, causing tetanic convulsions, which are followed by paralysis. It acts as a muscle poison affecting both varieties of muscle fibres after a primary stimulation, in which the heart, uterus, arterioles, and intestines are all exalted in their functions. Canadine exists in very small amount in the root, and its action need not be considered. The rhizome has been extolled in *catarrhal conditions of the gastric surface*, especially in those following alcoholic excess; it has proved valuable in the vomiting of pregnancy. It benefits the catarrhal conditions of all mucous membranes, as in *bronchitis*, *pharyngitis*, *otorrhæa*, *leucorrhæa*, *cystitis*, *gonorrhæa*, *hæmorrhoids*,

&c., a weak infusion of the drug, or a solution of the fluid extract, 1 in 20, acting still more potently when locally applied. It arrests *uterine hæmorrhage*, and many observers testify to its controlling *metrorrhagia* and *menorrhagia*, reducing *fibroids*, and in relieving *metritis*. It may be used wherever ergot is indicated; it does not cause painful uterine contractions, but hydrastine is more reliable for this purpose. It is vaunted as an internal remedy for *goitre*.

Hydrastinine is an alkaloid artificially formed by the oxidation of hydrastine; it acts like hydrastine, but does not affect the nerve centres unless in very large doses. Its effect upon the blood pressure and the arterioles is much stronger than that of the rhizome or its alkaloids, and it is believed to influence the uterine fibre as well as the muscular tissue in the uterine blood vessels. It may be given in uterine and other hæmorrhages in doses of 1 grain, by the mouth or hypodermically; it does not depress the heart, and has been recommended as a cardiac tonic and stimulant acting somewhat like strychnine. It has been given with success in *epilepsy*, where it is believed that it depresses the cortex cells. Locally applied, hydrastinine dilates the pupil.

Hydrogenii Peroxidi Liq. is a powerful oxidising agent, giving off large amounts of free oxygen on contact with organic tissues. It thus becomes a potent antiseptic, in some respects rivalling even corrosive sublimate, and it is practically harmless. 1 of the pure peroxide in 100,000 will prevent the growth of germs in bouillon, and the official liquor will sterilize 1,000 times its bulk of very impure water. It destroys organized ferments with avidity, but has no effect upon enzymes, and does not precipitate albumin.

When injected hypodermically or into a vein, large quantities of free oxygen are given off, and death may result from air emboli; but by the mouth it is not poisonous.

It is an antidote in poisoning by Prussic Acid. (See Index of Poisons.)

Coming into contact with pus, brisk effervescence results owing to the liberated gas, germs of all kinds are destroyed, and by its mild stimulating effect a new action is set up in the suppurating tract which leads to rapid healing. In cavities like the pleura and peritoneum free egress must be provided, otherwise enormous distension may result, and air emboli may gain an entrance into the circulation. Diluted with an equal amount of water, it forms a valuable dressing for *ulcers*, *venereal sores*, and *abscesses* of all kinds; half of this strength may be applied to the throat in *diphtheria* and foul conditions of the mouth and throat. 1 of the solution in 8 of water may be freely applied to the urethra, eye, nose, and ear as an injection, spray, or swab. It bleaches the colour of hair effectually, and in various forms has been used as a cosmetic; and it is credited with hæmostatic powers in *epistaxis*. It has been successfully used for the removal of gunpowder stains.

Internally, it has been recommended in a host of ailments with the view of acting as an antiseptic and supplying a more abundant supply of oxygen to the blood, but its utility is very doubtful in these cases, nevertheless it has some reputation in *pneumonia*, *fetid bronchitis*, *pertussis*, *scarlatina*, *diabetes*, *epilepsy*, and *phthisis*.

Ozonic Ether is the name given to a solution of hydrogen peroxide in ether which has been given in drachm doses in the above-named diseases. It is the basis of the disinfectant known as Sanitas.

Peroxide of Sodium is a white powder used for stopping and bleaching decayed teeth; it forms hydrogen peroxide on the addition of water.

Hyoscyami Folia—This drug affects the system like belladonna, producing delirium, dryness of the mouth, dilatation of the pupil, and sleep. It differs from it in being more decidedly hypnotic and less stimulating to the heart, and in its sedative influence over the urinary mucous membrane. Small doses are sedative and tonic to the heart; large doses excite, whilst excessive doses depress it; hence it has been used in *cardiac asthma* and excitement of the heart from valvular lesions. In all the *spasmodic* affections in which belladonna is useful it may be employed. In inflamed and irritable conditions of the *bladder* it is valuable. The active principles of the drug are mildly *diuretic*, and in passing out of the system exert their sedative influence upon the terminal nerves of the irritated membrane; and it is especially indicated when the bladder is contracting frequently, to expel small quantities of urine unnecessarily. It may be advantageously combined with alkalies in these cases.

Children bear enormous doses of hyoscyamus, whilst the aged are seriously affected by even small quantities. It corrects the painful griping of purgatives, increases peristalsis, and relieves the pain of *internal neuralgic affections*. The juice in teaspoonful doses is the best preparation.

R. *Tinct. Hyoscyami* ℥iiss.
 Liquor. Polassæ ℥iv.
 Ext. Pareiræ Liq. ℥ij.
 Infus. Buchu ad ℥viii. *Misce.*

Fiat mist. st. coch. i. mag. quater in die ex paul. decoct. hordei.

Hyoscinae Hydrobromidum differs materially in action in some points from atropine, with which it is so closely allied chemically. It has a powerful sedative and hypnotic action, and the stimulating effect produced by atropine on the brain and heart is absent. After the $\frac{1}{150}$ grain, drowsiness, languor, and calm, apparently natural sleep soon supervene, and the patient wakes

up feeling well, only some dryness of the throat remaining for a time. It is the best hypnotic in *mania*, and the various forms of mental disease. The drug acts best by hypodermic injection, but as some patients are very susceptible to its action it is well to begin with a dose not exceeding the $\frac{1}{200}$ gr. It produces in rare cases wild delirium like that seen in atropine poisoning. It powerfully dilates the pupil (1 in 1,000) like atropine, being at least 4 or 5 times stronger in its action. Krauss states that after its administration the maniac collapses as if struck by lightning, but that the calming down of the general paralytic is gradual, his restlessness soon settling into peaceful slumber. In *delirium tremens*, *puerperal mania*, and various forms of *insomnia*, it has proved most valuable. In *insomnia*, where there is a latent element of insanity, it is the best known hypnotic. Bruce finds that it acts well where the kidney is diseased, and it may be given in *angina pectoris*.

It has been used ($\frac{1}{200}$ gr.) in *paralysis agitans* by Erb, and the writer has witnessed most unmistakeable relief from it in this condition when given by the mouth in doses of less than $\frac{1}{200}$ gr. It has proved successful in *asthma*, *seminal emissions*, and in the sweating of *phthisis*.

Hyoscyaminæ Sulphas is the soluble salt of another alkaloid obtained from *hyoscyamus* leaves. There are still many points to be settled about the action and dose of this substance.

It has been employed in *insomnia*, *mania*, *delirium tremens*, *paralysis agitans*, *asthma*, *neuralgia*, and *chorea*, but it would seem with less benefit than hyoscyne. It seems to resemble atropine more closely in its action than hyoscyne does, but in the majority of cases it produces sleep without the preceding delirium. Ringer, who possibly administered an impure salt, reports that he compared its effects in acute mania with atropine, and could not observe any marked difference. It is a powerful mydriatic, and is used in ophthalmic practice, but possesses no advantage over atropine. A. R. Cushny quite recently has demonstrated that pure hyoscyamine is twice as powerful as pure atropine in dilating the pupil and checking the salivary secretion. The writer was informed by a most competent authority who lived upon the Atlantic that this is the only certain preventive of sea-sickness if taken for a few days in $\frac{1}{100}$ gr. doses before embarking, and he has tried it with success.

Iodoformum, in long-continued doses, or where it has been slowly absorbed from wounded surfaces, produces disturbance of digestion, loss of appetite, malaise, vertigo, rapidity of pulse, insomnia, increase of temperature, and cerebral disturbance, not unlike some forms of alcoholic intoxication, passing into hallucinations, melancholia, collapse, and in a few instances death. These symptoms may come on suddenly without warning if the salt has been applied to a large surface; the temperature may rise to 104° ; delirium, mania, and coma may set in, and speedy death

may ensue. Moorhof says that symptoms of poisoning never occur if the drug be used alone, and no other antiseptics be employed with it. Bicarbonate of potash acts as an antidote in poisoning by iodoform. Experiments prove that *in the laboratory* germs will live in a 50 per cent. solution, but it is equally certain that *even weak solutions coming in contact with pus at the temperature of the body* become powerful germ destroyers. Many authorities deny the antiseptic action of iodoform, and strongly recommend that before it is used it should itself be sterilised by heat—they affirm that it does good, not by killing germs, but by exciting new action in the tissues. Binz found that fat and ptomaines set its iodine free, and this substance, he thinks, produces the therapeutic and toxic action of the drug ; but this cannot be accepted without reserve, since the peculiar intoxication noticed is never caused by free iodine—in all these cases unchanged iodoform in the blood is answerable for the mental symptoms, whilst grafted upon these are the symptoms of iodine poisoning. Cushny points out that the acceleration of the heart and some other symptoms are produced by the abnormal activity of the thyroid secretory cells.

Iodoform is freely excreted by the pulmonary surface and kidneys, appearing as iodine in the urine, and though containing 96·7 per cent of nascent iodine, it does not produce the irritant symptoms of even small doses of that drug. It is for its antiseptic properties that iodoform is used in surgery ; dusted in fine powder over *sloughing sores, chancres, buboes, bed sores, and cancers*, it prevents decomposition and excites healing. The stench of cancerous discharges from the vagina and rectum is instantly removed by the use of a pledget of lint soaked in 1 dr. iodoform to 1 oz. glycerin. A solution of 1 in 12 of flexible collodion may be painted over *syphilitic sores*.

Iodoform is a local *anæsthetic*, weakening sensation in the parts to which it is applied as carbolic acid does ; the official suppository causes the sensation to be much blunted after its introduction into the rectum or vagina.

A bougie containing 10 per cent. of iodoform, with eucalyptus oil and cacao butter, has been used in *gonorrhœa*.

The B.P. ointment may be used for all ordinary sores, whilst 10 to 20 grs. to 1 oz. may be applied in *ophthalmia* ; 1 to 4 may be used for *granular lids*. Its anodyne and antiseptic properties render it a remedy of great value for *burns*, where the gauze soaked in glycerin and water and covered with cotton wool and oiled silk can be used with benefit.

It has been vaunted as a remedy in *phthisis*, but has fallen into disuse ; it has no power over the tubercular bacilli, and the sprays, inhalations, and inunctions are now abandoned. The method of injecting into basilar and tubercular cavities in the lung is also falling into disuse, though its value as an agent in the treatment of tubercular abscesses in other parts is beyond doubt. Barling extols injections of about $\frac{1}{2}$ oz. of a 10 per cent. glycerin emulsion

into or around tubercular joints, whilst others with success inject a mucilaginous emulsion into the joint cavity. It has been given in *ulcer of the stomach* for its local action as a hæmostatic. Coumarin or Tonquin bean, musk, coffee, Peruvian balsam, and turpentine cover its nauseous odour.

Iodum externally is a valuable counter-irritant, weak solutions causing mild rubefaction, whilst the liquor will sometimes vesicate. Weak solutions are absorbed when applied to the skin, and finding their way into the tissues stimulate the absorbent vessels, and thus aid the removal of *glandular swellings* and *pleuritic effusions*. The drug can always be found in the urine of patients so treated. Equal parts of the liquor and tincture is the best form for application. The liquor applied in its strength is found to cause changes of position in the corpuscular elements under the skin, but any effect produced by it is not owing to its absorption, but to its counter-irritant qualities. It has been found useful in chronic *glandular enlargements*, in various painful affections of the *thoracic nerves* and muscles, and, painted in the neighbourhood of small *local inflammations*, it often arrests the suppurative process and prevents the growth of *boils*. It is a powerful antiseptic, and the liquor will destroy parasitic skin diseases.

One part of the tincture in 50 of water is used to wash out *cysts* in which putrefactive changes are going on; and diluted with an equal bulk of water, or alone, the tincture is injected into the serous cavity surrounding the testicle to excite adhesive inflammation and work a radical cure in *hydrocele*.

The vapour of iodine is used for inhalation in chronic suppurative *bronchial* affections. By incorporating iodine with the constituents of an ordinary candle a most valuable method of obtaining its virtues is obtained; such "Iodine Candles," when burned, give out the vapour of the drug. The tincture (15 mins.) injected into *solid bronchoceles* and enlarged *lymphatic glands* causes their absorption. Durante's method of treating surgical tuberculosis by injections of iodine has given splendid results.

Iodine is a powerful irritant poison, producing violent vomiting, purging, giddiness, convulsions, syncope, and death.

Internally, iodine in the free state is not often used, since iodide of potassium possesses nearly all the properties of the metalloid, without the disadvantage of causing gastric irritation. Dr. S. B. Coates has recently reported to the writer marked benefit in the treatment of *lumbago* and *muscular rheumatism* by 3 or 4 minim doses of the tincture in fresh mucilage and water. The salt is inferior to iodine in the treatment of *scrofula*, and iodine produces results in *malaria* where iodide of potassium is inert. Granville uses it in *gout*. Liq. Iodi Co. (Lugol's Solution) consists of 5 per cent. of iodine dissolved in 10 per cent. iodide of potassium solution.

Since *Iodide of Potassium* or of *Sodium* is the form in which iodine is generally prescribed internally, its use will here be

referred to. Given to a healthy man, iodide of potassium in small doses improves the appetite and increases the weight of the body. It is rapidly absorbed, and probably remains as iodide of sodium in the blood; and if the dose be increased, and taken frequently, a characteristic group of symptoms is developed, to which the name of *iodism* is given. A brassy taste is felt in the mouth, the amount of saliva is increased, and there soon appear signs of irritation of the mucous membranes of the eye, nose, throat, and bronchial passages, resembling an ordinary catarrh, with swelling of the eyelids; the brows and teeth ache; eruptions like acne, purpura, or urticaria appear; appetite fails; nausea and diarrhoea come on; waste increases, causing emaciation, debility, and a sinking feeling at the bottom of the sternum; sexual power is destroyed, and the urine becomes increased, a well-marked cachexia follows, and tuberculosis may supervene. All the glandular organs of the body are stimulated to increased activity, and the drug has been said to cause wasting of the mamma and testicle. In some the symptoms of iodism cannot be produced, as patients have been known to take 1 to 2 drs. daily for many months. It is eliminated by the kidneys, salivary glands, bronchial membrane, and mammary glands; and Binz believes that whilst being eliminated, and also whilst being carried to the different tissues of the body, *free* iodine is given off, which produces all the effects of the drug. In this way the irritation of the eye, nose, and bronchial membranes is produced, and the eruptions are probably produced by the elimination of the free iodine by the glands of the skin. He has demonstrated by a simple experiment that when *living* protoplasm is brought in contact with iodides in the presence of carbonic acid free iodine is always given off.

It should be remembered that some patients cannot take even the smallest dose of this drug without suffering from alarming iodism. The writer has many times witnessed the remarkable phenomenon pointed out by Brunton, that patients who took 1 or 2 grs. with great inconvenience ceased suddenly to have any trouble as soon as the dose was increased to 4, 6, or 8 grs.

It is invaluable in many *scrofulous* states, causing the absorption of various *effused unhealthy products*, either by increasing the activity of the absorbents or by rendering such products more fluid. In this latter way it acts upon the secretion of *chronic bronchitis*, and thus becomes one of our best expectorants. The products of *pleuritis*, *pneumonia*, and *pericarditis* often yield to moderate doses (5 grs.), and it is the best remedy for the early stages of *cirrhosis of the liver and lungs*. Schmidt has used it with success internally, along with the local application of cold to *goitres*. It is a strong anaphrodisiac and antigalactagogue, diminishing the secretion of milk satisfactorily in 10 gr. doses. Upon its elimination by the kidneys it acts as a powerful diuretic.

Full doses are said to cure *erythema* in the first few days, and it is given with success in *psoriasis* in very large doses.

In *chronic rheumatism*, *gonorrhæal rheumatism*, and *rheumatoid arthritis* it gives good results.

In large doses (20 grs. and upwards) iodide of potassium has been used for the treatment of *internal aneurisms* beyond the reach of surgery. It probably acts upon the coats of the diseased blood-vessel, and may effect alterations in the physical qualities of the blood; it also leads to fibrinous deposition and solidification. It may give marked relief to the wearying pains caused by aneurysmal growths without exercising any cure, and it gives good results in *angina*.

Germain Sée and Laborde maintain that it acts like digitalis as a true cardiac tonic, and the writer has obtained splendid results with it in *aortic valvular disease*. The recent researches of Stockman and Charteris prove that the drug, even in large doses, does not reduce arterial tension.

It has been used with apparent success in the treatment of *enteric fever* on the Continent.

In *chronic metallic poisoning* the iodide of potassium, entering the blood, meets with the albuminates of mercury or lead stored in the tissues, and by forming soluble salts, which are eliminated, the system is purged of the poison.

In a somewhat similar way iodide of potassium combines with the specific poison in *tertiary syphilis* and decomposes it. Its power over *nerve lesions*, the result of syphilitic deposit, is rapid and certain; *gummata* melt before its influence, and *bony enlargements* of a specific origin are often speedily reduced, but it must in such cases be pushed boldly in doses of 20 to 40 grs. Some physicians push the drug in such cases to the extent of 1 oz. in 24 hours, and Seguin states he has given 2 drs. thrice daily to patients between 4 and 8 years old without any bad results; this line of treatment he speaks of as the "American." The physician will seldom meet with cases where such doses are necessary. The effects of the drug in *syphilis*, though marked, are not lasting or curative, unless mercury be combined with it.

The same result is occasionally noticed as was mentioned about mercury in congenital syphilis—*i.e.*, after the apparent destruction of the specific poison, the system is less tolerant of the drug. It appears to possess little influence over the earlier stages of syphilis. Gowers insists upon the injury which long courses of the drug produce, but the writer has known large doses to be taken for many months without ever noticing any symptoms of injury.

The pains of *rheumatoid arthritis* are often benefited by the judicious administration of the iodide, and it speedily relieves *bronchial asthma depending upon simple catarrh*. It is perhaps the best remedy in asthma when pushed. It acts occasionally as a powerful but uncertain diuretic.

The treatment of *hydrocephalus* by iodide of potassium has many advocates, and though it appears to have some control over the

amount of fluid poured out, still evidence is not forthcoming to prove that it has any curative influence.

Half a grain, with 10 minims of hippo wine, is a valuable tonic given after food. Ammonia increases the effect of iodide of potassium; and when the dose exceeds a few grains it never should be given to a fasting patient.

On page 48 will be found the description of a method by which 6 grs. of the iodide can be ordered in a pill.

Iodine is bleached by Carbolic Acid, and Boulton recommends the following colourless antiseptic for general purposes:—Liquor iodi (B.P. 85) 2 drs., carbolic acid 50 grs., hot water 20 ozs. Dr. J. Wilson finds that 40 minims of the liniment (B.P. 85), 8 minims of carbolic acid, and 32 minims of liquor potassæ, make a colourless liquid (containing 1 of iodine in 18) which is neither caustic, vesicant, nor irritant. For colourless Tincture of Iodine see the B.P.C. formula at the end of this volume.

Ipecacuanha was formerly employed as a counter-irritant, owing to its power of producing a pustular eruption. The active principle (*emetine*) is a powerful poison. Large doses of the powdered root cause vomiting—*directly*, by acting upon the peripheral extremities of the pneumogastric in the stomach; and possibly also *indirectly*, by stimulating the vomiting centre; this effect is produced either by the hypodermic injection of the alkaloid, or by its internal administration. When administered hypodermically the vomiting is long delayed and uncertain, but marked irritation of the gastro-enteric membrane has been found; this is considered evidence by many authorities that the drug has no centric action, but is simply excreted by the stomach and bowel, which it irritates. Its emetic action is too slow to be of use in poisoning, but it is highly beneficial in *croup* and *bronchitis* in children. In smaller doses ($\frac{1}{2}$ gr.) ipecacuanha acts as a direct stomachic, increasing the vascularity of the stomach, and promoting the flow of gastric juice, and, combined with the same quantity of iodide of potassium, we have one of the best remedies for *atonic dyspepsia*. Still smaller doses (1 min. of the wine), Ringer affirms, will cure the *vomiting* of various conditions, as *pregnancy*, *alcoholism*, *migraine*, &c. In larger doses (3 to 5 grs.), the powder acts as a diaphoretic, but is uncertain unless when combined with opium—as in Dover's powder—and it is remarkable that the combination is so efficacious, only a grain of either remedy being in each dose, whilst much larger quantities of each, separately, are so uncertain. In diaphoretic doses it also acts very markedly upon the *bronchial* mucous membrane, causing free secretion of thin mucus, hence in disease it is one of the best expectorants we possess. The tough secretion of *chronic bronchitis* is thus rendered more fluid, and comes up with greater ease to the patient; whilst in acute attacks the dry inflamed membrane is soon covered over with a moist secretion.

Rosbach demonstrated the expectorant powers of emetine upon the exposed tracheal membrane, and his results prove it to be almost as invaluable as apomorphine in *bronchial catarrhs* and *laryngitis*. It is especially indicated in inflammatory affections of the bronchial membrane in children, assisting the expulsive action and diminishing the adhesiveness of the secretion, its *diaphoretic* effect in these cases being also beneficial.

In *winter-cough* there is no remedy more efficacious than ipecacuanha, and a spray of equal parts of the wine and water has been successful in Ringer's hands.

The writer, in conjunction with Dr. Workman, made a series of experiments on the action of various remedies upon the cilia of the bronchial mucous membrane. Though a weak solution of ipecacuanha succeeded oftener and more effectually than any other remedy in restoring the movements after their cessation, the results were far from satisfactory or conclusive.

In speaking of ciliary excitants on page 315, the probability of medicinal substances assisting expectoration by their influence upon the cilia was referred to.

Ipecacuanha has been given in nauseating doses in various *hæmorrhages* with uncertain results. On the liver this remedy acts as a stimulant, and it slightly increases the intestinal secretion.

In *dysentery*, in the acute stage, it possesses powers which are deemed almost specific; it should be given in doses of at least 20 to 60 grs., and the stomach seldom rejects it if absolute rest be enjoined and liquids sparingly swallowed. Merck has introduced a deemetinised preparation, *i.e.*, ipecac. without any emetine in it, for dysentery. In *acute pneumonia* doses equally large have been given with good results. It has some influence over *whooping-cough*; as an emetic the wine may be given in tea-spoonful doses every 15 minutes to a child 1 year old, or 5 minims may be administered every hour in *bronchitis*.

(Fothergill's Dinner Pill.)

R. *Pulv. Ipecacuanhæ* gr. j.
 Acid. Arseniosi gr. $\frac{1}{20}$.
 Pil. Aloes et Myrrhæ gr. iiss.
 Pulv. Pip. Nig. gr. ij. *Misce.*

Fiat Pil. "The same dose of strychnine may be substituted for the arsenic." Above is an excellent fillip to the digestion.

Jaborandi and Pilocarpine act as powerful sialagogues and diaphoretics. After the hypodermic injection of $\frac{1}{3}$ gr. of the nitrate of the alkaloid marked results follow in a few minutes. There is flushing of the face and neck, beads of perspiration appear on the skin of these parts and rapidly extend over the body, and soon the entire cutaneous surface becomes bathed in profuse

perspiration, which may pour in streams for more than an hour from the patient, saturating his garments or soaking the bed-clothes. Saliva at the same time commences to flow, and it becomes also very profuse. Other secretions are augmented—the tears, bronchial and nasal mucus, gastric and intestinal juices, the cerumen from the ears, the urine, and, if a female, the milk, and uterine and vaginal mucus are increased. The blood vessels dilate as seen by the throbbing carotids, the pulse quickens, and the patient seems warm; soon, however, with the full establishment of the perspiration, he feels cold, and shivers, the pulse slows a little, while the blood pressure rises and finally falls. The pupils contract, and the accommodation becomes tense; vomiting and painful forced micturition occur. As the effects pass off, the pupils may dilate, and the patient feels sleepy and exhausted, and if put in the balance may sometimes be found to have lost as much as 7 lbs. in weight. The salivation and perspiration are the result of a stimulant action on the peripheral terminations of the nerves of the salivary and sweat glands; the lachrymal, bronchial, gastric, and intestinal pancreatic and other secreting glands are similarly affected. The contraction of the pupil is caused by the irritation of the peripheries of the third nerve, and follows also its local application. The spleen, uterus, bladder, and intestinal muscular fibres contract owing to the stimulation of their nerve endings, and in large doses the heart fails through paralysis of the endings of the vagus, which are at first stimulated, as is seen in the slowing of the cardiac contractions. The bile is not increased; the drug is eliminated by the kidneys, but not by the skin. The respiration is scarcely affected. The writer has sometimes seen collapse and alarming prostration speedily follow the hypodermic injection of even $\frac{1}{4}$ grain.

The effects of pilocarpine resemble those produced by muscarine and are antagonised by atropine, and it fails to produce salivation and sweating if this latter drug has been previously administered. Atropine should be promptly injected if alarming symptoms show themselves during the use of jaborandi or its alkaloid, but the effects of atropine are not so readily antagonised by pilocarpine.

Pilocarpine has been applied locally to the eye in *glaucoma*, *intraocular hæmorrhage*, *iritis*, and *retinitis*, and good results sometimes follow its hypodermic administration in *detachment of the retina*. In *uræmic coma* and *convulsions* the hypodermic use of $\frac{1}{4}$ gr. will sometimes save life by the rapid elimination of urea and other products by the perspiration.

The writer has pointed out that the danger of the drug causing œdema of the lung in these cases is prevented by only administering it after the patient's skin has been powerfully stimulated in the hot pack. In Bright's disease the hypodermic injection of the alkaloid, or 10 minims of the liquid extract by the stomach, give good results by diminishing blood and albumin and increasing the amount of the urea. In the same way it diminishes

anasarca, and by stimulating the kidneys assists in the removal of *pleural* and *peritoneal* accumulations. In *bronchial* affections it produces most marked effects, even blocking up the tubes by the profuse secretion which it creates, but it does not achieve anything which apomorphine and ipecac. will not perform without the serious drawback of its action upon the skin and saliva (see page 321). Nevertheless it has been used in *asthma*, *pertussis*, *bronchitis*, *tonsillitis*, *laryngitis*, and *diphtheria*; in *diabetes*, *amenorrhæa*, *uterine* affections, *syphilis*, in poisoning by *atropine*, and in chronic poisoning by *iodine*, *arsenic*, *lead*, and *mercury*; and in skin diseases, as *prurigo* and *urticaria*. Under its use the hair has been noticed to grow rapidly, and it has been given to cure *baldness*; it may be applied externally to the scalp, but best results follow hypodermic injections into localised areas of baldness. Hypodermic injection will relieve ordinary *toothache*, and enlarged glands have been reduced by injecting the drug into their centres.

Small doses ($\frac{1}{15}$ gr.) are beneficial in the sweating of *phthisis*, and large doses ($\frac{1}{2}$ gr.) cause contraction of the *uterus*, and may induce labour. *Hydrophobia* and *myxædema* have been treated in a few isolated cases by its use. Josham has found that $\frac{1}{3}$ gr. hypodermically has most remarkable sobering powers in *drunkenness*, and a similar daily dose has been given to increase the secretion of the mammary glands.

Jalapa is a powerful hydragogue cathartic, acting, like scammony, entirely by its *local* irritating effects upon the intestine, as injection of its active principle into the circulation has no effect upon the bowel. It must come in contact with the bile to be efficacious; the extract and resin produce considerable pain and griping; the compound powder will be found the most satisfactory form for giving the drug, and it is especially in *anasarca* and *ascites* that it is indicated. It may be given in 1 dr. doses, stirred up in a tumbler of water, or swallowed dry in wafer-paper. The resin is less bulky and less nauseous than jalap, and may be given in 4 gr. doses, in pill.

Juniperi Oleum.—A mild stimulant and stomachic in small doses. It rapidly enters the blood, and is picked out by the kidneys, which it powerfully stimulates, carrying with it increased quantities of water if *dropsy* exist, whilst in health it may even diminish the quantity of water. It excites the *genital organs*, and seems to resemble turpentine and cantharides when given in very large doses, as strangury and priapism have been known to follow its use. The spirit makes a good addition to diuretic mixtures, and may be used as a substitute for gin when added to alcoholic liquors.

Kaolin is chiefly used as an excipient for pills containing permanganate of potassium, gold and silver salts, made into a mass with a little vaseline. Purified by elutriation and grinding

it forms a dusting powder for *intertrigo*, *weeping eczema*, *impetigo*, &c., though inferior to Fuller's Earth.

Kino is a powerful astringent, containing nearly $\frac{3}{4}$ of its weight of tannin; it acts like it, and is useful in *diarrhæas*, *hæmorrhages*, *relaxed throat*, or when the effect of tannin is desirable. The compound powder is an excellent preparation, combining with the astringency of kino, the narcotic effects of opium. It resembles in its action both catechu and krameria.

Kousso. (See Cusso.)

Krameria — Rhatany is a valuable astringent and tonic, resembling kino and tannin in its action. 5 grs. of the extract and $\frac{1}{4}$ gr. morphine made into a suppository are valuable in *fissure* and *prolapse of the anus*; and a tea-spoonful of the tincture in a wine-glassful of water make a valuable wash for *spongy gums*, *relaxed throat*, or *mercurial stomatitis*; or the following may be used:—

R. *Tinct. Krameriaë*
 Tinct. Myrrhæ
 Tinct. Cinchonæ
 Tinct. Kino ana ʒj. Misce.

Fiat mist. ʒj. ex ʒi. aquæ utend. pro lot. oris mane nocteque.

Laurocerasi Folia, though often used as a mere flavouring ingredient, contain hydrocyanic acid, and possess, when taken in sufficient doses, all the powerful sedative properties of that drug. (See Acid. Hydrocyanic.)

Lavandulæ Oleum acts as an antispasmodic like the following; it is seldom used except as a perfume, and the tincture is prized as a colouring ingredient, and enters into Fowler's solution, which undoubtedly would be better without it. Five minims of the oil on sugar will rapidly relieve *colic*, and it can be given in combination with cajuput.

Limonum—The oil and rind of the lemon are used in medicine only on account of their flavour, though in 3 to 5 minim doses the oil is a valuable remedy in painful and *irregular contractions of the intestinal tube* caused by accumulations of gas. The aromatic constituent of the oil has been isolated. It is known as Citral, and is used for its flavouring powers, being about 8 times stronger in this respect than the oil.

A decoction prepared by boiling fresh unpeeled lemons, sliced, is regarded as a valuable antiperiodic in *malaria*. The *fresh juice* has been found to promptly check *epistaxis* when injected into the nostril. (See under Acid. Citric., where the action of the Succus is described.)

Linum—Flaxseed contains a mucilaginous principle, which it yields to boiling water, and which acts as a soothing demulcent when it comes in contact with the gastro-intestinal mucous membrane, protecting it from irritating secretions. It has reputed expectorant qualities, which probably entirely depend upon its action on the throat as it passes through on its way to reach the stomach. Large doses of an infusion act as a diuretic by mildly stimulating the kidneys, and a patient with an *irritable bladder* often finds relief from it. *Linum contusum* in the form of poultice affords the best medium for the application of continuous moist warmth to *local inflammations*. When a hot linseed poultice is applied to a part, the warmth causes the small vessels to dilate freely; the muscular elements in the skin, hair follicles, and gland ducts are relaxed, and thus the tissues get soft, and the tight feeling or tension of inflammation is reduced or passes away; the sensitive nerve endings experience less pressure by the blood being drawn to the surface. A warm poultice to the *inflamed hip joint* sometimes relaxes spasm of the muscles and diminishes the transferred knee pain.

Poultices should be as warm as can be comfortably borne; a very hot poultice will often aggravate pain and tension by acting as a direct local stimulant.

The question often arises, when should poultices be applied to local inflammations, as in a case of *whitlow*? If applied early, general relaxation of the tissue is the result, and the tension which is fatal to the life of the part is removed, and resolution is more liable to occur; but if inflammation has already progressed so far that the white corpuscular elements have wandered through the coats of the vessels, or a purulent collection has already formed, poulticing assists it materially in reaching the surface. Thus poultices, by making the part an internal one, are useful in *all stages of inflammation*; if applied early they prevent suppuration, and if used in the advanced stages they hasten or encourage it; and if an antiseptic quality existed in them, everything that is desired would be achieved. We have this desideratum in the spirit lotion, or boric lotion, when covered in with oiled silk.

The oil is laxative, but is seldom given except as an enema. Externally, it is a favourite application to burns, when made into an emulsion with lime water, constituting "Carron Oil."

Lithium—The carbonate and citrate of this element act like the corresponding salts of potassium, over which they possess the advantage of forming much *more soluble salts with uric acid*. The urate of sodium, which exists so largely in the system in *gout* is converted into the more soluble biurate of lithium, which acts as a diuretic as it is eliminated by the kidneys. This result follows the use of either the carbonate or citrate, the latter being changed into the former in the system; and a solution of the carbonate ($1\frac{1}{2}$ dr. to 1 pint) has been found useful by Garrod for removing

the *chalky deposits of gout*. The prolonged administration of lithium salts will dissolve uric acid calculi in this way, hence they are called lithontriptics, but many authorities deny any such power to them on the grounds of their extremely diluted condition in the blood after ordinary medicinal doses.

The effervescing citrate is an agreeable form for administering the drug. Up to 1 oz. of it may be taken daily.

Lobelia in large doses excites vomiting and purging, depresses, and finally paralyzes the respiratory centre and peripheral endings of the vagus in the heart, and causes intense prostration and complete muscular relaxation, acting like tobacco, as a powerful narcotico-acrid poison, and causing death through its action upon the respiration. It is seldom employed except in *asthma* and *bronchitis*. It possesses two very decided actions—it is a powerful antispasmodic and expectorant.

These actions are not obtained unless the drug is pushed. 10 mins. of the new B.P. tincture may be given every half hour for 3 or 4 doses till nausea is experienced, but it is better to follow Ringer's plan of small doses frequently—3 minims of the new B.P. tincture every 15 minutes as soon as the attack of asthma comes on till relief be obtained.

There is no reason why the antispasmodic effects of lobelia may not be intensified by narcotics, and the combination with opium, morphine, or preferably chlorodyne, will give satisfactory results. It can be given with advantage in *catarrhal asthma* along with apomorphine, or with iodides in full doses.

Small doses sometimes relieve *spasm* of the bowels caused by faecal accumulations. It has been used in *whooping-cough*. It increases the action of the skin and kidneys, acting as a diaphoretic and diuretic.

The alkaloid—lobeline— $\frac{1}{50}$ gr. is given in *asthma* and *angina*.

R. Tr. Lobeliae Æther. ℥iv.
Spt. Ammon. Aromat. ℥vi.
Tr. Chlorof. et Morphinae Co. ℥ii.
Syrupi Pruni Virg. ad ℥iij. Misce.

Fiat mist. cpt. ℥i. tertiis horis p.p.a. ex aqua.

Lupulus—Hop is a stomachic, increasing the vascularity of the gastric membrane, aiding digestion and promoting appetite; by its slight narcotic effects it promotes sleep in various *irritable* or *delirious conditions*, either when taken by the mouth or made into a pillow, to rest the head upon. It is largely owing to the hop contained in them that malt liquors possess tonic properties. A bag filled with hops, dipped in very hot water, makes an agreeable fomentation in *colic* or *local inflammation*. Lupulin, in 5 gr. doses, is the best form for administration.

Magnesia and its carbonates act in the same way; entering the stomach, a portion is dissolved by the gastric juice and absorbed; the residue passing down the bowel is converted probably into bicarbonate of magnesium, and, acting like the sulphate, though much more mildly, it purges or acts as a laxative. Most of the oxide passes out unaltered in the fæces. The antacid properties of magnesia are serviceable in *acid dyspepsia* and *heartburn*, whilst tastelessness and freedom from acrid qualities and danger, in large doses, make it a favourite *purgative* for *children*. Gregory's powder is a valuable antacid laxative tonic. Magnesia can be given in 2 dr. doses in milk or lemonade. This latter increases its purgative qualities. The carbonate, by giving off carbonic acid in the stomach, has local sedative qualities not possessed by magnesia. 32 grs. of light calcined magnesia will absorb about 1 quart of CO_2 , hence its great value in some forms of flatulence. The Liquor Mag. Carb. is an agreeable and mild purgative, not liable to lead to the formation of concretions of magnesia in the colon as the lighter powders are prone to do. It affords the best treatment for acute and chronic *urticaria* in the adult, and for the various forms of *nettle-rash* in infancy and childhood. It may be combined in these cases with tincture of rhubarb.

(Dr. Gregory's Colic Mixture.)

R. *Magnesii Carbonatis* ℥i.
 Tincturæ Card. Co. ʒij.
 Aquæ Anethi ʒss.
 Syrupi ʒij. *Misce.*

Fiat mistura, sumat cochleare i. min. frequenter in die.

Magnesii Sulphas is the most certain and safe of saline purgatives. It acts not by increasing peristalsis, as Thiry supposed, but by causing increased secretion of fluid, and retardation of absorption. Hay, who has demonstrated the action of this salt, found that it produced copious intestinal secretion according to the amount of the dose and the strength of the solution. The low diffusibility of the salt prevented the absorption of the secreted fluid, and thus between retarded absorption and stimulated secretion a large amount of serous fluid accumulated in the bowel until the quantity of liquid amounted to about what would be necessary to form a 5 or 6 per cent. solution of the salt. (The accumulated fluid is of the nature of a true succus entericus, and not an inflammatory exudate, though Kuchanewski maintains that it is a transudate from the intestinal capillaries.) The peristaltic action of the bowel was but slightly increased, and this increase was owing to the distention caused by the large collection of secreted fluid. The sulphate was split up, and the acid, being more

easily absorbed than the base, disappeared partially from the small intestine, to return, however, shortly afterwards. Meanwhile, the base (magnesia) was gradually undergoing absorption, but never pursued the same peculiar course of absorption and excretion as did the acid. In this way he explains the remarkable fact that one-fourth of a purgative dose, if injected into the veins, will cause death, but when swallowed the salt is split up in the canal, the toxic or basic part entering the blood so gradually that it has time to be excreted by the kidneys. These important results were obtained with phosphate and sulphate of sodium and sulphate of magnesium. It was that portion of the salt *which remained within the bowel* that caused the secretion of intestinal fluid, and not the portion absorbed into the blood. When the salt was injected into the blood directly, purgation did not follow, but rapid poisoning by profound depression of both heart and respiration soon supervened. The fluid accumulated in the intestine after the administration of sulphates of magnesium, and sodium at the expense of the fluid part of the blood, which afterwards recouped itself from the fluid of the various tissues. The weaker the solution of the salt administered, the less fluid was extracted; and if less than 5 per cent. solution were swallowed, no increase in the intestinal secretion from the blood occurred. If, however, a *very* concentrated solution were given, and the canal were quite empty, and no water were swallowed before or after a dose, a profuse pouring out of intestinal secretion, and subsequent concentration of the blood, soon followed; thus after fasting, a large dose (say 1 to 2 ozs. sulphate of magnesium dissolved in its own weight of water) will cause almost as free depletion as if the lancet were used.

Prof. Hay obtained good results from the drug when used in this way in *dropsies* and in the removal of large *serous accumulations*. The rapid withdrawal of so much serous fluid from the blood is speedily followed by the extraction of large quantities of the transuded fluid from the areolar tissue or peritoneal cavity.

Sulphate of Magnesia is used as an antidote in *lead poisoning*, the metallic salts being changed into the inert sulphate which is evacuated by the bowel through the purgative action of the magnesia.

Wyatt-Smith states that the drug in the form of white mixture is a specific for *tropical dysentery* when given in full doses.

Many of the natural mineral waters contain sulphate of magnesium, most of them also contain sulphate of sodium, and are popular remedies for *portal congestion*, occasional *constipation*, *gout*, and *obesity*.

The carbonate may be well combined with the sulphate, and if administered in peppermint water, constituting the hospital Mist. Alb., makes a palatable and efficacious purgative, suitable in many diseased conditions. The Mag. Sulph. Efferves. is a very good preparation.

Sulphate of Magnesia has been administered hypodermically (2 grs.) by Fincke and Luton, who report that it causes purgation, though this is denied by others. J. Wood maintains that this result is owing to its paralysing the inhibitory power of the abdominal nerves, thus permitting a free flow from the intestinal glands, while Hay maintains it can only act as a counter-irritant by causing pain and inflammation. The practice is not to be recommended.

Manganese Salts act somewhat after the manner of iron. They are used in *amenorrhœa*, *gastrodynia*, and *anæmia* by some. The black oxide is merely introduced into the B.P. Appendix for making chlorine. When injected into the circulation Kobert found that the paralysis of reflex action which resulted was produced by the destruction of the transverse conducting power of the cord. Death resulted from respiratory depression. For the action of Permanganate of Potassium see under Potassium.

Mel Depuratum is seldom used in medicine, except as a vehicle for more active remedies. In large doses it acts as a mild laxative. It has been praised for its expectorant qualities, which, if they exist, are probably owing to its local effect upon the throat and fauces. Externally, honey has been used as a protective application to boils and *excoriations*. Its efficacy in *aphthous* states of the mouth entirely depends upon the borax with which it is associated. It has antiseptic properties like sugar. Oxymel is used as a *cough syrup*, and probably its action is purely local.

Menthæ Piperitæ Oleum and **Menthæ Viridis Oleum** are rapidly absorbed into the system, and behave as mild diffusible stimulants. Coming into contact with the gastric mucous membrane, they exercise at first a stimulating and afterwards a local sedative or *anæsthetic* effect, dispelling *nausea* and correcting *uneasiness*. They correct the irregular painful sensations caused by accumulations of *flatus*, giving speedy relief, probably through a reflex act by driving on the imprisoned gas. In a somewhat similar way the *gripping* of *cathartics* is obviated. 3—5 minims of the oil may be given on a little powdered sugar, and repeated every hour. Externally, when applied undiluted, these oils produce *anæsthesia* and *relieve the pain of superficial neuralgias* and *herpes zoster*, and possess powerful antiseptic properties which have been useful in *diphtheria* and *phthisis*.

Menthol is a powerful antiseptic and local *anæsthetic*. When applied to the skin it destroys sensation, producing numbness without corrosive action, and thus it relieves when painted over the course of painful nerves, as in *neuralgia*, *sciatica*, and *pleurodynia*; it diminishes the itching in *eczema*, *lichen*, and *pruritus ani*. The sensation of cold is believed to be produced by the action of the drug upon the special nerves of temperature. It relieves *toothache* when applied to the carious cavity, and is a

parasiticide when applied to various skin diseases. A 20 per cent. solution in olive oil has been applied with a syringe in *laryngeal* and *tracheal tubercle* with good results, its anæsthetic effects being cumulative, so that Rosenberg found, after a few injections, that the anæsthesia lasts 24 hours. It appears to possess the power of aborting *boils*, *whitlows*, and *glandular abscesses* when applied locally. Internally it acts like camphor, and has also expectorant qualities.

Mezerei Cortex is used now only as an irritant ; when applied externally it causes inflammation of the skin and raises the cuticle like cantharides, though uncertain and slow in its action. It has diuretic properties, and was at one time supposed to act as an antidote to the poisons of *syphilis* and *rheumatism*, and to be useful in *inveterate skin diseases*. It should be removed from the B.P.

Morphine. (See under Opium.)

Morrhua Oleum is the most easily-digested of fats, and possesses very high nutritive qualities, it is therefore to be regarded mainly as a food and not as a drug. Its great efficiency as a restorative agent in *wasting diseases* depends to some extent upon its power of aiding the assimilation of other foods, which would not be absorbed except in its presence. After meeting with the pancreatic juice and bile it readily emulsifies and enters the lacteal vessels, and it appears to have the power of bringing along with it the oily and nitrogenous elements of the food. Digestion is thus considerably facilitated, the blood corpuscles are augmented, the weight of the body is increased, and a stimulus is given to healthy cell formation, which to some extent depends upon fat supply. It is a valuable expectorant, and Brunton believes, in *bronchitis*, that it acts by nourishing the newly-formed cells, which otherwise could not take on the character of mucous cells.

The great utility of cod-liver oil in *wasting diseases* is beyond dispute, and often its effects are decidedly curative in some forms of *chronic phthisis*, and in conditions like *scrofula*, *syphilis* and *rickets*, depending upon defective nutrition or errors of assimilation.

By directly supplying fat, which is an important element in the composition of the nervous system, cod-liver oil is beneficial in *nervous exhaustion* and *neuralgia*, and hastens repair in various structural and functional affections of the *nerve centres*.

The chemical constituents found in cod-liver oil have been regarded as affording an explanation of its value in increasing the weight of the body and combating disease ; but the mere traces of bromine, iodine, and phosphorus are too insignificant to account for its action, the traces of biliary matter contained in cod-liver oil may assist the absorption of the oil and hasten its passage through animal membranes, but this is absent in the pale oil. The fatty acids present, especially in the dark oil, aid in its emulsi-

fication and absorption, and so does cholesterin. (See under Morrhual, &c.)

The writer found as a result of carefully weighing the subjects of disease under a course of cod-liver oil that they *increased considerably more than the weight of the oil taken by them*. The oil causes the absorption and assimilation of food elements not usually finding their way into the lacteals, and it nourishes the body independent of its own highly nutritious qualities. The many diseases for which this remedy appears to act as a specific depend upon some deep-seated error in assimilation, which is removed by the continued use of this valuable food. Hence the slowness of its action in cases of *chronic rheumatic arthritis, lupus, psoriasis, &c.*

Cod-liver oil should not be given in febrile conditions, nor in irritable nor catarrhal affections of the stomach and intestines. *Phthisis*, accompanied by high temperature, is not benefited by it, but a slight degree of fever should not prevent its administration if the digestive organs are healthy; and if in such cases an effervescing mixture of the bicarbonate of potassium with lemon juice be given with a minute quantity of morphine for three or four days *the oil will be often relished afterwards*.

No advantages follow the mode of giving cod-liver oil in very large doses, except that the surplus quantity generally acts as a mild purgative, but it often upsets the stomach and causes slight congestion of the liver. Drachm doses will be found enough to begin with, afterwards 3iv. may be given *ter in die*, and it is a good rule to confine its administration to bed-hour for the first few days. It should always be given about 1 to 2 hours *after a meal*.

Various plans are suggested to cover its taste, but it is probable that the efficacy of the oil is diminished by the saponification and chemical changes which it undergoes in producing many of the so-called emulsions. The combination with extract of malt is a valuable one.

It can be emulsified by gum acacia or tragacanth, and flavoured with cinnamon, lemon, or bitter almond. This latter is the best, but, as a rule, it is advisable to begin with the oil in small doses, and leave the vehicle to the taste or caprice of the patient, who may try water, milk, coffee, wine, orange juice, beer, punch, &c., according to fancy. Some patients can swallow the oil without any trouble, but the unpleasant eructations afterwards cause intense discomfort. In these cases the addition of any flavouring ingredient is a mistake, and the only preventive (if the patient can tolerate it) is to hold the oil in the mouth for a time, and cause it to be thoroughly mixed with saliva by moving the tongue round the inside of the cheeks. Where this can be tried, the oil will be found to rapidly digest.

When no method can be found by which the oil is retained in the stomach, then recourse must be had to inunction; two to four drs. should be rubbed into the skin after a hot bath, and

there can be no doubt that good often follows this practice. *The process of inunction is of the greatest use in the wasting diseases of children.* After about one table-spoonful is well rubbed into the skin of the abdomen, a deep flannel binder should be put on. This in a few days becomes saturated with the oil, and should be covered with as much thin mackintosh as will surround the body. The inunction should be repeated twice a day, and the flannel should be changed not oftener than once a week.

The writer is satisfied that by the persistent and intelligent application of the oil in this manner surprising results may be obtained. Hypodermic injection of the oil is recommended, but rectal administration is better where the oil cannot be tolerated by the stomach.

Moschus is a diffusible stimulant and antispasmodic. It has enjoyed some reputation in low *febrile* and *typhoid states* with great nervous *excitement* followed by *prostration* and collapse. It acts as a stimulant to the respiratory centre. It has also been used in *hysteria* and in various disorders supposed to be of spasmodic origin. The dose (10 grs.) costs so much that the use of the drug is now practically confined to cases of such gravity that there is little opportunity given to test its questionable properties, and moreover it is often much adulterated.

Myristica—Nut-meg is a well-known aromatic stomachic remedy, used for its agreeable flavour. In small doses (10 grs.) it acts as a stimulant to the stomach by increasing the flow of the gastric juice, aiding digestion and promoting the desire for food. In the same way it acts further down the canal by dispelling accumulations of gas, and relieving *colic* and *spasm*. In large doses it is a *powerful and even dangerous narcotic*, acting upon the cerebrum and producing symptoms like those following poisonous doses of camphor—viz., vertigo, giddiness, and coma.

Myrrha possesses the power, in common with other gum resins, of stimulating mucous surfaces, and astringing their relaxed condition in disease that the abundant secretion is checked: thus *bronchial catarrh* and *chronic cystitis* are improved, and it appears likewise to relieve *leucorrhœa* and diminish excessive secretion from the *cervical mucous surface*. Its reputed emmenagogue properties rest upon very questionable foundation. Striking results have been reported from tincture of myrrh in diseases like *diphtheria*, especially where there is mixed infection. Stroll (Munich) treated 80 cases with only one death. He gives the following mixture every hour in $\frac{1}{2}$ to 4 dr. doses—Tincture of myrrh 1, glycerin 2, water 47 parts. Binz has demonstrated that myrrh causes increase in the leucocytes, and the theory of its action is that it stimulates phagocytosis.

Locally, myrrh has a very beneficial tonic action upon *diseased mucous surfaces*, and may be applied to *spongy gums* and *aphthous conditions of the tongue* (see R. on page 399). *Foul ulcers* are likewise benefited by it.

Naphthol—Beta-naphthol in small quantities is fatal to low organisms of all kinds, and at the same time can be given safely to the human subject. Bouchard affirms that this substance is the best known intestinal disinfectant, and that it would require $\frac{1}{2}$ lb. to kill an adult weighing 130 lbs., whilst 40 grs. will produce intestinal disinfection. Nevertheless its free use may cause fatal nephritis in the human subject, and Brunton states that when absorbed it causes vomiting, loss of consciousness, and hæmaturia. It should be given with caution in renal and vesical diseases. It has been used with success as a gastric disinfectant in cases of *pyloric obstruction*; it may be combined with salicylate or other salt of bismuth. In *typhoid* fever Bruce believes that it shortens the duration of the attack and lessens the risk of complications; and many other authorities corroborate his conclusions. It must be given in cachets, as it is insoluble in water.

Its action upon the skin resembles that of tar, and it was for this that it was introduced into medicine. Kaposi used it in *eczema*, *psoriasis*, *scabies*, *chronic ulcers*, &c. His ointment consists of beta-naphthol 1 dr., lard 1 oz.. It has been likewise used as a gargle in *diphtheria*, an injection in *leucorrhœa*, *gonorrhœa*, &c., in the strength of 2 to 5 per cent. Ointments for scabies and psoriasis should contain 15 per cent., and for *tinea* 20 to 30 per cent.

Nitroglycerin. (See Trinitrin).

Nux Vomica or Strychnine, in moderate doses, is found to act as a mild stimulant or exciter of the centres of those nerves going to supply the striped muscular tissue of the body. Experiment proves that its characteristic effects are not produced by its action upon the brain, nor upon the muscles themselves, nor upon the nerve-trunks nor endings, but only on that part of the cord where the motor centres are situated—i.e., the large ganglion cells or their dendrites in the anterior cornua. Cushny maintains that the drug acts upon some portion of the cord intermediate between these and the posterior roots. A large dose acts as a violent irritant to this part of the nervous system, and also to the vaso-motor and respiratory centres, causing convulsions of all the voluntary muscles, soon followed by spasm of the respiratory apparatus, and causing death by rigidity of the diaphragm and thoracic muscles or paralysis of the respiratory centre.

After death the motor nerves are found to be impaired, owing to the exhaustion caused by the violent contractions preceding death, and only slightly through a direct action of the poison upon the nerves themselves.

The vaso-motor centre is stimulated, and the arterial pressure rises. This rise is exaggerated by the asphyxial condition induced by the convulsions, the blood being loaded with CO₂, which irritates the vaso-motor centre still more. The violent contractions of the muscles retard the circulation in the adjacent

vessels, and the blood pressure is thus further increased. The cardiac ganglia are stimulated ; and the least stimulus, as a draft of air, produces powerful reflex spasms.

The symptoms closely resemble those of tetanus, but rigidity does not begin in the muscles of the jaw ; the convulsions are *tonic* in both cases, but in tetanus there is absence of the muscular relaxations which give the appearance of clonic contraction in strychnine poisoning. The phenomena after the administration of strychnine come on rapidly, and soon pass off, or are fatal ; and there is no history of a wound or operation, as in tetanus.

Small doses after a time stimulate the *sensory nerve centres*, so that ordinary sensations are felt with unusual sharpness and keenness. The special senses and mental faculties thus are also quickened. In large or poisonous doses the mind is not further affected, but remains clear to the last.

Owing to its stimulating action upon the reflex function of the cord, strychnine is useful in the treatment of many neurotic affections. In *paralysis* it is valuable, especially in those cases where the loss of muscular power is not great—*i.e.*, *paresis*. In *hemiplegia*, *paraplegia* of *reflex origin*, and in various forms of *local paralysis*, strychnine is the most serviceable remedy we possess ; but it should not be given—(1) in recent cases, (2) whilst *rigidity* exists, or (3) in cerebral paralysis with continuance of head symptoms ; (4) nor is it of much use where *great* wasting or fatty degeneration of the affected muscles is present, nor (5) where the muscles do not respond to the electric current.

Various spasmodic diseases are said to be cured by strychnine—*chorea*, *asthma*, and *epilepsy*, though the writer often finds the symptoms are exaggerated by it.

Strychnine acts most beneficially upon the alimentary canal ; being a pure bitter, it increases the tone and vascularity of the stomach, improves appetite, and promotes digestion ; and in *atonic dyspepsia* and various *chronic catarrhal affections* of the gastric mucous membrane, it acts as an excellent tonic. Further down the canal its effects are even more marked ; by its stimulating power over the reflex action of the cord, it greatly increases the muscular contractions of the intestinal tube, counteracting *constipation* and *fecal accumulations*, and affording a valuable addition to purgatives. These effects are so marked that occasionally the stools are much altered in size, and may be seen to present the attenuated appearance observed in stricture of the rectum.

(A good Tonic in Dyspepsia or Paralysis.)

R. Tinct. Nucis Vomice ʒiii.
Acid. Nit.-Hydrochlor. Dil. ʒvj.
Tinct. Aurantii ʒj.
Inf. Gentianæ Co. ad ʒx. Misce.

Fiat mist. cujus cpt. ʒss. mensura ex ʒi. aquæ ter in die ante cibos.

In the same way it proves useful in *prolapsus* of the *anus*, *nocturnal enuresis*, and *atony* of the *bladder*, and has a strong aphrodisiac effect, and is useful in *sexual debility*. Functional *amaurosis* often very rapidly yields to strychnine in $\frac{1}{40}$ gr. doses. By stimulating the respiratory centre it relieves the *night sweats* of *phthisis*, and is often most valuable in *bronchitis* and *pneumonia*, where the condition of this centre is depressed.

In *local paralysis*, the hypodermic injection of strychnine is often useful. $\frac{1}{30}$ — $\frac{1}{20}$ gr. injected into the muscular substance is soon followed by increased growth and power. As a rule, it is said to be useless where the muscles will not respond to the slowly interrupted current. Barwell injects $\frac{1}{20}$ to $\frac{1}{12}$ gr. in *infantile paralysis*, but it is not advisable to begin with more than two or three minims of the official liquor.

The writer believes that he has upon several occasions saved life in *diphtheritic paralysis* by free hypodermic doses, and in cases of *cardiac failure*, as in *acute failing compensation*, it is the only reliable drug when a rapid effect is necessary. Cushny believes that it has no direct action upon the cardiac muscle, and that its value in cardiac failure depends upon its power of raising the blood pressure through its contraction of the small blood vessels. This is at variance with the results of clinical experience.

Strychnine accumulates in the system by causing contraction of the renal vessels which prevents its own elimination, and its administration should be carefully watched. In a case of poisoning where death almost resulted, the writer found that the urine afforded not the *slightest trace* of strychnine, though the patient had been convulsed for 7 hours; the alkaloid appeared to have become oxidised or burnt up in the system.

It is advisable not to begin with a larger dose than $\frac{1}{30}$ gr., which may be gradually increased to the $\frac{1}{12}$ gr. 10 to 12 minims of the tincture of *nux vomica*, or $\frac{1}{2}$ gr. of the extract, will be enough for a fair dose. Death has resulted in man from $\frac{1}{2}$ gr. strychnine. It acts more powerfully from the rectum than if swallowed. Hypodermically it affords relief in *acute peritonitis*.

By its quickening or stimulating effect upon the sensory centres, the writer has found strychnine to be generally injurious in various *hysterical* and *nerve ailments* where there is undue irritability of the peripheral sensory fibres, but it is useful in *sea-sickness*.

Strychnine is antagonistic to chloral and alcohol, and the writer believes that poisonous doses of alcohol afford the safest and best hope of success in strychnine poisoning. Since making this statement about the antagonistic effects of alcohol and strychnine in the first edition of this work, many observers have noticed that strychnine is antagonistic to alcohol, and strongly advise its use in *chronic alcoholism*. It is likewise useful in chloral and chloroform poisoning when administered hypodermically. The drug must not be prescribed with alkalies and tannin, and it forms sparingly soluble compounds when prescribed in concentrated mixtures

containing iodides and bromides. Brucine, the other alkaloid of nux vomica, acts in a similar manner to strychnine, but it is very much weaker.

The following form will be found convenient for the administration of nux vomica or its alkaloid :—

(*Pills for Constipation.*)

R. *Ext. Nucis Vomicae* gr. ss.
Ferri Sulph. Exsic. gr. i.
Ext. Aloes Barb. gr. i.
Pulv. Ipecac. gr. i. *Misce.*

Fiat pil. mitte tales xxiv., i. omni vespere sumend.

Olivæ Oleum, given in ounce doses, produces soft, painless motions, and by its soothing qualities it protects the bowel from contact with irritating secretions, foreign matter, or partially digested food. Thus it is highly beneficial in *constipation, inflamed or ulcerated hæmorrhoids, and fissure of the rectum or anus*; it is especially useful as a laxative in cases where the bowels have been locked up by opium. In small quantities it is a nutritious food. Its hypodermic administration has been advocated.

In 6 oz. doses, 12 hours after the administration of a blue pill, gall stones are said to have been passed in great quantity, and 20 to 40 ozs. have been administered by some physicians with good results. Pure oleate of soda is also efficacious.

Externally, its bland, unirritating qualities have obtained a place for it in liniments, poultices, and ointments, but it causes smarting when applied to the conjunctiva.

Opium and Morphine resemble each other so closely in their action that the description here given will apply to both.

A moderate dose of opium will act upon the alimentary tract from the mouth to the anus; dryness of the lips, tongue, throat, and gullet will be evident in a very short time, secretion being stopped or diminished; gastric juice ceases to flow, digestion is retarded, and the appetite fails. The intestinal fluids are not secreted as before, and constipation ensues after a time. Arterial tension slightly rises, the pupils contract, and the nervous system is influenced; first, there is a sense of pleasant activity of the cerebral faculties, ideas flow with speed through the mind, and exhilaration bordering upon mild intoxication may be noticed, soon followed by a calm of variable duration, which passes into drowsiness and sleep; often the stage of mental activity is absent, and it is always best marked in those accustomed to the use of the drug.

Headache, mental confusion, and malaise, with digestive disturbance, often remain after waking.

In fuller doses the above symptoms are present, only in greater intensity; the stage of stimulation is *shorter*, the somnolency comes on swiftly, and soon passes into sleep, with irregular, slow breathing, and, if the dose be large enough, coma supervenes. In poisonous doses sleep comes on so rapidly that the excitement stage is not apparent. The pupils are strongly contracted; the breathing, at first slow and stertorous, becomes feeble and irregular, the face is cyanosed, and the skin cold and moist; the pulse, at first full and strong, becomes feeble and rapid; the coma, at first incomplete, and out of which the patient was easily aroused for a time, becomes more profound, until finally no stimulus appears to arouse the least response, and death occurs from asphyxia, caused by paralysis of the respiratory centre.

Opium checks every secretion in the body except that of the skin and mammary glands.

Only the higher cerebral centres are affected by full doses, but if repeated, gradually the basilar ganglia are influenced. The spinal cord does not escape, as may be often noticed by the retention of urine following large doses, and the sensory nerve fibres throughout the body are more or less under the spell of opium, for sensibility becomes diminished, apparently by the conductivity of the impressions being less perfect. Brunton found that opium influenced the peripheral terminations of the vasomotor nerves, and thus diminished or prevented the reflex dilatation of the vessels, which always occurs when local irritation is present. This, he thinks, is the probable explanation of how opium cuts short inflammations.

These two distinct effects produced by opium—cerebral *excitement* in the first instance, and *sleep* afterwards—vary very much in different individuals, and also to some extent depend upon the way in which the drug is administered. Thus, in nervous, excitable women, the first effect may be the only one noticeable, sleep not following; while again, a very large dose will likely produce only the second effect, no excitement, or only a momentary flash being observed, sleep quickly supervening. By graduating the dose, the opium-eater can avoid the second stage, and prolong the excitement indefinitely.

Sleep results from the power of the drug to diminish or depress the functional activity of the cerebral cells, the action being probably the result of a chemical combination between the protoplasm of the cell and the alkaloid, and this view is supported by the recent theory of Myer and Overton that the anæsthetic action of a substance is a function of its solubility in fatty compounds. The extreme contraction of the pupil, characteristic of opium poisoning, is clearly *centric*.

The effects of opium upon the pulse are explained by the action of the drug upon the cardiac motor ganglia, at first causing the slow full beat; this is intensified by the dilatation of the cutaneous

vessels. Afterwards the pulse fails from the condition of the vaso-motor and respiratory centres.

Nothnagel believed that constipation resulted from the drug *stimulating the inhibitory nerves of the intestines* through the splanchnics.

Very large doses injected into the jugular, purge rapidly by tetanising the intestine. Full doses paralyse the bowel. The stomach excretes the drug from the blood after absorption, and morphine is found in the stomach within a short time after a hypodermic dose—a fact to be remembered in the treatment of opium poisoning.

These hypnotic and anodyne qualities of opium render it the most important of drugs, and its application in disease is so extensive that only a brief reference to its numerous therapeutic uses can be made.

To produce sleep in all conditions requiring it, and especially when sleeplessness is caused by pain, opium is the most reliable hypnotic known, and it may be used as an hypnotic in the restless *delirium of fevers, acute inflammations, delirium tremens, mania, and melancholia*, indicated when the brain is congested or inflamed, and the eyes suffused and pupils small.

As an analgesic or pain reliever, opium or morphine surpasses all others in certainty of action and safety. It relieves the pain of *sciatica, neuralgia, lumbago, gastralgia, and cancer*, and soon removes the agony caused by the passage of *renal or hepatic calculi*. In these cases the hypodermic injection of morphine is by far the best form in which to administer the drug, and it is a mistake to regard its effects as merely palliative, for *sciatica* is sometimes *cured* by a single insertion of the needle, a result which is not met with when morphine is given by the mouth. The physician must guard against the patient getting into the habit of using the syringe too often, as there is great danger of the opium habit becoming established; and though space prevents any description of the evils arising from opium eating, a word may be said about its treatment. The writer's plan is to stop the administration of the drug completely, and to administer large doses of alcohol instead for 2, 3, or 4 days, till the depression and craving are quite blunted, then the alcohol is gradually withdrawn.

Though this plan is open to the risk of establishing a more terrible disease than that which it is intended to cure, still it appears worth trying, but should only be used in cases where a considerable remnant of will remains. The writer succeeded with it completely in one hopeless case. See "Dictionary of Treatment," 4th Edition, page 630-635. See a recent plan of treatment mentioned under Bromum, page 332.

Cough is relieved by opium, but discrimination should be exercised in the exhibition of the drug for this purpose. In cases of *exhausting bronchitis, with profuse expectoration*, where there is only enough cough to empty the tubes, this remedy is a dangerous

one ; but where a harassing, frequent cough wears down the patient's strength, without much secretion, then opium is a blessing. It acts in these cases by diminishing the excitability of the respiratory centre.

In *acute inflammation* opium gives great relief, and seems in some instances to shorten the attack, and even to save life, but since the introduction of surgical methods of treatment in *acute peritonitis* and grave *abdominal obstructions* this practice has been severely censured as leading to the masking of all the symptoms which should be the guide to the surgeon for operative interference. Nevertheless, it is already evident that the exclusion of opium in such cases is a mistake, and that, given with judgment and discrimination, it is invaluable in many cases of peritoneal inflammation.

The peristaltic action of the bowel is diminished, and thus it is doubly useful in *inflammation* of the *peritoneum* and in *intestinal hæmorrhage* ; and from its tranquilising effect upon the circulation it is our sheet anchor in *hæmoptysis* and other *hæmorrhages*.

Small doses ($\frac{1}{10}$ gr. opium) have been found successful in the treatment of *irritative dyspepsia* by Graves; and all *enteric affections*, with excessive secretion, after the irritating cause has been removed by purgatives, are benefited by opium—thus *dysentery*, *enteritis*, *cholera*, &c., are so relieved.

After *abdominal surgical operations*, a morphine suppository is followed by great benefit, and opium has been found useful in averting the rigor liable to follow *urethral irritation*. The presence of severe pain is always an indication for a large dose of this drug ; women are more susceptible than men ; children bear opium badly, and the physician will be wise who makes the rule, in the first few years of his practice, never to give opium in any form to a child under a year old. Gout and renal disease have been said to be barriers to the use of opium ; but experience shows that the hypodermic injection of morphine may be beneficial in *uræmic convulsions*. The administration of opium diminishes greatly the amount of sugar in the urine in *diabetes*.

Idiosyncrasy influences the dose of the drug, some bearing very small doses badly ; and the after evil consequences—head-ache, nausea, intolerable itching, &c.—vary much in different subjects. Those accustomed to its use can take enormous doses of the drug.


The 18 alkaloids found in opium produce different effects when administered separately ; thus—

Morphine and Papaverine are hypnotic ; while Thebaine is a violent convulsant acting like strychnine ; and Codeine in large doses always produces convulsions in animals ; but it is generally only with morphine that the physician has to deal. It differs from opium in being (1) less astringent and constipating ; (2) less powerful as a diaphoretic ; (3) it possesses less power over acute inflammations, especially in the abdomen ; (4) it is less likely to

cause excitement, headache, and nausea ; (5) it is more decidedly hypnotic and anodyne, and more liable to cause itching and retention of urine.

Morphine and atropine are antagonistic to each other, and the dangerous symptoms often following the hypodermic injection of morphine are certainly less likely to occur if $\frac{1}{100}$ gr. of atropine be added to each dose, and the combination is more effective. Not more than $\frac{1}{8}$ to $\frac{1}{4}$ gr. of morphine should be given for the first time by the hypodermic method.

Of the various official preparations, none equal in certainty and uniformity pills made out of the crude opium (powdered opium is about $\frac{1}{8}$ stronger). They may be given in 1 to 2 gr. doses ; and next to them in constancy comes the tincture, which generally produces sleep in $\frac{1}{2}$ dr. doses. The favourite Dover's powder expends itself chiefly upon the skin, which it stimulates more than a much larger dose of either of its constituents would do if given singly. 1 gr. of morphine is equal in therapeutic power to about 6 grs. opium.

 For Poisoning by opium see Poison Index.

R. *Liq. Morph. Hydrochlor.* ʒss.
 Aq. Laurocerasi m.xv.
 Pot. Bromidi gr. xxx.
 Aquæ Chlorof. ad ʒi. *Misce.*

Fiat haustus, hora somni sumendus.

Ovi Albumen—The liquid white of the egg—consists of about 14 parts coagulable albumin, 3 of mucus, and 83 of water, with traces of salts, and it is highly nutritious, supplying to the blood an element which is found in most tissues. It is introduced as a test for metaphosphoric acid in Acid. Phosph. Conc., and it is used to coat pills and clarify liquids.

It is used as an antidote in poisoning by salts of mercury and copper, as it forms insoluble compounds with these.

Ovi Vitellus—Egg-yolk is highly nutritious, consisting of nearly 30 per cent. of oil and crystallisable fat and 18 per cent. of albumin and some phosphorus. It is used in making emulsions, and enters into Mist. Spt. Vini Gallici.

Oxymel and Oxymel Scillæ. (See under Mel and Scilla).

Pancreatis Liquor is a solution of the digestive principles of the pancreas. The pancreas produces at least four ferments, the most important being Trypsin, which changes proteids into peptones in an alkaline or neutral medium ; another ferment coagulates milk casein ; another emulsifies fats, and another changes starch into sugar. This liquor contains at least three of these. The place of pancreatic ferments in medicine is chiefly

that of predigesting foods before being swallowed. If the liquor be administered it is mostly destroyed by the acid gastric juice, but notwithstanding this, stomach digestion may be assisted by administering the ferments with the food at the beginning of a meal before the gastric secretion has reached its full acid strength; in this way the ferments will aid the saliva in changing starch, and proteids will be also attacked.

Trypsin, pancreatin, desiccated pancreas, and various dry extracts are now procurable which can be administered in *dyspepsia* in the pilular form coated with keratin so as to supplement the natural pancreatic function in the duodenum. They have also been applied with the view of breaking up the false membrane in *diphtheria*, and for stimulating the growth in *ulcers*, &c., or they may be used like the liquor for mixing with nutrient enemata before being injected, or for injecting into the bladder to disintegrate blood clots. If pepsin be added to liquid foods the products formed as digestion proceeds are unpalatable and nauseating, and the compound cannot be swallowed or retained; but if pancreatic liquid be employed, and the digestion stopped after about 15 to 20 minutes, an almost tasteless product can be obtained. This is easily accomplished by boiling as the pancreatic digestives are destroyed by a heat above 140°F .

To make peptonised milk, the liquid is diluted with about one-third of its bulk of water, and heated to 120°F , and 2 drs. of the liquor and 30 grs. bicarbonate of soda added, and the mixture allowed to remain for 15 minutes in a warm place. After this it may be swallowed, or if not to be used immediately it should be brought to the boiling point or placed in ice to stop all further fermentation, else it becomes bitter and curdles. Gruel, soups, or other liquid foods can be treated in the same way.

Fairchild's powder contains a dry extract mixed with soda, and it is more convenient than the official liquor.

The liquor has been administered in *diabetes* where the disease has been suspected to be of pancreatic origin, but 5 gr. pills of pancreatin, coated with keratin, are preferable.

Dyspepsia, gastric dilatation, ulcer, cancer, and tubercular peritonitis, and many other conditions are improved by pancreatic feeding, but the best results are seen in the feeding of infants deprived of their natural nourishment. Benger's food consists of wheaten flour partially dextrinised by dry heat and mixed with pancreatic extract; during the cooking of the powder with diluted cow's milk pancreatic digestion takes place.

Pancreon is the name given to a reddish-grey powder prepared from pancreas, which is not affected in the slightest by the gastric juice. It is recommended in 8 gr. doses in cachets or tabloids in *diabetes*.

Papaveris Capsulæ resemble opium in their action, though much more feeble. The old B.P. extract, when carefully pre-

pared, was a good hypnotic, not so liable to cause headache and nausea as opium. A decoction of poppies has long enjoyed a reputation as an anodyne when applied to various local inflammations; its good effects are partly owing to the moist heat of the application.

Paraffinum Durum—Hard paraffin is introduced into the B.P. to make a firm, bland, and unirritating basis for various ointments. Its high melting point, hardness, and unchangeableness confer special obvious advantages upon ointments containing it.

Recently hard paraffin has been successfully used by hypodermic and submucous injection to remedy certain deformities beyond the surgeon's skill. Thus the bridge of the nose, destroyed by syphilis, has been replaced by the hypodermic injection of sterilised paraffin of a melting point of about 104°F. , and it is never absorbed. Incontinence of urine has been remedied when the sphincter vesicæ has been removed.

Paraffinum Molle or Vaseline, or Petrolatum, is not affected by the majority of substances, and exhibits little tendency to become rancid. The absence of irritating or changeable constituents in it, and its absolute freedom from smell and grittiness, render it a good basis for ointments.

It is insoluble in water, and mixes with oils in all proportions, and it dissolves most alkaloids. It is, however, not a good basis if we wish to get these substances *absorbed*.

Its low melting point is a disadvantage, as when applied to the skin it melts and becomes quite liquid, and soaks into the dressings or garments, often leaving the incorporated substance almost dry and in direct contact with the skin; the addition of hard paraffin obviates this, and a better basis is obtained by a mixture of the two. Lanoline, lard, or any bland animal oil should be used when we wish to secure the absorption of the active ingredient by the skin. Thus ointments of the alkaloids are now made with lard, whilst the antiseptic remedies, as carbolic, boracic, and salicylic acids, eucalyptus, &c., are now compounded with vaseline.

Alone, it forms an excellent and bland application to *eczema*, *intertrigo*, *burns*, *sores*, and *scalds*.

Paraffinum Liquidum* is a solvent for various substances. It has been given internally as a demulcent, or applied as an emollient in various *skin diseases*, and as a basis for several hypodermic injections, and as a solvent for menthol, and thymol in the solutions used in the various sprays or atomisers employed in the local treatment of *diseases of the nose, fauces and larynx*. The soft and liquid paraffins have been vaunted as substitutes for cod-liver oil, but they have no nutritive value.

* This liquid is known in commerce as Paroleine, Glymol, Adepsine Oil, Dee Oil, and Chrismaline.

Paraldehydum is an hypnotic, and resembles chloral in its action, only it has no depressing effect upon the heart ; it affects the cerebral cells, and, in poisonous doses, the respiratory centre. It acts as a diuretic, increasing the amount of urine, but has no diaphoretic action. It has been given in *mania*, *melancholia*, *sleeplessness* from various causes, with success, and does not cause digestive or cerebral disturbances afterwards. Its only drawback is its rather unpleasant, chloroform-like odour, which affects the breath for many hours, and its sharp, disagreeable taste. It may be given in peppermint water and syrup or in almond mixture. The sleep which it produces is calm and refreshing, like natural slumber. It produces no excitement, and is more speedy in its action than chloral. It is especially valuable as a safe hypnotic in the *insomnia* of *cardiac diseases* and *mania*, but like the newer hypnotics it has no effect where pain is present. It has been found useful in *epilepsy* and *asthma*. Recently it is stated by Cosimo Noto that 45 mins. given one hour before chloroform narcosis renders anæsthetisation perfectly free from all danger.

R. Paraldehydi ℥iss.

Tinct. Aurantii ℥ij.

Aquæ Menthæ Pip. ℥iss. Misce.

Fiat haustus, hora somni sumendus.

Pareiræ Radix is eliminated by the kidneys, which it stimulates, thus acting as a diuretic ; and, as the active principle passes over the mucous membrane of the genito-urinary tract, it exercises a soothing and tonic influence on the bladder ; most valuable in *hæmorrhage* and *cystitis*. In the same way *suppurative kidney affections* are relieved, and sometimes unhealthy conditions of the *urethra*, causing *gleet* and smarting pain after micturition, are relieved by pareira. Its active principle undergoes change in the blood, for when injected for *gonorrhœa* and *cystitis* it does not appear to have any local beneficial action, though it appears to act like an ordinary tonic when admitted to the stomach.

The liquid extract may be given in ℥ii. doses with liquor potassæ and buchu or hyoscyamus.

Pepsin is a ferment, possessing the power in presence of warmth, acidity, and moisture of converting proteids into peptones. Pepsin will work this change outside the body, and there can be no doubt that a similar action takes place in the atonic stomach when pepsin is administered. The deficiency of gastric juice is known in many cases of *cancer*, *dilatation*, *atonic dyspepsia* and *chronic gastric catarrh* to be the direct cause of the indigestion, and since there is also always a deficiency in these cases of HCl. this acid must be prescribed along with it.

Pepsin is a *ferment*, and large doses are not generally necessary, since its activity depends more upon the *state* of the stomach's contents than upon the *amount* of the ferment administered. It acts as a direct stimulant to the gastric mucous membrane, which it causes to pour out more secretion. It is recommended in the *diarrhœa of children*, depending upon the presence of quantities of partially digested food passing along the intestines. It is useful in some forms of *vomiting* and *nausea*, probably caused by imperfect digestion.

If added to *nutrient enemata* it greatly increases their chances of being absorbed. Pepsin cannot be used to peptonise food intended for swallowing, as the taste of the product is most unpalatable. It has been applied to the false membrane in *diphtheria* with the view of causing its digestion.

Phenacetin possesses decided and valuable antipyretic and analgesic powers. It reduces fever heat with safety and certainty, in doses of 5 to 10 grains, which may be given every eight hours. It has been used in all the conditions in which antipyrine and antifebrin are indicated. It has been found not to possess toxic properties to any appreciable extent, and it may therefore be regarded as the safest of the new antipyretic remedies. D-Beaumetz gave it as an analgesic in daily quantities of from 15 to 30 grs. for months in every variety of pain always with success, and without harm resulting. *Migraine, neuralgia, acute rheumatism, and ataxy* pains all speedily yield to it. Every form of fever and high temperature also are favourably influenced by it. It is best given in the form of cachet or powder, swallowed with water. The fall in the temperature lasts four or more hours, and there is generally some sweating, but no rash or cyanosis. It is best given in the evening, and 2 to 4 grs. may be given to children.

Phenazonum—All that has been said of acetanilide upon page 291 applies to the action of antipyrine, save that this latter drug is taken in treble the amount of dose and is safer, and not likely to produce cyanosis, &c. Thus, the chief action of the drug is upon the temperature. This is very slight in health, but marked in fever. It may be taken as established that this reduction of temperature is the result of *diminished production* of heat, and this is effected by its action upon the heat centre situated in the corpus striatum; to a slight extent the fall also depends upon heat dissipation. Metabolism is checked and the urea diminished. Sweating occurs, but it in no way explains the fall in the temperature. The reflex excitability of the cord is much depressed, and, ultimately, anæsthesia results; poisonous doses paralyse the frog's heart, the colour of the blood is altered, and the pressure falls. The drug is eliminated in the urine. Antipyrine has been given in nearly every disease with high temperature and in almost every conceivable feverish condition—*typhus, typhoid, scarlatina, rheumatism, erysipelas, and pneumonia*. But the

routine treatment of these diseases by this agent has certainly fallen into disfavour, as no appreciable gain results in the long run, and the drug is not to be relied upon in *hyperpyrexia*, where the cold pack or bath is often the sole means of saving life. There is, perhaps, no condition in which its antipyretic virtues are more apparent than in *phthisis* with high temperature. 10 grs. at first, and 5 grs. in one hour, and 5 grs. in one hour again, will be found a full and satisfactory dose. The temperature may be found to drop as many as 10°F., with relief of all the symptoms and distress for the time. Formerly these doses were doubled, and the drop often lasted 20 hours. Small and frequently repeated doses, though safer, are not satisfactory. It may be given hypodermically or by rectum. Though this treatment cannot be said to be curative, in selected cases its benefits are most marked, but it must not be forgotten that untoward effects are far more likely to follow its use in the asthenic fevers and especially in tuberculosis. Often the temperature falls without sweating; there is often some cyanosis and even collapse followed by a rash. It is calculated that ten times the above dose would be required to make a decided impression on the body heat in health. In the febrile diseases of childhood (1 grain per year) it may be given hourly for 3 doses, and it has marked power in reducing the frequency of the paroxysms in *pertussis*.

In addition to its antipyretic action it is a powerful hæmostatic when administered internally or applied locally, and the writer believes that a strong solution should act well in *post-partum* hæmorrhage; it controls *epistaxis*, and its action is intensified if tannin be added to the 5 per cent. solution. Antipyrine is one of the most certain of analgesics, and there is hardly any pain which is not relieved by it. Its effect in *migraine* has been, in the writer's hands, most satisfactory. In nearly every form of headache and neuralgia, swallowed in doses of 10-15 grs. and repeated often, it generally gives speedy relief. The lightning pains of *ataxy* and the *gastric crises* are cut short by it. Aneurysmal and anginal agony also yield to it. After the relief of pain sleep often follows. The pains of labour are rendered bearable, and if ergot be administered it is said almost painless labour may result; *dysmenorrhœa* may be relieved. The drug has also been given with success in *diabetes*, *sea-sickness*, *epilepsy*, *nocturnal emissions*, *asthma*, *hæmoptysis*, and *laryngismus*. Hypodermically 5-15 grs. in water will relieve local pain and neuralgia like morphia, but it causes smarting and local sores.

The writer now generally gives the drug in combination with caffeine as in the recipe appearing upon page 335.

In *pleuritis* it is claimed that small doses cut short the attack, and have a surprising effect upon the absorption of the effused fluid. The writer is satisfied that 5 grs. every three hours give the most satisfactory results in *influenza* (*Grippe*) and in *inflamed sore throat*, and if the drug be given early in the first-named

disease the attack is modified and complications do not occur, and a fatal issue is exceedingly rare.

Phosphorus in *minute* doses is a tonic and stimulant to the nervous system, probably by acting as a restorative and supplying food to nerve tissue. The mental faculties seem more active, the circulation is quickened, and the pulse rises; the temperature is said to rise also; the products of waste are increased in the urine; and the appetite increases, whilst the nutrition of the body also is improved. After a considerable time the bones are affected, osseous deposit filling up the medullary canal, and it has been proved by Wegner that the cancellated tissue becomes compact bone.

In larger doses, vomiting, purging, albuminuria, and the ordinary signs of irritant poisoning supervene, only they may first show themselves *many hours after the first dose has been taken*. These symptoms may subside, a lull or apparent recovery supervening when they return with cardiac weakness, reduction of temperature, jaundice, hæmorrhages, convulsions, and death, after which are found fatty degeneration of the liver, blood vessels, and muscular tissue generally. These symptoms are not unlike those observed in *acute yellow atrophy of the liver*.

In chronic phosphorus poisoning the hepatic connective tissue is increased and cirrhosis results, with marked fatty degeneration. This latter change is produced by the *increased metabolism* and *diminished oxidation* which characterise the action of the drug, the fat being derived from the rapid splitting up of the protoplasm of the cells, though the most recent observers maintain that the fat in the cells of the liver and other organs is simply deposited in them after being carried from other tissues.

From its restorative effect upon the nervous system, phosphorus has been extensively tried in *neuralgia*, on the ground of this affection being always associated with a more or less impoverished condition of the diseased nerve. Sometimes benefit follows its administration, but more frequently it fails utterly. It is valuable in cases of *simple brain exhaustion* from prolonged mental strain; It acts upon the centres which preside over the *reproductive act*, and is an aphrodisiac in cases of functional loss of power.

In affections depending upon mal-nutrition, as *pernicious anæmia*, or *leucocythæmia*, phosphorus will be found sometimes useful. Kassowitz has demonstrated its value in *rickets*, and states that cranio-tabes of a most marked character, involving both the occipital and parietal bones, disappeared completely in from four to six weeks, and children who had never been able to stand or sit upright were found running about after taking phosphorus for one or two months. The dose for a child 12 lbs. weight was from $\frac{1}{120}$ to $\frac{1}{80}$ gr. in the day. The writer in his "Dictionary of Treatment" has ventured to point out a possible danger in giving this drug in some cases of rickets, as it may cause the bones to harden

in their bent condition. Phosphorus has been used in *tubercular meningitis* and *diabetes*, but with very doubtful benefit. Its stimulating action upon the skin has led to its questionable employment in developing the suppressed rashes of the eruptive fevers, and as a substitute for arsenic in *chronic scaly skin diseases*. From its influence over the growth of bone, it is used as a constitutional treatment for *ununited fractures*, especially during pregnancy, and for *osteomalacia*.

The *fumes* of phosphorus cause disease of the jaws, leading to exfoliation of the bone; this action is a local one, caused by the vapour reaching the alveolus through a decayed tooth. It does not follow the internal administration of the drug, even in poisonous doses, and only affects those exposed in the manufacture of lucifer matches who have caries of the teeth. These operatives often suffer from a peculiar cachexia like that seen in phthisis, and considerable numbers of them suffer from spontaneous fractures of the long bones.

Not more than $\frac{1}{80}$ grain should be given at first, and its effects should be carefully watched. The phosphorated oil may be given in gelatin capsules, each containing 2 minims, or 1—2 grs. of the recently prepared official pill may be prescribed. The writer prefers to give it in rickets in combination with cod-liver oil—20—30 minims of B.P. phosphorated oil mixed with 6 ounces cod-liver oil—the dose of the mixture being 1 dr.

For *Phosphate* and *Hypophosphite of Calcium* and *Phosphoric Acid*, see under Calcium and Acid. Phosphoricum. None of these substances possess the therapeutical virtues of free phosphorus, which enters the system and remains in the blood as the element—phosphorus—and not, as has been supposed, after its conversion into phosphoric acid or a salt. Compounds in which the affinities of phosphorus are not completely saturated produce poisonous results not unlike phosphorus. They are not, however, used medicinally.

Physostigma and Eserine—Calabar bean is a deadly poison, long used by the West Africans as an ordeal for determining the guilt or innocence of suspected witches.

The drug causes vomiting, colic, and diarrhœa, with increase of blood pressure and salivation, and general muscular weakness and giddiness. If the dose be continued, *profound depression of the spinal motor centres* follows, with loss of reflex action and death from paralysis of the respiratory centre. The pupil is contracted generally, and there are marked muscular twitchings all over the body, which may simulate convulsions, these are caused by the action of the drug upon the peripheries of the nerves in the muscle or upon the muscular fibre itself. The cerebrum is unaffected, the mind remaining clear till death. The drug resembles pilocarpine in some respects, thus it increases the secretions, viz., sweat, saliva, tears, gastric juice, pancreatic fluid,

&c., by stimulating the ends of the nerves, or by acting on the gland cells. Peristalsis is greatly increased, and the eye muscles are affected. The local action of the drug always causes marked contraction of the pupil by stimulating the peripheries of the motor nerve in the sphincter of the iris, whilst at the same time, the ciliary muscle being affected, there is spasm of accommodation.

Physostigma contains Eserine or Physostigmine and Calabarine ; the former produces effects resembling those produced by the bean itself, whilst the latter causes tetanic convulsions like strychnine. A third alkaloid—Eseridine—resembles the action of the first. They appear in the urine soon after administration.

Physostigmine is antagonistic to atropine, and may be tried in cases of poisoning by this drug. It has been used in *tetanus*, and in various convulsive diseases, in *chorea*, *epilepsy*, *paralysis agitans*, *acute mania* and *general paralysis of the insane*, and in minute doses for *chronic constipation* and *bronchitis* with the view of stimulating the involuntary muscular fibre ($\frac{1}{3}$ grain of the extract). It should be given hypodermically, but the drug is very seldom employed internally. It is for its local action that Calabar bean is so valuable in ophthalmic practice ; the alkaloid—Eserine—applied to the conjunctiva produces contraction of the pupil, diminishes intra-ocular tension, and causes spasm of accommodation. The official discs or a few drops of a solution of the sulphate (2 grs. to 1 oz.) are used for this purpose—(1) to counteract the effects of atropine ; (2) to prevent prolapse of the iris after *wounds of the cornea* ; (3) to diminish the amount of light falling upon the retina in hypersensitive states or inflammations of the eye, as in *strumous ophthalmia*, *ulcers*, &c. ; (4) to diminish intra-ocular pressure in *glaucoma* and *perforating keratitis* ; (5) used after atropine to break down the adhesions resulting from *iritis*. It has proved beneficial in *detachment of the retina*.

Picrotoxin, externally as an ointment (1 gr. to 1 dr.), kills *pediculi*, but it must be used with caution. Internally it is, in doses of a few grains, a powerful poison, irritating the respiratory and other centres in the medulla, and producing violent *clonic* muscular contractions from its stimulating action upon the medulla oblongata, whilst the spinal centres are scarcely, if at all, affected—the opposite condition of affairs which occurs in strychnine poisoning. It has been used in *epilepsy*, especially in the nocturnal variety, in *paralysis* affecting the muscles of the pharynx, and in *sick headache*. It is, however, to check the *night-sweating of phthisis* that this drug has been much used, and good results have been obtained by Murrell, who first introduced it, in doses of $\frac{1}{200}$ to $\frac{1}{100}$ gr., three times a day. It probably acts in this condition by stimulating the respiratory centre.

It may be given in pills, and the dose increased to $\frac{1}{25}$ gr., or in solution with a little acetic acid ; or hypodermically, $\frac{1}{50}$ gr. It is antagonistic to the action of chloral hydrate.

Pilocarpine. (See Jaborandi, page 396).

Pimento, like cloves, is a stomachic, and though in large doses it acts as a stimulant of some power, still it is seldom employed in medicine, except as a flavouring ingredient or adjuvant to purgatives. Like pepper, it improves digestion and increases the vascularity of the mucous membrane, when mixed with food. Hence it may be taken as the type of a condiment.

Pinus Pumilio has been used as an inhalation in pulmonary complaints, and is the basis of the "pine cure" practised at various health resorts. Inferior terebinthinate products from the same pine are used in baths for *rheumatism*, *sciatica*, and *gout*.

The B.P. oleum pini may be taken internally (5 minims) in *bronchitis* and all wasting lung diseases; it is excreted by the bronchial surface and acts as an astringent and expectorant resembling turpentine oil. It may be used as a spray, or inhalation, or the vapour may be inhaled from the handkerchief, or it may be put into any of the various respirators or inhalers, thus the phthisical patient may be enabled to live in an atmosphere saturated with the oil, as it possesses only very slight irritating qualities. In this way at home the benefits of a stay at Arcachon may be to some extent enjoyed. Dr. Davidson has obtained excellent results from this treatment at Bournemouth.

Piper Nigrum resembles pimento in its stomachic qualities. It has been supposed to possess febrifuge properties on insufficient evidence. It is eliminated by the kidneys, which it stimulates, and it increases the amount of their secretion, but its diuretic action is uncertain; it imparts to the urine a characteristic odour. In passing over the genito-urinary tract it exercises a beneficial influence upon the bladder and urethra, and has the power of bracing up the relaxed and chronically inflamed mucous membrane of these parts in *gonorrhœa* and *gleet*. In this respect its action resembles that of cubebs; it may stimulate, by reflex action, the genital organs, and possibly aggravate matters in the acute early stages of the disease. The *excess* of the remedy which passes through the intestines unabsorbed is decidedly beneficial in inflamed and relaxed conditions of the mucous membrane in the neighbourhood of the anus. In *hæmorrhoids* its good effects will be found by giving the official confection in tea-spoonful doses three times a day. If cubebs be added, and copaiba balsam substituted for the honey, a preparation results which will seldom fail to arouse a healthy action in relaxed and painful affections about the anus; or the following may be used with or without the cubebs,—

R. *Pulv. Piperis Nig.*
 Pulv. Carui Fructus
 Pulv. Cubebæ ana \bar{z} ss.
 Glycerini q.s. Misce.

Fiat electuarium, capiat coch. parv. ter in die.

Pix Burgundica is a mild rubefacient, and its physical qualities render it suitable as a basis for plasters, which are used in *lumbago*, *rheumatism*, and various painful *joint* and *nerve* troubles, where they act by stimulating the lymphatics and protecting the parts from variations of temperature.

Burgundy pitch has been supposed to exert some special action upon the rectum, and has been employed for *hæmorrhoids*, made into pills with the following liquid.

Pix Liquida — Wood tar contains amongst its complex constituents some creosote, turpentine, and phenols, upon which many of its properties depend. It is thus antiseptic and stimulating, and possesses considerable power in checking profuse bronchial secretion; and as an expectorant is decidedly superior to any compound which can be distilled from it. It probably exerts its beneficial tonic effects upon the bronchial mucous membrane in the act of its elimination. Yeo finds that tar exhibits its expectorant qualities either when swallowed, inhaled as spray, or used as a fumigation. Ringer advocates its administration in *winter-cough*.

Tar possesses decided advantages over creosote and carbolic acid in the treatment of *chronic scaly skin affections*. It is a powerful stimulant when applied to a healthy sensitive skin, and often causes considerable inflammation and pain, especially in regions where there is much hair. In *psoriasis* the ointment of tar sometimes cures; and in *chronic eczema*, with painful itching, it will be found to relieve the itching, and, at the same time, to remove the disease which causes it.

The internal administration of tar in 5 or 8 minim doses, gradually increased to 15 minims, in pills or capsules, is employed by Anderson in *chronic eczema*.

Tar water is made by adding 1 part of tar to 4–10 parts of water, and, after agitation and subsequent rest, on being poured off it makes a good stimulating lotion for *wounds* and *sluggish ulcers*. As a means of administering the remedy, it may be taken in 5 oz. doses; 3 grs. of tar may be made into a pill with 1½ grs. lycopodium.

Pix Carbonis Præparata—Coal tar has the same action as wood tar.

Chaplin advocates his “creosote chamber,” which is a small room where the fumes of tar over a spirit lamp are inhaled for about one hour in cases of *fetid expectoration*, *bronchiectasis*, &c.

The Liquor Picis Carb. is now the representative of the old Liq. Carb. Detergens, which the writer has found to be the best known remedy for *chronic eczema*.

Hutchinson recommends a lotion of 1 oz. Liq. Plumbi Subacet. and 7 ozs. Liq. Carb. Deterg. A tea-spoonful mixed with 10 ozs. water, as a lotion, to be applied on lint to the parts at night, and covered with oiled silk, and an ointment consisting of Liquor

Carbonis, to be applied in the day-time. The following formula will be found the best routine treatment of *chronic eczema*, seldom failing to cure this obstinate disorder :—

R. *Liquor. Carbon. Delerg.* ʒj.
 Liquor. Plumbi Fort. ʒss.
 Hydrarg. Ammon. Chlor. ʒj.
 Vaselin et Lanolin. ā ʒss. *Misce.*

The liquor may be painted over diseased patches of *psoriasis* or *inveterate eczema* and permitted to dry. The liquor upon being added to water makes an emulsion, which is a powerful antiseptic, and can be used for *foul wounds*, *putrid sore throat*, or taken internally in *bronchial affections*, *winter-cough*, *hæmorrhoids*, &c.

Plumbum—All the salts of lead are more or less poisonous, though the acetate is the only one used internally, and when administered for a time they give rise to grave and varied symptoms of chronic poisoning. There is loss of appetite, wasting, anæmia, and constipation, followed by slowing of the pulse and heart's action, with violent colic, cramps in the flexor muscles, arthralgia, and paralysis of the extensors of the forearm, causing drop-wrist; occasionally blindness, deafness, headache, stupor, and convulsions are observed.

Lead becomes fixed in all the tissues, chiefly in the central nervous system, and in the affected muscles. These at first present no sign of change on the application of electricity; but as the paralysis lasts the current seems to have less and less effect, till finally it does not cause any contraction, and the muscular fibres become the seat of fatty degeneration, and finally may lose all traces of striation. The change probably is of spinal origin, since it generally occurs in groups of muscles which act together, as in the forearm and hand; but other groups of muscles may be affected as those of the larynx, eye, and leg. Many authorities maintain that the affection is of the nature of a true peripheral neuritis, the changes found in the cells of the anterior cornua of the cord being secondary to this.

The joints get stiff and very painful, probably owing to gouty changes, for lead prevents the excretion of urates by hindering the decomposition of uric acid. The structure of the liver and kidneys becomes affected, causing slight jaundice and albuminuria; and gout may supervene. The urine, at first scanty, becomes abundant and clear. It has been shown that the red blood discs are destroyed. *A blue line appears along the gums*, near to the teeth, this is known as Burton's line; it is caused by the metal deposited in the tissue of the gums being converted into a sulphide by the action of sulphuretted hydrogen generated by bacteria. It is best marked over the region of the incisors, and is absent or indistinct where the teeth are away.

The walls of the arteries contract, the blood pressure rises, the pulse slows, and becomes tense and full. The vascular condition being almost identical with that found in cases of contracted kidney. The nervous system is seriously affected by lead, the changes in the sensory nerves giving rise to various neuralgic symptoms throughout the body; thus, arthralgia, gastralgia and sciatica may give trouble, sensibility to touch becomes diminished, and especially about the upper part of the body. The optic nerve occasionally suffers, producing amaurosis.

Abortion often results from lead poisoning, either on account of the toxic power of the drug on the foetus or from its influence over the muscular tissue of the uterus.

Lead is eliminated by the urine, bile, intestines, and saliva, but chiefly by the intestines.

The symptoms of acute lead poisoning generally noticed after a large dose of the acetate are a sweet taste in the mouth, soon followed by nausea, vomiting, intense abdominal pain, and sometimes diarrhoea, great reduction in the pulse rate, collapse with livid lips and pallid face and convulsions or coma—symptoms which depend mainly upon the local irritant action of the salt.

As the different salts of lead have slightly different actions they may be referred to under their different names.

Metallic Lead is inert in the system till converted into a soluble salt by acids, as those of the stomach, where it is converted into the chloride and finally absorbed as albuminate.

Acetate of Lead is a valuable astringent. It combines directly with albumin, forming albuminate of lead, and when a strong solution is applied to a fresh wound or sore, a film of this substance imperfectly glazes it over. It causes contraction of the vessels when applied in weaker solution; thus, it directly diminishes the blood supply, acts as a local sedative, and checks excessive secretion in *ulcers, wounds, and most local cutaneous inflammations*. *Itching* is often relieved in this way, and a weak solution (5 grs. to 1 oz.) makes a good injection in *gonorrhœa* and *gleet*. In the painful, red, and inflamed stage of *eczema*, characterised by much serous discharge or weeping, lotions of lead give relief by constringing the small vessels, diminishing pain, itching, and discharge.

Lead Collyria should not be used in ulceration of the cornea on account of the danger of their forming opaque deposits in the tissue, interfering with sight.

Internally, the acetate finds its way into the blood, probably as an albuminate, and by its astringent effect upon the smaller vessels it diminishes the secretion of the bronchial tubes, stops *hæmorrhages*, as in *hæmoptysis*, and controls *diarrhœas*. 2 to 5 grs. may be given every two or three hours in these affections, and there is little danger of lead poisoning except in very susceptible subjects. It is very doubtful that lead has any remote astringent action as in *hæmoptysis*. The following may be tried :—

R. *Plumbi Acetatis* gr. xxxij.
Liq. Morphine Acet. ℥ss.
Acidi Acetici Diluti ℥j.
Aq. Destillatam ad ℥viij. *Misce.*

Fiat mist.umat cochlearia ii. ampl. secundis horis.

The *Subacetate Solutions of Lead* act like the acetate, and are generally confined to external application, where their unirritating astringent action renders them invaluable in *local cutaneous* or *superficial inflammations*, and *erysipelas*.

A valuable astringent application to *sprains*, &c., may be made by mixing *Liq. Plumbi Subacet.* ℥ss; *Acid. Acetic. Dil.* 3j; *Spirit. Vini Rectif.* ℥ss; *Aquæ Rosæ ad* ℥xij.

Carbonate of Lead is only used externally as a sedative and astringent application to excoriated or inflamed surfaces, either in the form of ointment or in fine powder dusted over the affected spots; white paint relieves the pain of *burns*.

The *Oxide* possesses similar desiccant properties, but is seldom used.

Iodide of Lead combines the alterative qualities of iodine with the astringent properties of lead. It is supposed to have a beneficial action in *scrofula*, but is seldom given internally. Externally, it is used in the form of a plaster or ointment.

The various plasters containing lead most probably act entirely independent of their metallic constituent, which is not absorbed in this form into the system. They act mechanically, as before explained, by causing such pressure when properly applied as will alter the circulation, and, acting as a stimulus to the lymphatics, will assist the removal of effused products or *indolent enlargements*. By covering up the affected or diseased parts, they protect them from all sources of external irritation, especially from changes of temperature, and promote a more rapid interchange between the blood and the tissues, hastening repair, and at the same time, in the case of *diseased joints*, securing some degree of rest. The superficial spot so treated is placed upon the same favourable conditions as a deeper part.

In chronic lead poisoning, iodide of potassium is used to dissolve out the insoluble metallic compounds lodged in the nerves, viscera, muscles, and brain, but its administration must be backed up with purgatives, especially saline sulphates, which will cause removal of the soluble salts of lead eliminated by the intestines. Sulphur baths may be employed, and the tone of the affected muscles must be kept up by friction and the free use of the constant or slowly-interrupted current. Alum has also been used with success, and belladonna is very useful in lead colic and paralysis.

As a prophylactic treatment to those much exposed to the fumes or dust of the lead compounds, lemonade made with sulphuric

acid, instead of citric or tartaric, has proved beneficial ; and a diet largely composed of milk and white of eggs has the power of preventing the poison affecting the system. Scrupulous personal cleanliness is a very important point.

Podophyllum root and resin are active cathartics. The latter is the form in which the substance is generally administered. It is an irritant when applied to the surface of the body ; and the dust produced by powdering it, coming in contact with the skin, causes sores and eye irritation.

It produces free purgation, with watery stools, by irritating the mucous membrane and acting as a powerful stimulant to the intestinal glands, whose secretion it greatly increases. The most of its force is spent upon the duodenum, whose contents it sweeps rapidly down the tube, resembling in this respect calomel ; and hence the name frequently given to it of "vegetable calomel." The resemblance ends here, for podophyllin does not possess any of the *alterative* properties of calomel. Podophyllin will purge when injected into the veins, cellular tissue, or serous cavities, or if applied to an ulcerated surface.

In its action podophyllin closely resembles jalap, only ordinary purgative doses ($\frac{1}{8}$ to $\frac{1}{2}$ gr.) are more tardy in producing their effects, and are much more variable in their results upon different individuals. Sometimes $\frac{1}{4}$ gr. of the resin purges in a few hours, while $\frac{1}{2}$ gr. in another individual will not operate for 10 or 14 hours, and in a third may produce no purgation at all. Florid individuals, or those with much red pigment in their hair, may be often noticed to be very susceptible to the action of the drug. Often great pain results from the administration of podophyllin, especially from impure samples of the resin ; common salt increases the cathartic properties.

Rutherford found that it produced decided stimulation of the liver, and marked increase in the amount of bile secreted. The bile is its proper solvent, but if a large dose of the drug be given the hepatic secretion in which it is dissolved is not absorbed, but is swept along the intestines, and the liver is less stimulated than if only moderate quantities had been administered. In doses sufficient to cause severe purgation the biliary secretion is decidedly diminished.

These effects upon the liver and intestines render podophyllin a popular drug in various diseases of the *liver* and *bowel* ; thus for passive congestion or *hepatic torpidity*, or *obstinate constipation*, $\frac{1}{2}$ gr. of the resin will be found a valuable remedy, relieving the portal circulation speedily. The danger of griping will be removed by the addition of extract of belladonna or hyoscyamus ; and if combined with some good cathartic pill, as aloes or colocynth, its action is much more certain and uniform, though Wood believes that owing to the tardiness of its operation it should not be combined with speedy cathartics. He advises its combination

dissolves it, and is used for *in-growing toe nail*, with a view of softening the nail and facilitating its removal. As a lotion it is likewise useful in *skin affections*, where it may be employed either to partially dissolve or hasten the removal of scales, as in *psoriasis*, or to allay the itching of *eczema*, *urticaria*, &c.

Internally, when *Liquor Potassæ* or any solution of the hydrate (largely diluted) is swallowed it readily finds its entrance into the blood on account of its easy diffusibility, but it first neutralises any free acid with which it comes in contact in the stomach ; it acts thus as an antacid, either locally or after its admission into the blood.

Hence it has been used to check excessive acidity anywhere, as in *irritative dyspepsia*, or acid conditions of the urine, leading to uric acid deposits ; but if given in doses sufficient to produce this remote antacid effect it will be often found to irritate the stomach, and, consequently, the less irritating bicarbonate or citrate is always preferred. It increases and liquefies the secretion in *bronchitis*, and has been given in the various forms of *rheumatism* and *gout*. It is diuretic to some extent, as it passes out by the kidneys, but it possesses less power (in safe doses) over the state of the urine than the citrate and carbonates. It does, however, cause an increase in the nitrogenous elements of the urine, possibly by encouraging the various tissue changes or destructive metamorphoses throughout the body, and not by any mere diuretic action of the drug. It has been used in *obesity*.

It appears to possess special sedative influence over the *bladder* and *urethra*, and its use in various irritable conditions of these parts, caused by unhealthy urine passing over them, is more liable to be followed by good results than if any of the salts had been given, the bicarbonate or citrate excepted.

Small doses, given with a vegetable tonic before meals, increase the flow of the gastric juice by acting as a direct stimulant to the mucous membrane, in the same way that acids given before meals correct or prevent the excessive secretion of acid juice.

Potassa Sulphurata possesses the properties of the sulphur compounds in a more marked degree than those of the potassium salts, and will be referred to under Sulphur.

Potassii Acetas, Citras, and Tartras—These salts, in moderate doses (about 30 grs.) enter the blood speedily. They circulate along with it, acting as restoratives to the corpuscular elements and muscles and the various tissues containing potassium salts ; reaching the kidneys the excess is secreted in the urine. Before passing out of the body the salts of potassium, with vegetable acids, are converted into carbonates or bicarbonates, increasing the alkalinity of the blood and rendering alkaline the acid urine. The alkalinity of the urine results even if the salts contain an excess of acid, and may occur, though slightly, after the use of the acid tartrate ; and since they possess no local corrosive action, but

may be taken in doses ten to twenty times larger than is necessary to produce their diuretic effect, they may be administered freely.

In this way the urine may be kept alkaline for many weeks, and during that time small uric acid stones in the kidney may be dissolved or so reduced in size that they may pass down the ureter and be expelled through the urethra. In health these salts often fail to increase the amount of urine.

In large doses, the tartrate, citrate, and acetate of potassium act as purgatives, from $\frac{1}{4}$ to $\frac{1}{2}$ oz. in solution being generally enough to cause mild catharsis. They are diaphoretic and febrifuge, opening up the cutaneous circulation by causing dilatation of the superficial capillaries, and the resulting perspiration affords one way for the extraction of heat from the body. It is, however, probable that at the same time they cause such alterations, either in the density or composition of the blood, as prevent or retard the changes taking place in that fluid upon which the increased temperature of the body may depend.

In *acute rheumatism* these salts are found beneficial; by increasing the alkalinity of the blood they counteract the effects of the rheumatic poison, and thus reduce the body heat and assist in the cure of the disease. Their antacid properties do not, however, account for all the good they do in acute rheumatism, for they probably exercise a *sedative* influence over the nervous system, though it is by no means clear that they materially shorten the length of the attack. (See Potassii Bicarbonas.)

The *acetate* of potassium is the most certain diaphoretic of the vegetable potassium salts; the *citrate* is the most reliable diuretic; whilst the *acid tartrate* possesses the most pronounced cathartic properties. The citrate is more commonly ordered than any other potassium compound, since it is this salt which is formed when the carbonate or bicarbonate is administered in effervescence with lemon juice. In this form the citrate is an elegant gastric sedative, and it is beneficial in irritable conditions of this organ; with the addition of a little morphine no combination gives such relief in *phthisis* when the skin is hot and dry, the cough harassing, and the tongue furred. The good effect in such cases is to some extent owing to the carbonic acid gas coming in contact with the peripheral nerves of the irritated mucous membrane. These salts (especially the citrate) have been recommended in *scurvy* by those who believe that the disease is caused by a deficiency of potassium in the system.

It is the *citrate* which should always be selected when we wish to act upon the urine and keep it alkaline for any considerable length of time, because this salt has the slightest destructive action upon the blood, and is the least likely to derange the digestion by its prolonged administration. (See recipe on page 300.)

with calomel, which takes about the same time to act. This must be also advantageous from another point of view, because calomel and podophyllin act upon the same portion of the small intestine, and must consequently intensify each other's effects.

By such a combination of purgatives as colocynth, podophyllin, jalap, and aloes, we get a more valuable intestinal stimulant than if any one be ordered singly in a large dose. By this means we also ensure an action possessed by no solitary drug, since the entire intestinal tract from the stomach to the anus is equally stimulated.

R. *Extracti Hyoscyami* gr. ij.
Resinæ Podophylli gr. $\frac{1}{4}$.
Extracti Colocy. Co. gr. iij. *Misce.*

Fiat pil. mitte tales xii., st. i. pro re nata, hora somni.

Potassium—All the salts of potassium act in large doses as powerful poisons independent of the acid with which they may be chemically combined. The respiration, cord, and nerve centres are weakened, the heart is depressed, and its movements rendered slow and irregular; and there is a fall of temperature and blood pressure.

One large dose of any potassium salt injected into the veins of an animal causes sudden arrest of the heart's action and death. Ringer believes that the potassium salts act as pure protoplasmic poisons, destroying all nitrogenous tissues, the more highly organised nerve centres suffering first.

After a time the blood becomes thin and poor when the administration is protracted, and there is loss of weight from absorption of the fat deposited throughout the body, the digestive organs are interfered with, and large doses cause paralysis of the muscular coat of the stomach and intestines. In small doses these salts are restorative, supplying the place of those used up in the blood corpuscles and in muscle. Potassium salts exist normally in the solid tissues, whilst sodium salts abound in the fluids of the body. Most of them are diuretic and slightly purgative. The salts of potassium possess higher diffusive power, and more readily enter the blood than the sodium salts. They increase the formation of bile. The soda salts should always be selected in preference to the potash salts, where prolonged administration is necessary, owing to the depressant effects of the latter on the heart and brain. There are, in many points, close resemblances between the potassium and sodium salts, and they may be taken as the representatives of a very important chemical class of therapeutic agents—the alkalies.

The alkalies when admitted to the stomach act as direct stimulants, and may increase the quantity of gastric juice when given before food; and thus their utility in *atonic dyspepsia*.

Ringer's law in reference to acids holds true conversely when applied to alkalies—*i.e.*, that alkalies check all alkaline secretions, while they stimulate all secretions of an acid reaction.

In *irritative dyspepsia* the alkalies give great relief after meals by neutralising large amounts of irritating lactic, butyric, and other acids. As will be mentioned further on, they diminish or prevent acidity of the urine, and act as expectorants.

Potassa Caustica—From its affinity for water, and its power of dissolving albumin, this substance, when applied to the tissues, causes their rapid destruction, producing an extensive eschar. Its destructive action being both deep and wide, its use must be restricted to such parts where no vital organs or structures are within reach. Its deliquescent properties cause it to run over the skin if allowed to remain in contact with it long; hence it is desirable to circumscribe its action with a ring of adhesive plaster, or with some adhesive cerate of firm consistence.

When the solid stick is applied to the skin for the destruction of any very superficial part, a contact of short duration will suffice, and blotting paper should be applied to absorb the moisture, else the eschar will be much deeper than is intended. *Cancers of epithelial* origin may be often satisfactorily treated in this way. It was used for making issues, and is still occasionally employed in opening *abscesses* or *cysts* in the interior of the abdomen, or in the substance of the liver. A series of mild applications of the caustic excites such inflammation that the abscess or cyst wall becomes glued to the abdominal parietes, when it may be opened with the knife or with further applications of the caustic without any danger of the contents escaping into the peritoneal cavity. *Unhealthy, foul ulcers*, showing a tendency to spread by sloughing, may be destroyed with caustic potash, and its efficacy in various chronic indurated conditions of the *os uteri* is highly spoken of. In these cases the good effects are not so much owing to the destruction of diseased tissue as to the alteration in the diseased action which always follows the free use of the caustic. The caustic, apparently, acts as a powerful stimulant to the healthy tissues, hastening repair and growth, and substituting a healthy inflammation for some abnormal tissue change.

The deliquescent properties and severity of action are corrected by mixing it with rather more than its own weight of lime, and making it into a paste as required, with alcohol; this is known as Vienna paste—a safer, milder, and more manageable remedy than the pure caustic potash. Internally, it is never given in the solid state, since small quantities would act like the powerful corrosive poisons, and cause death by destroying the mucous membrane of the stomach and gullet.

Potassæ Liquor is the form in which caustic potash is administered internally, though, if given in its undiluted strength, it is a powerful corrosive poison. Applied to the cuticle, it

R. *Potassii Acetatis* ℥iss.
Liq. Ammon. Acet. ℥ij.
Syrupi Aurantii ℥ss.
Aq. Camphoræ ad ℥viiij. *Misce.*

Fiat mistura, cujus capiat ℥j. *quartis horis.*

The *acid tartrate* may be given with sliced lemon in hot water, sweetened with a little sugar. Its purgative power is increased if it be administered in less water than will dissolve it; and there are few more agreeable laxatives than a paste made of cream of tartar and orange marmalade. The mildness of its operation recommends its use in the reflex constipation caused by painful *hæmorrhoids*, in which case it may be combined with sulphur, as in the official confection, or it may be given with marmalade.

R. *Potassii Bitart.* ℥j.
Conservæ Aurantii (Keiller) ℥iv.
Sulphuris Præcip. ℥ss. *Misce.*

Fiat electuarium, cujus capiat cochleare magnum omni mane nocteque.

Potassii Carbonas resembles in action the liquor potassæ. It is corrosive to some extent, and a large dose causes death by destroying the tissues with which it comes in contact, though its effects are not so severe as are those following caustic potash or the liquor. It is seldom given in medicine, the bicarbonate possessing all its virtues without its irritative qualities. It is eliminated as carbonate in the urine.

Potassii Bicarbonas—This salt possesses all the virtues of the potassium compounds, without any local corrosive or irritative action. It is a mild antacid; given in small doses, it stimulates the secretion of the gastric juice before taking food, and thus is beneficial in *atonic dyspepsia*. In *painful gastric affections*, accompanied by excessive secretion of acid and acrid fluid after meals, if administered in large doses it counteracts acidity, and often gives instant relief, though its continued administration in such cases is not productive of permanent benefit. In *gastralgia*, not evidently depending upon excess of acid secretion, the bicarbonate relieves by its local soothing or sedative action, possibly by giving off carbonic acid gas as it comes in contact with acids.

It makes the blood more alkaline, and is excreted as carbonate by the kidneys, which it stimulates. Passing over the mucous membrane of the genito-urinary tract, it either exercises its direct sedative influence, or else, by rendering the urine less irritating, it soothes the inflamed surfaces in *cystitis*, *gonorrhœa*, *pyelitis*, &c.

It may well be combined in such cases with buchu, pareira, or hyoscyamus. If the urine be already alkaline and decomposing, causing irritation by the rapid formation of ammoniacal compounds in the bladder, the potassium salts may do harm. If the irritation be caused by the presence of an abnormal amount of uric acid, then the bicarbonate gives relief.

There is much difference of opinion about the value of alkalies in *acute rheumatism*; but though it is unproven that this treatment possesses the power of cutting short the disease, still it is a well-recognised fact that the alkalies afford marked relief in this affection. It is possible that the beneficial effects of the drug do not depend upon its neutralising the supposed excess of acid in acute rheumatism, but from its so altering the composition of the blood that the changes in this fluid, caused by the rheumatic poison, are less easily effected.

In *gout* this salt has been long vaunted upon the theory that as it forms more soluble salts than soda does with uric acid, it prevents or causes the absorption of gouty concretions, but there appears to be a steady reaction setting in against the free use of alkalies in this condition, and the writer has of late years witnessed some cases where their administration increased all the symptoms and signs of the disease.

In *rheumatoid arthritis* and *chronic rheumatism* benefit is found from the free administration of the bicarbonate if combined with the iodide of potassium.

It should be remembered that the alkalies, when given for a long time in medicinal doses, cause deterioration in the quality of the blood and diminish the weight of the body; and thus a tardy convalescence may result after the disease for which they are administered is cured.

The best form in which to give the bicarbonate of potassium is effervescing with lemon juice, one table-spoonful of which will be found to neutralise 25—30 grs. of this salt; but the alkali may be in any excess that the physician considers his case demands. (See R. on page 300.) A solution of citric acid may be used as a substitute for fresh lemon juice, but the natural juice is always to be preferred.

Potassii Bichromas formerly was used for its supposed alterative action in *syphilis*; it is still recommended in painful *dyspepsia* and *gastric ulcer* in doses of $\frac{1}{8}$ gr. in pilule; 2 or 3 grs. act as an emetic. A saturated solution is employed as a caustic, brushed over *superficial growths*, especially of a syphilitic character. A peculiar ulceration of the hands, face, and septum nasi attacks persons working with this drug. The ulceration does not come on unless there has been a previous abrasion.

Potassii Bromidum and Iodidum. (See under Bromum and Iodum.)

Potassii Chloras—The greater part of this salt passes unaltered through the system.

Binz and Mering have demonstrated that a portion of it is reduced by decomposing fibrin and septic tissue, with the evolution of free oxygen, and most authorities are satisfied that some portion of it is decomposed in the body, though all agree that it cannot act as a general oxidising agent in the sense formerly attributed to it. Coghill believes that it oxygenates the blood by its mere catalytic action, and Henderson demonstrated that it relieved the dyspnoea felt in climbing the high passes in the Himalayas.

In moderately large doses (20 grs.) it stimulates the kidneys as it is excreted by them, and a portion appears in the urine. In poisonous doses (1 oz.) it causes active congestion of these organs, with bloody and finally suppressed urine. Death may take place in a few hours from the change of the blood pigment into methæmoglobin, which stable compound refuses to part with its oxygen to the tissues, and the corpuscles are destroyed. Sometimes heart failure and gastro-enteritis supervene.

It is, however, for its influence over *unhealthy mucous surfaces* that this remedy will always keep a high place in therapeutics. This effect is witnessed when a solution is applied to the *spongy gums* in various *aphthous conditions* of the mouth and throat, and in active *inflammations* of the *tonsils* and mucous lining of the *pharynx* and *nares*. A rational explanation of its action in these cases has yet to be given, and we must fall back upon such a term as "alterative" to explain its beneficial effects, for it seems by its local influence to alter in some way the unhealthy action of the membrane. One effect may be constantly observed when chlorate of potassium is used as a gargle in *follicular pharyngitis* or *acute tonsillitis*. Marked benefit at first follows its use, but if it is persevered in for any length of time, it keeps up a chronic irritation, which subsides only after its use is withdrawn. It appears to have an influence over the salivary and buccal glands, like what it has been observed to exercise over the mammary, viz.—it checks or moderates their secretion if excessive, and stimulates or increases it if scanty. It has been highly spoken of in excessive salivation from the injurious use of *mercury*.

A solution of about 6 grs. to each fluid ounce of distilled water is a satisfactory application to *unhealthy sores* and *ulcers*, and may be used for washing out foul *sinuses* or *cavities*, and will be found a valuable stimulant in various chronic affections of the *bladder*, if injected twice a day. The powdered salt may be applied to *aphthous* spots on the *cheeks*, *tongue*, or *gums*, and has been found to alter the action, diminish the pain, and check the growth of *epithelial cancers*. Small pieces sucked in the mouth, by reflex action, excite effectually the secretion of healthy mucus in chronic *bronchial* and *laryngeal affections*, so that the expectoration is rendered more fluid or less adhesive, and is readily swept up by the cilia; hence this salt is classed as a ciliary excitant.

After its absorption and entrance into the blood it appears to exercise the same alterative, stimulating, or regulating power over other mucous surfaces, especially the intestinal. In diseases of childhood, depending upon *catarrhal* and other *unhealthy inflammations* of the *mucous membrane* of the *alimentary canal*, from the mouth to the anus, the writer has found this drug invaluable. It is an expectorant in *bronchitis*, and has been reputed to act as an alterative in *scrofula*.

Dr. Harkin pointed out its usefulness in *purpura hæmorrhagica*, *epistaxis*, *hæmaturia*, and a host of blood ailments. By some unpublished experiments on milking cows, he proved that it materially increases the quantity of milk.

There is a feeling against the use of the drug in *diphtheria* and *scarlatina*, owing to the deaths attributed to it in these diseases.

The following is a useful combination :—

R. *Potassii Chloratis* *ʒiij.*
 Tincturæ Ferri Perchlor. *ʒii.*
 Glycerini *ʒvj.*
 Aquam Destill. ad *ʒxii. Misce.*

Fiat mistura, cpt. ʒi. ter in die.

Potassii Nitras—The salts of potassium, with the mineral acids, differ from the vegetable acid salts of potassium in passing through the system and being for the most part eliminated unchanged in the urine, whilst the latter are converted into carbonates.

The nitrate is a very active substance; it rapidly enters the blood, and in large doses prevents its coagulability by its action on the fibrin. It so alters the red blood corpuscles that they soon cease to possess any power of carrying oxygen to the tissues. The first effect upon the heart is to render it slower in its movements; afterwards it becomes quick and weak, and finally stops. Death may result from the violent irritant action of the salt on the alimentary canal, giving rise to severe vomiting and purging.

The salt is eliminated by the kidneys, during its passage through which it acts as a stimulating diuretic, appearing in the urine as nitrate. The skin is acted upon, this salt possessing very constant diaphoretic powers, which are increased if it be administered in some hot fluid at bed-time. A glass of whiskey or brandy, with boiling water and sugar and half a dr. of the nitrate, affords a good chance of getting the hot skin to secrete abundant moisture in *febrile affections*, whilst it slightly reduces the pulse, and the temperature falls a little.

Recently Brunton recommends nitre as a means of lowering arterial tension in the aged, especially when combined with small doses of the nitrite of soda.

This refrigerant action of nitre is generally explained by its sedative influence on the circulation and its effect upon the skin. It is a diaphoretic and diuretic in all *inflammatory affections*, except where the gastro-intestinal or renal apparatus is involved. It is, probably, partially excreted by the bronchial mucous membrane, over which it appears to exercise an influence not unlike that which it effects on the skin, and it is a reliable expectorant when the irritation or inflammation is confined to the *trachea* or *larger divisions* of the *respiratory tract*. Bibulous paper soaked in a strong solution of nitre, dried, and allowed to burn slowly in the patient's room, has long been a favourite remedy in *asthma*.

The nitrate may be given with great advantage in a mixture of the citrate or bicarbonate in effervescence.

Potassii Permanganas is a powerful oxidiser, readily parting with its oxygen, which, on being freed, forms harmless compounds with foul-smelling gases and liquids, thus acting as a very efficient deodoriser. In a similar way it destroys the germs of disease, and thus is a disinfectant. It makes an elegant and not unpleasant gargle in fetid *ulcerations* about the *gums*, *mouth*, or *throat*, in the proportion of about 2 grs. of the salt in 10 ozs. of distilled water. This weak solution may be also used as a lotion to *suppurating sores*, or as an injection into suppurating *cavities* and *sinuses*, as in *ozæna* and *empyema*, or as an injection in *cancer* of the *os uteri*. Applied in the powdered state, or in 1 in 50 solution, it sometimes gives excellent results in *lupus*. 1 gr. to 2 ozs. water makes a most valuable application to *burns*, *scalds*, and *frost-bites*. It should be prescribed with distilled water, and kept in stoppered bottles; or given in the form of pill (page 48) as it so readily parts with its oxygen. It is decomposed in the stomach before absorption, and cannot possibly exercise any oxygenating power in the blood and tissues.

As an antidote in poisoning by morphine, cyanides and phosphorus it is invaluable, and a lethal dose of morphine may be swallowed with impunity if a few grains of the permanganate in solution be administered immediately after. The stomach should be washed out with it at intervals during the treatment of opium poisoning.

The writer has found better results from an injection of this salt ($\frac{1}{2}$ gr. to 1 oz.) in *gonorrhæa* than from any other local remedy. It is very valuable (1 gr. to 1 oz.) in *gleet*.

It has been given in grain doses in *diabetes*, and has been very highly extolled as a specific in *amenorrhæa* or *scanty menstruation*, given in 2 gr. pills; the writer has not been successful with it.

It has been used to counteract the poison of *snake-bites*, and F. E. M'Farland has recommended it strongly in *cholera*.

Potassii Sulphas is used to effect the minute sub-division of the particles of powders and pill masses. It is a mild cathartic,

acting by increasing the intestinal glandular secretion ; and is especially suitable for children. The experiments of Rutherford prove that it is a decided hepatic stimulant.

Prunum—The dried plum is seldom employed as a medicine, but it is freely used in domestic life as a food and sweetmeat. It possesses faint laxative properties, and when stewed makes a tempting dish for constipated children. It probably acts by increasing peristaltic action.

Prunus Virginiana—Wild Cherry Bark is a bitter *tonic*, acting on the mucous membrane of the stomach as a slight irritant, increasing its vascularity and secretion, like the older bitters, calumba, &c. This action is, however, somewhat antagonised by the tannin contained along with the bitter extractive, which at the same time confers *astringent* virtues upon the remedy. It contains also amygdalin and emulsin, which give a percentage of Prussic acid in the liquid preparations that confers *sedative* properties upon them.

The syrup is given in tea-spoonful doses to allay the cough and sweating of *phthisis*. The tincture in $\frac{1}{2}$ dr. doses is a tonic in convalescence from acute diseases, and is useful in *dyspepsia*. Allbutt found the drug useful in cardiac *palpitation*, *mitral regurgitation*, and in *chronic bronchitis* with *fatty heart*, but its properties do not justify its introduction into the new B.P.

Pterocarpi Lignum has faint astringent properties depending upon traces of tannic acid which it contains. It is used solely as a colouring agent in Tinct. Lavand. Co.

Pyrethri Radix, when chewed, acts as a powerful stimulant to the salivary glands, causing a sudden increase in the quantity of saliva by its direct irritant action. It has been thus used to relieve the pain of *carious teeth*, and as a masticatory in *paralysis* of the *tongue* and relaxation of the *uvula*. Its pain-relieving properties are very uncertain, though the tingling and unpleasant sensation which it causes in the mouth will always to some extent mask pain ; and it appears to blunt the sensibility of the nerves distributed to the lining membrane of the mouth. Internally, it has been given in *globus hystericus* by Roth, who reports very favourably of it. He believes it acts by stimulating the sympathetic.

The writer has employed it with success as a rapid method of having *iodide of potassium* eliminated from the system in *chronic poisoning* by that drug.

The tincture may be used as a *mouth-wash* in the proportion of a tea-spoonful to a wine-glassful of water ; or it may be applied in its undiluted state on cotton wool to the cavity of the diseased and painful tooth.

Pyroxylin is only employed in making Collodion.

Quassia is a pure bitter tonic, devoid of astringency ; it is used in *dyspepsia* and *anorexia*. It closely resembles calumba (which

see), and, like it, may be given with the preparations of iron, since it contains no tannin.

It possesses toxic properties when eaten by flies and fish, and has been supposed to act in a similar way in various diseased conditions of the blood, destroying unhealthy organisms, and acting as a true febrifuge, like quinine, but only very doubtful success has resulted when thus administered, possibly because too small a dose has been used. When injected into the rectum a strong infusion will cause the death of the *thread worm*.

R. *Infus. Quassiae* ℥xj.
 Tinct. Quassiae ℥vj.
 Tr. Ferri Perchloridi ℥ij. *Misce.*

Fiat mist. cujus capiat cochlearia duo ampla ter in die.

Quillaia contains a glucoside resembling the active principle of senega, but it is a more powerful expectorant than senega. It is indicated in *emphysema* and *chronic bronchitis*, but not in hæmoptysis. (See Senega.) It contains five times as much saponin as senega, and may be used to make emulsions. The sapotoxins are all powerful protoplasmic poisons, causing violent gastro-enteritis and blood destruction. Trechinski has found it of great service in acute and chronic catarrhal *rhinitis*. He directs the patient to shake up the powdered bark in a paper bag, and breathe the dust arising from it. It has been reported as valuable in *amenorrhœa*. Kobert shows that saponin is a mixture of a harmless substance—lactosin—with sapotoxin, a dangerous blood poison, which breaks up the blood corpuscles. Shoemaker has used soap bark with success as a local stimulant to *chronic ulcers* by applying bandages soaked in an infusion. It is used as a lotion to the scalp in *dandruff* and *seborrhœa*.

Quinine. (See under Cinchona.)

Resina is not administered internally; it is used solely for its adhesive property and for making various fatty mixtures of suitable consistence for ointments. It has, however, feeble stimulating qualities, and is much used when made into an ointment with wax, lard, and oil as a mild stimulant to *sluggish ulcers* and *slowly healing wounds*; it appears to act in such cases by causing enough irritation to slightly increase the blood supply; at the same time it protects the ulcerated or wounded surface from the action of the atmosphere. (See also under Rosinol).

Rhei Radix—Rhubarb when administered in small doses (2 to 5 grs.) acts as a stomachic, increasing the quantity of the gastric juice, improving the appetite, and assisting digestion, and the tincture has been long used as a tonic. It soon finds its way into the blood, and, acting as a stimulant to the liver, or to that portion of it whose duty it is to secrete bile, it increases the quantity of

this fluid without diminishing any of its ingredients, and the cholagogue action of rhubarb is independent of any cathartic action.

In large doses (20 grs.) its cathartic properties are rendered apparent, and it produces mild purgation, probably by stimulating the muscular movements of the intestinal tube from the duodenum to the rectum. It also acts, though to a small extent, as a mild stimulant to the intestinal glands, and slightly increases their secretion. In doses of 60 grs. the intestinal fluids are considerably augmented.

Rhubarb after exercising its cathartic power becomes an astringent, and checks the alimentary secretions, causing subsequent constipation, owing to the rheo-tannic acid which it contains, and consequently it is not an advisable purgative for patients suffering under chronic constipation.

This renders it valuable in *diarrhæa* when we wish to produce an astringent effect after getting rid of some irritating food or matters remaining in the canal.

In *hæmorrhoids* few remedies will be found so useful as rhubarb, and some consider it much more efficacious if slowly chewed in the mouth; but in any case its only disadvantage is its astringency, which is entirely counteracted by table-spoonful doses of olive oil taken every night, floating on a little milk.

The stools are at first darkened, owing to the increased bile and colouring matter of the rhubarb; they afterwards become pale. The colouring matter consists of chrysophanic acid, and is found in the perspiration, milk, and urine, but chiefly in the latter. Hence the drug has been tried in *psoriasis*, but without success.

An equal quantity of bicarbonate of sodium is said to overcome the astringent properties of rhubarb and disguise its taste; and it may be so ordered as a powder in tea-spoonful doses in water.

It should be ordered with some substance like magnesia, as in the celebrated Gregory's Powder or Pulv. Rhei Co., which may be given in milk, and is an invaluable cathartic in the various *gastric* and *abdominal* troubles of *childhood*. The syrup is well suited for children, the coriander partially concealing the flavour.

The following form will be found a good one for producing the stomachic effects of rhubarb, though some prefer to substitute peppermint for the spirit of anise; or the official compound powder may be given in a mixture—half an ounce rubbed up with nine and a half ounces of Aqua Menthæ Viridis and half an ounce of Spiritus Ammoniaë Aromaticus:—

R. Pulv. Rhei ℥iss.
 Syrupi Simp. ℥j.
 Spt. Chloroformi ℥iij.
 Spt. Anisi ℥.xxxv.
 Aqua Carui ℥viss. Misce.

Fiat mistura. *Signa.*—"A small table-spoonful as a tonic or stomachic, or a wine-glassful as a purgative."

If a combination of rhubarb with an active cathartic is required, the official pill in 10 gr. doses will be found to answer all purposes.

Rhœados Petala possess very feeble narcotic qualities. Though it is impossible to get any traces of morphine when submitted to chemical examination, still the characteristic effects of opium have been noticed when the syrup has been given to *infants*. Nevertheless, it is only for its colouring properties that it is used.

Ricini Oleum is a mild cathartic, by some authorities-classed as a laxative. If rubbed into the skin of the abdomen, injected into a vein, or thrown into the rectum, castor oil is said to produce purging. The intestinal glands are slightly stimulated, and the vermicular contractions are increased in frequency and power, especially in the duodenal part of the canal, the result of which is, that in about six hours several very soft but not watery stools are passed with little pain and no constitutional disturbance. The oil passes out by the bowel; it may be recognised in the secretion of the mammary gland by its purgative effects upon the infant. The active principle of castor oil is ricinoleic acid existing in the form of a glyceride. The acid is set free by the pancreatic secretion. The seeds from which the oil is extracted are poisonous, containing a virulent irritant—or toxalbumin known as Ricin, one of the strongest of the vegetable poisons, which causes death when injected into the veins by producing gastro-enteritis and intestinal hæmorrhages. None of this substance exists in the oil. It appears to the writer to resemble the poison existing in the uncooked haricot bean, and like it, is rendered harmless by cooking. The interesting fact is that animals rapidly become immune after injections of this active poison, so that many thousand times the lethal dose can be administered with impunity, and this was demonstrated by Ehrlich to be owing to the formation of an antitoxin in their serum. (See Antitoxines.)

The oil possesses no power over the hepatic secretion, and appears to lose its influence after a time; and in some cases its administration seems to be followed, like rhubarb, by an astringent effect. In *pregnancy*, where it is a very safe purgative, large doses may be required if regularly and constantly employed; and it is strange that sometimes in these cases if the large dose (1 oz.) be withheld, and only one or two tea-spoonfuls given, the drug appears to regain its power, and to purge freely; it has also nutritive virtues.

Its bland qualities render it a favourite and safe purgative for *young children* and *infants*, and in cases of *pelvic disease*. In the *diarrhœa* of infancy it is a prized medicine, acting by safely causing the expulsion of all irritating matters.

In *fæcal accumulations* castor oil has long held a high reputation; but it should not be depended upon without the aid of enemata of

large quantities of warm water. Accumulations of the rinds of fruits (especially of gooseberries), so often found in children, are not advantageously expelled by castor oil, as is supposed. More energetic cathartics are required, and calomel is especially useful in such cases.

A drop of castor oil allowed to fall upon the *conjunctiva* is a soothing protective when a foreign body is present.

The unpleasant flavour and sickening, greasy taste of castor oil is a great hindrance to its use. If ordered alone, it may be administered when it reaches the sick chamber by floating it upon a little wine or spirit in a glass, after which it should be bolted quickly; some patients take it in orange juice, coffee, water, or gruel.

Directions are frequently given to float the dose between different strata of liquids. Perhaps the best of all methods is to pour some *thick* cream into a very clean wine-glass, turn it round, so that the sides get smeared well over, pour in a table-spoonful of castor oil, and a little cream on the top. The patient, having taken a tea-spoonful of cream into his mouth and caused it to come into contact with his palate by the movement of his tongue, is directed to swallow at a gulp, the oil and cream out of the wine-glass, throwing back his head, that they may more readily pass over the tongue. Castor oil should be *gently* warmed before being administered, as it is rendered thus more liquid and less adhesive. The essential oil of bitter almonds conceals its nauseous smell.

☞ When the oil is administered very early in the morning (4 to 5 a.m.), the secretions of the mouth are so dried up that often the taste of the drug cannot be recognised.

A favourite combination is a half-ounce dose of castor oil with 10 to 20 minims of tincture of opium to prevent griping.

Children bear large doses well, and a small tea-spoonful is often administered to newly-born infants without producing unpleasant effects. As a rule, never more than half an ounce should be administered for the first time to an adult.

One or two ounces, with as much mucilage of starch, may be injected into the rectum.

Rosæ Gallicæ Petala possess faint astringent properties, owing to the traces of tannin which they contain. They are only used for their colour.

The infusion made with dilute sulphuric acid and water is an elegant method of administering the mineral acid, and may be made the basis of many agreeable mixtures. Its activity depends upon the tonic and astringent properties of sulphuric acid, and it may be freely given in the *hæmoptysis* and *sweating* of *phthisis*, and as a gargle in *relaxed sore throat*. Dilute nitric acid may be substituted for the sulphuric.

Rosæ Oleum—Otto of rose is only employed for its fragrance

though some believe that in eye-washes and gargles rose-water exercises a soothing influence.

Rosmarini Oleum is a powerful stimulant when taken internally (which is seldom); it acts like peppermint.

Externally, it is a valuable rubefacient, and is much used as an application to the *scalp* in *baldness*, where it is commonly supposed to improve the nutrition of the hair-bulbs, by increasing the supply of blood to the skin. Its efficacy is greatly increased by combining it with cantharides. It is often added to liniments on account of its odour.

The following is a valuable remedy for *baldness* :—

R. *Olei Rosmarini* ℥iv.
 Liq. Epispastici ℥ii.
 Olei Amygdal. Dulc. ℥iss.
 Spt. Camphoræ ℥ii.
 Glycerini Boracis ℥j.
 Olei Rosæ gt. viij.
 Tinct. Jaborandi ℥i. *Misce.*

Signa.—"A little to be rubbed into the roots of the hair every night."

Saccharum—Sugar as a food possesses well-known properties; it is a nutrient to the adipose tissue of the body and a respiratory fuel. It is used in Pharmacy for a variety of purposes, but the physician only orders it to sweeten mixtures or to assist by its density in the suspension of powders.

Saccharum Lactis is used, owing to the hardness of its particles, to effect the minute sub-division of the particles of substances in powders or pills, and thereby to increase their efficacy and insure their equal distribution in each dose.

It resists fermentation, and is given instead of cane sugar to sweeten the food of *dyspeptic* infants, and for a similar reason it has been given in various *irritable conditions of the stomach*, and as a food in some *wasting pulmonary diseases*.

It has been demonstrated to be a valuable diuretic, greatly increasing the flow of urine in *cardiac dropsy*. It acts as a diuretic in albuminuria, but not so markedly. There is great discrepancy in the doses employed by different observers; these range from 3 drs. to 3 ozs. for a daily dose.

Salicin (See under Acid. Salicylic., page 304.)

Salol, after administration, is not decomposed in the stomach, but is changed immediately upon entering the bowel, when it comes into contact with the pancreatic juice, which splits it up

into salicylic acid and phenol, and it appears at once in the urine as sulphocarbolates and salicyluric acid. Ewald measures the rate at which food passes through the stomach by this means. Salol in large doses causes the urine to become greenish-black, and it may produce symptoms of carbolic and salicylic acid poisoning. Nevertheless, it is very much safer than proportionate amounts of these acids, and has been given in 15 to 30 gr. doses in fevers without ill effects. After such a dose there may be noticed a drop in the temperature of 5° . It is in *acute rheumatism* that salol has proved a most valuable drug, and its action is allied to salicylic acid in this disease. Innumerable reports testify to its success in acute and chronic rheumatism, *sciatica*, *neuralgia*, and *lumbago*, *cystitis*, *pyelitis*, and *phthisis*, and it possesses analgesic properties like antipyrine, in *migraine*, *ataxy*, *pains*, &c. Its internal use in putrid conditions of the urine is like that of boracic acid, and prevents the necessity of bladder injections or irrigation. It is used as a duodenal and intestinal disinfectant, and as a solvent for gall stones, as it liquefies the bile; it is given also in *catarrh of the bile ducts*, and has been used locally as a mouth-wash, and spray, and application to wounds. 12 grs. may be considered a fair average dose, and it may be repeated every four hours; it can be given in tabloids or suspended in water or in wafer-paper. It is liable to form calculi in the bowel, and these have caused obstruction; hence it should always be triturated and prescribed with some inert powder, as sugar of milk, bismuth, &c. Externally, it can be used exactly like iodoform, and it is maintained by many that it should replace that drug. It contains about 38 per cent. of phenol. Philippon has reported two cases of *general scleroderma* successfully treated by full doses of salol internally.

(Salol Camphor is a thick liquid prepared by heating together 2 parts of camphor and 3 of salol. It has been used externally as an antiseptic, and taken internally in small doses. By dissolving 2 drs. salol in 2 drs. ether and 2 ozs. collodion a thick liquid is obtained, which has been painted over the joints in rheumatism with benefit.

Salophen is a body of similar composition to salol; it contains 51 per cent. salicylic acid, and is given in similar doses. It is stated that it is less likely to cause phenol poisoning. It has been successfully used as a hypodermic injection (15 grs.) in *sciatica*.

Sambuci Flores—The water distilled from the flowers does not possess any therapeutic value, though other parts of the plant are by no means inert, for the bark is cathartic and emetic. A decoction of the fresh inner bark is a valuable diuretic, and has been used with success in *acute nephritis*. The water is used as the fragrant basis of lotions, and enjoys the popular reputation of a cosmetic, clearing the skin of freckles.

Santali Oleum closely resembles copaiba in its action, and is used in the treatment of *gonorrhœa* and *gleet*. It acts upon the

lining membrane of the bladder and urethra as it is being excreted in the urine. Posner believes that it has a specific action upon the prostatic portion of the urethra.

If it does not act speedily in 20 minim doses on the gonorrhœal discharge, which it generally diminishes in 60 hours, the probabilities are it will not do much good. The administration of the santal oil should be kept up for some time after every trace of the gleet or gonorrhœa has disappeared. It is excreted by the bronchial surface, and has proved useful in *fetid bronchitis*. It may be ordered with mucilage in a mixture, each $\frac{1}{2}$ oz. of which can be made to contain 20 minims of the oil, with 1 dr. of syrup, 1 dr. mucilage, and 2 drs. infusion of orange. It may be given before, after, or with food.

Santoninum is used to destroy worms in the intestinal canal. It is the best vermicide for the common round worms—(*ascarides lumbricoides*)—acting speedily and certainly when properly administered. It also kills the thread-worm, though it appears to have no effect upon the tape-worm.

It kills the worms in doses which do not produce purgation, though it purges if given in large doses, and may cause serious cerebral symptoms. Death has followed the use of the drug in very young children or infants, in whom it sometimes produces convulsions, vertigo, and coma, with purging and vomiting.

Santonin, like many other remedies of its class, produces its effects more certainly if administered after fasting, or after the operation of a mild purge. In castor oil, as pointed out by Kuchenmeister, it acts more satisfactorily than when given in any other way, and the writer can strongly endorse the accuracy of this observation, after seeing its administration in some thousands of instances in the practice of a children's hospital. Unpleasant symptoms were never observed, though the drug was given in full doses; *the oil appears to lessen very considerably the risk of any evil effects*. To a child 2 years old 2 grs. may be given at bed-time, mixed with a large tea-spoonful of castor oil, and more oil or other purgative administered in the morning if necessary. The worm is generally expelled dead, and it has been stated that the drug acts by causing convulsive movement in the worms, which excites the intestine to expel them.

Some curious effects follow the use of santonin. Yellow vision may be noticed inside an hour after administration; every object appears yellow or green to the patient, and violet objects are recognised with difficulty, though the humours or solid tissues of the eye are not in any way coloured. The effects appear to depend upon the action of santonin on the delicate retinal fibres. The retinal blood vessels are always congested. Perversions or alterations in the smell and taste are also occasionally experienced. The urine is very often stained yellow, orange, or red, apparently varying in colour according to the degree of its alkalinity; and

santonin acts as a diuretic, stimulating the kidneys, by which it is eliminated, and it also sometimes renders the bladder irritable. It is supposed to act in the blood in combination with soda. It has been tried unsuccessfully in *nocturnal incontinence of urine*, in *amaurosis*, and for *colour-blindness*. It has been said to remove the discharge in *gleet*, and to diminish slightly the albumin in *albuminuria*; Chéron lauds it in *dysmenorrhœa* and *amenorrhœa*. Recently it has been discovered to have analgesic action in small doses, and has been tried successfully to relieve the pains in *ataxia*. It has also been recommended in epilepsy when bromides fail. When given to *young* animals santonin produces cataract.

It may be given in the form of a lozenge or as a powder, with a little calomel, or in olive oil, to those who cannot bear the taste of castor oil; or it may be given in a suppository.

It may be dusted in fine powder over a slice of bread and butter, and is thus readily eaten by children.

For Santoninoxim, the non-poisonous substitute for santonin, see the Non-Official Remedies.

Sapo Animalis, Durus, and Mollis are introduced into the B.P. as excipients for pill masses, and as vehicles for liniments and plasters.

Soap, however, possesses other valuable qualities. Thus, it is an antacid, and, acting like the alkalies, will counteract an excess of acid. It can be so easily given in the pilular form that we can manage to have its alkaline effect produced at that part of the canal which the more soluble alkalies generally do not reach. It may act as a restorative by supplying to the bile some salts which are natural constituents of that fluid. At the same time it may assist in the emulsifying process going on in the duodenum, and, added to purgatives like aloes and jalap, it mitigates their acrimony, and at the same time quickens their operation; and this is frequently explained by pointing out the *solvent* power of soap over these bodies. Large doses of soap have been recommended as a solvent for *gall-stones*, and as a means of rendering the urine alkaline in cases of *renal calculi*.

It acts as a laxative when swallowed or introduced into the rectum, and this latter action of soap affords one of the most simple and convenient methods of emptying the lower bowel. In the case of infants, a thin, wedge-shaped piece of ordinary hard soap may be introduced through the anus for an inch or more, and held there for a few moments. By its irritation, reflex action is aroused, causing the contraction of the rectum and often of the entire colon. In adults, a small plug as large as the last joint of the index finger may be inserted like a suppository, and allowed to remain till expelled.

Externally, the cleansing properties of soap are well known, and it should be remembered that it often irritates *eczema* and prevents its cure, whilst sometimes, in sluggish cases, it may act

as a healthy stimulant. By far the least irritating soaps made are the superfatted soaps like vinolia.

The liniment of soap is a valuable remedy in *sprains, bruises, and stiffness of joints* from inflammatory effusion; its action in such cases is called "discutient." It removes the swelling by stimulating the absorbents, and requires friction in its application. The plaster is supposed to act in the same way, but it probably possesses no specific action beyond the support and pressure which it affords, at the same time giving the affected surface somewhat of the benefits of an internal part.

Sarsæ Radix—About this drug very different opinions prevail, some authorities condemning it as absolutely inert, while many physicians firmly believe in its virtue as a diuretic, diaphoretic, and antisyphilitic. It is probable that the *fresh* root possesses properties which render it of value in the treatment of *secondary and tertiary syphilitic affections, various skin diseases, &c.*

The dried root produces no appreciable therapeutic effects. The compound liquor may prove of some value, as there are three ingredients contained in it which possess well recognised tonic and diaphoretic properties.

Sassafras Radix is generally classed as a stimulant and diaphoretic; the oil produces the effects of a mild stimulant, acting upon the vascular and nervous systems.

The drug is often employed for its flavour, and it gives diaphoretic qualities to the compound liquor of sarsaparilla.

Scammonium and its resin resemble jalap very closely in their action. They are powerful hydragogue purgatives, producing their effects by their *local* irritative action on the bowel, causing in about four hours the evacuation of the contents of the colon in a semi-solid form, soon followed, with much griping, by liquid stools. Five grains of the resin, or ten of the gum-resin or scammony, are a fair dose for an adult; but this drug should be given in combination with some purgative which would assist its action and diminish the griping. The best way to achieve this object is to combine it with calomel.

It is indicated where the thorough evacuation of the contents of the bowel is desired, as in *impaction of fæces*, or where a quantity of serous fluid is required to be removed from the blood, as in *head injuries and dropsies*.

It appears to act more promptly when given with an alkali, and soap answers this purpose well; the drug does not act in the absence of bile, and it is the soda of this secretion which assists its action; sulphate of potassium corrects its griping.

Though a powerful stimulant to the intestinal glands, it has but a very feeble effect upon the liver.

Scammony has been much used as a remedy for the various forms of *parasites* infesting the alimentary canal, especially of

children. There is, however, no evidence to show that it acts as a true anthelmintic, since its beneficial results in such cases appear to be easily explained by its irritant purgative qualities.

R. *Scammoniae Resinae* gr. x.
 Hydrarg. Subchloridi gr. vj. *Misce*,
et divide in pulv. ii. st. i. statim.

Scilla—Squill is a violent irritant poison, causing death by its action upon the gastro-intestinal mucous membrane, giving rise to vomiting and purging and severe inflammation of the mucous tract. These effects are noticed in a more or less marked degree, whether the drug be swallowed, applied to the broken skin, injected into a vein or into a serous cavity, or under the skin. In its action it closely resembles digitalis, but it is more irritating to the stomach and bowels, and it has valuable expectorant powers which digitalis has not. It is excreted by three outlets—by the bowel, acting as a mild purgative; by the kidneys, which it stimulates, producing diuretic effects; and by the pulmonary mucous membrane, whose secretion it liquefies, thus acting as an expectorant. It is for this last effect that squill is ordered most frequently, and it may be well combined with ipecac. The syrup and the oxymel possess reliable expectorant powers in the *chronic bronchial affections of childhood and infancy*, in 10 minim doses. It is rarely used alone as a diuretic, but is generally given with digitalis and mercury. (See page 369).

Its use is indicated in *chronic catarrhal affections* with profuse *tough* expectoration, and in *dropsies*, in the absence of any inflammatory state of the stomach, bowel, or kidneys. It is especially useful in *cardiac dropsy*.

(As an Emetic for a Child one year old).

R. *Syrupi Scillae*
 Vini Ipecac. ana ʒj. *Misce.*

St. ʒi. omni semi-hora ad effectum.

20 drops may be given every 3 hours as an expectorant.

The active principles Scillain or Scillitoxin and Scillipicrin are powerful cardiac poisons.

Scoparii Cacumina—Broom is a valuable and safe diuretic, resembling buchu and digitalis. In large doses it is an irritant to the gastro-intestinal mucous membrane, producing vomiting and purging, though only to a slight degree. It is given in cardiac and chronic renal dropsies, where no active inflammation of the kidney is present. Sparteine, the active principle of broom, has

been found to possess properties of a cardiac tonic nature, like digitalis. (See Sparteine in the Non-official Remedies).

R. *Succi Scoparii* ℥iv.
 Tinct. Digitalis ℥iv.
 Spt. Æther. Nitrosi ℥iss. *Misce.*

Fiat mistura, capiat ℥ij. sextis horis.

Senegæ Radix is an expectorant acting upon the bronchial mucous membrane, over which it exercises a stimulating influence. It is given in *chronic bronchitis* and *emphysema* when there is *profuse* adhesive discharge. Some authorities explain its effects as depending upon a stimulating action on the respiratory centre or efferent nerves, which causes continual coughing, thus keeping the tubes clear and preventing the accumulation of mucus. Others believe that it acts as a tonic to the muscular tissue in the bronchial tubes, thereby facilitating the expulsion of their contents. Its action is greatly increased by carbonate of ammonium.

It causes a warm acrid sensation when chewed, and increases the salivary secretion; in large doses it is an emetic, and may cause purging. It does not increase the amount of urine in health, but, like digitalis, it augments it in diseased conditions of the kidneys or heart. Its active principle, identical with saponin, is a powerful cardiac poison antagonistic to digitalis.

The tincture emulsifies fats and oils in quantities so small that its medicinal action may be left out of consideration; thus, three minims will emulsify half an ounce of fixed oil.

The following is one of the most popular combinations for chronic bronchitis:—

R. *Tinct. Senegæ* ℥ss.
 Tinct. Camph. Co. ℥ss.
 Ammon. Carb. ℥iss.
 Infusi Senegæ ℥vii. *Misce.*

Fiat mistura, capiat cochleare magnum quartis horis.

Senna is a valuable purgative, containing, like rhubarb, cathartic and chrysophanic acids. Entering the blood, it produces its effect upon the bowel, and it has been supposed to act in the same manner whether administered by the mouth or injected into a vein. Stockman, however, injected poisonous doses without producing any results. The small intestines are stimulated by it, and both their secretion and movements are increased; it produces thin but not watery motions, generally accompanied by considerable

gripping pain. Senna, when administered to nursing mothers, appears in the milk, where, according to Dolan, "its peculiar flavour and odour are distinctly perceptible, though it does not lessen or increase the secretion of milk." It invariably gripes the infant.

Senna should be combined with aromatics to correct the griping, and the compound mixture is a valuable method of administering the sulphate of magnesium. Senna is said to be a chief ingredient in Tamar Indien, which is a valuable purgative.

It is a safe *purgative* for children; though causing pain, ill effects are rarely seen to follow large doses.

In *dyspepsia* and *obstinate constipation* the infusion in a wine-glassful dose, to which a table-spoonful of the tincture is added, makes a powerful purgative. It acts, according to the experiments of Rutherford, slightly as a stimulant to the liver.

The syrup is an elegant, though very uncertain purgative for young children, and it may be used as the vehicle for almost any medicine ordered as a powder. 2 grs. of grey powder given in a tea-spoonful of syrup of senna is a very palatable purgative and cholagogue.

The confection is a mild and safe laxative, suitable in most cases of *chronic constipation* when given in tea-spoonful doses.

The compound powder of liquorice owes its purgative virtues to senna, and is a safe, palatable, and efficient cathartic suitable for children and adults.

St. Germain's Tea—i.e., 30 grs. Senna leaves, 15 grs. Elder flowers and Anise fruits, with 8 grs. Cream of Tartar and Fennel fruits, infused in a cup of boiling water, is an elegant and palatable method of giving senna.

Serpentariæ Rhizoma—Snake-root is a doubtful tonic, possessing feeble aromatic properties. Small doses increase the appetite and promote digestion by mildly *stimulating* the mucous membrane of the stomach. Large doses produce irritation in the stomach and bowel, as evidenced by nausea and diarrhœa.

It is employed in *dyspepsia* arising from want of tone, or atrophy of the gastric tubules, and its supposed stimulating properties have obtained for it some repute in low febrile conditions, as in *typhus*, *typhoid*, *diphtheria*, and *rheumatism*. It is supposed to act in *gout* like guaiacum.

Snake-root does not, as once believed, possess any value in the treatment of *rabies* or *snake-bites*, nor is there any evidence of its emmenagogue or diuretic properties, and it is to be regretted that this comparatively worthless drug is still retained in the B.P., where it has got several preparations.

Sevum Præparatum—Suet is a well-known fat and a nutritious article of diet, but it is introduced into the Pharmacopœia solely for its physical qualities.

Sinapis—Mustard acts as an emetic in cases of poisoning, when a table-spoonful stirred up in a tumblerful of warm water, may be administered, and warm water freely swallowed afterwards. As a condiment it is supposed to increase the appetite, though the gastric juice is not markedly increased by its local action. The active principle—the essential oil—does not exist in the seeds, but is formed on the addition of cold water to them (see page 276).

Externally, mustard is the best counter-irritant for general purposes; it differs from cantharides in the rapidity and amount of pain attending its action. When applied to the skin, mustard quickly causes a flow of blood to the vessels of the part, and if its application be continued too long, inflammation of the skin, vesication, or ulceration may follow.

The plaster is spread on a variety of fabrics, and covered with tissue paper, muslin, cambric, &c., but every requirement is met by the following rapid, cheap, and convenient plan:—

The required quantity of mustard is put into a large cup (about a table-spoonful of mustard makes a fair-sized sinapism) and as much *cold* water is poured upon it as will make a soft uniform cream, not quite so fluid as to flow or pour readily out. A sheet of paper is procured of such thickness as will readily permit the fluid part of the cream to soak through it, without becoming too easily torn. Old newspaper is the best texture for this purpose, and it should be laid out upon a table or smooth surface, the mustard cream turned out of the cup, and roughly smeared or spread over its centre. The circumferential or clean parts of the paper are folded over this, making the required shape and size of the sinapism, which is lifted off the table, and the surface which was undermost applied direct to the patient's skin.

It will be observed that the mustard does not thus come in contact with the skin, but only its moisture, which soaks through, the paper being between the skin and the cream. The sinapism should be kept in contact with the patient's body by a bandage or pad of flannel for 15 to 30 minutes. In the case of children, the mustard before being moistened, should be mixed with from 1 to 4 parts of wheaten or corn flour to dilute it. Often the question is asked the young practitioner, How long should such an application be permitted to remain? This is difficult to answer, and he should direct that, after a few minutes the edge of the sinapism be raised and the redness of the skin noticed. If it remains scarlet for a few minutes the application should be removed, but if the redness is only temporary the sinapism should be kept on longer.

A mistake is made in directing the surface to be immediately covered with cotton-wool, greased linen, &c.; it should first be always wiped dry and clean with a very soft rag; otherwise as much acrid moisture may be left on it as may produce vesication and dangerous ulceration in the delicate skin of an infant.

In making a mustard poultice, the mustard should be first made

into a smooth paste with tepid water, and then added to the mixture of crushed linseed and boiling water. By adding boiling water to previously mixed dry mustard and linseed the ferment—myrosin—is destroyed, and oil of mustard—the active principle—is not formed.

The mustard bath is a favourite method of applying counter-irritation—to the feet for *headache*; to the abdomen for *amenorrhœa*, at the time of the expected period; or to the loins in *suppression of urine*. About 2 ozs. mustard (previously mixed with a pint of *cold water*) to 10 gallons of hot water (102°) will make an agreeable bath. In a similar way it may be used as a *hot pack* in *rheumatism*, &c. (See under Aqua).

Pain of various kinds is relieved by the application of a sinapism; but, as a rule, it is aggravated if it be placed directly over the pained nerve. It should, as a general rule, be applied over the site of its origin near the spine.

Headache is often relieved by a sinapism applied over the nape of the neck, and *vomiting* stopped when it is put over the epigastrium.

The action of mustard when placed over the seat of *internal inflammations*, or over the chest and legs in case of *stupor*, is to be explained on the theory of reflex action. It is easy to see that the impression produced by an irritant on the peripheral endings of any nerve may be conducted to the nerve centre or brain, and from thence may be reflected to any other part of the nervous system; thus a sinapism on the chest may stimulate the respiratory or cardiac centres. (See under Cantharis.)

Sodium—The salts of sodium possess such close resemblance in their pharmaceutical, chemical, and therapeutical properties to those of potassium, that only a brief enumeration of them is necessary. Speaking generally, sodium salts differ in the following respects from the corresponding potassium compounds—(1) they are less caustic when used externally; (2) they *exert scarcely any depressing influence over the heart*, and hence are not poisonous in the sense that potassium salts are; (3) they are less diuretic; (4) they form less soluble salts with uric acid; (5) owing to the entire system being saturated with sodium, medicinal doses do not appreciably affect metabolism (Mitchell Bruce); and (6) they are much less diffusible.

Soda Tartarata—Rochelle salt closely resembles the tartrate of potassium, though its diuretic powers in $\frac{1}{2}$ to 1 oz. doses are so feeble that they are doubted by some. It is a very popular saline purgative, acting as a strong stimulant to the intestinal glands. Small doses have the power of rendering the urine alkaline like the potassium salts, though not so certainly.

Its cathartic action is most unreliable unless given in a full dose, so that it is a good rule to give at least six drs. Often four drs. may be administered and *no effect whatever* be noticed, while

five or six drs. may purge freely. The B.P. *maximum* dose (240 grs.) is quite too small.

1 oz. Rochelle salt dissolved in a glassful of ærated lemonade or ginger ale makes a pleasant saline purgative; or it may be taken in the form of Seidlitz powder.

Sodæ Chlorinatæ Liquor—The hypochlorite of sodium contained in this liquor is readily decomposed when it comes in contact with the weak acid compounds of the body.

The hypochlorous acid, which is given off in contact with any acid, is a powerful oxidising agent, giving off its active oxygen, which greedily attacks most animal substances, whilst its chlorine enters into combination with the hydrogen of many bodies. This solution is a strong disinfectant and antiseptic. It is also regarded as a stimulant. These varied qualities render it of use in low *typhoid conditions* and *adynamic fevers*, especially in *diphtheria* and *malignant scarlatina*.

It should be given alone with water—1 scruple mixed with 1 oz. every two or four hours.

Externally, it is an invaluable remedy as a gargle in *putrid throat affections*, in which case it may be made of the same strength as for internal use. (See *Calx Chlorinata*.)

Sodii Arsenas is really an arsenical preparation. (See under *Acid. Arsenios*.)

Sodii Benzoas is identical in action with *Acid. Benzoic*. (which see). It is used for its diuretic and antiseptic qualities in *renal* and *bladder diseases*, being excreted as hippuric acid after uniting in the body with glycocoll. It has been given in *diphtheria*, *phthisis*, *rheumatic fever*, *uræmia*, and *gout*.

Sodii Bicarbonas closely resembles the bicarbonate of potassium (which see). Like it, it is antacid, and though less irritating, it possesses greater saturating power. It has also a more soothing effect upon the stomach than the corresponding potassium salt, but it is very inferior to it as an antilithic, since the salts which it forms with uric acid are only slightly soluble. This is seen in *gout* in the deposit which forms about the joints, which consists of urate of sodium. It does harm in cases where there are phosphatic sediments in the urine. To neutralise *gastric hyperacidity*, the drug may be used in 30 to 60 gr. doses with great benefit, and even for long periods.

In the form of Vichy water the bicarbonate of sodium has been long in use as a remedy for many complaints supposed to be of *gouty* origin, and has been found to relieve *frontal headache*.

Externally, the bicarbonate of sodium has been found to possess an almost magical power when applied to painful *burns* and *scalds*. If used *immediately* after contact with great heat, what would otherwise be a painfully blistered spot is entirely relieved, and often in a few hours may be found to differ in no way from the

healthy surrounding skin. It may be applied in solution of any strength, and the salt made into a paste with water and rapidly applied to the injured part generally produces surprising results. It should not be applied if vesication has already occurred.

It is strongly recommended in *acute tonsillitis* as a gargle, or brushed over the swollen glands.

It is used in a variety of *cutaneous affections*, and 1 oz. in a pint of water, sponged over the itching skin in *urticaria* and other complaints, often gives relief; it may be combined in these cases with Prussic acid. It relieves the pain of *wasp stings*, but is inferior to ammonia in this respect.

Sodii Bromidum acts like the bromide of potassium—(page 331)—only it is less irritating to the stomach and less depressing upon the heart, and should always be preferred in *epilepsy*.

Sodii Carbonas resembles the bicarbonate, but is more caustic and more soluble. It makes a very good effervescing mixture when given with lemon juice—superior, indeed, in its sedative effect upon the stomach to any other combination, and with it hydrocyanic acid can be given. The dried carbonate of sodium is the most convenient antacid to give in pill or powder; it is nearly three times stronger than the crystallised salt.

R. *Sodii Carbonatis* ℥vj.
 Acidi Hydrocyanici Dil. ℥. xxx
 Aquæ Destillatæ ℥x. *Misce.*

Fiat mistura, cujus cpl. ℥i. cum ℥ss. succi limonis recentis tertiis horis.

The alkaline bath is made by dissolving 8 ozs. of carbonate of sodium in a large bathful of water—say about 60 gallons.

Sodii Chloridum enters so largely into every tissue of the body that life cannot be sustained when it is withheld. It is absolutely necessary wherever cell growth is rapidly going on; animals would soon die without it, especially growing animals. This explains the craving for salt which is witnessed in the case of herbivorous animals. The large amounts of potassium salts contained in their food combine in the blood with the sodium salt, which is therefore excreted along with the potassium compounds. The result is a demand for sodium chloride. Small doses are restorative and tonic; large doses (1 to 2 ozs.) are either slightly purgative or emetic.

It possesses expectorant qualities if given in 1 dr. doses—every two or four hours. It is excreted by the mucous membranes of the body. It is a certain antiseptic, and destroys the small thread-worm, *ascaris vermicularis*, when administered by the rectum ($\frac{1}{2}$ oz. in 3 or 4 ozs. of water).

1 lb. of salt and 3 gallons of water make a convenient substitute for sea-water. The brine baths of Droitwich and Nantwich owe their virtues chiefly to this soda salt ; they are of great value in *chronic rheumatism and joint diseases*.

It is used sometimes (1 to 30) as a gargle in *chronic catarrhal throat affections*, and is a valuable antidote in cases of *poisoning with nitrate of silver*, or after swallowing a *leech*. Wyman applies the dried salt mixed with three times as much elm bark and a little hyoscyamus to the os uteri in *subinvolution*, and retains it in situ with cotton-wool. It depletes like glycerin.

Betz has used chloride of sodium in *internal hæmorrhages* with marked benefit. He dissolves a tea-spoonful in half a litre of water, and administers it by the mouth at the rate of three table-spoonfuls every five minutes. Since Nothnagel pointed out the good results of common salt in *epilepsy* various observers have reported cures. 1 dr. doses may be given. In a similar way *migraine* is sometimes relieved.

The *hypodermic* injection of normal solution of salt (1 drachm to 1 pint sterilized water) into the subcutaneous cellular tissue has been advised in *cholera*, and in doses of 5 to 40 ozs. it has often saved life in *uræmia*, *hæmorrhages*, *diabetic coma*, *eclampsia*, *sepsis*, &c. The writer has injected by the aspirator needle 120 grs. of salt, dissolved in 40 ozs. sterilised water, selecting the thighs, abdomen, buttocks, and back in many instances without the least untoward results. It may be injected into the veins in urgent cases, where it gives better results than transfusion of blood. Sometimes the peritoneal cavity is selected.

Sodii Citro-Tartras Effervescens—This agreeable antacid and purgative is the official representative of the popular "Granular Citrate of Magnesia," only the latter usually contains some Epsom salt. It may be taken in table-spoonful doses, dissolved in a large quantity of water, as it seldom affects the bowel unless freely diluted.

Sodii Ethylatis Liquor is a valuable caustic, powerful and almost painless ; it is antiseptic. Brushed over *lupoid growths* and small *navi*, it causes their obliteration with very little deformity. It should be applied occasionally with a glass brush or camel's hair pencil till a scab forms, and then its application should be withheld for a few days till the scab or destroyed cuticle falls off, when it may be re-applied. If pain results, a drop of chloroform, which converts the ethylate into ether and chloride of sodium, may be laid upon the part.

Sodii Hypophosphis resembles in its action the lime salt of the same name. It has been erroneously supposed to give all the benefits of free phosphorus without any of its drawbacks, but the evidence of its usefulness in *scrofula* and *phthisis* is regarded by several authorities as somewhat doubtful.

Sodii Iodidum resembles closely the iodide of potassium, and can be tolerated by the stomach in larger doses, and could be substituted for it on all occasions with benefit.

Sodii Nitris has been found to possess similar properties to nitroglycerin and nitrite of amyl; thus, within 10 to 15 minutes after a dose of 5 grs. there follow flushing of the face, throbbing of the head, increased frequency of the pulse, lowering of the arterial pressure, &c. Dr. Hay has tried nitrite of sodium in *angina* with the most satisfactory results. He has closely studied its chemical action alongside nitrite of amyl and trinitrin, and believes that they all owe their activity to the nitrous acid contained in them.

There appears to be a decided advantage in favour of nitrite of sodium over the amyl salt in the duration of its influence, but it has the corresponding disadvantage of being slower in giving relief unless taken *before* the attack. It is used with good results in the increased arterial tension of *granular kidney disease*, especially when associated with a weakened and dilated heart, and in some cases of *aortic disease*.

It does not cause so much throbbing and headache as nitroglycerin. Lublinski has employed it in *hemicrania* and in *asthmatic complaints* of purely bronchial and neurotic origin with marked success.

The difficulty always experienced in exhibiting the nitrites in *angina* is to keep up the action as continuously as possible; the writer's method (see under Trinitrin) meets this difficulty.

Sodii Phosphas is a most valuable saline purgative, and can be safely used when most purgatives are contra-indicated—in serious cases of *enteric fever* with bowel complication. It can, owing to its freedom from unpleasant taste, be given instead of common salt in beef tea or soup. This is a most satisfactory plan of giving a mild cathartic in *fevers*; half an ounce often will be found enough, but three times this quantity may be administered; the effervescing preparation may be tried. It is also recommended in small doses for the qualities which it possesses in common with all the sodium and potassium salts—antacid, diuretic, antilithic, &c.

Sodii Salicylas. (See under Acid. Salicylic., page 305).

Sodii Sulphas—Glauber's salt is chiefly used in veterinary practice, though, by its stimulating effect upon the glandular intestinal apparatus, it is a safe and certain purgative. The experiments of Rutherford also prove that it is a moderately powerful stimulant to the liver, and it has been given in 1 dr. doses in *biliary calculi*. (See under Magnesii Sulphas). The effervescing preparation is a great improvement. Reverdin affirms that sodium sulphate in 2 gr. doses every hour increases the coagulability of the blood in hæmorrhages.

Sodii Sulphis is a weak antiseptic, preventing fermentation, like sulphurous acid. It is given in 20 gr. doses in various *stomach* affections characterised by the presence of *sarcinae* and *torulae*, and, in solution, has been used externally in various parasitic skin diseases. The hyposulphite in drachm doses has been found valuable in gangrene of the lung.

Sodii Sulphocarbolas possesses the antiseptic and antipyretic qualities of carbolic acid. It has been given in *fermentative states of the stomach, cholera, diphtheria, scarlatina*, and all the *fevers*, and in various *septic* conditions, as in *ulcerative endocarditis*, where Sansom praises it strongly.

Spiritus Rectificatus and Vini Gallici. (See under Alcohol, page 309).

Staphisagriae Semina contain four alkaloids, Staphisagrine and Delphinine, being the most important. The former is a powerful poison like curara. Delphinine acts like aconite, and when applied over painful cutaneous nerves causes numbness and tingling, and diminishes pain like veratrine. It has been used as an ointment (20 grs. to 1 oz.) in *neuralgia*. Internally it slows the pulse like aconite, and diminishes the number of respirations, causing death by asphyxia with spinal paralysis. It has been given in *asthma, rheumatism, neuralgia*, and *dropsies*, in doses of $\frac{1}{4}$ gr.

Stavesacre seeds are, however, introduced into the B.P. on account of the satisfactory power which their ointment possesses over the parasite that frequents the hair of the head. The official ointment destroys pediculi with safety. Formerly the seeds were given internally as an emetic and vermifuge, but their use is now restricted to their antiparasitic action.

Stramonium possesses properties identical with belladonna, and yields hyoscyamine and atropine. The leaves of the plant have been long used as a remedy when smoked alone or mixed with tobacco for *spasmodic* bronchial affections, chiefly *asthma*. Sawyer recommends the inhalation of the fumes produced by burning a powder consisting of 1 oz. of the powdered leaves, $\frac{1}{2}$ oz. powdered anise fruit, and $\frac{1}{2}$ oz. nitre. This somewhat resembles, in composition, Ellis's, Himrod's and Girdwood's asthma cures. The extract made from the seeds, in doses of $\frac{1}{2}$ to 1 gr., sometimes prevents the asthmatic attacks when given a few hours before the expected seizure.

Stramonium belongs to a natural group, called from their action, by Headland—Delirians. The group contains Belladonna, Hyoscyamus, Stramonium, and Datura Tatula. (See Datura amongst the Non-Official Remedies.)

Strophanthus—Fraser first called attention to the effects of this remedy upon the heart. It is a powerful muscle poison,

stimulating and afterwards depressing all striated muscle and finally arresting the heart in systole. It very closely resembles digitalis, though it is more powerful, and its effects upon the circulation are produced mainly by its action upon the heart, as it has only slight influence in causing contraction of the arterioles.

It is diuretic, but not to the same extent as digitalis, and it is also said to be antipyretic. In every form of cardiac weakness, either arising from functional excitement, valvular disease, degenerative changes, or secondary to renal affections, this remedy has established for itself a reputation only second to digitalis, and in some respects it has the advantage of that drug, as it can be given in those cases which one meets with where digitalis cannot be tolerated, and the writer has noticed that this oftener occurs in mitral obstruction, with a very narrow orifice. It only slightly accumulates in the system, and it produces less digestive disturbance, and if its effects pass off more quickly they are certainly more rapid in their appearance, and it can be easily given hypodermically. Moreover, strophanthus is invaluable as a remedy to be given in the intervals, when it is found wise to suspend digitalis, and in those cases where the latter drug causes trouble by its effects upon the capillaries. It will be found a wise and often highly satisfactory plan to give digitalis for two months, and then strophanthus, combined with Easton's syrup, for one month, in ordinary cases of failing compensation. (See under Ouabain in the Non-Official Remedies). The writer has obtained good results from the drug in *exophthalmic goitre*. The new B.P. tincture is made so weak that it has the same dose as the tincture of digitalis.

Strychnina. (See Nux Vomica.)

• **Styrax Præparatus**—This balsam resembles those of Peru and Tolu in its action, being a feeble, stimulating expectorant and antiseptic. It possesses some tonic influence over the genito-urinary mucous membrane, and has been used in *gonorrhæa*. 20 grs. may be given, made into a bolus with liquorice.

Mixed with twice its bulk of olive oil it is efficacious in *scabies*, but albuminuria has been noticed after its application.

Sulphonal is the type of a pure hypnotic, and possesses no analgesic properties. In small doses it relieves the night *sweats of phthisis*.

In cases of simple *insomnia* uncomplicated with pain it acts with much certainty, and is free from the objectionable qualities possessed by chloral. Thus experience has proved that a sulphonal habit has been very rarely observed, and though it appears to have *slight* and insignificant cumulative action, there is little necessity for increasing the dose. Sleep does not come on immediately, sulphonal being very slow in its action, and sometimes three or four hours elapse before the soporific effect begins to manifest itself. Leech drew attention to the prolonged

deferred action of sulphonal, which sometimes causes a drowsiness, which may last for a considerable part of the day following its administration. This is liable to happen when it has failed to induce sound refreshing sleep after the usual interval. This drowsiness often extends into the following night, and some patients find that it produces better effects upon the second night without taking any more of the drug in the meantime. Hence the writer only gives sulphonal in full doses every alternate night in simple insomnia. Savage, in cases of insomnia following prolonged mental strain in barristers, recommends the drug to be given where the patient can remain 48 hours in bed. There is no depressant cardiac action, and the respiration and arterioles are not influenced. The only untoward effects are those which occasionally have been observed in the nervous system. Restlessness, hallucinations, vertigo, giddiness, and confusion of thought have sometimes, though rarely, been noticed to take the place of sleep, or to remain on awaking.

Ataxia and muscular weakness, with staggering gait occasionally follow the use of the drug, and after full doses the inco-ordination has appeared to resemble drunkenness. Hæmatoporphyrin and albumin may appear in the urine.

Thirty grains should be given from 1-3 hours before retiring to rest. If a moderate dose of very hot whiskey punch be selected as the vehicle, the most unobjectionable and certain hypnotic combination will be obtained. When the alcohol is combined with it, the dose should be given as the patient retires to bed, as when given in solution its effects are rapid.

The writer generally gives it in fine powder, made up as a sandwich between two pieces of thin bread and butter, or dropped dry upon the tongue and washed down by a draught of water.

It may be given in the sleeplessness of every disease where pain is absent, and it is one of the best remedies for *simple insomnia*. In *insanity*, however, it is inferior to paraldehyde and hyoscine, in the opinion of those best calculated to judge, and in all depressed states of the mind its action is less certain. It is the best soporific for children.

Sulphur when administered in a full dose (say 2 drachms) passes unaltered through the stomach, and meeting the alkaline pancreatic secretion and bile, a small quantity is absorbed after its solution in these fluids as alkaline sulphides and sulphuretted hydrogen. This quantity, after circulating through the blood as alkaline sulphides, is excreted by the skin in the form of sulphuretted hydrogen, staining any metallic substances with which it comes in contact. Some of it is also excreted by the kidneys as sulphates, and some passes off by the respiratory mucous membrane, which it stimulates. Of the surplus in the intestine a small quantity is converted into sulphides by the bile, and acts as a mild irritant (just as sulphide of calcium would do, if administered); this

causes slight purgation, producing large, softened motions. The residue, which constitutes the greater part of the dose, acts by the angularity of its gritty particles the part of an irritant, like bran, &c., and increases slightly the peristaltic movement of the bowel, and thus aids purgation. This seems to be the most probable explanation of the internal action of sulphur in full doses. Since it exists in large quantities in the bile, sulphur will act as a restorative in some conditions of the system characterised by a deficiency of that fluid; moreover it has marked antiseptic action. Buchheim found that when sublimed sulphur was administered 15 per cent. of it appeared in the urine as sulphuric acid, but when the milk of sulphur was taken 46 per cent. appeared.

Its purgative action renders it very useful in the treatment of *hæmorrhoids*, and Neligan believed that in addition to its effect as a cathartic in this complaint, it exercises a beneficial soothing influence over the *hæmorrhoidal* vessels, whereby their calibre is diminished and the symptoms ameliorated.

It has been used as a purgative in *skin diseases*, but it often aggravates if there be active cutaneous inflammation, and it is liable to cause boils.

Sulphur is an expectorant, probably stimulating as it passes out the mucous epithelial cells of the respiratory passages, with their cilia.

Sulphur is best administered in marmalade thus:—Sulph. Præcip. ʒiss.; Conservæ Aurantii (Keiller) ʒviii. The lozenges are a convenient and agreeable method of administering the drug in *chronic constipation* with anal troubles, and in *chronic rheumatism*.

All the virtues of sulphur are found in a vegetable containing it in considerable quantity (the onion), and it will be found for every purpose the most satisfactory form for the administration of the drug. The Spanish onion, boiled for one or two hours, and eaten freely at bed-time, is a certain purgative, and possesses most decided expectorant qualities. In cases of *chronic catarrh* of the larger *respiratory tubes*, it is more efficacious than any official expectorant, probably because it contains a volatile principle in addition to the sulphur.

Sulphur has been praised as an external and internal remedy in *chronic rheumatism*, and forms a principal ingredient in the "Chelsea Pensioner." (Page 380). Valuable results are obtained in *sciatica* by carefully bandaging the entire limb in flannel after being freely rubbed and sprinkled over with a thick layer of sulphur. In these cases the drug rapidly finds its way into the system.

The sulphides have been highly commended in various *suppurative skin affections*—as *boils* and *acne*; the onion treatment has proved much more satisfactory in the writer's hands than

sulphide of calcium, which is occasionally uncertain and intolerable.

Externally, sulphur is the best treatment for the *itch*; a thorough application of the official ointment to the skin, after a hot bath and good scrubbing with soap to break up the burrows of the insect, generally proves efficacious. The pentasulphide of calcium, prepared by boiling 4 ozs. of powdered sulphur with an equal quantity of lime-putty, or slaked lime, in 40 ozs. of water, is a more certain and elegant application, known as Vlemingx's Solution. It should be lightly brushed or sponged over the affected part. It appears to act by instantly giving off sulphuretted hydrogen on coming in contact with organic matter, this gas destroying the insect. It is free from the objectionable greasiness of the ointment, and is less irritating, since no previous scrubbing or soaping is necessary.

Sulphur has been used as a local application to the false membrane in *diphtheria*, either as a gargle or insufflation; as it comes in contact with the mucous membrane H_2S is freely given off.

The treatment of phthisis by rectal injections of sulphuretted hydrogen has almost passed into disuse.

The ointment is recommended in *seborrhœa* and *acne*, and often does good when well rubbed into the indurated spots. The precipitated sulphur in a lotion is an unobjectionable way to use this remedy for *acne*, but the drug generally increases eczematous conditions unless of a very chronic type.

R. Sulphur. Præcipitat. ʒij.
Glycerini ʒj.
Aquam Rosæ ad ʒviij. Misce.

Fiat lotio. Applic. mane nocteque.

Potassa Sulphurata acts like sulphur when given in very small doses; in large doses it is an irritant poison, and produces narcotic symptoms and convulsions. It is recommended in 2 grain doses in various chronic *skin* diseases. (See Calx Sulphurata.) Externally, it is used as a bath (5 ozs. to a large bath of warm water) in *scabies*.

Sulphuris Iodidum—This remedy possesses some of the properties of the two substances entering into its name. It is principally used externally as a remedy in *parasitic diseases* and occasionally in *acne* and *scrofulous affections*. From experience of the writer in an agricultural district where *herpes circinatus* was exceedingly common (being transmitted to the human species from the cow), this remedy was found more certain than any other, scarcely ever failing to entirely remove all traces of the parasite when applied a few times to the diseased spots. It is,

however, liable to produce irritation of the skin, but this greatly depends upon the method of its preparation, the official ointment requires great care and laborious trituration, otherwise the hard, gritty iodide is left in little masses, which produce local inflammation of the skin.

Sumbul—This root is supposed to possess nervine tonic properties closely resembling valerian and musk, and has been used as a substitute for this latter drug in low *typhoid* states and *fevers*, *asthma*, *delirium tremens*, *epilepsy*, and *hysteria*. It should be omitted from the B.P.

Tamarindus—The pulp of the tamarind is seldom used alone ; it is a laxative in doses of 1 oz., increasing the peristaltic movements of the intestines. It is said to be refrigerant, and is occasionally used in fevers in the form of "tamarind whey," made by mixing an ounce of the pulp in a little boiling water, and adding the infusion to a quart of milk. Its refrigerant action may be accounted for by the vegetable acids, malic, citric, &c., which it contains.

Taraxaci Radix has long enjoyed the reputation of a tonic, cholagogue, diuretic, and laxative. As it is now obtained from the chemist, it has little therapeutic power. The tonic effects of the *fresh* juice, prepared by the patient immediately before use, or even of an infusion prepared just after the root is gathered, when the juice is bitter, are decidedly good, and it is a useful vehicle for more active tonics.

Terebene is a powerful antiseptic, disinfecting, and deodorising liquid, with an agreeable balsamic odour, and very complex chemical composition, acting like turpentine. It is used in *phthisis*, mixed with thymol and carbolic acid in equal proportions as an inhalation ($\frac{1}{2}$ dr. to 1 pint of hot water), or sprinkled over wool in an antiseptic respirator.

Internally, it has been given with success in *chronic bronchitis* and *winter-cough* by Murrell as a stimulating expectorant, and the writer has often seen its benefits in these troublesome complaints, especially when *emphysema* is present. It acts like eucalyptus when used as a spray, and is said to exert its good influence over the urinary and gastro-intestinal mucous membranes ; and Betrin reports that, applied freely on pledgets of lint and kept in contact with uterine epitheliomata, splendid results are obtainable.

10–15 minims, in thick syrup or in capsules, may be given three times daily.

The cheap disinfectant liquor sold under this name is a valuable deodoriser for the sick room.

Terebinthina Canadensis, though possessing the properties of the oil of turpentine, is only used for its physical qualities. It is largely used in the preparation of microscopic objects, and has

been occasionally given (made into a pill, with carbonate of magnesium), for *gleet* and *chronic gonorrhœa*.

Terebinthinæ Oleum externally acts as a counter-irritant. The ordinary turpentine stupe is made by sprinkling the oil over flannel cloths wrung out of very hot water, and applying them quickly to the part. In this way rapid vesication can be produced. It is powerfully antiseptic, and hæmostatic when applied to *fresh wounds*, and it is useful in *parasitic skin diseases* and *sloughing sores*.

Small doses produce contraction of the capillaries, and the vapour causes the minute pulmonary vessels to contract after inhalation, and the secretion is checked.

In large doses turpentine acts as a general stimulant, and, if it does not purge or pass off by the bowels, it causes inebriation like alcohol, and in very large doses it depresses the functions of brain, medulla, and cord, dilating the vessels, and lowering blood pressure and respiration. After circulating in the blood, it is eliminated by the skin, respiratory mucous membrane, and kidneys, acting as a diaphoretic, expectorant, and diuretic; and is useful in *bronchitis* and *hepatic dropsy*. It is apt to cause strangury and bloody urine, and should be used cautiously where the kidneys are diseased. Turpentine also possesses very decided anthelmintic properties, but must be given in large doses ($\frac{1}{2}$ oz.), and its combination with castor oil renders it much less liable to cause strangury than if given alone. The *tape-worm* is dead on its expulsion after the use of this remedy.

The vapour of turpentine is a valuable hæmostatic in *hæmoptysis*, if the air of the patient's room be saturated with it. Large doses are valuable in *internal hæmorrhages* by causing contraction of the arterioles and increased coagulability of the blood, and 20 minims every hour may save life in hæmorrhages from the bowel in *typhoid fever* and *dysentery*. For the hæmorrhage of gastric ulcer it is of less use owing to its liability to increase vomiting.

As an enema it is a valuable remedy in *tympanitic distention of the abdomen*; it excites such uniform contraction as expels all accumulations of imprisoned gas in the bowels. Turpentine has a prophylactic and curative action in cases of *gall stone*, and it may cause the solution of small calculi in the gall bladder. It has been recommended internally on account of its astringent action on the cutaneous capillaries in *psoriasis*, *eczema*, *pityriasis*, &c., and in *iritis*, in *bladder diseases*, and in the hæmorrhages of *purpura*, in which latter it is invaluable. It has long enjoyed a reputation in *typhoid* and *typhus* fevers as a stimulant in adynamic cases. Turpentine may be best given in capsules. Dr. E. Nelson gives 3 drs. of turpentine, 3 drs. ether, 1 oz. syrup of tolu, 1 oz. mucilage, and 5 ozs. Aq. M.P. in table-spoonful doses.

Oil of turpentine which has been kept some time is rich in ozone, and is considered to be a valuable antidote to the poison of phosphorus.

Theobromatis Oleum is only used as a basis for suppositories.

Thus Americanum is not used internally. It is added to plasters on account of its mild stimulating influence on the skin, and also on account of its toughness and adhesiveness.

Thymol acts as a feeble caustic, and as a powerful antiseptic. 1 gr. dissolved in 2 ozs. water makes a solution which instantly puts a stop to putrefactive or fermentative changes in any fluid to which it may be added. It is thus a more potent antiseptic than carbolic or salicylic acid; an ointment (1-8 of vaseline) has been used by Squire as a remedy in *parasitic skin diseases*. A solution of 1 part of thymol in 18 of petroleum or 15 of ether is a valuable remedy in ringworm of the scalp or beard; it penetrates into the hair follicles.

The following formula is used at the London Throat Hospital in *laryngitis* and *bronchial affections*:—Thymol, 20 grs.; spirit, 3 drs.; carbonate of magnesium, 10 grs.; water to 3 ozs. A teaspoonful to a pint of water at 150° for each inhalation.

Burns, washed first with a watery solution ($\frac{1}{2}$ gr. to 1 oz.) and then brushed with an oleaginous solution ($\frac{1}{2}$ gr. to 1 dr.), heal rapidly.

A solution in water (1 in 1,000) is used as an injection in *leucorrhæa*, and as a lotion to *wounds*, *chronic eczema*, *ozæna*, *psoriasis*, and *ulcerated throat*. Thymol gauze and lint are used as antiseptic surgical dressings, and a 1 per cent. solution is used *warm* to swill out the abdomen after operation for perforative peritonitis.

Internally, thymol has an action like carbolic acid, and also produces symptoms like those seen in turpentine poisoning. The centres in the medulla and cord are paralysed, the temperature, respiration, and blood pressure falling markedly before death. It is eliminated by the bronchial and renal surfaces. According to Brunton, these surfaces are congested, and the lungs and kidneys are inflamed in animals poisoned by thymol. The urine is often coloured green after moderate doses of the drug. It has been given in *typhoid fever*, *pleurisy*, and *pneumonia*, in doses of 25 to 45 grs.; it caused persistent diminution of temperature, and no ill effects. Good results have followed its administration in *chronic cystitis* with profuse discharge, and it has been recommended in *diabetes*. In *diphtheria*, Warren gives it in combination with chlorate of potassium, quinine, and brandy.

Bozzolo urges the administration of thymol in *cholera*. It is the only reliable method of destroying the *ankylostoma duodenale* when given in doses of 15-30 grs., repeated four times at intervals of two hours, care being taken that no solvent for the drug be administered afterwards. The B.P. dose is $\frac{1}{2}$ -2 grs.

It should never be given in solution, as it causes a burning sensation in the throat and mouth.

Volkmann's Antiseptic Liquid consists of thymol 1, alcohol 10, glycerin 20, and water 1,000 parts.

Thyroideum Siccum, and Liquor—The introduction of thyroid gland into therapeutics marks one of the most notable epochs in the science of treatment. After the recognition of *myxœdema* came the discovery that it was due to absence or disease of the thyroid gland. Thyroid grafting, injections of the gland substance, and finally the administration by the mouth of glycerin extracts, and other preparations made from the glands of sheep, were tried and proved to be entirely successful in the removal of the disease.

In a short time after a daily dose corresponding to $\frac{1}{12} - \frac{1}{8}$ of a sheep's thyroid, amelioration of all the symptoms and signs sets in, the subnormal temperature rises, and metabolism increases (for the appetite improves and the body weight falls), the facial expression changes, and the mental symptoms pass off, and the patient so improves as hardly to be recognised by his friends. The writer has seen a luxuriant growth of hair cover a scalp which had been like polished ivory.

The only danger liable to arise is in pushing the remedy too eagerly, as syncope may occur, and when full doses are administered the patient should be kept in bed. Marked acceleration of the pulse, emaciation, febrile temperature, and gastro-intestinal disturbance are proofs that the drug must be suspended, or given in smaller doses or at longer intervals. 5 mins. of the B.P. liquor in one daily dose by the mouth may be safely given at first, and increased to 10 mins. if improvement does not show itself in 10 or 14 days. 1 minim represents one-hundredth part of a sheep's thyroid. 5 grs. of the dry thyroid in pill, capsule, or tabloid is a fair dose. After the obvious symptoms have passed away, half the above maximum doses every second or third day will be found enough to keep up the improvement.

The drug has been vaunted in exophthalmic goitre, but the writer has tried it in a series of cases, and has never seen anything but harm follow, and in two cases grave injury to the patient resulted, and he believed death was hastened in one of these after a few small doses. The next brilliant discovery in this domain demonstrated that *cretinism* (dwarf growth associated with idiocy) was caused by the congenital absence of the thyroid gland, and results were soon obtained which appeared incredible. 1 to 3 mins. of the liquor may be given in such cases daily; as symptoms indicate, the dose can be increased or diminished; ordinary *idiocy* and *imbecility* and various forms of *insanity* have yielded to its administration. The drug has been successfully used in the treatment of *obesity*, but its administration requires

care. Various skin diseases, as *psoriasis*, *pityriasis rubra*, *ichthyosis*, *eczema*, *lupus*, &c., have been benefited by it. Cheron uses it in threatened abortion with hæmorrhage, and as a galactagogue. Serafine extols the thyroid treatment in *simple goitres*, especially in the form known as *struma parenchymatosa*, and many observers have reported diminution in volume, and in many cases complete cure, after the use of the drug. It acts best in recent goitres, and has little effect in old-standing fibrous ones. Gauthier has successfully administered thyroid in cases of ununited fracture. Telford Smith has drawn attention to the tendency of the bones to bend in cretins under thyroid treatment, as in cases of rickets. The drug has been recommended for hypodermic injection in *puerperal eclampsia* upon the theory that this condition depends upon defective action of the thyroid.

Tragacantha—This gum is only employed to aid the suspension of heavy metallic powders in mixtures, it swells upon the addition of water into a thick mass or mucilage, which readily diffuses through any quantity of water. In the official mucilage of tragacanth it is doubtful if the gum can be regarded as in a state of solution. (See pages 39 and 40 for Glucanth and Proctor's Paste.)

Trinitrin or Nitroglycerin acts like nitrite of amyl, but its effects are more prolonged. One or two of the tablets cause in about 3 minutes throbbing and fullness of the head, soon spreading over the entire body; the increase in the pulse rate, and of the flushing of the face, is considerably less than that resulting from amyl. The blood pressure falls, the temperature is but slightly depressed in ordinary doses, but giddiness and severe frontal headache often last for a considerable time. If the dose be increased the pulse and respiration are greatly quickened, paralysis of the motor and sensory centres of the cord occurs, the heart becomes very much weakened, and the respiration slower, and finally paralysis of the respiratory centre supervenes, and the blood assumes a dark chocolate colour, as in poisoning with nitrite of amyl and nitrites of sodium and potassium. Enormous quantities of the drug can be taken without causing serious harm to the human organism, and when it fails in relieving *angina* it is often owing to the dose being too small.

Hay believes that the activity of nitroglycerin is due to the nitrous acid which is formed by its decomposition within the body. He shows that the astonishing activity of so small a dose as $\frac{1}{100}$ gr. is owing to its being absorbed unaltered by the stomach, which decomposes to a great extent the ordinary nitrites, and the *nascent* nitrous acid formed by its final decomposition in the blood and tissues exerts a more incisive action than the nitrous acid of a nitrite. (Nitroglycerin is a *trinitrate* of glyceryl.)

Murrell found that excellent results follow its administration in *angina*, where its action, though not so prompt, is much more lasting than that of amyl. One tablet is given every 3 or 4

hours, and the dose gradually increased till 3, 4, or 6 be taken during the threatening of an attack.

☞ The writer believes that the method by which he employs this drug in *angina* will give better results than any other treatment of this serious malady. He directs the patient to break up each tablet into 6 or more portions, one of which he takes every 15 or 20 minutes during the day. There is really no difficulty in administering the drug so frequently, and patients readily adhere to the plan which saves them headache and malaise, and generally they appear unconscious of any action of the remedy when so administered save that the attacks are prevented. The writer has never failed with the drug when so employed. The plan is based upon a study of its physiological action. In cases of threatening attack, of course a large dose should be given, and the effects kept up by small ones.

It has been successfully used in most forms of *cardiac dyspnoea*, *epilepsy*, *Brighl's disease*, *neuralgia*, *tinnitus*, *puerperal eclampsia*, *asthma*, *migraine*, &c. It has been given with elaterin in *myxœdema*, and to cut short attacks of *renal* and *hepatic colic*, and *ague*. It may be given in 1 to 3 or 5 minim doses of the 1 per cent. solution. Small doses prevent *sunstroke*.

Nitroglycerin will often prevent *sea-sickness*, and the writer has noticed a peculiar effect which it sometimes produces if the treatment be commenced *after* sickness has already occurred—*i.e.*, the patient may continue to vomit but all feeling of depression and nausea disappear, and the physiological action of the drug does not take place.

Uva Ursi is a vegetable astringent and tonic, owing to its contained tannin. It contains arbutin, which, after absorption, is split up into hydrochinon in the blood, and, as the sulphate of this body, it passes out in the urine, which it darkens and renders aseptic; it is recommended in *pyelitis* and *chronic inflammatory conditions of the bladder* where there is much discharge. It has been used in *menorrhagia*, *dysentery*, and *gleet*. (See under Arbutin, in the Non-Official Remedies.)

Valerianæ Rhizoma—Valerian acts as a tonic and stimulant to the nervous system, and is especially useful in *hysteria*. It contains a volatile oil, which paralyses the cerebral nerve centres and cord, and reduces the blood pressure and slows the pulse (Brunton). Large doses of the infusion of the rhizome increase the rapidity and force of the ventricular contractions, cause an increase in the cutaneous secretion, and produce hiccough, nausea, vertigo, and slight mental disturbance. The good it effects in disease appears to the writer *to be owing to its diminishing the irritability of the terminations of the sensory nerves throughout the body*. This probable explanation of the action of valerian mentioned in a former edition of this work is supported by the results of Martel's observations; he found that a strong

decoction possessed marked *local sedative* influence when applied to *painful wounds*. He states that the inhabitants of Normandy use a lotion made from the root to relieve the pains of fractures and wounds. Binz found that a previous injection of the oil always prevented the convulsions which are produced by brucine and ammoniæ carb. owing to its sedative action upon the spasm centres.

It has been used with doubtful success in *diabetes insipidus*, *chorea*, *epilepsy*, *whooping-cough*, *laryngismus*, &c.

The salt of zinc with valerianic acid, in addition to its anti-hysterical properties, is a weak anti-periodic; and, combined with quinine and opium, is a valuable remedy in the treatment of *neuralgia*, especially if there be a tendency to show signs of periodicity, and it has been recommended in *diabetes*.

Veratrina, the alkaloid of cevadilla, is a violent irritant poison, producing vomiting and purging, with intense abdominal pain, convulsions, extreme muscular prostration, and great cardiac weakness and collapse, with a prickling sensation felt in the skin of the body. It exerts its action chiefly upon the *muscles* by producing *prolonged contraction*, which Brunton found could be removed by extremes of heat and cold. The sensory and motor nerve endings, at first stimulated, become paralysed, and the heart muscle, after slow and prolonged contraction, is arrested in systole, the pulse and blood pressure, having at first become increased, then fall markedly. The respirations, at first quickened by small doses, become slowed by large ones, and finally paralysis of the vagus and respiratory centre takes place. It is only used externally.

Veratrine, applied to the skin, paralyses the filaments of the sensory nerves, acting as a local anæsthetic, and hence has been used as an application in the form of the official ointment to various *neuralgic nerves*. The best results have followed its use in the case of the fifth nerve, and it has been found useful in *severe sciatica* and *sick headache*, when rubbed over the affected or tender nerves. Its use is generally followed by some local irritation in the skin. When it comes in contact with the nasal mucous membrane it acts as a sternutatory and an errhine.

Vinum Aurantii and **Vinum Xericum** are introduced into the Pharmacopœia for their solvent properties; the former to make quinine and citrate of iron wines, and the latter to form the menstruum for the remaining wines.

Zincum and its salts—When used externally these substances are astringent and corrosive.

The astringent quality probably depends upon their forming insoluble albumin compounds, causing condensation of the tissue elements, at the same time producing contraction of the smaller vessels. The corrosive action depends upon their affinity for

water, which they rapidly extract from the tissues, thereby causing their death. The effect varies in intensity from the powerful action of the chloride and iodide to the mild influence of the sulphate or oxide.

When administered internally, the zinc salts soon enter the blood, in which fluid they remain for a time, probably as albuminates, and are gradually and slowly eliminated in the fæces and slightly by the kidneys. After a long course of zinc medication, symptoms of chronic poisoning may show themselves, not unlike those seen in cases of lead poisoning.

Acetate of Zinc—This salt is used as a local astringent, and with some skilful practitioners is their favourite remedy in *gonorrhœa* and other discharges. The following is a valuable injection, and with six times as much *Tr. Lavandulæ Co.* constitutes the "Red Lotion" of Hospitals:—

R. *Zinci Acet. gr. xxv.*
 Tr. Lavand. Co. ℥.xxv.
 Aquæ Destillatæ ʒx. Misce.

Fiat injectio, secundis horis utenda,

Carbonate of Zinc and *Calamina* are used as mild, unirritating astringents or "drying applications" to *excoriations, intertrigo, &c.* They resemble the oxide in their action upon *eczema*.

Chloride of Zinc is used as a powerful caustic by surgeons for the destruction of *lupoid, cancerous*, and other *growths*; death has often followed its use when carelessly applied. It is best applied mixed with about three parts of dry flour, and laid upon the diseased spot. Great care is necessary to prevent its spreading to the surrounding healthy parts; this is best accomplished by sprinkling them over with plaster of Paris. Jules Felix applies for 6 to 24 hours the following in fine powder made into a putty with water:—Dry chloride of zinc, 110; starch, 37; wheaten flour, 112; corrosive sublimate, 1; iodol, croton-chloral, bromide of camphor, and carbolic acid, of each, 10. This paste is painless, does not spread, and keeps indefinitely.

The astringent qualities of the chloride have rendered it a valuable remedy in *gonorrhœa*, injected in the proportion of about 1 gr. to the ounce every two hours. It destroys the low organisms upon whose presence the disease depends. It is a powerful antiseptic and deodorant. The liquor diluted with forty times its bulk of water arrests putrefaction and decomposes all gases with which it comes in contact. It may be used as a lotion to *putrid ulcers*, in the proportion of 3 minims to each ounce of distilled water. Burnett's fluid is a concentrated impure solution.

Oxide of Zinc is chiefly used as a mild, soothing astringent in *eczema*. The zinc ointment is the best remedy for the troublesome *eczema of childhood* and *infancy*.

Internally, the oxide is found to enter the blood as lactate or chloride, and to exercise the functions of a mild astringent and sedative to the nervous system, and it has been extensively used in *epilepsy*.

In the *sweating of phthisis* the oxide has long enjoyed a high reputation, and may be used in the following form :—

R. *Zinci Oxidi* gr. v.

Ext. *Belladonnæ Vir.* gr. ss. *Misce.*

Fiat pil. mitte tales xvi. st. i. ter in die.

Sulphate of Zinc is the most popular local astringent, and is used in the following strengths in each oz. of injection:—

In *Gonorrhœa*, 2 grs.; in *Leucorrhœa*, 3 grs.; in *Otorrhœa*, 1 gr.; in *Ophthalmia*, 1 gr.

The dried salt is used as a caustic to *uterine* and other *ulcers*.

Internally, the sulphate has been found highly useful in *choera*, given in doses, beginning with 2 grs. for a child of about 7, increased to 10 grs., 3 times a day. The stomach in a very short time becomes markedly tolerant of large doses. Its use has been advocated in *epilepsy* and other *convulsive ailments*, in *bronchorrhœa* and *diarrhœa*, but with varying success.

In doses of 30 grains, sulphate of zinc is the speediest and safest emetic, and is especially useful in cases of poisoning, being quicker in its action than ipecac., and much less liable to be followed by depression than tartar emetic. It acts by irritating the nerve endings in the stomach, and hence has been regarded as the type of local emetics. It is not a safe emetic for young children, but may be given in doses of $2\frac{1}{2}$ or 3 grs. to a child one year old, when an urgent action is required, and the dose may be repeated in 15 minutes. For a child 5 years old 10 grs. may be given, followed by copious warm water draughts.

For the *Valerianate of Zinc* see *Valerian*.

Ointment of the *Oleate of Zinc* acts like the ointment of the oxide.

Sulphocarbolate of Zinc possesses the properties of the sulphocarbolates (page 458). It is sometimes used as an antiseptic lotion in *gonorrhœa* and *leucorrhœa*, 2 grs. to 1 oz.

Zingiber is a powerful aromatic stimulant, acting like capsicum and cardamoms (which see); chewed, it is a valuable sialagogue; and used as snuff, it causes severe nasal irritation.

PART V.

NON-OFFICIAL REMEDIES.

OWING to the numerous synonyms by which many of these new remedies are known, cross references are not used in this section, and the reader is advised, in looking up a new remedy, to turn to the general Index at the end of the volume.

Abrus Precatorius (Jumble or prayer beads, Jequirity seeds) have been used for granular ophthalmia. A 1 per cent. infusion applied to the conjunctiva produces intense inflammation, followed by the formation of a croupous membrane, which separates upon the third day to form and separate again in a few days, and though it has proved useful in those cases where the trachoma has disappeared and left a thick pannus, it is a dangerous remedy owing to the difficulty of limiting its action. It has been used as a paste with 4 parts of water applied to lupus, tubercular, indolent, and syphilitic ulcers. Its active principle—Abrin—has been shown by Martin to contain a very powerful globulin and an albumose. Abrin acts like ricin, and immunity to its potent action is obtained by graduating the dose, as in Behring's method. The serum from immunised animals is now used as a means of limiting the jequirital inflammation.

Absinthium—The leaves and flowering tops of *Artemisia A.* (worm-wood) have been used as a stomachic or bitter tonic in 3i. doses of the tincture (1 in 10). The French liqueur is the source of much drunkenness, and it produces, in addition to the ordinary effects of alcohol, a form of delirium tremens characterised by epileptic convulsions. Though the drug finds a place in nearly all the Continental pharmacopœias it is wisely still refused a place in the B.P. The oil powerfully stimulates the cerebral cortex, and produces symptoms like camphor followed by epileptic convulsions and hallucinations.

Artemisin is an active principle discovered by Merck in *Artemisia Maritima*. It is used as a bitter tonic, and in combination with quassin has a reputation in anorexia and with iron in chlorosis and anæmia in doses of $\frac{1}{300}$ grain.

Acetone is a colourless ethereal liquid, being dimethyl-ketone prepared by the distillation of various acetates. It is mainly used as a solvent for fats and resins. It has been recommended as an expectorant and antispasmodic in asthma, in 30 to 60 min. doses. Under the name of

Spirone, a 50 per cent. solution with 2 per cent. iodide of potassium has been vaunted in hay-fever, asthma, and various irritable conditions of the respiratory tract.

Acetopyrine (Acetosalicylate of Antipyrine) is a white crystalline powder possessing all the antipyretic and analgesic properties of antipyrine. It is useful in acute rheumatism, phthisis, and migraine, and has been recommended in gonorrhœa and bronchitis. The dose is 10 grs. in mucilage and water or in cachets.

Acid. Alpha-Oxynaphthoicum is a naphthol derivative, existing as a white, almost inodorous powder, scarcely soluble in water, though it dissolves in glycerin and oils. It costs little and has powerful antiseptic properties, being five times stronger than salicylic acid. It has been used as a disinfectant and as an ointment ($\frac{1}{2}$ per cent.) in scabies, but like the beta acid it is too irritating for internal use.

Acid. Cacodylicum contains over 54 per cent. arsenium, which is equivalent to 71.4 per cent. arsenious acid. Cacodylate of soda contains arsenium equivalent to almost 62 per cent. arsenious acid. These substances have recently been vaunted as almost specifics in many diseases formerly treated by arsenic, as tuberculosis, pernicious anæmia, leucæmia, goitre, psoriasis, &c., chiefly upon the grounds that enormous doses of arsenic can be safely and easily introduced into the system by their hypodermic and stomach administration. Thus $\frac{3}{4}$ to 1 grain of the soda salt may be given hypodermically dissolved in 15 to 20 mins. sterilised water once daily for considerable periods without danger. It is, however, advisable to stop the injections after 10 days for one week, and then begin again. $\frac{1}{2}$ — $\frac{3}{4}$ gr. may be given in pills or by the rectum. A powerful alliaceous odour soon taints the breath, and the appetite fails. The usual hypodermic dose ($\frac{3}{4}$ gr.) can be obtained in sterile glass capsules. Fraser has shown that when a salt of cacodylic acid is administered, it is absorbed and eliminated, but with the arsenic which it contains so firmly combined with the other cacodyl constituents that it does not become disassociated, and that it is thus therapeutically powerless, the arsenic ion remaining pharmacologically inert. He found that the urine of patients taking the salt did not give up its arsenic when treated by Marsh's process until its organic constituents had been destroyed by a prolonged and elaborate process of oxidation. Cacodylate of iron (1 grain doses), however, when given hypodermically, is valuable because of its base, which acts as any other iron salt will act; the cacodylate group remains incapable of disassociation, its arsenic continuing firmly united with methyl. It is thus highly probable that the cacodylates will fail to sustain their sudden popularity. Cacodyliacol, or the cacodylate of guaiacol, is injected into tuberculous joints or given by the mouth in 1—2 gr. doses. It is a dangerously unstable salt. Mercury cacodylate is also a dangerous salt, and causes irritation if injected. Magnesium cacodylate is equal in value for hypodermic use to the soda salt.

Acid. Camphoricum—This white, odourless acid is obtained by the action of nitric acid on camphor. Reichert has found that it exercises a marked destructive action upon the tubercular bacilli in the body when a solution is injected into the peritoneal cavity. It has been used in laryngeal phthisis, coryza, &c., applied as a spray or linctus in 4 per cent. alcoholic solutions. It has been given internally in cystitis and incontinence of urine, and in a host of nervous diseases, as epilepsy, chorea, &c.,

and in acne, in doses of 5 to 10 grs. Its best effects are seen in the treatment of tubercular diarrhoea, and in the night sweats of phthisis. Stockman and Hare testify to its value in this latter condition. Hare gives 20 grs. in cachets one or two hours before the sweating is expected. A $\frac{1}{2}$ per cent. solution has been used for washing out the bladder in obstinate cystitis, and 5 grs. every 4 or 6 hours will disinfect the urine in cystitis when salol fails.

Acid. Catharticum is a brown, nearly tasteless, soluble glucoside obtained from senna. It has been given to children in constipation, dissolved in sweetened water, in doses of 1 to 2 grs.; 6 grs. may be given to adults. It gripes less severely than senna. The purgative principles of senna are the magnesium and lime salts of this acid. The pure acid is unstable. It is also known as Cathartic Acid.

Acid. Cinnamicum exists in micaceous, inodorous crystals, obtained by oxidising oil of cinnamon. It is only slightly soluble in water, but is a powerful antiseptic, and possesses remarkable power of increasing the number of the white blood cells, and has been vaunted as an intravenous injection for the cure of tuberculosis. The soda salt is soluble, and has obtained, under the name of Hetol, an extensive trial in various forms of tuberculosis when given by the mouth, but more particularly when injected into the veins (1 in 20) or hypodermically into the tissues surrounding a tubercular nodule, as in lupus. Numerous reports testify to its efficacy in these cases.

Acid. Glycerophosphoricum and its many salts, according to Robin, act as powerful nerve tonics; after absorption they have an accelerating action upon nitrogen metabolism, and he believes that their use tends to the saving of nerve energy. They are formed from lecithin during the progress of digestion, and since lecithin is a constituent of the secretion of the testicle and other organs, it and the glycerophosphates have been given in neurasthenia, sexual debility, brain diseases, and neuralgias. The number of red cells is found to considerably increase under their use, but they do not supply free phosphorus to the blood or tissues.

The potash and soda salts may be given hypodermically in 5 gr. doses, and the iron, quinine, manganese, and lime salts by the mouth in similar doses 4 times a day in neuralgia, influenza, hysteria, &c. The best preparations are the syrups, of which there are two—Robin's and the B.P.C. syrups, the doses of which are 1—2 drs. *ter die*.

The glycerophosphate of calcium has been recently recommended as a valuable drug in nocturnal incontinence of urine in children in 5 gr. doses.

Acid. Glyconicum is a syrupy mass produced by the oxidation of cane sugar. It has been successfully used by Schwartz in the treatment of diabetic coma; he gives it in doses of 1 to 2 ozs., neutralised by sodium bicarbonate in 10—15 times its bulk of water, by the mouth and rectum. Large doses of bicarbonate of soda should be also administered in a similar way at the same time.

Acid. Hydrofluoricum is a powerfully corrosive liquid, readily attacking glass, and causing a deep destruction of animal tissue. The diluted acid (1 in 500) has been successfully given in goitre by Woakes, in doses of 20 to 60 minims. The fumes of the acid have been inhaled in diphtheria, but the remedy has never obtained wide trial. Garcin thought that the immunity of glass makers from phthisis was owing to the

destructive action of this agent upon the bacilli, and he treated patients by keeping them for an hour in a chamber whose air was acidified by the acid, and though he reported success, the treatment has been allowed to fall into disuse. Fluorides of quinine, ammonium, and iron have been administered in cases of splenic enlargement—5 to 30 minims of a 1 in 120 solution. Salufer is the name of a disinfectant consisting of neutral sodium silico-fluoride. Under the name Antitussin, an ointment consisting of 5 per cent. of difluordiphenyl in lanoline and vaseline, is vaunted as a specific in whooping cough. It is, however, most unreliable, and sometimes causes skin ulcers. Gaseous Fluoroform, $2\frac{1}{2}$ per cent. in water, known as Aqua Fluoroformi, has been extolled in 1-2 dr. doses in all forms of tuberculosis.

Acid. Hypophosphorosum and Syr. (See B.P.C. Formulæ; see also page 337.) The hypophosphites of lime, ammonium, iron, manganese, potash, and soda are given in 5 gr. doses, but the B.P.C. compound syrup is the best form for administration; it resembles Fellows' syrup.

Acid. Iodicum has recently been re-introduced as a mild caustic in eye surgery. With a little water and acacia it is moulded into rods which are applied to trachoma, ulcers of the cornea, &c. Recent reports demonstrate the value of subcutaneous injections of 1 grain of iodate of soda in chronic articular rheumatism.

Acid. Iodo-Salicylicum—This crystalline powder (like the di-iodo-salicylic acid) is an iodine compound of salicylic acid which possesses the virtues of both drugs. It is powerfully antiseptic, and has been given in doses of 10-15 grs. in acute and chronic articular rheumatism. The di-acid may be given in similar doses in cachets. It relieves pain and reduces temperature like the salicylates.

Acid. Osmicum or Perosmic Acid is prepared by heating metallic osmium. A hypodermic injection of 5 minims of a freshly-prepared 1 per cent. solution into the tissues over the painful spots in the course of neuralgic nerves has given excellent results. Bilroth found it to cure sciatica which had resisted treatment for years, when injected deeply between the ischium and trochanter.

15 minims may be injected, but the solution should be freshly prepared. The writer injects deeply 1 to 2 minims in 5 or 6 places over the course of the sciatic nerve in sciatica. It has been injected into strumous glands, cancers, and goitres, and deeply into the muscles in lumbago and muscular rheumatism, but with varying success. Wildermuth has reported the results of two years' trial of the drug in many cases of intractable epilepsy. In some, marked amelioration of the symptoms occurred. He gave the aqueous solution, but found better results from $\frac{1}{84}$ gr. osmiate of potassium in pill, 15 of which was the maximum daily allowance. No ill effects were noticed.

Acid. Picricum (Trinitro-phenic Acid)—A yellow substance formed by slowly mixing carbolic with fuming nitric acid; it is known as Picric or Carbazotic Acid, and is used as a yellow dye. It has been introduced as a test for sugar and for albumin in the urine; a saturated solution of the acid in water throws down a cloud, even when the albumin is in small quantity. It is of great value in burns and scalds, when applied on lint soaked in a watery solution of 1 in 200, and the parts bandaged in wool; the dressing need not be changed for two days, and no impervious covering should be placed over the lint, the solution being allowed to dry by

absorption and evaporation. The same method should be used in treating acute eczema, which rapidly heals under this plan.

It has been tried in erysipelas, apparently with some advantage. The saturated solution should be painted over the affected parts. Its administration generally produces yellowness of the skin. Dr. H. Monypeny gives 1 gr. doses as a bitter tonic, and reports favourably of it.

The picrate of ammonia in 1 gr. doses has been reported as successful in exophthalmic goitre and malaria.

Acid. Pyrogallicum, or **Pyrogallol**, constitutes the white feathery crystals which sublime upon heating gallic acid. It is a powerful antiseptic from its affinity for oxygen. Introduced by Jarisch, it has been found useful in the form of his ointment (1 dr to 1 oz. of lard) when brushed over the patches of psoriasis. If applied in concentrated form it is a powerful local irritant, and has been used to cause the destruction of epithelial cancers, chancres, lupus, &c. It stains the skin and hair dark, though not so deeply as goa powder.

$\frac{1}{8}$ grain in solution every hour has been proved useful in internal hæmorrhages, but it is a *dangerous* drug, and should never be administered internally. Alarming symptoms have followed the application of the ointment, which should only be applied to limited surfaces, and several deaths have occurred in psoriasis from its use. It breaks up the red blood cells, and causes hæmoglobinuria and jaundice. Vidal applies it in powder mixed with four times as much starch, and blown upon phagedenic chancres, or applied as an ointment (1 in 6). The writer has ceased to employ the drug, even externally, owing to its dangerous properties, and he has seen sloughing follow its use. (See under Pyrogallol Oxide.)

Acid. Quinicum obtained from cinchona is a crystalline soluble white substance, which becomes changed into benzoic acid in the system, which then unites with glycocholl. and is finally excreted as hippuric acid. The formation of uric acid is markedly diminished under its administration in 5 gr. doses. It has been used in gout, and the reports of many Continental observers are striking. The following compounds are recently introduced—Urosin (Lithium quinate), Urol (Urea quinate), Sidonal (Piperazine quinate), Quinotropine (Urotropine quinate). These may be given in 15 gr. doses in all gouty conditions. The most recently introduced compound of this series is the new Sidonal—which is the anhydride of quinic acid, it very markedly diminishes the amount of uric acid secreted.

Acid. Scleroticum is one of the active principles found in ergot. It is doubtful if it will cause contraction of the uterus, and the results attributed to its action have been caused by other principles of ergot which were incorporated with it. When injected hypodermically it causes spinal paralysis. It may be given hypodermically in doses of $\frac{1}{2}$ gr. dissolved in 5 minims of water. The solution must be fresh; the substance itself is very hygroscopic.

Acid. Trichloraceticum is a crystalline antiseptic body soluble in water. Applied to the skin, it acts as a powerful but comparatively painless caustic. 1 per cent. solutions destroy nearly all forms of bacterial life without causing irritation of the skin, and have been found useful as a dressing for wounds, ulcers, venereal sores, erysipelas, gonorrhœa, &c.

Internally, 2 to 5 grs. of the acid in dilute solution have been recommended in diarrhœa, gastric catarrh, and gastric cancer.

Excellent results are reported from its use in the concentrated form when applied as a caustic in chronic pharyngitis. A 50 per cent. solution is used like cold nitric acid as a test for albumin in the urine, and under the name Acetocaustin it is introduced as a caustic. Mono and dichloracetic acids are also used as caustics.

Acid. Trichlorphenicum, known as Trichlorphenol, is derived from carbolic acid and exists in acicular crystals. It is stated to be 25 times stronger than carbolic acid. It is insoluble in water, but forms soluble salts with alkaline bases which have been used as antiseptic dressings and as disinfectants, being much stronger than carbolates. The magnesium salt, 4 grs. to 1 oz., has been used in conjunctivitis and purulent ophthalmia. (See under Paramonochlorphenol.)

Aconitum Ferox, known in India as Bikh, is the root of a plant allied to the *A. Napellus* but more highly toxic. A tincture and liniment prepared from the root have been employed for the same purposes as the B.P. preparations. The chief interest and importance attached to Indian aconite lies in its being the source of a crystalline alkaloid called Pseudoaconitine. For similar reasons Japanese aconite (*A. Japonicum* or *A. Fischeri*) is mentioned here as being the source of Japaconitine. These two alkaloids are closely related to Aconitine B.P., but are not identical with it. Cash and Dunstan, in a recent elaborate research, have proved that though the three alkaloids possess distinctly different constitutions their pharmacological action may be taken as qualitatively identical when the dose is accurately graduated. Thus taking aconitine as 1 the dose of pseudoaconitine should be only .4, and that of japaconitine .85. In these proportions the action of all three may be taken as identical, and these authorities recommend the use of the alkaloids in dilute solutions instead of the official Galenical preparations of aconite.

Aconitum heterophyllum is employed as a bitter tonic in India under the name of Atis. Benzaconine, a hydrolytic product of aconitine, has an antagonistic action to aconitine upon the heart; it is the chief constituent of Napelline, and in toxicity is only $\frac{1}{100}$ that of aconitine. Aconine has only $\frac{1}{8}$ the toxic power of benzaconine, and it powerfully strengthens the heart beat. Pyraconitine and Methylbenzaconine are derivatives of aconitine obtained by expelling the acetyl group, and in the latter substance a methyl group takes its place. These changes in the constitution of both bodies very materially remove their toxic powers.

Oleandryne is an oleic acid combination consisting of the alkaloids aconitine, morphine, atropine, and veratrine dissolved in oleic acid, used in various strengths as a substitute for aconite liniment.

Actol, or lactate of silver, has been introduced by Cr  d  , who has found the drug to be as powerful almost as corrosive sublimate in destroying germs. He injected the remedy ($\frac{1}{8}$ gr. in 7 mins. water) into the subcutaneous tissue of the abdominal wall in hopeless cases of anthrax with success, and also in a more dilute solution in erysipelas with similar results. The injections should be made under cocaine. 1 grain in 10 ozs. water may be used as a gargle or lotion, and 2-5 grs. to 10 ozs. may be injected in gonorrh  a.

Adonis Vernalis resembles digitalis in its action; it contains a glucoside—adonidin—which has been given in cardiac diseases, where it has strengthened the ventricular contractions, and reduced the frequency and increased the strength of the pulse, with very little action upon the

arterioles. It is not cumulative. It is doubtless a remedy of great power, but it is doubtful if it will accomplish in failing compensation as good results as digitalis. It is, however, more rapid in action, and it can be given in the intervals when digitalis is suspended. One table-spoonful of an infusion ($\frac{1}{4}$ oz. to 10 ozs.) should be given every three hours. The drug has been recommended in epilepsy with bromides.

Merck's Adonidin should be preferred to the crude drug; it is hygroscopic, but keeps well in chloroform water. $\frac{1}{10}$ gr. may be given 4 or 6 times daily.

Æsculus Hippocastanum, or horse-chestnut, has been recommended in diseased conditions of the rectum and anus, as in painful hæmorrhoids, especially where there is little bleeding and no constipation. Mayhoffer has found it effective in pharyngo-laryngitis.

Æsculin, a glucoside from the rind of the fruit, has been recommended in malaria; and Æscorcin, a derivative from it, is used to detect defects in the cornea owing to its temporary red staining (10 per cent. solution).

Æthyl Bromidum, Bromide of Ethyl, or Hydrobromic Ether, is a liquid obtained by distilling a mixture of phosphorus, alcohol, and bromine. It has been extensively tried in America as an anæsthetic, especially in ophthalmic and dental practice. Its action upon the heart and respiration is the same as that of chloroform, from which it differs in the *rapidity* of its action (1 to 3 minutes) and the *promptness* with which patients come from under its influence; it has, however, the drawback of being more irritating to some patients. It certainly has been demonstrated to be more dangerous than chloroform or ether, and as a general anæsthetic its use should be abandoned. It is especially dangerous when phthisis, renal, or cardiac disease is present. It is decomposed readily by light; it should be perfectly colourless. With some operators about 45 minims poured on a folded towel and placed over the patient's face cause anæsthesia in 1 minute. Chloroform is then poured on, and the narcosis kept up by this latter drug. It is not inflammable, and is valuable for its *local* anæsthetic effect, which can be produced by simple contact with a little of the liquid on lint, covered or not with oiled silk, or better still by being sprayed upon the part by a spray producer, though freezing of the part is unnecessary. It has also been administered internally as an antispasmodic. It should not be confounded with Ethylene Bromide.

Kelly has shown that it is so frequently found impure as to be unfit for use. He speaks well of the pure drug in throat surgery, but points out the dangers of its action in general surgery.

Æthyleni Bromidum, or Bromide of Ethylene ($C_2H_4Br_2$), formerly tried as a general anæsthetic, but now discarded because of its dangers, should not be confused with Bromide of Ethyl. It has been given in the capsular form (1-2 mins.) for epilepsy. (See page 513.)

Æthyl Chloridum or Hydrochloric Ether is a colourless, ethereal, inflammable gas, easily condensed into a liquid, closely resembling sulphuric ether in its action; it is introduced as a local anæsthetic for neuralgia, toothache, and minor operations. It may be used in the form of a spray, or by being expelled through a capillary tube in a fine jet it soon produces insensibility in the area to which it is applied, by causing rapid freezing of the skin, the heat of the operator's hand being sufficient to expel the liquid gas. The skin should be carefully freed from grease before applying the liquid, which should be held about 6 or 8 inches from the

part to be frozen. Narcotile, Sœmnoform, Coryl, Anestile and Anæsthol are fancy names given to mixtures of this substance and methyl chloride (which see) sold for local anæsthesia in screw tapped cylinders. Chloride of Ethyl has recently been used as a general anæsthetic by allowing the spray to issue into a funnel-shaped compress held over the mouth.

☞ This substance is also known as Kelene and as Muriatic Ether. Chloride of Ethyl is wrongly used as a synonym for Ethidene Dichloride.

Æthyl Iodidum, or Hydriodic Ether, is a liquid prepared in the same way as ethyl bromide, by substituting iodine for bromine. It has been tried with success in cardiac dyspnœa and in spasmodic affections of the larynx and bronchial tubes, and has been used as an inhalation in bronchitis and catarrhal laryngitis, in syphilitic ulceration affecting any part of the air tract, in laryngeal tuberculosis and pertussis. It is an expectorant, and often gives relief in asthma, by cutting short the attack or rendering the breathing easy and deep. It should be used like nitrite of amyl, and can be had in glass capsules, 5 mins. in each, as recommended by Martindale. It affords the best method of saturating the system rapidly with iodine, upon which substance the activity and efficacy of its action to some extent depend; 3 or 4 capsules may be used at once. When painted on the skin and covered with wadding and oiled silk it is rapidly absorbed, and the system may be saturated with iodine in this manner.

Agaricus Albus, White or Purging Agaric, is a fungus growing upon the old trunks of the larch.

15 grs. of the powdered fungus, or $\frac{1}{2}$ gr. Agaricin or Agaric Acid (a white crystalline powder) has a very decided action in checking the night sweats of phthisis. It was formerly used as a purgative, and in large doses causes watery stools; in small doses it checks diarrhœa and dysentery, and is useful in hæmoptysis; it diminishes the secretion of the bronchi and mammæ.

After copious sweating is checked by agaricin, the cutaneous and pulmonary discharges remain unaltered, the urinary organs discharging the surplus of liquid, and the diminished thirst decreasing ingestion of liquids. Moderate perspiration yields to a single $\frac{1}{2}$ grain dose, whilst profuse sweating requires repeated equal or increasing doses for its suppression, the physiological action of the drug manifesting itself five hours after its exhibition without any undesirable symptoms. It is best given in the pill form with a grain of Dover's powder.

Agathin is a compound of salicylic aldehyde with methylphenylhydrazine, in greenish-white insoluble scales. It is used as an anti-neuralgic and anti-rheumatic agent where salicylic acid is indicated, as in acute rheumatism, sciatica, &c., in doses of 8 grs. *ter die* in cachet or in lemonade. Its anodyne action does not show itself for two or three days.

Airol, Airoform, and Airogen are the names given to Bismuth oxy-iodide-gallate. It is a light greenish, tasteless, insoluble powder, possessing powerful antiseptic properties, and has been dusted over foul ulcers, operation wounds, chancres, intertrigo, &c., as a substitute for iodoform, and injected as an emulsion with glycerin (10 per cent.) in gonorrhœa. Thibault has recently shown that airol is not a definite chemical compound, but consists of a mixture of bismutho-gallic acid and tri-iodide of bismuth.

Ibit is one of the newest bismuth substitutes for iodoform; it is the bismuth oxy-iodide-tannate, and is said to be applicable in all cases where iodoform is indicated. It is probably not a definite compound.

Albargin is a light yellow soluble powder containing 15 per cent. of silver. It is a compound of silver and gelatose—a substance derived from glue. It is introduced as a gonorrhœa remedy, and is said to be superior to protargol in many respects. It is injected in solution 1 in 500 *ter die*.

Alembroth Salt, or Ammonio-Mercuric Chloride, is the substance formed when solutions of corrosive sublimate and sal ammoniac are mixed together. It exists in rhombic prisms, which are very soluble in water, and which do not very readily combine with albumin. For this latter reason it is prized as an antiseptic dressing, being much less irritating than solutions of pure sublimate. It is the salt which some authorities recommend for hypodermic injection in syphilis. Bloxam uses the following solution for this purpose:—32 grs. sublimate, 16 grs. chloride of ammonium, in distilled water 2 ozs.; the dose of which is 10 minims. (See Author's "Dictionary of Treatment," page 921.) 3 grs. sal alembroth contain 2 grs. sublimate. As a dressing it is generally used in the form of gauze containing 1 per cent., and coloured blue by aniline. The pink gauze—Eucalembroth—contains in addition eucalyptus oil.

Allium, or Garlic.—The volatile oil—Sulphide of Allyl—obtained from the clove of garlic is a powerful expectorant of the stimulating class, and markedly increases the bronchial secretion, and renders it less difficult in being expelled. Garlic appears to act like the onion (see page 461) upon the bronchial mucous membrane during the process of excretion by this channel. It is valuable also as a rubefacient in bronchitis, and is a certain anthelmintic, killing the round worm. It is a powerful antiseptic, and in the concentrated form will produce vesication, purging, and vomiting. The oil is not given internally, owing to its irritant qualities, but the fresh juice in 30 minim doses, or the tincture of the bulblets (1 to 5) in dessert-spoonful doses, will act as a valuable expectorant and diuretic; $\frac{1}{2}$ oz. of the syrup of the U.S.P. is the most agreeable preparation.

Sejournet injects allyl sulphide into the supraspinous fossa in phthisis. 1 min. is dissolved in 2 drs. sterilised olive oil, and of this 20 mins. are injected every day.

Althæa, or Marshmallow Root, has been long recognised as a valuable demulcent and emollient, and enjoys great popularity in bronchitis and catarrhs. The entire plant—leaves and young branches—made into a fomentation (4 ozs. of the dried herb to 1 pint), has been used to prevent suppuration and to relieve pain and tension in the inflamed mammary gland and in various acute joint affections. An ointment made by boiling the chopped leaves in lard (1 to 1) and straining has been in use for a variety of skin affections, and has been recommended in the treatment of palmar psoriasis.

Althein is a crystalline body identical with *Asparagin*, and may be obtained from the root of marshmallow and asparagus. It possesses diuretic qualities, and is, in medicinal doses (2 grains dissolved in 4 drachms of water) a remedy in cardiac dropsy, Bright's disease, and gout, which has given results worth further trial.

Alumen Ammonio-Ferric. or Iron Alum.—This pale violet-coloured salt is an ammonia iron-alum, in which ferric oxide replaces oxide of aluminium.

It possesses stronger astringent properties than ordinary alum, is more soluble and less irritating in small doses, and may be used where an

unstimulating iron salt is indicated with a good astringent. It is useful in hæmorrhage from the kidneys, and especially in intermittent hæmaturia; 5 to 10 grs. given four times a day will sometimes be found to diminish the albumin in Bright's disease. 1 dr. to 8 ozs. water makes a good astringent gargle in relaxed and inflamed conditions of the throat.

Aluminium Aceto-Tartrate is very readily soluble in water; it has a pleasant taste, and is not poisonous. A solution known as Alsol has been long used as a disinfectant. It possesses powerful antiseptic properties, and is more stable and easily prepared than the Acetate of Aluminium, which is a much less powerful antiseptic. The Liq. Aluminii Acet. P.G., 1 in 4, in orange flower water is the astringent mouth wash used at Aix during inunction treatment. See "Dictionary of Treatment," page 918.

Aluminium borico-tartrate (or Boral) and the tannate (or Cutol) are used as ointments (10 per cent.), or powders in eczema, ulcers, &c. The soluble tannate or Tannal, and the corresponding Gallal, are useful when tannin is indicated. (See also under Salumin.) The Caseinate has recently been used as an astringent (4-5 grs.).

Alummol is the name given to an aluminium naphthol sulphonate in the form of a white soluble powder. It is a powerful astringent and precipitates albumin, but the ppt. is soluble in excess. It is powerfully antiseptic, and 1-2 per cent. solutions are used for otitis, gonorrhœa, leucorrhœa, conjunctivitis, endometritis, and 5 per cent. ointments for ulcers and chancres. A 20 per cent. solution is used as a caustic. Sozal is the name given to a similar aluminium substance prepared from phenol; it possesses similar action. Boroformate of aluminium has the same action and indications as alummol.

Amyl or Anodyne Colloid, is a thick liquid used for painting over the course of painful nerves in neuralgia, sciatica, &c. It is prepared by dissolving 6 grs. veratrine, 1 gr. aconitine, 1 oz. hydride of amyl (Pentyl hydride) in 1 oz. collodion.

Amyl Salicylate is introduced as a substitute for methyl salicylate—the synthetic oil of wintergreen. It is much less irritating, and its odour is mild. It is applied externally over rheumatic joints and then covered with wool, and it is given in 5 min. doses in capsules.

Amylene Chloral, also called Dormiol, is an oily pungent liquid obtained by acting upon chloral with amylene hydrate. All that is said of the following remedy may be applied to it only that the dose is considerably less—15 mins. being an average amount for one administration. It is much praised in the insomnia of mental diseases, and Hoppe reports most favourably of it in the status epilepticus when given by the rectum in 40 grain doses in water.

Amylene Hydrate is a colourless tertiary alcohol acting like chloral, but with little depressing effect upon the heart. There is little or no preliminary excitement, sleep occurs often in a few minutes; it seldom fails in its action even in those accustomed to narcotics, and no after ill consequences follow on awaking. It may be safely given to children. To adults it may be given in doses of about 50 minims in claret or suspended in a flavouring syrup, or it may in the same dose be administered by the rectum, or given in capsules. Its strong taste and smell, and its high cost, are barriers to its use. No ill effects have been noticed after doses as high as 2 drs., but occasionally symptoms resembling alcoholic poisoning have

been recorded. It has been used successfully in delirium tremens, mania, &c., and Wildermuth has obtained excellent results in epilepsy of a severe type where bromides fail, also in petit mal and in pertussis. It should not be given in epilepsy till a considerable interval after the cessation of bromide treatment. It has been recently found to remarkably relieve the thirst in diabetes insipidus in small doses (15 min. *bis in die*). The drug is also known under the name of Dimethylethyl-Carbinol.

Amyli Iodidum consists of iodine 5 parts, triturated with a little distilled water, and rubbed carefully with wheaten starch 95 parts. It is used as a means of administering iodine, and may be given in doses of 2 drs. rubbed up in milk or water. It can be employed as a dry dressing in every case in which iodoform is indicated. It has also been recommended as an antidote in poisoning when the nature of the poisonous drug is unknown. (Similar compounds with bromine and chlorine are prepared, and they may be taken in similar doses; they are known as bromide and chloride of starch.) Iodide of Starch Paste is made by boiling starch 1, glycerin 2, and water 6, and when cold adding $\frac{1}{2}$ part liniment of iodine. It is used as a poultice to foul syphilitic and other ulcers.

Andrews and Goettsch have recently pointed out that the composition of starch iodide varies with the heat employed in making the compound.

Anacardium or Cashew Nut.—The oily liquid obtained from the pericarp has been held to be a cure for leprosy. It contains 90 per cent. of anacardic acid. Internally it has been given as an anthelmintic, but it is chiefly used as an external application to ringworm and leprous ulcerations. It has been seldom employed in this country. Cardol, its active principle, is used as a blistering oil.

Anæsthesin or the ethyl ester of para-amido benzoate is a tasteless white powder with marked local anæsthetic action. 5 grs. in wafer relieve gastric pain, and the same amount in a suppository relieves rectal tenderness and pruritus. It is suggested as a dressing to ulcers, used like iodoform. Kassel uses it in laryngeal cases by means of a steam inhaler, and he affirms that it is non-poisonous and effectual.

Analgene is a substance analagous to antifebrin, but derived from the chinoline group. It is introduced as an analgesic, and it is claimed for it that it has no drawbacks, but its sparing solubility and the red discoloration of the urine which it produces are objections. It is indicated in every condition in which antipyrine is used, and good results are claimed in rheumatism, neuralgia, hysteria, and asthma. The dose is 10 grs. *ter die*.

Aneson, or Anesin, is a new local anæsthetic consisting of a 1 per cent. solution of acetone-chloroform. It is claimed to be about equal to a 2 per cent. cocaine solution, and to be devoid of all irritating qualities. It has been used in the removal of small tumours, in teeth extraction, and in eye surgery. Acetone-Chloroform, or Chloretone, possesses hypnotic qualities, and may be given in doses of 10 to 15 grs. in cachets. It is in white acicular crystals.

Anhalonium Lewinii is a plant of the cactus order, the tops of which are known as mescal buttons, and are used by the Mexican Indians to produce intoxication. About 4 of the buttons cause pleasing mild delirium, with visions of beautiful kaleidoscopic colours. The pupils dilate, and the muscular power is diminished, but the organic functions

are not disturbed. The blood pressure rises and the pulse is slowed owing to the powerful strengthening of the cardiac muscle. Mescal contains 4 alkaloids more or less similar in action. A fair dose will be 1 grain of these total alkaloids, which has been found to act as an hypnotic in insomnia, but vertigo, headache, and nausea follow its use. Smaller doses may be given in fatty and dilated conditions of the heart. Tinctures made from the buttons appear to be worthless.

Anilipyrine is a white and very soluble powder, obtained by fusing two parts of antipyrine with one of antifebrin. It possesses all the advantages of both remedies as an antipyretic in rheumatism and influenza, and as an analgesic in migraine and neuralgia, in doses of about 12 or 15 grs.

Anthrarobin is a yellowish-white powder produced by reducing alizarin, into which it readily changes by absorbing oxygen. Liebermann introduced it as a substitute for chrysarobin in psoriasis. It does not stain or irritate, but some authorities deny its usefulness. It is applied as an ointment (1 in 8), or as lotion 5—10 per cent. in alcohol.

Antiseptin is the name given to Monobromphenyl-acetamide—an antifebrin compound with bromine in the form of white, tasteless crystals, which are antipyretic and analgesic, in 10 grain doses. The drug does not seem to possess any advantage over antifebrin. It is not to be confounded with Antiseptin, which is a mixture of the sulphate and iodide of zinc, boric acid, and thymol.

Antiseptol is a brown, insoluble powder without odour. It is the iododisulphate of cinchonine and contains 50 per cent. of iodine, and is introduced as a substitute for iodoform on account of its cheapness and freedom from odour. Shoemaker used it in the form of an ointment (1 dr. to 1 oz.) for lupus, ulcers, &c. Internally it has been given in doses of 1 to 5 grs. in phthisis, scrofuloderma, lupus, syphilis, and psoriasis.

Antithermin, or Phenyl-hydrazin-lævulinic Acid, is a coal tar derivative. The anhydride only is used in medicine, and it possesses properties closely allied to antipyrine; thus it reduces fever heat, and has powerful analgesic qualities. It causes irritability of the stomach and vomiting; the ordinary dose in tabloid form is 5 to 7 grains.

Antitoxines—The introduction of the various serums in the treatment of certain parasitic diseases marks the most brilliant epoch in therapeutics. Only the briefest reference to this great subject can be made in the limited space available in this portion of the present volume.

Antidiphtheritic Serum—It is needless to detail the various steps which led up to the great discovery of Behring, who demonstrated that an animal may receive gradually increasing doses of the living cultures, or of the sterilised chemical poison of diphtheria, till complete immunisation has been established. This had previously been demonstrated by Pasteur in the case of anthrax and other diseases. Behring, however, went further and found that the blood serum of the protected animal was capable of affording immunity to another animal, and finally, by experiment, he proved that the serum was *curative* when administered to an animal already poisoned by the original virus or its chemical poison. Upon such experimental data is founded the new Serumtherapy of diphtheria, tetanus, snake bite, &c. The animal immunised against enormous lethal

doses of the poison is bled, and the strength of the serum is determined so as to provide for suitable dosage.

Behring was able to protect animals to such a degree against diphtheria that $\frac{1}{15000}$ part of 1 c.cm. (= nearly $\frac{1}{10000}$ part of a drop) of their serum mixed with a fatal dose of diphtheritic toxine, when injected into a guinea-pig, produced no effects whatever. The same dose without the serum always killed the control animal.

Klein, commenting upon these marvellous results, states—"I venture to say that nothing can be found in the whole range of experimental pathology or pharmacology which offers clearer or more striking results than these experiments."

The dose of the antitoxine is stated in units, the unit now recognised being the amount of antitoxine capable of neutralising 200 fatal doses of toxine. The student will observe that the dosage of the serum is thus settled by its strength and not by its bulk. One sample may differ from another, but the requisite number of immunising units must be administered regardless of the bulk of the dose. 8,000 to 10,000 units are administered in *severe* cases and in *late stages* of the disease to patients of all ages from infancy to adolescence, and this dose may be repeated every 8 or 12 hours. A 5,000 unit dose may be considered an average in ordinary cases. The various serums, dried or liquid, should state on the label the number of units contained in the bottle, and no serum should be used which does not bear this information. Experimental results prove that the efficacy of the antitoxine depends upon the shortness of the time between the administration of the poison and the remedy. When the poison has been forming in the throat of a patient, and absorption has been going on for days, enormously more serum is required than if the injection had been resorted to upon the first appearance of the membrane. Hence the great increase in the mortality of serum cases where delay in injecting has been marked, and it must not be forgotten that the treatment has its limits, and the antitoxine may be useless when administered in almost any amount in cases where the system has been long saturated with the poison before the remedy is used. But as it is harmless it should always get a trial, even in the worst and most delayed cases. Sometimes pyrexia, rashes, and articular pains are noticed after the injection. The mortality of diphtheria has fallen to about half what it was before the serum treatment, judging from the statistics of all countries, though the fall is much less in England than upon the Continent and in America, and it is a significant fact that the mortality is lowest where the dosage is largest, and where the treatment is resorted to early. There is nothing so striking in the results as the total change in the clinical picture of laryngeal cases. Where tracheotomy was formerly fatal, under the serum it is largely robbed of its dangers in those cases where it is still necessary.

After a full dose the membrane ceases to grow and soon disintegrates, and general improvement rapidly sets in. Laryngeal cases require larger doses. Antiseptic precautions should always be taken, and the abdomen or flank or back affords the best site; the serum is useless when given by the mouth or anus. The liquid serums are to be preferred to the dry preparations.

The serum is protective, but the protection lasts only a short time; nevertheless, recent reports prove that injections of 200 units in schools and dormitories give excellent results in outbreaks of the disease.

Belfanti extols an injection of 5 c.c. hypodermically in all cases of

ozæna, and reports of the good effects of injections in asthma, typhoid fever, and phthisis have been published.

Antitetanic Serum, prepared upon the same principles for tetanus, has now been extensively tried. Experimental evidence proves its wonderful efficacy, but in practice the results are disappointing, owing to the fact that the microbe has been manufacturing and discharging its virulent poison into the system for a long time before the symptoms give any warning of the disease, and then it is either too late to administer the drug, or it will require enormous amounts of the serum to be of any use. Statistics are not yet sufficiently numerous for safe conclusions, but the serum should always be used. The Jenner Institute serum is of the strength of 1 to 5,000,000, and the dose is 10 to 20 c.c. Behring's dry serum is given in doses of 80 grains, and Tizzoni's in doses of 40 grains.

There is little good to be expected from small doses, and the results are more hopeful in those cases where the symptoms do not come on abruptly. In severe cases the serum must be administered by slowly injecting it deeply into the brain substance after drilling a hole in the cranium over the centre of the motor area under rigid aseptic conditions. D'Ancona injects the serum into the cerebro-spinal cavity by lumbar puncture. Local treatment, as excision of the wounded area, when possible, should be resorted to. Prophylactic treatment, by injecting a small dose after the receiving of wounds, contaminated by clay, soil, or dust, would probably be certain. The serum is not antibacterial as the tetanus bacillus will flourish in it, and the same is true of the antidiphtheritic serum.

Antityphoid Serum—This agent, as regards experimental value, is in a different position from the two previously-mentioned remedies, and reports of the use of the serum are still most contradictory and somewhat disappointing. Nevertheless, if the serum be administered at the very early stage of the disease, before the typhoid bacilli have had time to reach their fullest development, there is fair reason to hope better results, especially as the antityphoid serum is believed to act by its *bactericidal* and not by *antitoxic* properties. About 3 drs. of the serum may be given daily. The reports of Wright prove that the serum is prophylactic to a considerable degree, about 15 mins. of the Netley serum reducing the incidence of the disease from 14 to 2 per cent., whilst the mortality in those previously inoculated who soon afterwards catch the disease is reduced by about 50 per cent.

Antistreptococcic Serum has been reported upon favourably in erysipelas, surgical and puerperal septicæmia, pyæmia, scarlatina, &c. It resembles the last-mentioned serum in as much as its action is not strictly antitoxic but bactericidal, and the results are not to be compared with those obtained by the antidiphtheritic serum, which is a true antidote to the toxine producing the symptoms. An inherent difficulty lies in the fact that different streptococci may be at work in producing the diseases mentioned, and it has been demonstrated that the serum prepared from one variety will not protect against a different streptococcus. This is the probable explanation of how in one case the remedy will save life, whilst in the next it will be useless.

The writer has seen a case where erysipelas was conveyed to an infant a few weeks old from its mother; the symptoms of the disease were daily anticipated, and immediately upon their first appearance full doses of the dried serum were daily, and sometimes twice daily, administered without

the least result in retarding a fatal issue. It seemed a typical case for trial of the efficacy of the remedy, but probably liquid serum might have given different results. 30 c.c. should be given immediately, and half this amount every 6 or 12 hours till the improvement manifests itself. The serum has been reported as giving good results when used in phthisis.

Recently Menzer, believing that acute rheumatism is always the result of a streptococcus infection, treats his cases with a serum prepared by immunising animals with streptococci obtained from the tonsils in rheumatic cases. This antirheumatic serum gives promise of success, in doses of 10 c.c. daily.

Anticholera Serum has proved valueless, as it is only antibacterial and not antitoxic, and the acute nature of the disease does not give time for its action. The prophylactic vaccines of Haffkine, which contain the living vibrios of cholera are decidedly valuable, and those injected within a period of 14 months who catch the disease have a mortality 22 times smaller than the unvaccinated.

Antipneumococcic Serum, prepared by injecting horses with virulent cultures of the pneumococcus has not as yet given the results which the experimental data led observers to expect. The serum is like that of the streptococcus, not antitoxic, and only protects against its own specific microbe, whilst pneumonia is generally a multiple or varying form of infection. The dose of Pane's serum is 15 c.c. twice daily, but the reports are very conflicting.

Antisyphilitic, Antitubercular, and Antirabitic serums are being employed, but they must be regarded as still upon their trial, though Maragliano's serum has given good results in lupus. It is prepared from the serum of horses which have been injected with attenuated cultures of living tubercular bacilli for 6 months, and it is of the strength of 1,000 units, and the daily dose is 1 c.c. (See under Tuberculin for Koch's remedy.) The researches of Richet, Kollman, Spiegler, Boeck, and Grosz, with syphilitic serums, prove that this method, in its present condition, is practically valueless. The serum treatment of hydrophobia is being perfected by Tizzoni, Centanini, and Babes, and promises to supersede Pasteurism. See Pasteur's treatment of hydrophobia in the Author's "Dictionary of Treatment," page 429-434, Fourth Edition.

Antivenene is a serum prepared by immunising an animal with rapidly increasing doses of snake venom. Most striking results have been demonstrated by Calmette and Fraser in their experiments. The remedy has been successfully tested for cobra bites in the human subject, and when used early in doses of 10 to 20 c.c. success is to be expected in cases of bites of all poisonous serpents. The bite of the more venomous variety of snake or serpent requires a larger amount of the remedy, which should be injected into a vein. Hanna and Lamb have pointed out that Calmette's serum is useless for viper toxins.

Anticarcinomatous Serum has been produced by Dubois and Richet, who injected into healthy animals emulsions made from living cancerous tumours. After the appearance of cancerous tumours in these animals, their serum was obtained and injected into patients suffering from gastric, mammary, and epithelial cancers, and successful results are published, the malignant growths being converted into fibrous nodules. Berrata has, however, reported 73 cases treated by this method unsuccessfully. The serum treatment of cancer must not be confounded with

Coley's plan of directly injecting the mixed toxins of erysipelas and *B. prodigiosus* into malignant tumours. (See "Dictionary of Treatment," page 113.) The dose of his fluid is .5 minim injected at the margin of the tumour.

Leprosy Serum.—Carrasquilla has reported striking results in leprosy, following the injections of a serum prepared by injecting horses with serum from lepers, and Merck supplies this antitoxine, but the reports are unsatisfactory.

Plague Serum.—There is still much uncertainty about the real value of serumtherapy in this disease, but great hope is inspired by the most recent reports which demonstrate that the curative value of the serum depends upon its being taken from horses immunised with the living bacilli as in the serum of Yersin, and not from animals injected with sterile culture. There cannot be any doubt that doses of 20 c. c. by a vein, followed by twice this amount hypodermically in 4 hours, and repeated in 12 hours hypodermically, reduces the mortality very greatly. The serum is also prophylactic. Haffkine's prophylactic vaccine is not to be confounded with serumtherapy; it is a pure culture of the bacilli, sterilised by a temperature of 65°C, and contains the dead bacilli and their toxins; the dose is 40 mins. injected subcutaneously. The remedy generally prevents the patient catching the disease for several months, and if he should fall a victim to it the affection is so lessened that his chances of recovery are doubled.

Apiol—A green oily liquid, the active principle of the fruit and root of parsley (*apium petroselinum*). It is a powerful diuretic; in large doses (1 dr.) it produces effects like quinine, ringing in the ears, headache, and vertigo. It was formerly used as an antiperiodic in ague and intermittent neuralgia. It is chiefly recommended in dysmenorrhœa and amenorrhœa, given immediately before the expected menstrual period, in capsules containing 3-5 minims. Apiol camphor in white silky crystals is given in doses of 10 grs. Apiolin is a yellow fluid obtained by saponifying apiol. It is recommended in 5 min. doses in capsules in all menstrual disorders in which apiol is given.

Apocodeine is formed from codeine (as apomorphine is from morphia). It was vaunted as an emetic and expectorant, but its action is doubtful. Recently it has been found in 30 min. doses of a 1 per cent. solution of the hydrochloride when injected subcutaneously or deeply into the buttock to produce increased peristalsis of the bowel leading to several soft evacuations with certainty and regularity.

Apocynum Cannabinum—The root of American Indian hemp or Canadian hemp exerts a powerful slowing action upon the heart like digitalis, and is a reliable diuretic. It resembles strophanthus more than digitalis, as it has no effect upon the arterioles. It has been used in mitral disease. It is given with advantage in dropsies of cardiac and renal origin, and its power over effusions is said to be so great that it has been called in America the "Vegetable Trocar." Dose—Of a tincture (2 ozs. to 1 pint) 20 to 60 minims, or of the liquid extract 10 minims, or of the eclectic principle—Apocynin—as an expectorant, $\frac{1}{4}$ to $\frac{1}{2}$ gr. If given in fuller doses it is a hydragogue cathartic. It contains a resin—Apocynin and a glucoside—Apocynein.

Apolysin is a white crystalline sparingly soluble powder, closely allied in composition and action to phenacetin. The reports of those who have been using the drug show that it is harmless even when given in daily amounts of 120 grs. It does not relieve pain so promptly as phenacetin, nor can it be depended upon to reduce the temperature as speedily as antipyrine, but in every condition in which these agents have been used its utility and its harmlessness have been demonstrated. It may be given in the powder form in doses of 10 to 30 grs., and is very suitable for children. It is also a powerful antiseptic.

Arbutin is a glucoside of Uva Ursi. It is split up in the system—hydrochinon appearing in the urine, which becomes brown or olive green on exposure. It is not poisonous; the hydrochinon into which it decomposes is a powerful antiseptic, even in 1 per cent. solutions. It is beneficial in chronic cystitis and vesical catarrh arising from obstruction, &c., and in suppurative conditions of any part of the urinary tract. It may be given in the form of powder in 15 gr. doses, in water.

Arecolinae Hydrobromas is the salt of an alkaloid obtained from areca nut. It is introduced as a substitute for eserine, and has powerful sialagogue action, and is an anthelmintic resembling pelletierine. 1 per cent. solution causes contraction of the pupil in 10 minutes, which passes away in about an hour. It has given excellent results in glaucoma where eserine has failed. It is a powerful poison, acting like muscarine when swallowed.

Tenaline is another substance prepared from areca; it is a powerful anthelmintic, and less toxic than arecoline.

Argentamine is a solution of 1 part of phosphate of silver in 1 part of ethylenediamine and 10 parts of water. It is powerfully antiseptic, and, though more efficacious than the nitrate because it penetrates deeper into the tissues, it produces less irritation owing to its alkaline reaction. It does not form deposits or discolorations upon the diseased cornea, and has been found (in 5 per cent. solutions) more satisfactory in eye work than the ordinary lunar caustic. In gonorrhœa it is much praised, injections of 1 in 2,000 to 4,000 speedily destroying the parasite. Recently it has been given internally in tubercular ulcerations of the bowel in tea-spoonful doses of a 1 in 1,500 solution.

Argentol is Quinaseptolate of silver—a yellow, sparingly soluble powder, which readily splits up into oxyquinoline and metallic silver. It is used as a dusting powder like iodoform, and it is also hæmostatic when so employed, and as an injection (1 in 1,000) in gonorrhœa. Recently it is recommended as an intestinal antiseptic in doses as large as 5 grs. The Sulphophenylate of silver is introduced as a substitute for the nitrate; it is more soluble than the new organic salts, and is very slightly irritating. It is known also as Silberol, and is used in 2 per cent. aqueous solutions in eye cases.

Argentum Colloidale is another of Credé's silver preparations. It is metallic silver in a colloid state, and in the form of Credé's ointment (15 per cent.) it is rubbed into the skin in syphilis and various septic states for 20 minutes with the view of being absorbed like mercurial ointment. 45 grs. of the ointment are used, but the drug is already passing into disuse. The drug is also given internally as an intestinal and gastric disinfectant, in doses of 1-2 grs. in pill, and used as a 1-5 per cent. albuminous solution in conjunctivitis and cystitis.

Argonin is a compound of silver with casein which possesses many of the properties of the preceding drug. It has been used successfully in 5 per cent. solution in gonorrhœa. It causes little irritation, and is powerfully antiseptic like Actol (which see). A soluble form—Argonin L.—is used in 1 per cent. solution for gonorrhœa in the early stages.

Aristol is a brown, insoluble, unstable, odourless powder, prepared by the action of thymol upon iodides; it contains about 46 per cent. iodine. It is introduced as a substitute for iodoform in every diseased condition in which iodoform has been used. In lupus it has given excellent results, but has no action upon the unbroken skin, and therefore does not affect lupus which is not already freely ulcerating. It may be dusted as a powder over the ulcers or applied as a 10 per cent. ointment, and it has been applied to corneal ulcers.

In scrofuloderma, epithelioma, and all late syphilitic ulcers, it has been found efficacious, but the drug has not gained in favour, though reports of its value were published in tinea, gonorrhœa, chancres, psoriasis, eczema, ozæna, otorrhœa, rhinitis, &c. In vaginal and uterine ulcerations it may be used as a pessary. In psoriasis the best plan is to apply a 10 per cent. solution in flexible collodion, or a 10 per cent. starch paste, or a plaster (20 per cent.). For chancres and ulcers of the legs a good plan is to sprinkle them with a mixture of equal parts of aristol and oxide of zinc.

The iodides of diiodophenol, diiodoresorcin, diiodosalicylic acid, and of cresol are also brown powders which are being used as antiseptics. (See also Sanoform and Soziodol.)

Arrhenal, or Disodic Methyl Arsenite, is an almost tasteless, odourless compound of arsenic introduced by Gautier as a substitute for the cacodylate of soda in tuberculosis, cirrhosis of liver, and other conditions. It does not cause the garlic odour from the breath, and does not upset digestion when given by the mouth in doses of $\frac{1}{3}$ to $\frac{2}{3}$ grain for 7 days continuously, and then stopped for a similar period.

Asaprol is a soluble white powder, known also as Abrastol, being a lime salt of beta-naphthol-sulphonic acid. It possesses the properties of the salicylates, and relieves pain and reduces fever heat, and has been much used in France in cases where antipyrine and phenacetin are indicated, especially in rheumatism, influenza, and neuralgias. It is antiseptic, and has been given in painful dyspepsia in doses of 5 to 15 grs. in solution or in powder. It has been praised as an internal remedy in hæmorrhages, and as a lotion (3 per cent.) for wounds and sore throats, and as a spray in whooping-cough. Riegler has found that asaprol is a sensitive test for albumin, albumoses, and peptones. The drug is incompatible with antipyrine, quinine, iodides, soluble sulphates, &c.

Asclepias Tuberosa, or Pleurisy Root, is allied to *A. incarnata* and *syriaca*. It produces in $\frac{1}{2}$ dr. doses of the 1 in 10 tincture diuretic effects, and is a good expectorant. In larger doses it is an active cathartic and emetic. It is a good diaphoretic in the early stages of fevers, and combined with more powerful expectorants in bronchial catarrhs. American physicians believe that it gives best results in pleurodynia and pneumonia.

Aseptol is a 33 per cent. solution of Sulphocarbolic or Sozolic Acid, and is a syrupy liquid with a faint carbolic odour. It resembles in its

properties both salicylic and carbolic acids. It differs from the former in being very soluble, and from the latter in being less caustic, and in being perfectly harmless. It has been consequently used in abdominal surgery in 5 per cent. solution, and in half this strength as a mouth wash and gargle. It is a delicate test for albumin and bile pigment in the urine. The Copper Salt, known as Copper Aseptol, is a valuable astringent and hæmostatic. The zinc and soda salts are official. Aseptoline should not be confounded with aseptol. It is a weak solution of carbolate of pilocarpine for injection in malaria and phthisis.

Oxychinaseptol or Diaphtherin and Chinaseptol or Diaphthol are allied antiseptic and unirritating crystalline bodies. The former is used in 1 to 2 per cent. solution for burns, wounds, otorrhœa, &c. It is especially valuable for washing out cavities, but it blackens nickel and silver instruments.

Aspidospermine is an active principle of Quebracho Bark, which has been used in cardiac asthma and in all varieties of dyspnœa. It is a powerful drug and must be used with caution. It acts directly upon the blood and enables it to take up more oxygen, and by reducing the irritability of the respiratory centre it proves beneficial in relieving dyspnœa depending upon disorders of the circulation, or diseases of the heart. Da Costa gives 20 minim doses of the liquid extract every hour in the asthma arising from failure of cardiac contraction; the pulse is reduced 20 beats without any alteration in the arterial pressure. It has been given in pulmonary emphysema with advantage, and in spasmodic croup. Large doses of aspidospermine have a marked antipyretic action. Hydrochloride of Quebrachine has been given hypodermically and by mouth, in doses of 1 gr. It acts as an emetic, like apomorphine, speedily and energetically.

Commercial Aspidospermine is a mixture of six alkaloids found in the bark, and is given hypodermically in doses of $\frac{1}{8}$ grain.

Aspirine is Salicylo-Acetic Acid, which is introduced as a substitute for the salicylates in acute rheumatism. It will be found mentioned under Salacetol.

Atoxyl, or Met-Arsenious Anilide, is another new arsenical compound introduced by Schild. It is given by hypodermic injection in doses up to 2 or 3 grs., in warm water, as a substitute for the cacodylates.

Auri et Sodii Chloridum is an orange-yellow deliquescent powder, which has been found to give results superior to the salts of silver in various nervous diseases. Small doses ($\frac{1}{16}$ gr.) increase the appetite and promote constructive metamorphosis; larger doses, according to Bartholow, increase waste—the tissue yielding most readily being the connective, especially that of pathological formation—hence its usefulness in sclerosis, and he affirms that it has cured posterior spinal sclerosis and interstitial nephritis. Results which appear to warrant confidence in this drug have been obtained in hystero-epilepsy, melancholia, sexual debility, nerve diseases characterised by spasm, as laryngismus, asthma, chorea, in cirrhosis of the liver and lung, amenorrhœa, &c., and in various ovarian and uterine affections. In tertiary syphilis it seems to act like the chloride of mercury. It is said to be the basis of the Keeley cure for chronic alcoholism. In concentrated form it acts as a caustic. Dose— $\frac{1}{16}$ to $\frac{1}{4}$ gr., in pill.

Wood reports most favourably of gold with bromide of arsenic in the neurotic diseases of old age. The bromide of gold is recommended in epilepsy and hystero-epilepsy in doses of $\frac{1}{10}$ gr. in water.

Bacillol is an odourless liquid obtained in the distillation of coal tar. It contains 52 per cent. of cresols, and it is introduced as a cheap substitute for Lysol (which see), which it very closely resembles in antiseptic power and comparative innocuousness. 1 per cent. solutions destroy most pathogenic bacilli with rapidity.

Baptisin is the extract from the root of the wild indigo, which is one of the eclectic remedies. In the form of powder—1 to 5 grs. in pill—it has been found to cause vomiting and purging. It is believed to be an hepatic and intestinal stimulant of considerable power; it has been useful in amenorrhœa and in low typhoid states.

Barium—The observations of various writers have proved that salts of barium have very decided action upon the heart, blood-vessels, and muscles like digitalis in nearly every respect. Their action also resembles, in some degree, that of physostigmine. Injected into the veins they, like pilocarpine, greatly stimulate the salivary glands. The blood pressure is increased, and there is marked contraction of the blood vessels. The chloride is the best salt for use, but owing to its powerful toxic properties it has very seldom been employed. There is yet no accurate data to guide one in determining the dose. Shoemaker mentions a case where death followed the administration of $2\frac{1}{2}$ grs., in daily doses of only $\frac{1}{4}$ gr. The sulphide has been given in doses of $\frac{1}{2}$ gr. in keratin pills. The drug has been freely given for colic in horses with success.

Basicin is a white soluble powder introduced recently by Kreidmann, consisting of a combination of pure caffeine with quinine. It is given in wafers or as simple solution in water (5—10 grs.) in all cases where these drugs are indicated as in malaria, migraine, gout, &c. But it has far more important qualities claimed for it, *i.e.*, that it serves as a basis for a series of combinations with the alkaloids. Thus atropine, strychnine, hyoscyne, and many other alkaloids form combinations possessing very different actions from those possessed by the same alkaloids in their pure state, and thus the possibilities of this agent are most numerous and promise to become important. A preparation of it is made for inunction and for hypodermic injection.

Benzo-iodo-hydrine is a brown substance prepared from benzoyl-iodide, introduced as a substitute for iodide of potassium. Its composition is seen by its proper name—benzo-chlorhydro-iodhydrin, and its dose is only 1 grain. It should be prescribed with sugar, and it is claimed for it that when in the blood it parts with its iodine very slowly.

Benzosol, or Benzoyl-guaiacol, is a white crystalline insoluble powder, without odour, prepared from a potassium salt of guaiacol and benzoyl chloride. It contains over 50 per cent. guaiacol, which is supposed to be set free in the intestines. It has been introduced as a palatable form in which to administer guaiacol in phthisis and abdominal tuberculosis, in which disease it has been given in 8 grain doses 4 or 6 times a day, with marked benefit, mixed in sugar or chocolate. It does not appear to possess any advantage over guaiacol, save in being less nauseous, and it is not likely to come into very general use owing to the difficulty in producing it in a pure and uniform condition.

Benzanilide is a colourless compound in scaly crystals, closely allied to antifebrin, obtained by boiling benzoic acid and aniline. It has been given as an antipyretic to children, in doses of 3 to 8 grs., but as the newer antipyretics have come into general use it is now seldom employed. Kahn

has obtained excellent results from it in pneumonia, meningitis, and phthisis in children.

Benzoyl-Eugenol, or Benzoeugenol, is the benzoic ether of eugenol. (Eugenol is an oxidation product of oil of cloves.) It exists in colourless, inodorous crystals, which are bitter and only slightly soluble in water. It is suggested as a substitute for creosote and guaiacol in the treatment of pulmonary phthisis, and it has been injected in this disease in 10 per cent. solution in sterilized olive oil. Owing to its less objectionable taste it is preferred to both eugenol and guaiacol. It is given in the same doses as these drugs.

Benzonaphthol is a colourless, tasteless, and almost odourless crystalline powder, obtained by acting on benzoyl chloride by beta-naphthol. It is used as an antiseptic, and when given internally it acts like most of the naphthol compounds as a disinfectant to the stomach and intestinal tract, the naphthol exerting its local action, whilst the benzoic acid is excreted as hippuric and acts as a diuretic. It has been used in typhoid fever and infant cholera, in doses of 6 grs., in tabloid form, to be given every 3 or 4 hours. It is claimed to be most successful in pruritus senilis.

Lactol is identical in action, but more soluble. It is the lactate of beta-naphthol.

Berberis Aquifolium, or Holly-leaved Barberry, and other species of *B.* have been extensively tried in America made into a tincture (1 to 5). It is said to be an alterative and tonic in 20 minim doses, and has been reported useful in various forms of syphilis and struma. Berberine possesses anti-periodic powers, and has been used as a substitute for quinine, in 5 to 10 gr. doses, in malaria. It possesses marked power in causing contraction of the malarial spleen.

Betol is a body in small white tasteless crystals analogous to salol only having the base of naphthol. It splits up in the body into salicylic acid and naphthol. It has been given in rheumatism and cystitis with benefit, but sometimes without any result. Kobert affirms that it is preferable to salol in rheumatism; it may be given in doses of 10 grs. every 6 hours. It contains 10 per cent. less salicylic acid than salol. It is also known as Naphthalol, Naphthosalol, and Salinaphthol, but is seldom ever used.

Alphol is the corresponding salicylate of a-naphthol, and resembles salol in its action and dosage.

Bile Salts, Taurocholate and Glycocholate of Sodium, are extracted from ox-bile, and have been used with success by Granville in gouty obesity and dyspepsia. They are said to act as cardiac tonics like digitalis, but without raising the blood pressure. Stadelmann has demonstrated that they possess surprising cholagogue action, and in animals he raised the quantity of bile excreted by 120 per cent. by administering these salts. The glycocholate is preferred, and it may be given in doses of 10 to 15 grs. in pills coated with keratin in gall stone cases and in fatty or amyloid liver. Phisalix states that it is a chemical vaccine against viper poison, and Fraser has proved that bile contains an antitoxine against snake venom and some parasitic diseases.

Bismuth Salts—The following salts of Bismuth have been lately tried in medicine and surgery:—

The Soluble Phosphate is used in acute gastric and intestinal catarrh in

doses of 5 grs. dissolved in 3j. water. It has also been applied to wounds. It is an impure salt.

The Sulphite, a white powder soluble in acids, which gives off sulphurous acid in the stomach, has been recommended in fermentative states of this organ in doses of 5—15 grs.

The Oxyiodide is a red, heavy, insoluble powder used as a substitute for iodoform, and as an injection (1 in 100) for gonorrhœa, and in 5—10 gr. doses in gastric ulcer. Its tannin compound is called Ibit, and is vaunted as a harmless and superior iodoform substitute. It is a greenish grey insoluble powder, which makes a good gauze preparation.

The Oxychloride is a soft, impalpable powder, which may be used for all the purposes for which the official insoluble salts are employed in the same doses. It is the popular cosmetic known as Pearl White.

The Oxybromide is an insoluble yellow powder, recommended in 5 gr. doses as a gastric sedative.

Of organic salts of bismuth there seems to be no end.

The Beta-naphtholate or Orphol and the Carbolate are insoluble powders, which split up slowly in the digestive canal, and the phenols act as disinfectants. They may be given in tuberculosis, cholera, and diarrhœa, in doses of 10 to 20 grs. Orphol is highly recommended by Chaumier in typhoid and the diarrhœa of children.

The Naphthalin-benzoate or Intestin has similar properties.

The Benzoate (oxybenzoate) is used as a stimulating powder for chancres and ulcers, and also for internal use.

The Tribromcarbolate or Tribromphenolate, also called Xeroform, is a yellow powder recommended as a specific against cholera, in doses of 8 grs. every two hours. It is one of the best of intestinal antiseptics, and may be used as a substitute for iodoform in the form of a dusting powder.

The Iodide of Bismuth and Cinchonidine, known as Erythrol (not to be confounded with the drug on page 512), is given in gastric neurosis in doses of $\frac{1}{2}$ grain.

The Sulphocarbolate or Sulphophenate is a pink powder given in 5 gr. doses as an intestinal antiseptic.

The Lactate has been given in 15 gr. doses in gastrodynia and colic.

The Oleate is a bland, unirritating emollient used in intertrigo, &c.

The Pyrogallate is used in skin therapeutics; it differs from the other bismuth antiseptics in being soluble in alkaline secretions. It is also known as Helcosol.

The Subgallate is described under Dermatol on page 509.

The Gallate of the subiodide is described under Airol on page 479.

The Bilacto-monotannate is a yellow, tasteless, insoluble powder, known as Lactannin; it is recommended in the diarrhœa of infants in doses of 5 grs.

Bismuth Methylen digallate, or Bismal, is used where the insoluble bismuth preparations are indicated, as in gastric ulceration and intestinal irritation. It is, moreover, markedly astringent, and has proved of much use in the diarrhœa of intestinal ulceration in doses of 15 grs. 3 or 4 times a day. Sprinkled over ulcers and in intertrigo its antiseptic and astringent qualities are already well recognised.

Loretinate of Bismuth is used as a dusting powder in eye cases instead of calomel; it is dusted on ulcers and wounds like iodoform, and has been administered internally in the diarrhœa of phthisis in 8 gr. doses. (See also Loretin.)

The so-called Chrysophanate or Dermol is, according to Merck, a mixture of impure chrysarobin and a salt of bismuth.

The Basic Dithiosalicylate, or Thioform, is a light, yellowish, grey, insoluble powder, which has given satisfactory results as a substitute for iodoform in every variety of ulcer and wound, including burns, in erysipelas, eczema, otitis, and dusted into the eye, ear, and throat in various diseased conditions. It is also an efficient intestinal antiseptic, and has given good results in diarrhoea, &c., in doses of 6 grs. *ter die*. The Basic Salicylate is now in the B.P.; it may be used as a substitute for iodoform. The Salicylate of Bismuth and Cerium has identical action and dose.

The Sodium-phospho-salicylate is a white powder used as an iodoform substitute mixed with talc (1 in 5). It is also given internally in solution. It is known as Bismuthol.

The Peptonate is a brown powder, claimed to be the most easily assimilable of the bismuth preparations; it contains only $3\frac{1}{2}$ per cent. of the oxide, and may be given in tea-spoonful doses. The Albuminate contains three times this amount of bismuth, and is given in intestinal affections in 30 gr. doses.

The Resorcinat is a yellowish powder, introduced as an iodoform substitute.

The bismuth salt of Nosophen is described under Eudoxin.

The Sulphocyanide of Bismuth and Quinoline, known as Crurin, is another iodoform substitute, but it has not been much used except as a dressing in cases of ulcer of the leg. Recently Jacobi extols it as a specific when injected (1 in 200) in gonorrhoea.

Bismutose is a white, tasteless, odourless powder being a compound of bismuth 22 per cent. with albumin. It is recommended in gastric and intestinal affections, in 1 to 4 dr. doses, and as a dusting powder for burns, intertrigo, &c.

Blatta Orientalis—Cockroaches have been used by the Russian peasants for centuries as a remedy for dropsy; when given in the form of powder, infusion, or tincture, they greatly increase the quantity of urine, diminish the amount of albumin, and rapidly reduce anasarca and ascites. Their virtues depend on *blattic acid*, which forms soluble salts with potassium and sodium. It slows the pulse in small doses and accelerates it in large doses, and causes falling of the blood pressure and paralysis of the cardiac muscle. Bogomolow named the active principle Antihydropin. He gave the powdered beetles in 4 to 5 gr. doses to children thrice daily. Recently the tincture of blatta has been extolled in 2 min. doses in pertussis.

Boldoa Fragrans—The leaves of the boldo tree, a native of Chili, are used as a substitute for quinine. Dose—10 to 20 minims of a tincture (1 to 8) in dyspepsia, atony of the bladder, cystitis, gonorrhoea, Bright's disease, rheumatism, and cirrhosis of the liver.

A glucoside, Boldo-glucin, has been isolated from the leaves; it has been given for liver diseases, bladder affections, and gall stones in 3 gr. doses in capsules and by the rectum as an hypnotic. The alkaloid, Boldin, is given as an hypnotic in doses of $\frac{1}{12}$ gr. It is also a local anæsthetic.

Borol is a boron compound ($\text{SO}_2, \text{OBo}, \text{OK}$ or Na) introduced by Jäger. It is a soluble, colourless, odourless, vitreous solid, with powerful antiseptic properties, and free from any irritating qualities when administered internally. 1 per cent. solution has been successfully employed in

diphtheria, gonorrhœa, and ozœna. Internally, 3 to 6 grs. may be dissolved in 1 dr. of water and administered every 4 hours in erysipelas and all septic conditions.

Brain and Spinal Cord Extracts (Cerebrin and Myelin or Medullin) have been introduced in the mania for animal extracts, which has developed since the discovery of the virtues of thyroid gland preparations.

Cerebrin from the grey matter of the sheep's brain has been used in hysteria, melancholia, nearly every form of neurosis, chronic alcoholism, and imbecility. The results are apparently not such as to justify the use of the agent in these diseases, though it does not appear that in 5 to 10 gr. doses any untoward effects have been noticed.

Nearly the same remarks apply to Spinal Cord substance. Dose—10 mins. of the liquid extract hypodermically or 5 grs. of the tabloids.

That these agents are not, however, absolutely inert is proven by Wassermann and Takaki, who have demonstrated that an emulsion prepared from the normal brain and cord has the power of conferring immunity from tetanus.

1 c.c. brain substance they found was able to save an animal from 10 lethal doses of tetanus poison. These observers believe that Ehrlich's view is thus proven, viz.—That the tetanus poison combines with the cells of the spinal cord and brain.

Brenzaine is Guaiacol-benzol-ether, a crystalline compound used by Marcus for producing local anæsthesia by the new cataphoretic method; the drug is dissolved in vasogen and applied by means of the electric current. It is also suggested as a remedy for tuberculosis.

Bromal Hydrate, allied to chloral hydrate in chemical composition, is a powerful hypnotic, in doses so small as 5 grs., but it produces much gastric disturbance, and its internal use has been seldom resorted to. It has poisonous action upon the heart. It is recommended in gout.

Bromaline or Bromethylformine is a crystalline powder, containing about half the amount of bromine present in KBr. It was introduced for epilepsy and other spasmodic affections. It is given in solution in water, or in capsules in twice the amount of the alkaline bromides, and it is claimed for it that the ordinary drawbacks—rash, fetor, and anorexia—do not occur, and the results are reported as most satisfactory. Merck gave the name of Bromaline to it, and it is not to be confounded with Bromelin.

Bromamid is a crystalline, tasteless, insoluble salt, being the hydrobromide of tribromaniline. It is introduced as a remedy for neuralgia, and as an antipyretic in acute rheumatism, in doses of 10 grs. every 3 or 4 hours, in cachets.

Bromo-eigon is a compound of bromine with albumin, which has been introduced (15 to 30 grs. in wafers) as a substitute for the alkaline salts. It resembles Iodo-eigon, an iodoform substitute, and forms salts known as Bromo-eigons. It has proved valuable as an agent for the relief of itching in skin affections and for chordee. The soluble salt, Pepto-bromo-eigon or Bromopeptone, may be given in doses of one to two drs. There is a corresponding Pepto-iodo-eigon.

Bromelin is the name given to a new digestive ferment obtained from the pine apple. It converts proteids into peptones in acid, alkaline, or neutral solutions as papain does, and it promises to be useful in gastric

complaints where pepsin or papain is indicated, but accurate data for dosage are not forthcoming. It is not to be confounded with Bromaline.

Bromidia is an American preparation containing various hypnotic substances, mixed with bromide of potassium, and given in doses of 1 to 2 drs. It contains Indian hemp, chloral, and hyoscyamus.

Bromipin, or Brominol, is a yellow, oily liquid obtained by adding bromine to sesame oil. It contains $33\frac{1}{3}$ per cent. bromine, and is introduced as a substitute for the ordinary bromine salts in chorea and epilepsy, in drachm doses given in wine or mucilage or in capsules. The 10 per cent. bromipin may be given in 5 or 6 dr. doses by the rectum. This amount represents 40 to 48 grs. bromide of potassium.

Bromocoll is Dibromotannic glue, and contains 20 per cent. bromine. It is a brownish, odourless, and tasteless powder which passes unchanged through the stomach. It can be given in wafers, in doses as high as 2 drs., and is recommended in epilepsy.

Bromoform is a colourless, sweet-tasted liquid, analogous to chloroform, which has been used as a general anæsthetic, but its use is attended with such dangers and drawbacks that it should not be used for this purpose.

It has been found to control the violence of the spasms of whooping-cough, and has given excellent results in this disease in doses of 1 to 3 mins. ($\frac{1}{2}$ a minim may be given every hour to a child 1 year old), in water and tincture of senega. It is a powerful poison and should be used with caution.

Externally the liquid has been painted over painful spots, and applied to the larynx.

Bromo-Hæmol is a compound of bromine with hæmoglobin, and is introduced as a substitute for the inorganic salts of bromine. As it contains less than 3 per cent. of this element, it must be given for long periods and in much larger doses (15 to 30 grs. in wafer) more frequently. It is indicated in hysterical affections in anæmic subjects.

Bromol, or Tribromphenol, is a white, crystalline, insoluble salt, prepared by the action of bromine on phenol. It is powerfully antiseptic and somewhat caustic. An ointment, 1 dr. to 1 oz., and a solution, 1 dr. in 4 ozs. olive oil, have been used as dressings to fresh wounds and ulcers. A solution of 1 dr. in 3 ozs. glycerin has been used as a swab in diphtheria.

Given internally in doses of $\frac{1}{4}$ to $1\frac{1}{2}$ grs. it passes unaltered through the stomach, and, reaching the alkaline secretions in the duodenum, it is dissolved and absorbed, and finally excreted by the kidney as tribromphenol-sulphuric acid. It has been given in doses of 1 gr. as an intestinal disinfectant in typhoid fever and diarrhœa. It is not to be confounded with Bromal (an oily liquid allied to Chloral). (See Bromal Hydrate.)

Brucine is an alkaloid in small whitish, bitter, acicular crystals, obtained from *nux vomica*. In physiological and therapeutic action it closely resembles strychnine (only it is 38 times weaker, and is eliminated with much greater rapidity). It increases the reflex activity of the spinal centres. It has been recommended in epilepsy, in doses beginning with $\frac{1}{16}$ grain, gradually increased to $\frac{1}{2}$ grain, and it is used as the basis of some of the cures for the alcohol habit, and is recommended as a substitute for strychnine in eye cases when injected over the temples.

Bryonia—The fresh and dried roots of *Byronia alba* and *B. dioica* are used in medicine. It is a hydragogue cathartic of dangerous power, and is

given in dropsies. The fresh leaves are counter-irritants, and will produce vesication.

Bryony is believed to have a powerful effect in controlling *inflammations of serous membranes*. 5—10 minims (B.P.C. Tincture) have been given in acute pleurisy with much benefit. It may be given where aconite is indicated in acute febrile conditions and in rheumatism. An infusion, 1 in 10, is strongly styptic.

Bryonin and Bryonidin are the two glucosides of bryony, and in large doses purge freely. $\frac{1}{30}$ gr. may be given every 2 or 3 hours till purgation occurs, then $\frac{1}{100}$ gr. every 6 hours as long as the serous inflammation lasts.

Cactus or Cereus Grandiflorus—The flowers and stems made into a tincture have been used in heart diseases. In painful palpitation from functional causes it has been stated to give great relief. Other observers state that it has cardiac tonic properties and diuretic powers like digitalis, and it has been administered in angina and valvular lesions with benefit in doses of 5 to 10 minims of the fluid extract. The tincture (1 in 5) is given in doses of 5 to 20 minims. It has also been recommended in exophthalmic goitre. Some authorities deny that this drug possesses any cardiac tonic properties, and they are probably correct, as experimental results are negative or most conflicting. There may be some such virtue in the Cactina obtained from *C. Mexicana*. It is given in doses of $\frac{1}{100}$ — $\frac{1}{50}$ grain.

Cæsium and Rubidium—The bromides of these rare metals have been used in epilepsy and painful cardiac palpitation in 20 gr. doses. Botkin has published the results of a series of experiments made with the chlorides of these metals, his results in the main agree with those of Ringer. The pulse is slowed and strengthened and the arterial pressure raised. The pneumogastric centre and the peripheral inhibitory apparatus of the heart are stimulated. In other respects there is a close resemblance between their action and that of potash salts, and they may be given in similar doses.

Calcii Pentasulphidi Liquor, or Vlemingx's Solution, is mentioned under Sulphur, page 462. It is not official.

Calcium Borate is a white insoluble powder administered internally in diarrhoea in 10 to 15 gr. doses, and used as a dusting powder in skin diseases, and as an ointment for burns and gangrenous ulcers and sloughing wounds.

Calcium Carbide is a greyish black solid substance which has been introduced as an agent for the production of acetylene gas in the treatment of cancer. When applied to ulcerating growths it is claimed for it that the lime acts as a caustic, and the acetylene gas checks hæmorrhage.

Calcium Glycerophosphate, mentioned under Acidum Glycerophosphoricum, is a powerful alterative and nervine tonic in doses of 5 to 10 grs.

Calcium Iodate, or Calcinol, is a tasteless, sparingly soluble powder, introduced as an iodoform substitute, and occasionally given in 5 grain doses as an intestinal disinfectant. It is useful as a gargle and mouth wash.

Calcium Permanganate is a salt closely resembling permanganate of potassium. It has been used in solution under the name of Monol to purify drinking water in France. It is claimed for this salt that it is 100 times more powerful in its antiseptic and bactericidal action than the potassium compound. A solution of 1 in 1,000 is used for disinfecting instruments,

1 in 300 for the surgeon's hands, 1 in 500 for the vagina, uterus, and urethra. It is better for gargles and mouth washes than the potash salt, since it tastes better.

Calcium Peroxide is a yellow powder, which in presence of water splits up into the hydrate and oxygen. It is valuable in 2 to 4 gr. doses when given in milk for the diarrhoea of children.

Calcium Salicylate is odourless, and has a sweetish taste, and being only slightly soluble is given in those cases where an intestinal action is desired. It resembles salicylate of bismuth in action and dose (5—20 grs.).

Calendula (Marigold)—The flowers made into a tincture (1 in 5) are used as a popular application to bruises and fresh wounds when diluted (1 in 8). It is antiseptic, and is believed to have the power of causing the absorption of effused blood, of destroying germs and promoting healing. The tincture or liquid extract is given in amenorrhoea in 20 minim doses, and an ointment is used in cancer of the breast and uterus.

Camphoid is a substitute for collodion, introduced by Martindale. It is prepared by dissolving pyroxylin in 20 times its weight of absolute alcohol and of camphor, and may be made the medium for the local use of iodoform, chrysarobin, &c.

Camphor Naphthol is prepared by heating 1 part of beta-naphthol with 2 parts of camphor. It is used in tinea and other parasitic skin affections. Phenol Camphor is made of different strengths, and is used for similar purposes. 1 of camphor in 3 of carbolic acid and $\frac{1}{4}$ water is the usual proportion.

Camphor Salol is an oily liquid, prepared by fusing 3 parts of salol with 2 of camphor. It is used as an application in tinea, and on wool for suppurative conditions of the middle ear. Camphor Salicylate is a similar substance in solid form prepared by heating 7 parts camphor with $5\frac{1}{2}$ salicylic acid. It may be applied to the scalp in tinea or to ulcers in the form of strong ointment 1 to 3.

Camphora Monobromata exists in long acicular crystals in which bromine replaces an atom of the hydrogen of camphor. In large doses it produces great muscular prostration, convulsions, reduction of temperature and pulse, slowing of the respiration, coma, and death. In medicinal doses (5 to 10 grs.) it has been used in delirium tremens, epilepsy, hysteria, chorea, neuralgia, pertussis, and asthma; not with sufficiently good results to warrant its use when better known available remedies are at hand. Wood has seen it do good in spermatorrhoea. It is an hypnotic of no mean power. The drawbacks to its use are its unpleasant taste and smell, its irritative effect upon the stomach, and the local irritation following after hypodermic injection. It is best given in the form of pill or capsule.

Canadol is a colourless, very volatile liquid obtained from naphtha. It has been introduced in Russia as a cheap and efficient substitute for ether in producing local anaesthesia, and with the ordinary Richardson's spray apparatus Studensky has demonstrated that in some respects it is better, especially in the certainty and rapidity of its action, complete congelation of the tissues being sometimes produced in 45 seconds.

Cannabin Tannas is a yellowish powder obtained from Indian hemp. Fronmüller has found it "a useful hypnotic, powerful without being dangerous, and one which does not disturb the secretions or leave

unpleasant toxic after-effects if given in proper dose." Dose—5 grs. in powder ; for insomnia it may be increased to 10 grs.

Occasionally, good results have followed its administration in acute mania. Wood found it to be inert, and Marshall states that it is of little value, and the reports are contradictory, perhaps from the varying purity of the samples of the drug experimented with.

Cannabinol is a stable resinous substance extracted from Indian hemp. It is of complex constitution, into which the hydroxyl group enters. 1 gr. produces active intoxication, and it has been recommended and successfully employed in $\frac{1}{2}$ gr. doses in neuralgia and migraine. It appears probable that the crude cannabinol is more reliable than the very pure samples.

Cannabinon is a purified resin obtained from Indian hemp, and when obtained from a good source (Bombelow) is fairly reliable ; though much more certain and powerful than the previous drug, it, too, occasionally proves inert. It has been given with good results in the sleeplessness of mania in doses of $\frac{1}{4}$ —1 gr. rubbed up with sugar of milk. Haschischin is the name given to a brownish powder prepared from the alcoholic extract, which is variable in its effects.

Cantharidin occurs in flat, glistening crystals ; and Dietrich advocates the abandonment of all other preparations of cantharides for solutions of various strengths in formic acid, turpentine, oils, collodion, lard, &c. 1 in 300, or about 1 gr. in 5 drs., will cause vesication. It is a terrible poison. Liebreich introduced cantharidinate of potassium as a remedy in *tuberculosis*, but it has fallen into disuse. (See under Cantharides on page 341).

An attempt was made to revive this treatment, but Liebreich advises pure cantharidin, which is to be taken internally and not injected. He gives it for lupus and pityriasis rubra in doses of $\frac{1}{1000}$ grain in pill (fasting) daily.

Carbonic Acid Gas has been given alone or with H_2S by rectal injection in various pulmonary affections, but the treatment has fallen into disuse. CO_2 plays an important part in Schott's treatment of heart diseases at the Nauheim baths. An artificial bath saturated with CO_2 can be easily prepared from the solid ingredients, procurable from most pharmacists, and there is no difficulty in carrying out the treatment at home. At Harrogate the Nauheim bath can be prepared with natural sulphur water and CO_2 , and the writer has satisfied himself of its advantages by observations made upon the spot. Inhalation of the gas has been recommended in leucocythæmia and pertussis.

Carbonis Detergens Liquor is a concentrated alcoholic solution of coal tar. It is now represented in the B.P. by the Liquor Picis Carbonis. (See page 425.)

Carbonis Tetrachloridum—The vapour of this colourless, mobile liquid will produce general anæsthesia, like chloroform, but its effects are very transitory, and it is seldom used except to relieve local pain and discomfort, as in hay fever, asthma, tic, &c., when the vapour may be inhaled with benefit. When applied over the seat of neuralgic nerves and pained joints it gives relief speedily. It can be applied upon lint, and covered over with thin mackintosh, or it may be sprinkled upon spongiopiline. It is seldom given internally.

Cardin (Heart Extract) is the name given to a purified extract obtained from the cardiac muscle of the ox by Hammond, who has introduced it for the treatment of failing compensation and other affections of the heart, but the results require further corroboration before this agent can be recommended.

Carlsbad Salt owes its therapeutic virtues to the chloride, sulphate and bicarbonate of sodium in its composition, and Harnack gives the following form for its *artificial* preparation:—Sodium Sulphate 10 parts, Bicarbonate 8 parts, and Chloride 4 parts. It is a mild saline purgative in dessert-spoonful doses, dissolved in a tumblerful of water, in constipation associated with diseases of the kidneys and liver, and in gout, rheumatism, &c. The natural salt is no doubt more valuable, as it contains all the constituents of the natural Carlsbad water, but the natural salt in *large* crystals, though valued most in this country, is much inferior to the *fine* crystals which are now prepared with the greatest care at the Springs, being, after their production from a concentrated solution of the natural water, submitted for long periods to an atomised spray of the natural water. See also Pulv. Salis C., B.P.C., Formulary.

Carpaine is an alkaloid obtained from the leaves of carica papaya—the source of papain. It is a cardiac poison, in large doses paralysing the heart muscle. It acts like digitalis in valvular disease, especially it is said in aortic affections, and it acts with great rapidity when given hypodermically, as recommended by Oefele, in doses of $\frac{1}{8}$ gr., and it slows the pulse, relieves dyspnoea and increases the urine, and never causes irritation at the site of puncture. Papaw juice acts like papain as a gastric sedative and digestive.

Casca Bark (*Erythrophlœum guineense*), or Sassy Bark, closely resembles digitalis in its effects. The dose is 10 minims of Brunton's tincture (1 in 10).

Sansom has employed the tincture substitutively for digitalis in a considerable number of cases, but was unable to convince himself that it has any more beneficial effect in mitral disease. Brunton has found it useful in dilated heart without valvular disease, in mitral disease, and in dropsy.

Erythrophlœine is the name given to the alkaloid of the bark; it closely resembles digitalin. It was credited with local anæsthetic properties. $\frac{3}{16}$ grain is an average dose.

Cascara Amarga, or Honduras Bark, is the bark of a Mexican tree of the order Simarubaceæ. It has been used in America as a remedy in syphilis and as an alterative in various chronic skin affections, hepatic diseases, and nasal catarrh. Its advocates agree about its uselessness unless tobacco and alcohol be abstained from. Dose— $\frac{1}{2}$ dr. of the fluid extract representing an equal weight of the bark.

Casearia Esculenta is an Indian drug of repute among the Hindus. Hooper found that the root contained cathartic acid and a large amount of tannin. It acts as a mild purgative, and has been found to possess valuable cholagogue properties. Though it has been vaunted as a specific in diabetes and numerous other diseases, it does not appear to possess any very marked action save in chronic hepatic affections, hæmorrhoids, and ascites depending upon hepatic enlargement. Dessert-spoonful doses of the liquid extract (1 in 1) may be administered.

Castanea—The leaves of the American or edible chestnut, which is almost identical with the Spanish tree, have found a place in the U.S.P. The fluid extract (1 in 1) has been found to possess considerable influence over the paroxysms of whooping-cough. Its *modus operandi* is unknown, but the drug is perfectly harmless, and may be given in teaspoonful doses. The inner bark is astringent.

Caulophyllin—An eclectic remedy prepared from the root of *Caulophyllum thalictroides* (U.S.P.), blue cohosh, or squaw root. It is a brownish powder, best given in form of pill, 1 to 4 grs., and is recommended as a diuretic, emmenagogue, and parturient. It has been given with some success as an anthelmintic.

Cedron—Simaba Cedron seeds have been long employed by the natives of New Granada as a febrifuge and antidote to bites of venomous animals. They contain a bitter principle which appears to have antiperiodic powers like quinine. The powdered seeds in 5 gr. doses have been given in ague, dysentery, cholera, and facial neuralgia, and have been employed in gout, and in smaller doses in atonic dyspepsia.

Cerasin is an extractive existing in the form of a brown aromatic powder, prepared by evaporating a strong tincture of *Prunus Virginiana*. It is also known as Prunin, and may be given in doses of 3 to 6 grs. (See *Prunus Virginiana*.)

Ceresin is the name given to a firm white hydrocarbon, which is prepared from ozokerit. It is recommended as a basis for ointments and cerates.

Cetrarin—Since the authorities have removed Iceland moss from the B.P., a notice of its active principle may be inserted here. It has been much praised on the Continent as a remedy in the catarrh of early phthisis, and in amenorrhœa and chlorosis; in the latter case mixed with organic iron salts. Its dose is 1 to 2 grs., and it is reported that appetite improves, weight increases, and the richness of the blood becomes marked. In larger doses it is a laxative and bitter tonic.

Chaulmoogra Oil is the solid, yellowish oil expressed from the seeds of *Gynocardia odorata*. Its active principle, Gynocardic acid, is the most convenient form for the use of this drug. It may be given in doses commencing with 1 gr. three times a day, and may be pushed till 3 grs. three times a day are taken in capsules or pills. 5 grs. of the oil may be given in capsules. In India the oil is a fluid, but in this country it generally remains solid. It has been administered in phthisis without any benefit. The oil has been used, with some success, as an external application with friction to the chest and abdomen in phthisis, tabes mesenterica, and struma. It has been also tried in a similar manner rubbed into the skin over joints the seat of chronic rheumatism and rheumatic arthritis; also with some advantage in very chronic eczema, leprosy, lupus, and psoriasis. The best application in the various stages of leprosy is an ointment composed of one part of the oil with two of lard; though there is no evidence that this has cured the disease, it certainly, when used at the same time as the acid internally, does possess considerable power in retarding the progress of leprosy. See Colonial Addendum.

Chekan—The leaves of *Myrtus Chekan* contain a volatile oil and a volatile alkaloid combined with an organic acid. They have been found

by Murrell, Dessauer, Holmes, and others to possess valuable expectorant qualities. Tangeman compares the action of chekan to that of eucalyptus. He found in chronic catarrhs that it gave tone to the relaxed mucous membrane and made the breathing freer, especially in the case of old people. He gave $\frac{1}{2}$ to 1 dr. of the fluid extract every 5 hours. It has been used in diphtheria, laryngitis, dysentery, and in catarrhal conditions of the bladder; in Chili it is used in rheumatism.

Chelidonium Majus (Greater Celandine or Swallow-Wort—Papaveraceæ), has been long used as a local agent for the cure of warts; the yellow juice being painted over them causes their destruction. Denisenko has reported in glowing terms of the results of the drug when given internally in various forms of cancer. About 1 dr. of the stalks should be taken daily, and 2 drs. of the extract dissolved in water should be injected every 48 hours into the tissues surrounding the tumour. Other observers report that the results are nil, and the drug is again rapidly passing into disuse. In large doses it is a purgative.

Chelidonine, its active principle, is given in doses of 1—3 grs.

Chian Turpentine, about which so much has been written, is the semi-solid oleo-resin, obtained by puncturing the trunk of *Pistacia Terebinthus*. It mainly derives its interest from the reports of its marvellous powers in the treatment of cancer by Clay, but it has now passed into disuse.

Chimaphila Umbellata leaves, under the name of Pipsissewa, are strongly recommended by Wood in external scrofula. After extensive use he believes that this remedy comes near to cod-liver oil and iodine; his opinion is supported by that of many others, who state that it is not only an astringent, but a valuable alterative and tonic. It has an action on the bladder like *Uva Ursi*, and has been used extensively on the Continent in dropsy, albuminuria, cystitis, and gleet, in doses of 1 dr. of the liquid extract (1 in 1).

Chinolinum is an oily liquid derived from quinine. It is artificially prepared from nitro-benzene and aniline. It is a powerful antiseptic, and, before the discovery of antipyrine, was tried as an antipyretic and as a pigment in diphtheria. Its smell, taste, and irritating qualities are barriers to its use. The tartrate is soluble, and may be given in doses of 5 to 20 grs. in water in ague and neuralgia. The Salicylate may be used in similar doses. These salts have been used locally in dilute solutions (1 in 100) as antiseptics in gonorrhœa and other affections.

Chinosol, or **Quinosol**, is the oxyquinolinesulphate of potash, which, as a yellow soluble powder, was introduced as a disinfectant for the hands in surgical and gynecological practice (3 per cent. solution) as a substitute for hyd. perchlor. It is a powerful germ destroyer, but it irritates fresh wounds. Reports show that, even in dilute solutions, it prevents the growth of various micro-organisms, but it has nevertheless not gained in favour. Mixed with five times its weight of boric acid, it has been used as a substitute for iodoform, and it has been given in 5 gr. doses in phthisis. Recently it has been used as an injection for the preservation of dead bodies, as it does not affect the colour of the tissues.

Chloralamide, or Chloral Formamide, is an hypnotic in colourless crystals, which are slightly bitter, soluble in water, and incompatible with alkalis. It was introduced as a substitute for chloral hydrate, and it was claimed for it that it was more pleasant to take, and possessed no

objectionable cardiac depressant action. Its hypnotic power is estimated as about $\frac{2}{3}$ that of chloral. It has been given in doses ranging from 25 to 60 grs. dissolved in water. It acts well in simple insomnia, but generally fails in moderate doses when pain and excitement are present.

It is stated that it does not tend to form a habit like chloral, but this statement is probably premature. Charteris obtained good effects from it in sea-sickness, and it has been used in whooping-cough, chorea, epilepsy, &c. Under the name of Chlorobrom it has been recommended in 15 gr. doses with 15 grs. bromide of potassium in sea-sickness and insomnia, and as a gastric sedative.

Chloral Camphor is a liquid consisting of equal weights of chloral hydrate and camphor heated together. It is a valuable local anæsthetic painted over superficial neuralgias, and in it most alkaloids can be dissolved.

Chloralimide is a newer hypnotic, differing in chemical constitution from Chloralamide. It is prepared by the action of heat upon chloral ammonium. It exists in colourless, tasteless, odourless crystals, insoluble in water. It is stable, and is reported to be more efficacious than chloral or chloralamide. Choay states that in doses of 5 to 8 grs. it is analgesic and antipyretic to a remarkable degree. It does not possess any superiority over chloral when given in similar doses as an hypnotic, and it is already passing into disuse.

Chloralose is a new hypnotic in colourless needles, obtained by the action of chloral on glucose. Introduced like all the chloral compounds, it was heralded in as a perfectly safe and harmless substitute for this dangerous hypnotic; experience has proved that it is a powerful hypnotic in doses of 4 to 10 grains given in cachet (as the drug is bitter and insoluble), but already many untoward effects are recorded, though these were absent in the experience of some physicians who gave 30 grs. It causes deep sleep, coming on in a few minutes, sometimes preceded by excitement and visual disorders and marked muscular tremors or contractions: these latter may appear during sleep, and sometimes dilatation of pupils, great slowness of pulse, and involuntary evacuation of the bladder and bowels have been observed. It is doubtful if the drug should be given where there is organic brain or spinal disease. Epilepsy, mania, and simple insomnia seem to indicate its exhibition, but there is danger in repeating the dose, as it may not be absorbed.

Chlorsalol (Para and Ortho) is a compound of chlorphenol and salicylic acid, introduced as a substitute for salol. It is claimed for these soluble crystalline salts that they act better than salol upon the urinary tract. The para salt is preferred for internal use, and the ortho may be sprinkled instead of iodoform. They may be given in the same doses as salol.

Cinchonine, Cinchonidine, and Quinidine are the three out of the thirty-one alkaloids of cinchona bark which come next to quinine in therapeutic value, quinidine being much more active than the other two. They are much less frequently employed than formerly, owing to the cheapness and almost unlimited supply of quinine. The dose of quinidine is about $1\frac{1}{2}$ times that of quinine, while the other two must be given in dose of about $2\frac{1}{2}$ times the dose of quinine, in which amounts they are badly borne by the stomach. Antiseptol is a salt of cinchonine for external use. (See page 483.)

Citrophen is a white powder, being a combination of citric acid with paraphenetidin, acting like phenacetin. It was urged that as an analgesic and antipyretic no danger whatever followed its use. It is certainly a most efficacious agent for relieving pain and reducing fever, but Trupez points out that it is decomposed in the system, and that one of the products is irritating to the kidney and intestines; the dose is 8 grs. It causes considerable sweating. It has recently been given in pertussis with success.

Cobalto-nitrite of Potassium is prepared by adding an acidulated solution of a cobalt salt to a solution of nitrite of potassium. The resulting salt is more stable, less soluble, and more uniform and purer than the other nitrites. Given in doses of $\frac{1}{2}$ gr. every two hours it acts like nitroglycerin, and may be given in every case where it or nitrite of amyl is indicated, viz.—angina pectoris, uræmia, high arterial tension from whatever cause, and in asthma. The action of the drug is apparent inside 30 minutes, and it lasts for three hours.

Cocaine Salts—Only the pure alkaloid and the hydrochloride are official, but many other compounds are used.

The Carbolate or Phenylate is a semi-solid salt. It is claimed for it that its local action is slower and more prolonged; owing to its lesser solubility it is not absorbed so rapidly, and hence deleterious effects are not observed when freely applied to fresh wounds, and it is an antiseptic. It is used in dentistry.

The Lactate, a white semi-solid, is used by Wittzack for injection into the bladder in tubercular cystitis. He injects $1\frac{1}{2}$ grs. with 6 minims lactic acid and 9 minims water into the empty bladder twice a week, commencing with a watery solution of the same strength, and gradually increasing the amount of acid.

The Borate, owing to the stability of its solution, is praised for eye surgery.

The Nitrate is selected when a cocaine salt is required in eye or urethral surgery in conjunction with nitrate of silver solution.

The Salicylate is used in asthma (3 to 5 grs. hypodermically). The Nitrate, Hydrobromide, and Sulphate may be regarded as identical in action with the official salt.

The Hydriodide of Cocaine has been used by Marcus in dental surgery for producing electro-anæsthesia; and Guaiacol-cocaine, or a mixture of guaiacol and cocaine, may be applied by means of a current of 2 milliamperes, and in a few minutes teeth can be painlessly extracted by this new method.

Tropacocaine, obtained from Java coca, is more rapid, and it is alleged more safe and less irritating in eye cases. 3% of the hydrochloride solution is used, and it does not dilate the pupil. It is injected in dental cases as more rapid and safe. It is more stable, and, since it has been produced synthetically, it is now to be found purer, and almost as cheap as cocaine. 1 per cent. solution causes anæsthesia in $2\frac{1}{2}$ minutes. The drug is also less poisonous than cocaine; the only drawback reported being its liability to lead to bleedings after its use. It is also known as Benzoylpseudotropine hydrochloride. It is suitable for the induction of local anæsthesia by the new infiltration method of Schleich, and Schwartz employs it after Bier's method by injecting it into the cerebro-spinal cavity through the lumbar puncture.

Acoin is used chiefly in eye surgery; it is the Di-para-anisyl-mono phenethyl-guanidine hydrochloride.

(See also Eucaïne, Holocaine, and Orthoform.)

Cocillana Bark is a Bolivian remedy, introduced by Rusby. Wilcox has satisfied himself of its value in bronchial affections, where it renders the sputum less adhesive. He insists upon its superiority to ipecac. and apomorphine, as its valuable expectorant powers are independent of its emetic action; it increases the appetite, and is laxative. In bronchitis 20 minims of the liquid extract or 1 dr. of the syrup may be given.

Colchicine and Coniine are the active principles of colchicum and conium suitable for hypodermic injection when the actions of these drugs are indicated, the former in $\frac{1}{32}$ gr. doses in painful joint affections, chronic rheumatism, and gouty troubles; the latter in $\frac{1}{2}$ minim doses in acute mania. Success is reported in tetanus by Demme with hourly injections of $\frac{1}{10}$ gr. of Coniine Hydrobromide, and Gometz has used the same salt in tinnitus aurium in doses of $\frac{1}{32}$ gr. with much benefit. Tobias has obtained good results in gout, rheumatism, and rheumatic arthritis by doses of $\frac{1}{90}$ gr. Colchicine Salicylate, which is now obtainable in capsules, each of which contains $\frac{1}{30}$ gr. dissolved in methyl salicylate.

Collinsonia Canadensis, known as stone or knob root, has been used in America for a host of ailments, though practically nothing is known of its physiological action beyond that it acts as a local and possibly a remote astringent. The dose of the root is from 15 to 60 grs.; fluid extract (1 in 1), 15 to 60 minims.

It is a sedative to the urinary mucous membrane in obstinate gonorrhœa, gleet, and in cystitis, and has been proved valuable in hæmorrhoids and in anal spasm. As an antispasmodic, it has been used in whooping-cough, chorea, and in cardiac palpitation. Externally, it is used for wounds and bruises like arnica, but it is free from the serious objections to which arnica is open.

Colloid Styptic (Richardson)—Prepared by making a saturated solution of tannin and gun cotton in absolute alcohol and ether, and adding a few drops of tincture of benzoin. (See B.P.C. Formulæ.)

The solution is a most valuable styptic applied to wounds with a brush or in the form of a spray. 20 grs. Carbolic Acid added to each ounce form Carbolic Colloid used as a local anæsthetic.

Salicylic Colloid or Collodion, is 1 part of salicylic acid dissolved in 5 of flexile collodion with a little Indian hemp added; it is used as a corn cure. Salol Collodion is salol and ether dissolved in 8 parts of collodion; it is used as a local application in rheumatism.

Condurango Bark was introduced by Friedreich for cancer of the stomach, and surprising results were at first reported of its action in relieving the pain of gastric ulcer and cancer and dyspepsia. It is needless to say that it has no curative action in cancer, but it is a valuable gastric sedative in ulcer, cancer, and hæmatemesis. 30 grs., or $\frac{1}{2}$ dr., of the liquid extract (1 in 1) may be given four times daily.

Convallaria Majalis, or Lily of the Valley, has been long in use by the peasants in Russia for dropsies. It has been found to possess powers resembling digitalis, and it is said without objectionable qualities.

It contains two glucosides—one, *convallarin*, is a drastic purgative in large doses; the other, *convallamarin*, is a cardiac tonic. The most active

preparation of the drug is an extract made from one part of the root and leaves, and three parts of the flowers and stalks; this may be given in 5 gr. doses, but the most uniform action is obtained from convallamarin, which is a whitish powder, and may be given in doses of 1 gr.

One grain of the dried flowers, infused in 1 oz. water, and given every four hours, is a convenient method for administration.

In valvular disease, with cardiac failure, decidedly beneficial results follow; dyspnœa and palpitation disappear, and the action of the drug is maintained for a week after its use has been suspended, the pulse becomes more regular, fuller, and somewhat slower, the urine increases in amount, and dropsy diminishes.

Cornutine is an amorphous brown insoluble powder. It is maintained by Kobert that it is the active alkaloid of ergot. The citrate is a soluble salt. It is indicated in every condition in which ergot is used. The ordinary dose is $\frac{1}{16}$ to $\frac{1}{8}$ grain by the mouth in pill. It has been extolled in menorrhagia, endometritis, urethral and vesical hæmorrhage, &c. Subcutaneously $\frac{1}{16}$ gr. may be given in uterine hæmorrhage. Meisels finds that it lessens the irritability of the spinal reproductive centre, and he finds it the most efficient remedy for spermatorrhœa, $\frac{1}{16}$ gr *ter die*. In large doses it causes convulsions of cerebral origin. It has a powerful action on all voluntary and involuntary muscular fibre. (See Ergot.)

Coronillin is a cardiac tonic, being the glucoside obtained from the seeds of *coronilla scorpioides*. It acts like digitalis in failing compensation, in doses of 1½ grs. every 4 hours, and it is claimed for it that it acts with rapidity, and its action is not prolonged after stopping the last dose, and it does not affect the stomach.

Cosaparin is a whitish, soluble, amorphous powder. It is a sulpho-derivative of antifebrin, and appears to possess all the advantages and virtues of the drug from which it is derived, without, it is stated, any of its drawbacks. Thus it is very soluble, prompt in action, and it is claimed to be non-toxic, but further reports must be forthcoming before dosage and therapeutic value can be settled. Phesin is the corresponding salt of phenacetin. They are recommended in doses of 15 grs. in tabloids.

Coto Bark yields an active principle called Cotoin. Paracoto yields Paracotoin, which is weaker.

Albertoni found they increased the appetite and absorptive power of the intestinal surface by dilating the intestinal vessels.

Cotoin has proved very valuable in the treatment of the diarrhœa of children, and in the diarrhœa of phthisis, teething, marasmus, and intestinal catarrh, especially in the feeble-minded and insane, and in the sweating of phthisis, and it has been tried in cholera with marked success by Baelz, of Japan. It is not an astringent, and has but feeble antiseptic power, and Albertoni thinks it acts by increasing the intestinal absorption, the diminution of which is the cause of the diarrhœa. It is contra-indicated in hyperæmic states of the abdominal organs, or in hæmorrhage from the bowel, or in acute catarrhal conditions. Yeo has tried it in exophthalmic goitre. The dose is 1 to 2 grs of cotoin and 2 to 3 grs. of paracotoin. Fortoin, a compound of cotoin and formaldehyde with similar action, and in doses of 4 grs., has been recently much praised in diarrhœa.

Coumarin is the odorous principle of the Tonquin bean; it exists in colourless crystals, and has been prepared synthetically from salicylol.

Its chief use in medicine is for disguising the objectionable odour of iodoform when added in the proportion of 2 per cent.

Creolin is a dark-brown, syrupy liquid, also called *Liquor Antisepticus*, prepared from coal tar; it contains cresols, but is free from carbolic acid. (See under Cresol). It is practically non-poisonous and non-irritating, forms an emulsion when mixed with water in small proportions, and is a most efficient antiseptic. It has been used as a substitute for carbolic acid in gynaecology and operative surgery, and has answered the expectations of its first advocates. 1 or 2 per cent. solution may be used for instruments and wounds. In dysentery good results have been obtained by injecting a $\frac{1}{2}$ per cent. liquid to be retained for 30 minutes twice a day. The same strength has been successfully injected in cystitis, and applied to burns, wounds, bed-sores, gonorrhœa, ozœna, psoriasis, eczema, &c.

It has been given internally in doses of 3 mins. (in pills) in gastric fermentation, phthisis, bronchitis, cystitis, and gonorrhœa, and as an intestinal antiseptic in enteritis.

Izal is a milky liquid of somewhat similar composition obtained from coal oil. It is used as a disinfectant and antiseptic for ulcers and wounds, in .5 per cent. solution in water. Colin Campbell uses a solution of izal in glycerin for intratracheal injection in phthisis with most satisfactory results.

Creosal, or Tannate of Creosote, is a brown powder which combines the action of its two constituents. It is dusted on like iodoform in nasal and throat diseases, and given internally in doses of 15 grs. in phthisis and tubercular disease of the intestine. It contains about 40 per cent. tannin.

Creosotal, or Creosote Carbonate, is a honey-like liquid obtained from pure beechwood creosote. It breaks up slowly in the intestine into creosote and CO_2 . It increases the appetite, and is easily swallowed, and may be given in doses of $\frac{1}{2}$ to 1 dr. 4 times a day in milk, cream, or wine. It is claimed for it to be equal therapeutically to pure creosote in phthisis and in every form of tubercle, phthisis, bronchitis, and in gastric affections. Recently Weber has reported most favourably of the action of the drug in acute pneumonia, in which disease he affirms that it is antidotal to the toxins. Oleocreosote is an oily liquid resembling creosotal, being the oleic ether; it is given in 30 min. doses. Sulfosote is a brown syrupy liquid being the creosotic sulphonate of potassium; it is used in phthisis like creosote, the dose of the syrup being 2 drs. Pneumin is the name given to a yellow, tasteless, odourless powder, which is a compound of creosote and formaldehyde, containing the active methylphenols and their ethers, which are found in beech tar. It is used as a substitute for creosote in phthisis, in doses of 8 grs. three or four times a day. Pulmoform is the name given to the corresponding formaldehyde compound with guaiacol, with which therapeutically it is identical.

Creosote Phosphate, or Phosote, is a liquid resembling creosotal, and is given in similar doses, and the Tannophosphoric ester or Taphosote is also similar in dose and action, and is astringent. Phosphotal is the name given to Creosote Phosphite, in solid crystals. Its dose is that of creosote, *i.e.*, 1 to 5 grs., and its action is identical. (For the Valerianate see Eosote.)

Cresalol, or Salicylate of Cresol, exists in the forms of ortho-, meta-, and para-cresalol, which are light, crystalline powders, insoluble in water; they are powerful antiseptics. The meta-salt is used as a surgical dressing

in the form of insufflation or dusting powder. According to Widmer they are all three superior to iodoform, inasmuch as they are harmless and less objectionable in their odour, and have an astringent action upon the secreting surfaces to which they are applied. The meta-salt is the best for this purpose. The para-salt has been given internally in diarrhoea and typhoid fever in doses of 3 to 8 grs. as an intestinal disinfectant, preferable to salol. A gauze is used whose meshes are impregnated with this substance as a substitute for iodoform gauze.

Paracresotate of Sodium has been used in acute rheumatism as a substitute for salicylates. 20 grs. may be given in 1 oz. water. Paracresotic or Cresotic Acid is obtained from cresol, and is homologous with salicylic acid, but is more toxic.

Cresol or Cresyl—The ortho-, meta-, and para-cresols are obtained from coal tar oil by fractional distillation; the mixture of the three is known as Cresylic Acid, or so-called 100 per cent. Carbolic Acid of commerce (Helbing). They are powerful germicides, and are only slightly poisonous, but, owing to the difficulty in isolating each and owing to their insolubility, they have not come into general use in the pure state. Meta-cresol closely resembles creosote in its action. Creolin is chiefly a solution of cresols. Kresol is the name given to ortho-cresol. (See also Lysol and Trikresol.)

Cresol Iodide is a pale yellow powder, introduced as an iodoform substitute. It is a powerful antiseptic, but the sticky and resinous-like feeling which it induces in the surgeon's fingers is objectionable.

Cumol is the name given to a thick fluid obtained from coal tar oil, which has been found most valuable for the sterilisation of catgut, after boiling for two hours. The catgut is afterwards to be washed in petroleum benzine.

Curara, Woorara, Urari, or the South American Arrow Poison, is a dried extract, the product of various unknown plants. Strychnos and cocculus contribute to its terrible potency. Injected hypodermically or thrown direct into the blood stream, it produces profound muscular relaxation, with slight contractions, and if the dose be large enough, general muscular paralysis soon results and death follows from stoppage of the respiration. The heart's action persists to the end, and the centres and sensorium are unaffected, the action of the poison being upon the peripheries of the nerves, supplying voluntary muscle. When swallowed, the kidneys are able to excrete it so rapidly that a large dose may produce no effect. It has been used subcutaneously in chorea, $\frac{1}{15}$ gr., in hydrophobia and tetanus, and, it has been stated, with some success in the latter diseases.

Dose, hypodermically, 1—6 mins. of B.P.C. injection (1 in 12).

Böhm's Curarine is a powder free from curine, and representing the active principle of curare. It is given hypodermically in $\frac{1}{15}$ — $\frac{1}{10}$ gr. doses.

Cypripedin is a dried extract of *Cypripedium pubescens*—known as Ladies' Slipper. It is recommended as an antispasmodic in hysteria, hypochondriasis, chorea, epilepsy, spermatorrhœa, and in amenorrhœa, given in doses of 1 to 5 grs. in pill.

Damiana is the name given to a drug (*Turnera microphylla* and *T. aphrodisiaca*) long used by the Mexicans as a powerful stimulant to the reproductive centres. The leaves and flowers are the parts used in medicine as an aphrodisiac. It has been used in America with success in many

forms of brain exhaustion, and want of tone in various regions of the nervous system, especially about the genito-urinary centres. It is a mild purgative, and has been given in paraplegia with apparent benefit, and in sick headaches. The writer has obtained good results from it in cases of sexual debility and hypochondriasis. It is a tonic; in its action upon the appetite it resembles quinine and calumba, and it acts also as a stimulating diuretic.

Dose—1 oz. of an infusion representing $\frac{1}{2}$ to 1 dr. of the leaves three times a day; or 1 dr. of the fluid extract (1 in 1).

Datura Tatula is a solanaceous plant, resembling stramonium in therapeutic action. It has been introduced as a remedy for asthma, to be smoked like stramonium, and though it may not be generally found to be more certain than this plant in its action, yet the writer has seen it give most unmistakable relief when stramonium had failed after many trials; and in this case it *continued* to give relief for years.

Daturine, obtained from stramonium and datura tatula, though supposed formerly to be a pure alkaloid, is now believed to be but a mixture of hyoscyamine and atropine.

Dose— $\frac{1}{120}$ to $\frac{1}{80}$ gr.; 1 in 200 is used to dilate the pupil.

Dermatol is a fine yellow powder without odour, being non-poisonous and perfectly unirritating, and possessing astringent and antiseptic properties. It is the subgallate of bismuth. The reports of the value of this agent when used as a dry dressing instead of iodoform are most satisfactory. Ulcers, burns, and fresh wounds heal with great rapidity, and its drying up properties have proved most valuable in weeping eczemas and intertrigo. It may be used as a dry powder, collodion, paste, ointment, or glue. It has been given internally in gastric ulcer and cancer, and is most valuable in diarrhoea, especially if tubercular, in doses of 20 grs. *ter die*. 1 in 20 may be injected for gonorrhoea. (See also under Bismal.) Dermol is the name given to bismuth chrysophanate.

Dermosapol is a superfatted cod liver oil soap containing lanoline and Peruvian balsam. It is used as an inunction in scrofulous and tubercular affections, etc. It has a wider range, however, when made the bases of drugs like mercury, iodine, lysol, iodoform, etc., and dermosapols of these agents are recommended in the diseases in which the crude drugs are indicated.

Diaphthol, or **Chinaseptol**, referred to under the heading Aseptol, is the aseptol of the chinolin series. It occurs in yellowish crystals, very slightly soluble in cold water. Guinard found it to be a powerful antiseptic without any irritating qualities, and he points out its superiority to salol as an agent for disinfecting the urinary tract.

Digitalin—The chemistry of digitalis is still in a most unsatisfactory state, and it is impossible to arrive at a conclusion about the relative values of the substances recommended as substitutes for the crude drug, which contains at least three active glucosides—*i.e.*, Digitoxin, Digitalin, and Digitalein. Digitonin also exists, but it is antagonistic to the others, acting as saponin, and being devoid of cardiac tonic action. There are several substances in use under the name of digitalin, but these are mixtures of the glucosides, the digitalin verum of Kiliani is probably the purest one, and it may be given hypodermically in doses of $\frac{1}{15}$ grain. Merck's crystalline digitoxin is perhaps the most active and reliable of all

the substitutes, but it is insoluble in water. It is clearly the glucoside which dominates the action of the others when the crude drug is employed, but it cannot be given hypodermically except when dissolved in Petit's Fluid. By the mouth Merck's digitoxin may be administered in $\frac{1}{340}$ grain tablets, each of which may be taken as representing $3\frac{1}{2}$ grains of the dry leaf, or 1,000 times that of the crude drug. It can be dissolved in spirit before administration. The Digitaline of Homolle is amorphous digitalin, of variable composition, and should not be used. Nativelle's Crystalline Digitaline in $\frac{1}{340}$ grain granules is said to consist of an impure form of Schmiedeberg's digitoxin. Digitalinum Purum, of German manufacture, consists, according to the most recent reports, of a small amount of digitoxin, one-fifth its weight of digitonin, and the remainder being digitalinum verum. It is given in doses of $\frac{1}{34}$ — $\frac{1}{32}$ grain. According to Merck it contains some of Schmiedeberg's digitalein in addition to the above-mentioned constituents.

It will be seen by this short statement that the safest and most reliable form for the administration of digitalis is still the tincture, infusion, or leaf. The writer has often injected the B.P. tincture alone or with strychnine, and never saw any local trouble follow its use.

A preparation of digitalis leaf made by Golaz's method of dialysis is much praised by Georges. This Dialysate of Digitalis may be given in the same dose as the B.P. tincture.

Diiodoform, or Ethylene Periodide, is a yellow, insoluble crystalline powder without odour, prepared by the treatment of acetylene iodide with excess of iodine. It contains 95.5 per cent. iodine, and is used as a substitute for iodoform, being similar in action to iodol and aristol. It is easily decomposed by sunlight.

Dionine, or Ethyl-Morphine, allied to codeine, is introduced as a morphia substitute. It is a soluble crystalline powder, given in doses of $\frac{1}{4}$ to $\frac{3}{4}$ grain, and it is claimed for it that it is superior to morphia in all pulmonary affections, since while it diminishes cough it acts as an expectorant. It has also been advocated as a remedy for the morphia habit. A 5 per cent. solution instilled into the eye relieves corneal pain most markedly, but it causes severe smarting at first.

According to Marshall it increases the depth and the duration of inspiration, though not so markedly as heroine does. It closely resembles codeine in its action.

Dithion is a white crystalline soluble powder, prepared from salicylic acid by the action of sulphur chloride. It is the Dithio-salicylate of sodium, and is introduced as a substitute for salicylates on account of its small dose—i.e., 3—5 grains.

Diuretin is a sodio-salicylic compound of theobromine, corresponding to the soluble caffeine salts. Theobromine has been proved to act as a powerful diuretic, but it is almost insoluble. Diuretin contains 49 % of theobromine, and is very soluble in water. It must be given in doses of 15 grains at least four times a day in order to obtain its best effects. It has been given successfully in all forms of dropsy. Its value depends upon its stimulating power over the renal epithelium, and it has proved safe in both chronic and acute Bright's disease, the quantity of urine being markedly increased without any untoward symptoms. It has no action upon the nervous system, and has often succeeded where caffeine and digitalis have failed, and its action is more lasting. It acts well in cardiac asthma and cardiac dropsy, but is of less use in the dropsy following

hepatic congestion and serous inflammations. It is best given in warm water.

A combination of theobromine with iodide and salicylate of soda—Iodo-theobromine—is a white soluble powder, given in 15 gr. doses as a diuretic in cardiac, renal, and hepatic dropsies.

Lithium Diuretin is referred to under Lithium Salts.

Agurin is the name given to theobromine-sodio-sodic acetate in the form of a white powder; it is claimed to be more active and less irritating than diuretin. It may be given in 10 grain doses in capsule, wafer, or solution.

Duboisia Myoporoides is an Australian solanaceous plant, yielding Duboisine, formerly supposed to be a pure alkaloid, but now regarded as a varying mixture of hyoscine and hyoscyamine, according to the soil and condition of the plant from which it is extracted. It is used in ophthalmic surgery (1 in 400) as a substitute for atropine, than which it is said to act more promptly. Stronger solutions have been reported in a few cases to cause faintness, giddiness, and hallucinations.

Dulcin, Sucrol, or Valzin, is a crystalline powder, being a para-ethoxyphenyl urea, introduced as a sweetening agent by Kobert. It is 200 times sweeter than sugar, but, though safe in ordinary sweetening doses, it is not likely to come into general use as poisoning has followed its experimental administration to animals.

Eka-Iodoform is a compound of iodoform with 0.5 per cent. of paraformic aldehyde. It is introduced by Schering with the view that the aldehyde is changed at once into formalin vapour, which sterilises the iodoform. It is used like iodoform, which it closely resembles in every way.

Emetine—A white, amorphous, pure alkaloid, obtained from ipecacuanha. It acts as a powerful emetic, and should not be given except in very small doses and diluted condition. $2\frac{1}{2}$ grs. dissolved in 1 pint Sherry make Emetine Wine equal in strength to Vin. Ipec. This powerful substance must not be confused with the extractive called Emetin, which can be given in 1 gr. doses. The hydrochloride of Paul's pure emetine has recently been found to contract the small vessels, and markedly raise the blood pressure. Its emetic dose should not exceed $\frac{1}{10}$ gr.

Cephaeline is the name of another alkaloid obtained from ipec., but it is never employed.

Emol is an impalpable powder, something like Fuller's earth, introduced by W. A. Jamieson; it is found in Perthshire. Used with water it raises a lather like soap, and the powder made into a paste with water has been applied to the palms and soles in keratosis, and covered over with oiled silk. The epidermic masses peel off, leaving healthy skin behind. It does not appear to differ very much from Talc, Selenite, Dimatos, Kaolin, Calamina, Fuller's Earth, French Chalk, and the host of other absorbent earth powders in general use.

Enterol is the name given to a new antiseptic, being a liquid mixture of the three cresols. It is praised as a urinary antiseptic of great value which acts upon the pelvis of the kidney and bladder after elimination. The dose is 1 dr. of a 1 in 500 solution in gonorrhœa, cystitis, pyelitis, &c. It may be given in pill or capsule, but it is contra-indicated in gastric ulcer and acute Bright's disease. (See Lysol and Trikresol.)

Epicarín is a yellowish powder with slight odour; it is beta-oxy-naphthyl-o-oxyl-meta-toluylic acid. It has been introduced as a remedy for scabies in 10 per cent. ointment, but there are many more certain remedies for this affection. It has recently, however, proved valuable for seborrhœa of the scalp and lichen planus in 5 per cent. alcoholic solution, and a 10 per cent. ointment is a very reliable means of treating chilblains.

Eosote, or Valerianate of Creosote, existing in the liquid form is introduced as an anti-tubercular remedy. It is claimed for it that it is devoid of corrosive or toxic properties, and it is given in capsules, the daily dose being brought up to 30 mins. The reports of Grawitz show that it is well tolerated by the stomach, and that it acts as an intestinal and gastric antiseptic.

Eriodictyon (Yerba Santa) is a stimulating expectorant, used in phthisis and bronchitis, from California, and as it contains a resinous principle which stimulates the mucous membrane of the bladder on its elimination by the kidney it is given also in tea-spoonful doses in cystitis. It has been used also as a vehicle for quinine, whose bitter taste it effectually disguises. The leaves are the part of the plant used in medicine.

Erythrol Tetranitrate, or Tetranitrin, has been used by Prof. Bradbury with success in angina pectoris. It is a derivative of erythrite, and belongs to the group of vaso-dilators containing nitrite of amyl and glonoin. 1 gr. of the solid crystals may be given, dissolved in 1 dr. alcohol, every three or six hours in water, but it can be best given in tabloid form; it may be taken in doses as large as 6 grs. five times a day. The value of the drug lies in its being able to ward off the attacks, and by a judicious use of it these may be prevented entirely. It has no advantage over amyl or glonoin in cutting short the attack if once started. It is unfortunately very expensive, and liable to explode when heated and triturated during its manufacture into tabloids. Mannitol hexanitrate, or Hexanitrin, acts also in a similar manner, and in the same doses may be substituted for it. It is not so expensive, but its action is more prolonged though less effective.

Eseridine has been introduced as a substitute for eserine; it exists in the Calabar bean, and was supposed to be less toxic than eserine, a statement disproved by subsequent research. Schweber's experiments prove that it possesses no advantages over eserine, and it is only $\frac{1}{2}$ part as active. It has been used as a purgative, but more efficient and safer cathartics are always available.

Ethidene Dichloride, or Chlorinated Chloride of Ethyl, is an anæsthetic which closely resembles chloroform in its physical characters. It was recommended by Snow, and has been made the subject of very careful experiments by a committee appointed by the B.M.A. They reported that it was more dangerous than ether, but less so than chloroform. It is more pleasant than chloroform, and much less exciting in the early and after stages, and recovery from its influence is more rapid than in the case of ether or chloroform. The vapour of about $\frac{1}{2}$ oz. will, generally speaking, be found enough to produce anæsthesia in the adult. Opacity of the cornea has been seen to follow its use owing to its power of dehydrating the corneal tissue. Much difference of opinion exists about the safety of this anæsthetic, and Ringer states that it affects the ventricle like chloroform, whilst others affirm the contrary. Many

deaths have been reported from it, and notwithstanding the results of experiments the drug is probably decidedly more dangerous than chloroform and ether.

Ethylene Bichloride is isomeric with Ethidene Dichloride, with which, however, it should not be confounded. It is also known as Ethene Chloride or Dutch Liquid. It is capable of producing anæsthesia like chloroform and dichloride of ethidene, and probably is safer than either of these drugs, as it always acts in overdoses upon the respiration, and not upon the heart. The objection to its use is the great irritation produced by the local action of its vapour upon the air passages, and hence it has fallen into disuse.

It is a good local anæsthetic. The opacity of the cornea resulting from its administration is not caused by actual contact, but occurs after the drug has gained admission to the blood.

Ethylene Bromide is a heavy, sweet liquid, with a chloroform-like odour, and containing about 91 per cent. of bromine. It is a powerful irritant, and should be used with caution. There is difficulty in its administration owing to its insolubility; it is best given with, at least, 4 times its bulk of almond oil in capsules. 3 minims appear to be a fair dose. It is reported to give results in epilepsy far superior to those obtained by any other bromine preparation. Donath gave it mixed with an equal quantity of spirit flavoured with peppermint in milk.

It should not be confounded with Bromide of Ethyl. (See page 478.)

Eucaine Hydrochloride A is a crystalline salt introduced as a substitute for cocaine. It is Benzoylmethyltetramethyl-g-oxypiperidin-carbonicmethylester in the form of colourless soluble crystals. It is a local anæsthetic, and may be applied to the throat and nose in 2 to 5 per cent. solutions. It has not proved quite satisfactory in eye work, as it causes smarting, but Berger uses 1 part of cocaine with 1 part of this substance in 90 of water for the conjunctiva. It hardens the tissue and injures the corneal epithelium, but it is less toxic than cocaine, and does not affect the pupil. It is useful in dental work, and may be injected into the tissues round the teeth before extraction. It may be rubbed into the skin before operating in the form of an ointment 10 per cent.

Eucaine B is a more satisfactory preparation; it can be sterilized by boiling without decomposition, and can be injected hypodermically in doses of 5 to 10 grs., and it is less toxic than eucaine A. The anæsthesia produced by both substances lasts only half as long as that produced by cocaine. Eucaine, owing to its freedom from toxic action, can be employed by Schleich's method of local infiltration. Barker uses 1 part of eucaine, 8 of chloride of sodium, and 1,000 of water, and 2 to 5 ozs. of this fluid may be injected into the deeper layers of the skin around tumours, before and during the removal of these, so as to ensure local anæsthesia, and sometimes cocaine in small amount is added to the liquid.

Eucaine Acetate is more soluble, and is recently advocated as preferable to Eucaine B.

Fink recommends eucainization of the spinal cord by Bier's method in those cases where chloroform narcosis is dangerous. He injects 40 mins. of a sterilized 5 per cent. solution of eucaine B. into the dural sac between the third and fourth lumbar vertebræ, which causes complete anæsthesia in the lower extremities, the genitals, and rectum.

Eucalypteol, or Hydrochloride of Eucalyptene, exists as white scales, obtained from eucalyptus oil, and its action is the same. It is recommended for internal use in preference to the oil, especially for bronchial troubles and phthisis, in 5 gr. doses in capsule or emulsion, or with sugar; it may be given wherever the oil is indicated; or 30 grains may be given as an enema with olive oil.

Eucalyptol, or Cineol, is a colourless liquid prepared from the oil of eucalyptus (six different species), being that portion of the oil which passes over between 347° and 351°. It is used in all the conditions in which eucalyptus oil is indicated. Martindale recommends it for oro-nasal inhalers, because it does not dry up like a varnished coating. It is given internally in capsules containing 5 minims each, in bronchial affections, cystitis, diarrhoea, asthma, &c.

Eucasin is a tasteless powder like somatose, easily soluble in water or warm soup. It is a compound of ammonia and casein, and is of great nutritive value, especially recommended in gout, typhoid fever, phthisis, and chlorosis. It is easily digested, and leaves little residue. Salkowski finds it a suitable substitute for meat albumin, and it leads to a reduction in the excretion of uric acid; 1—2 ozs. may be given in soup or cocoa. Weiss states that it contains 95½ per cent. proteid, as against 20½ in beef.

Euchlorine is the name given to a solution of chlorine in water, which is used as a gargle in diphtheria, and as an intestinal antiseptic in typhoid, &c. (See under Chlorine.)

Eudoxin is a bismuth salt of the iodine and phenyl compound called Nosophen, existing as a brown insoluble odourless powder. It is given in 15 gr. doses in tubercular ulceration of the intestine, and in 2—4 gr. doses in the enteritis of children. Externally it is used as a substitute for iodoform, especially in nose and throat cases. It is similar to Antinosin. (See Nosophen.)

Eugenol, or Eugenic Acid, is an oily liquid, smelling like cloves, obtained by oxidizing oils of cloves, cinnamon, and other oils. It is a powerful antiseptic, and is not toxic; it possesses antipyretic properties, and is a very valuable local anæsthetic in neuralgia and toothache. 15 grs. may be given in wine 3 times a day in phthisis. It has been employed 10 grs. to 1 oz. lanoline in pruritus. The Acetamide is more reliable.

Euguform is a white amorphous insoluble powder, introduced as an iodoform substitute. It is acetylated methylene guaiacol. It relieves itching, and is useful in acute eczema and ulcers and herpes.

Eulactol is a food consisting of sugar of milk 3 parts, fat 1 part, and albumin 2 parts. It may be given in tea-spoonful doses to infants. It is recommended by Ewald in cases of faulty nutrition combined with milk, cocoa, or soups.

Eunatrol, or chemically pure sodium oleate, is a white soluble powder, introduced as a powerful cholagogue and solvent for gall stones. It is best administered in the form of pills, each containing 5 grs., and 3 or 4 such may be taken twice daily. Blum reports most favourably of this remedy.

Cipriani states that upon entering the stomach it is converted into an oily substance, which lubricates the duodenum, and the absorbed portion acts as a cholagogue and solvent of the calculi.

Eupatorium Perfoliatum, or Boneset U.S.P., is a valuable bitter tonic, like calumba, but it possesses diaphoretic properties. The warm infusion (1 oz. to 1 pint) in wine-glassful doses every two hours produces copious sweating; in four times this quantity it is an emetic, like warm chamomile infusion, and also a purgative. It has been used to act upon the skin in bronchial catarrh, influenza, and muscular rheumatism, and its cathartic action has been utilised for the expulsion of tape and round worms.

Euphorbia Pilulifera, or Pill-bearing spurge, paralyses the respiration and heart, through its direct action on the respiratory and cardiac centres. Good results are reported with it in the dyspnoea of asthma, emphysema, bronchitis, and in dyspnoea of cardiac origin. It appears to act beneficially upon spasmodic dyspnoea, from whatever cause arising, probably by its influence over the vagus, but its best effects are seen in ordinary spasmodic asthma; coryza and hay asthma have been markedly benefited by it. The gastric irritation arising from its administration can be avoided by giving the dose in a state of free dilution. 1 gr. of the extract, or 10—30 minims of the B.P.C. tincture, 1 in 5, freely diluted after meals, may be given 4 times a day.

Euphorin, or Phenyl-urethane, is an insoluble, colourless, crystalline powder, with a clove-like odour. It has antipyretic, analgesic, antiseptic, and antirheumatic properties like salicylic acid and antifebrin, and has been used in about the same doses as antifebrin (5 grs.) in fevers, neuralgia, migraine, acute rheumatism, sciatica, orchitis, and other painful febrile affections. Its antipyretic action is prolonged, and accompanied with profuse perspiration. 5 grs. are about equal in antipyretic effect to 10 grs. of antipyrine. It may be given in tabloids or dissolved in wine. The powder is applied to chancres and ulcers, and is much praised in gynaecological practice.

Euphrasia, or Eyebright, is a scrophulariaceous plant, containing tannin, and an acid which appears to exercise some astringent and alterative action upon the upper part of the respiratory tract. It has been extolled in coryza, bronchial affections of the larger tubes, hay fever, and measles. The tincture (2 ozs. to 1 pint) may be given in doses of 10 or 15 minims every 3 hours.

Euphthalmine Hydrochloride is a colourless, crystalline, soluble salt, derived from n-methyl-vinyl-diacetone-alkamine. A 5 per cent. aqueous solution causes rapid and complete dilatation of the pupil without pain or other drawback, and it is recommended in ophthalmic work in preference to atropine. Its cost is a barrier to its usefulness.

Eupyrine (Paraphenetidin-vanillin-ethyl carbonate) exists in greenish yellow crystals almost without taste. It is introduced as an antipyretic, and promises to be one of the safest yet found. In doses of 20 grs. it reduces the temperature with certainty, and without producing any unpleasant symptoms, whilst at the same time it acts as a stimulant, and is indicated in feverish conditions where antipyrine and phenacetin are contra-indicated owing to exhaustion or cardiac weakness. It may be given in cachets or placed upon the tongue, and washed down with a little water. It has no analgesic action.

Euquinine, or Euchinin, is a crystalline almost tasteless substance, obtained by acting on quinine with ethyl-chlorocarbonate. The chloride is soluble in water, and is introduced as a substitute for quinine in 10 gr.

doses as an analgesic, and antipyretic in cachets or tablets in whooping-cough, tubercle, neuralgia, &c. Gray has obtained good results from it in malaria. It may be given to children in soup or milk. Recently it is highly recommended as a prophylactic against malaria, and Celli has demonstrated this on a large scale in Italy; he gave 4 grs. in the morning, followed by another dose at noon, and this was continued for five months without injury. Only 10 per cent. of the protected persons were affected, and the disease was always mild, whereas 63 per cent. of unprotected persons suffered from the disease in its usual forms. It is unquestionably a more effective and manageable prophylactic than quinine.

Saloquinine is the quinic ester of salicylic acid, and is therapeutically identical with euquinine, but it is chiefly used in neuralgias, in doses double those of quinine.

Eurobin, or Acetate of Chrysarobin, is a brown powder free from the irritant qualities of araroba or chrysarobin, and it does not cause staining. It is used in all the cases where the latter drug is indicated. The Triacetate or Lenirobin is also recommended, but at present it is not possible to judge of the efficacy of these salts.

Europhen, or Iodide of Isobutylorthocresol, is a yellow bulky powder with a saffron-like odour, insoluble in water and soluble in alcohol. It is bland and unirritating, and acts like aristol. It slowly gives off free iodine in contact with moist surfaces. From the voluminous literature of this drug, it would seem to be the best of all substitutes for iodoform, and it has been used like it in every conceivable condition of wound, ulcer, chancre, lupus, tubercular growth, &c. In venereal sores it certainly should replace iodoform entirely. It may be diluted if necessary with borax, but not with starch, and 5 per cent. ointments may be used as dressings and applications to moist skin diseases, as intertrigo and impetigo. It contains nearly 30 per cent. of iodine, and does not smell, irritate, or poison, but is easily decomposed by light and heat. Flick claims to cure early phthisis by rubbing in $\frac{1}{2}$ oz. of a solution (1 in 20) in olive oil into the groins and armpits. It is also administered as a hypodermic injection (15 minims of a 1 per cent. solution in olive oil) in secondary syphilitic affections.

Exalgin, or Methylacetanilide, is a salt occurring in needle-like crystals, which are sparingly soluble in water, and easily soluble in dilute alcohol. It is used only for its pain-relieving qualities. 4 grains will be generally found to relieve most cases of pain from whatever cause. Its best effects have been obtained in neuralgia, and it has been known to relieve patients in whom the other new analgesics had failed. Fraser found it to succeed in 48 cases out of 52; his dose was $\frac{1}{2}$ to 2 grs. The writer has failed very many times with this dose. 2 or 3 grs. 3 or 4 times a day will relieve almost all forms of neuralgia, migraine, sciatica, and every painful affection in which antipyrine has been successful. It diminishes the amount of urine and of sugar in diabetes as the other analgesics do, but its administration does not lead to any lasting results in this affection. The urine has been found to become almost black under its prolonged administration for neuralgia, but no harm resulted. The drug cannot be said to be gaining in favour, and the writer's experience of it is that it sooner requires increase of the dose than the older analgesics, and untoward effects are not rare.

It may be administered in pill or weak spirituous solution.

Ferratin is a reddish, brown powder, claimed to be identical in composition with the iron substance found in pig's liver, and from which the colouring matter of the blood is formed. It is a weak albuminate (7 per cent. of iron), and is prepared from albumin and ferri et sodii tartras. It is claimed for it by Schmiedeberg that it is a food, and should be used in all cases of faulty nutrition, and that it is the most easily absorbed iron preparation yet known. It has been used extensively in every condition where iron is indicated, in daily doses of 10—20 grs. in powder. It is probable that further experience will prove it to be a valuable iron preparation, not more efficacious, however, than the tried inorganic salts. Carniferrin is another tasteless brown powder, containing iron in combination with the phosphocarnic acid of muscle prepared from extractum carnis. It is given in 5 to 10 gr. doses. Fersan given in drachm doses has a somewhat similar composition.

Ferratogen is a yellow powder prepared from ferric nuclein, which is obtained by cultivating yeast in the presence of iron. It is suggested as a remedy for chlorosis.

Triferrin is the paranucleinate of iron, containing 22 per cent. of iron and $2\frac{1}{2}$ per cent. of organically combined phosphorus. It is prepared from the casein of cow's milk. It is used in anæmias in doses of 5 grs. in cachets or pills.

For other organic iron compounds see under Hæmoglobin and Hæmol.

Ferripyrine, or Ferropyrin, is a dark, red, soluble powder, containing 12 per cent. of iron and 64 of antipyrine in combination. It has been found a valuable hæmostatic or styptic when applied in 20 per cent. solution. It does not cause any irritation or destruction of tissue, and is a mild anæsthetic. It may be used for the nose, middle ear, throat, vagina, or uterus on tampons, and taken internally in chlorosis, gonorrhœa, hæmatemesis, and diarrhœa, in doses of 5 grs. in solution.

Ferrosol is a dark-brown liquid with an unpleasant taste, being a compound of ferric saccharate with sodium chloride saccharate. It is recommended by Böhm as a remedy in anæmia, chlorosis, and all diseases in which iron is indicated, in 3i. doses.

Formalin, or **Formol**, is a 35 per cent. solution of Formaldehyde or formic aldehyde, which is prepared by passing the vapour of methyl alcohol over red hot coke. It is found to be one of the most powerful antiseptics known; 1 in 50,000 prevents the growth of bacteria in meat solutions. A 3 per cent. solution will kill all pathogenic organisms in a minute, and is used to sterilise the hands and instruments, though it cannot be satisfactorily used as a disinfectant to wounds as it possesses a necrotic action. Sprayed through a sick room it is a powerful antiseptic, even in 1 per cent. solution, and this will immediately deodorise fæces and cause no injury to leather or clothes, but it is maintained that it has no penetrating power, and that where there is much dust it is useless. A 40 per cent. solution has been applied to chancres and ringworm of the scalp and to soft corns; a $\frac{1}{2}$ per cent. solution cures gonorrhœa; 2 per cent. glycerin solution is a most efficacious application in all forms of sore throat and stomatitis. The inhalation of formol has been used with good results in tuberculosis, pertussis, and diphtheria. Under the name of Igazol, Cervello has used as an inhalation in phthisis a mixture of formaldehyde, trioxymethylene, and an iodide, and reports most favourably of its effects. Maguire injects in tuberculosis a weak solution of formaldehyde

into the veins. Under the names Holzine, Holzinol, and Sterisol, a 20 per cent. solution is introduced for domestic use as an antiseptic for rooms, utensils, &c. It has been used for the hardening and preservation of specimens and in microscopic work, and to the writer it seems to preserve the colour of the specimens in a remarkable way (1 of Formol in 20). Merck has patented a process for making Formaldehyde-Casein, a yellowish, white powder, which is antiseptic, and has been used as a powder, and as a gauze for ulcers and wounds.

Glutol, or Formacoll, is the name given to a formalin gelatin made by exposing gelatin or isinglass to the fumes of formalin. It becomes hard and can be easily powdered, when it forms a good dressing for wounds, ulcers, burns, etc.

Amyloform is a compound of starch with formaldehyde used in the same manner as glutol. It is an intestinal disinfectant.

Dextroform is a compound of formaldehyde with dextrin, and has been given internally and used as a 10—20 per cent. injection in gonorrhœa. Tannoform, Tannopine, Thymoform, Quinoform, Galloformin, Euformol, Saliformin, Formopyrine, Creoform, Ekaiodoform, &c., are compounds of formaldehyde with the drugs whose names are suggested by their titles.

Formanilide, or Phenyl-Formamide, exists as colourless crystals, obtained by acting on aniline with oxalic acid. It is a powerful analgesic, antipyretic, hæmostatic, and local anæsthetic. It is given in doses of 2 to 5 grs. in neuralgia, &c., and mixed with starch as an insufflation in throat and laryngeal ulcerations, and as a 2 per cent. solution for the urethra before passing instruments.

Fuch sine (Roseine or Magenta) is the brilliant iridescent crystals of the hydrochloride of rosaniline, recommended by Bouchut as a remedy for albuminuria with œdema. The drug is rapidly passing into disuse, it often contains arsenic; it colours the saliva and the urine red, and can only be given in pill as its watery solution stains the lips deep red, and it also affects the vision. Reiss affirms that the proper dose is $\frac{1}{8}$ to $\frac{1}{10}$ gr., though others give up to 4 grains.

Fucus Vesiculosus, or Bladder Sea-weed, at one time enjoyed a position in the Dublin Pharmacopœia. Its virtues have been chiefly found useful in scrofula, various glandular and joint enlargements, and bronchocele. D.-Duparc used it in psoriasis, and discovered that it caused the absorption of adipose tissue. Its pharmacology has yet to be worked out; some believe it causes emaciation by the amount of iodides which it contains, but iodine or iodides will not produce the results claimed for this wrack; others believe it to be uncertain or powerless, and it is rather a significant fact that the pig, which is regarded as closely allied to man in some physiological and structural points, has been fattened for market on the fucus vesiculosus in the North of Ireland. An extract has been sold as a remedy for obesity under the title of "Anti-fat."

5 to 30 grs. of extract, or 1 to 3 drs. of the fluid extract, may be given 3 times a day.

Fuller's Earth—A clay or native silicate of alumina, containing minute quantities of iron. In the form of impalpable powder, it is a valuable emollient and "drying" remedy in weeping eczema, and especially in the intertrigo of infants. It resembles the oxide of zinc in its properties. See under Emol for similar drugs.

Galium Aparine, or Cleavers or Goose Grass, is a succulent annual

plant which has been a domestic remedy for various strumous disorders, and the juice has been applied to disperse glandular growths, and to stop hæmorrhages. Dr. Boyce testifies to its value as a palliative in cancer. He gives 5 ozs. of the juice daily, and applies a strong ointment to the ulcerated surface, which he afterwards covers over with a dressing of the bruised leaves.

Winn has found it to cure psoriasis after all other remedies failed, and Ogle recommends its administration in epilepsy. It also is given in cystitis.

Gallacetophenone is a yellow powder derived from pyrogallol, which is introduced as a substitute for this drug in psoriasis; it does not stain linen, and in 10 per cent. ointment has given good results. Its effects show themselves, it is stated by Rekowski, in 12 hours. It may be applied in solution 4 per cent. in water in which 30 per cent. sodium acetate has been dissolved. It has been tried also in eczema.

Gallanol or Gallol (Gallic Acid Anilide) exists in colourless, sparingly, soluble crystals. It is introduced as a substitute for chrysarobin in psoriasis, applied as a paste with traumaticine, mixed with inert powders dusted on eczemas or applied as a 1 in 5 ointment. It has also been used in ringworm. It is non-irritating and non-poisonous, and is recommended when the face is affected, as it reduces hyperæmia without staining.

Gallicin is a soluble crystalline salt; it has been found serviceable in phlyctenular ophthalmia, and in all inflamed conditions of the conjunctiva. It is dusted twice daily into the eye (in form of *fine* powder) as a substitute for calomel. It is the methyl-ester of gallic acid, and resembles this substance in its action. Iodogallicin is an iodine salt of gallicin, which is introduced as a rival of airol (page 479).

Gallobromol or Dibromogallic Acid exists in white crystalline needles, soluble in 10 parts water; it is recommended as a substitute for the ordinary bromides in the usual doses. It is a powerful antiseptic, and has many advocates as an injection (3 per cent.) in gonorrhœa and cystitis. It is claimed for it that it prevents chordee. The injection should be prepared fresh.

Gaultheriæ Oleum—The fragrant oil of winter-green consists of salicylate of methyl to the extent of over 90 per cent. The oil of sweet birch has a similar composition. It has been administered as an antipyretic in acute rheumatism, in which disease its effects are identical with those produced by salicylic acid. It has a pleasant taste, and may be given in doses of 15 minims in emulsion or capsule every 3 or 4 hours. It is a source from which to obtain salicylic acid, and it is still a disputed point whether the acid derived from it is more efficacious than the artificial acid. It is also applied externally in rheumatic joint affections, and it is prepared for this purpose synthetically, and is known as Methyl Salicylate, which see, and also see Colonial Addendum.

Gelatins, Medicated, are used by Unna instead of greasy ointments. His dressing consists of a firm elastic gelatin preparation containing gelatin 4, water 10, glycerin 10, and zinc oxide 4 parts. This is prepared by heating, and becomes a white solid like vulcanised India-rubber. It keeps in the solid form till required for use, when it can be easily melted by heat and applied to the limb with a brush; over it is applied a gauze bandage which receives another coating, and one or more layers of bandage

are then put on, each receiving its coat of gelatin till a firm elastic covering is applied to the entire limb. He claims for this that it can be worn for two months, and is far superior to the rubber bandage. If an ulcer be present it is dressed before applying the gelatin, and afterwards, when its discharge soaks through the coating, a little window is cut, which permits of its inspection and the application of suitable remedies. He makes a soft basis of gelatin 3, oxide of zinc 3, glycerin 5, and water 9 parts, which may be used in all cutaneous inflammations, prurigo, eczema, acne, &c., and to it, substances like resorcin (2 per cent.), ichthyol (2 per cent.), chrysarobin (5 to 10 per cent.), iodoform and sulphur (25 per cent.), may be added.

Pick dissolves clean white commercial gelatin in double its weight of water on a water-bath. The resulting solution brushed over the skin forms a protective coating, and has been used to form a basis for the application of chrysarobin, naphthol, iodoform, pyrogallie acid, and other active ingredients. Thus, for psoriasis, about 35 grs. of chrysarobin are added to 1 oz. of the hot gelatin solution, and stirred till thoroughly mixed. This when cold makes a cake which can be afterwards melted and applied with a brush to the diseased spots. The Sublimate gelatin used in the treatment of scaly eczema and other skin affections is an elegant and efficient agent. It is prepared by dissolving in a water-bath with water 30 parts of pure gelatin, and evaporating the mixture till its weight falls to 75 parts, at which point 25 parts glycerin and .05 perchloride of mercury are to be added.

Gelanthum is a new gelatin or ointment basis used as a varnish dressing, and made of gelatin, gum acacia and tragacanth, with 5 per cent. glycerin and 2 per cent. thymol. Ichthyol, resorcin, and other bodies can be suspended in it.

Bassorin Paste is a basis made by dissolving tragacanth 5 in glycerin 2, alcohol (90 per cent.) 10, and water 83. It is used as a drying lotion. A similar basis is used like the medicated gelatins for active skin remedies. For the use of gelatin as a remedy for hæmorrhage see under Gelatin, page 377.

Gelosin, or Agar-agar of Japan, is a mucilaginous principle extracted from *Gelidium corneum*. Wilde recommends it as an excellent excipient for suppositories. It is dissolved in its own weight of hot water, the active ingredients added, and then run into moulds. It is used as a medium for the growth of bacilli, &c. Recently Kramer has injected a sterilised solution 4 per cent. in inguinal hernia with success, the closure of the hernial sac following, and he also successfully injected it in penetrating chest wound with internal hæmorrhage.

Geranium Maculatum, or Cranesbill—The rhizome is an astringent containing tannin. It is used in America in the diarrhœa of children, and may be given in every condition in which rhatany is employed, and as a local astringent in hæmorrhoids, rectal fissure, and in gleet. Dose of the liquid extract (1 in 1) 1 dr. ; of Geranin, its active principle, 2 to 5 grs.

Gland Substances—There is not a gland in the body which has not now been suggested or actually administered for some diseased condition, and under Spermine, Thyroideum Siccum (page 466), Spleen Pulp, Pancreatis Liquor (page 415), Suprarenal Gland, &c., will be found short descriptions of the therapeutics of each agent.

There are many of these preparations which are doubtless unscientific and useless, but it is difficult to say that they are wholly inert, or that they may not yet be found of some value, especially when we reflect upon the decided action of the suprarenal extract on the local blood pressure, and the marvellous effects of thyroid substance in disease.

The following gland preparations are being tried mostly in tabloid form:—

Lymphatic Gland Substance in $2\frac{1}{2}$ to 5 gr. doses of the dried tissue in Hodgkin's disease, leucocythæmia, exophthalmic goitre, &c.

Bronchial Gland Substance (Glandulen) has been recently recommended in tubercular disease of the lung and abdomen in 5 gr. doses. Nearly all the reports are unfavourable, and Phthisin—a bronchial gland extract—has been used also, but with unsatisfactory results.

Mammary Gland Substance has been tried in various uterine affections in doses of 10 grs. *ter in die*, but like most of the present list of gland substances it is improbable that it is of much value, though some reporters state that it cures uterine fibroids.

Ovarian Substance seems to have some future before it. In 10 grain doses of the dried gland many observers have reported relief to the distressing symptoms which have appeared after removal of the ovaries, and about the climacteric period, in amenorrhœa, chlorosis, Grave's disease, acne, neurasthenia, and a host of neurotic conditions accompanying disordered menstruation. The writer tried it in one case where a patient, otherwise healthy, had only menstruated a few times in 10 years the flow appeared in a week after the use of the ovarian drug and continued with considerable regularity, but the result may have been a mere coincident. Friedmann states that he ensured or determined the sex in the case of guinea-pigs, as he succeeded in producing a male animal by the internal administration of ovarian substance, and a female by giving spermine. Even uterine substance has been given in menstrual disorders and in puerperal mania, but with negative results, and recently placental tissue is urged as a remedy for puerperal subinvolution and anæmia.

Pineal and Pituitary Gland Substances have also been tried in 2 gr. doses in various brain and nerve diseases; the latter substance has been vaunted in acromegaly, but it appears not to have any action in the disease, though early reports state that the symptoms improved. It, however, relieves the headache sometimes most markedly. The pituitary gland preparation is known by the name—Hypophysis Cerebri Sicc.

Prostate Gland Substance in 2 to 5 gr. doses, has been tried in enlargement of the organ, and in atrophy of the testicles and in presenility, but the results are not encouraging.

Salivary and Parotid Substance is fancifully suggested in various forms of ovarian disease; and one reporter states that in sixty cases of ovarian disease treated by parotid tabloids most cases recovered. Parotid gland extract, prepared by Merck, has been given in uterine and ovarian disease in 5 gr. tabloids with reputed success.

Thymus Gland Substance is used in exophthalmic goitre; and in 5 gr. doses thrice daily the writer has seen benefit from it in this disease, which is always made worse by the administration of thyroid gland. It is also recommended in rickets and in cases of defective nutrition in children. Neucleohiston is supposed to be the active principle of the gland, and is prepared

from it by Merck. It is recommended as an agent to promote phagocytosis.

Dried Liver and Kidney, or extracts from them, have been prepared and administered in a host of ailments, but with no definite results. The hepatic substance has been reported as useful in diabetes and in cirrhosis of the liver with ascites, and the renal is useless in albuminuria.

Dried Lung Substance has been extolled as a valuable therapeutic agent in phthisis, bronchitis, and pleural affections. It is almost certain that as at present prepared and administered it is worthless.

Merck has made a departure in this section of therapeutics, and has attempted successfully to place the animal extracts or gland substances in a more scientific form for the treatment of disease. He recognises the grave objections to the dried preparations which are merely media for the administration of the active secretion manufactured in the gland cells, and he has succeeded in isolating the leucomaines contained in the fluid of the glands or organs by the plan of forming double salts of them with chloride of sodium. These preparations he defines by the prefix "opo" (juice or sap), and thus we get Opothyminum from the thymus, Opothyroid, Opoprostate, &c., &c.

Glutinopeptonate of Corrosive Sublimate is introduced by Huffer for the hypodermic treatment of syphilis. It consists of soluble, silky scales, prepared by treating glutin with hydrochloric acid and adding bichloride of mercury, 25 per cent. 4 grammes of the salt are dissolved in 100 cubic centimetres of water, making a 1 per cent. (Hg.) solution, and each Pravaz syringeful contains one daily dose of sublimate. Four weeks' treatment will remove, it is said, all chance of relapse. Abscesses never occur, and only in a few cases have slight indurations at the site of puncture been observed.

Gluton is the name given to a whitish soluble powder prepared by acting on gelatin by acids. It is a valuable nutrient, and may be taken in the form of a liquid with sugar and lemon juice as a food. It is claimed for it by Brat that it can replace albuminous foods, may be taken in any amount, and that it is easily digested, and has the same nutritive value as gelatin.

Glycogenal is a white, odourless, tasteless powder, introduced by Rörig. It is known as Rörig's Glycogen, and is closely related, according to Merck, with glycogen, and is found in considerable quantities in the healthy body, but disappears in diseased conditions, notably in phthisis, and hence its use as a restorative in this disease. It is bactericidal, and has an extraordinary power of increasing the appetite, and it can be given in large quantities (1½ ozs.) daily without harm. The drug is given in 20 gr. doses with 1 gr. carbonate of ammonia before breakfast. It is also given hypodermically and per rectum, but the ordinary method by the mouth seems to meet all cases. In phthisis the results are reported as most favourable, and the drug is given by inhalation or insufflation by means of special apparatus. Rörig regards it as an antitoxine in scarlatina, and reports glowingly of it in a host of diseases, as migraine, exophthalmic goitre, cancer, abscesses, &c.

Glyconin is the name given to a mixture of nearly equal parts of egg yolk and glycerin (45 and 55) rubbed up together. It is used as a dressing for ulcers, burns, bed-sores, and fissured nipples. Glyco-gelatin is a basis for lozenges used at the Throat Hospital, consisting of a solution of gelatin in glycerin and aq. flor. aurant. tinged with carmine. Gelato-glycerin is a firmer basis used for bougies. Glycero-alcohol is a liquid containing 33

per cent. glycerin in alcohol and a little water, used as a French solvent for most alkaloids.

Glycosal (Mono-salicylic-glycerin ester) is a white crystalline powder, introduced as a substitute for the ordinary salicylates in rheumatism on the plea of its being less irritating to the stomach and less likely to cause ringing in the ears, &c. Merck states that a number of as yet unpublished reports prove that a 20 per cent. alcoholic solution brushed over the skin is rapidly absorbed, and it is suggested that the drug may be freely given in this way, and also per rectum. The dose is one drachm of glycosal three times a day, and it is only very sparingly soluble in water.

Gossypium Herbaceum—Cotton-root bark has been extensively used in America as a substitute for ergot. Prochownick recommends a fresh infusion in uterine hæmorrhage caused by abortion, or by fibroid tumours. Drachm doses of the liquid extract may be given in dysmenorrhœa and amenorrhœa. Some authorities deny its usefulness entirely. See Colonial Addendum.

Grindelia—The herbs *G. robusta* and *squarrosa* are used as asthma remedies. They act like lobelia, and prevent or control spasm of the bronchial tubes, and at the same time act as expectorants. The leaves are mixed with nitre and burned as a powder or cigarette like stramonium in all forms of asthma, and are given internally at the same time 20 mins. of the 1 in 1 fluid extract. The drug is extolled in America for a host of ailments. See Colonial Addendum.

Guæthol, or Ajacol or Thanatol, is an oily liquid, being Pyrocatechin-mono-ethyl-ester. It is the ethyl compound corresponding to guaiacol. It is introduced as a substitute for guaiacol when given internally in 4 min. doses in capsules 4 times a day in phthisis, or painted over the skin with the intention of reducing fever or of being absorbed, or of relieving pain in neuralgia.

Guaiacol is a colourless liquid introduced for the treatment of phthisis. It is the active constituent of creosote, and exists in beech-wood creosote to the extent of 60 to 90 per cent. It is the methyl ether of catechol or pyrocatechin, and is prepared synthetically in the pure state in crystals. It possesses powerful lethal action over the bacilli of tubercle even when in exceedingly weak solutions. Under its use all the symptoms of phthisis or tuberculosis disappear—cough, sweating, fever, chills, anorexia, thirst, &c. It is believed to enter into combination with the chemical virus produced by the tubercular bacilli and thus to destroy its action. Its effects are identical with creosote in the same doses, but is less irritating to the stomach. It can be given in cod liver oil or in solution—1 dr. with 2 ozs. tincture of orange, and 2 ozs. glycerin, and water to 10 ozs. Dose—1 dessert-spoonful; but the capsule form is decidedly preferable. It may be used in carrying out the intensive method of treating phthisis with creosote, and 15 minims three times a day have been given without bad results.

The drug possesses two other marked actions—painted upon the skin with a brush and covered over with oiled silk it reduces the temperature in fevers. This method is now abandoned owing to the dangerous collapse following its application. 15 to 30 mins. were used in this way, and more than half of the dose by the skin can be recovered in the urine. It is also powerfully anæsthetic and may be painted or injected over neuralgic nerves with great benefit, and chloroform can be injected with it

in sciatica with advantage. It is injected (5 per cent.) dissolved in sterilised olive oil alone or with 1 per cent. iodoform in phthisis.

Recently Bocchi has obtained excellent results by smearing a 1 in 10 ointment over the scrotum in gonorrhœal epididymitis.

Guaiacol Carbonate, or Duotal, is a colourless crystalline powder, used as a substitute for guaiacol owing to its tastelessness and unirritating qualities. It is insoluble in water, and may be given in 5—15 gr. doses four times daily in sugar or wafers. It contains 91·5 per cent. of pure guaiacol.

Guaiacol Chloroform is a solution of 12 parts guaiacol in 20 of chloroform; 10—15 minims may be injected in sciatica and other painful conditions instead of morphine.

Guaiacol Cinnamate, or Styraol, in crystalline needles, is the cinnamic acid ester. It is given in every case where creosote is indicated, and has been used in cystitis and gonorrhœa in doses of 5 grain cachets or capsules thrice daily.

Guaiacol Phosphite and Biniodide have similar actions to guaiacol.

Guaiacetin (Pyrocatechin-monoacetic acid), or its soda salt, which is a crystalline powder, is recommended in 5 to 8 gr. doses by Strauss as a substitute for guaiacol.

Guaiacol Iodoform is made by dissolving 1 part of iodoform in 5 of guaiacol. It is used as a remedy injected into lupoid patches. Iodocol is the name given to a compound of iodine and guaiacol, given by Catanni in 5 gr. doses in phthisis.

Guaiacol Salol, or G. Salicylate, is used in 15 gr. doses in tubercle, and as an intestinal disinfectant.

Guaiacolate of Piperidine, or Guaiaperol, is a crystalline salt used for tuberculosis in doses of 5 to 30 grs. *ter die* (10 grs. dissolve in 1 oz water). It is split up in the intestine into guaiacol and piperidine, and does not disturb the stomach.

Guaiacol-potassium-sulphonate, or Thiocol, exists in white soluble odourless crystals, which have been given in phthisis and tuberculosis in doses of 20—30 grs. or more four times a day.

Guaiacol Valerianate is known as Geosote; it is lauded by Rieck as the most valuable of the guaiacol compounds in phthisis, and locally in lupus and diseased joints or bones. 3 to 8 mins. may be given in capsule three times a day.

Guaiacform is a brownish powder prepared by the action of formic aldehyde upon guaiacol.

Guaiasanol is the hydrochloride of diethyl-glycocol-guaiacol in white soluble crystals. It is claimed for it that it is the only soluble guaiacol preparation giving off guaiacol in the body, and that it is practically innocuous, and may be given in doses up to 3 drs. daily to saturate the system in tuberculosis.

Guacamphol is the camphoric ester of guaiacol—a white, tasteless, insoluble powder, which changes in the duodenum into camphoric acid and guaiacol. It is used by Lasker in the night sweats of phthisis with success in 5 gr. doses before bedtime.

Guajamar is guaiacol-glycerin ester, a white bitter powder, given in 5—15 gr. doses in phthisis. An ointment (1 in 4) is used as an anodyne application to rheumatic joints.

Guarana is a dried paste, in hard sticks or subglobular cakes, of a chocolate colour, prepared from the crushed or ground seeds of Paullinia

sorbilis, a climbing, shrubby vine from Brazil. The alkaloid, of which it contains about 5 per cent., is identical with caffeine and theine, and is useful in sick headache in similar doses—1-5 grs. The dose of guarana is 10 to 40 grs.

Gurjun Balsam, or Balsam Dipterocarpi, or Wood Oil, has been used in India as a substitute for copaiba, to which it bears a strong resemblance, but is inferior in every respect as a diuretic. In 1 dr. doses it is a reliable expectorant. Good results have followed its use in leprosy, when used as a local application, and given internally in 2 dr. doses at the same time, in emulsion 1 part, with 3 of lime water.

Hæmalbumin, introduced by Dahmen, is a stable brown powder, soluble in warm water; it contains all the salts and albuminoids of the blood except fibrin. It is claimed for it all the virtues generally attributed to every organic iron preparation before falling into disuse. It is given in 30 gr. doses *ter die* in all states where iron is indicated.

Hæmatogen, introduced by Hommel, claims to contain all the albuminous constituents of the serum of blood and all the blood salts, as well as pure hæmoglobin, in an unpeptonised state, but it is improbable that it is identical with the hæmatogen of egg yolk. Sicco is the name given to dry hæmatogen, which is a brown, odourless, tasteless powder, given in 30 gr. doses.

Hæmoglobin, extracted from the blood of the ox, is administered by Ziemssen in the form of a large pill or bolus coated over with chocolate, and weighing over half a drachm. Two such pills are given three times a day, with good results in chlorosis. The actual amount of iron in each pill or "ball" does not exceed $\frac{1}{15}$ grain. Dried defibrinated ox blood can be obtained; it is, however, only suitable for enemata.

Ox-Serum is used by Grunbaum, who gives it by rectal injections as a method of feeding where the stomach is not available. He gives 3 ozs. every 4 hours. It has recently been injected with success in chorea.

Vachetta has urged the use of Albuminate of Iron, for which he claims somewhat similar advantages. He administers it in grave cases of anæmia in doses of 5 to 15 grs. every 6 or 8 hours, and has obtained striking results by injecting a 10 or 20 per cent. aqueous solution hypodermically, or into the peritoneal cavity, no evil effects following its use. Gempt and Biel use a solution of iron albuminate, which contains 5 per cent. oxide of iron. It may be given in gastric ulcer in 1 dr. doses, and mixes well with milk. 1 oz. dried egg albumin and 6 ozs. cold water are added to 160 minims of liq. ferri sesquichlor., 1½ ozs. glycerin, and 1½ ozs. cinnamon water, and well shaken and filtered. Dieterich's solution contains about 2 grs. iron per oz. Dieterich's solution of Peptonated Iron is of the same strength, and both are given in doses up to a table-spoonful.

Succinate of Iron has been prepared by Hausmann as a substitute for all the iron preparations. Buckler gives it with chloroform in biliary calculi, which he states are dissolved by it. It may be used in every disease in which iron is indicated. It is prepared by mixing hydrated peroxide of iron 5; succinic acid 3; citrate of potash 15; glycerin 15; and distilled water 120 parts. For calculi, 10 minims chloroform and a tea-spoonful of the above may be given 4 to 6 times a day, after each meal.

Carniferrin is an iron combination with the acid contained in beef extract; it contains 35 per cent. iron, and is given in doses of 5 to 10 grs.

Iron Somatose is prepared from meat, and contains the albuminous substances combined with iron. It is given in doses of 1 to 3 drs.

Roborin is a brown powder, which contains hæmoglobin and calcium albuminates.

Alboferine is a brown powdery compound of iron and phosphorus, with albumin, given in doses of 30 grains. Fersan is a new iron paranucleo proteid, prepared from ox blood. It is soluble, and is given in doses of a tea-spoonful in anæmia, &c.

Hæmol and **Hæmogallol** are two brownish, tasteless powders, obtained by reducing agents on ox blood. They are given in doses of 5 grs. in tablets, and marvellous results are attributed to them in anæmia, though Stockman, our best authority on the pharmacology of iron, could see no benefit from them in chlorosis. His experience is supported by the recent statement of Mercadante that hæmol has no blood-forming properties unless it is chemically combined with a heavy metal. The introduction of a long list of elements, in combination with hæmol, has materially extended the materia medica. Thus there are Bromohæmol (see page 496), Cuprohæmol, Iodohæmol, Ferrohæmol, Mercurio-iodised hæmol, Zinchæmol, Arseniohæmol, and several others which are of therapeutic value; but the list of organic iron preparations is bewildering, and there is little positive evidence that any of them are superior to the old inorganic salts of recognised value. The superiority of the latter has been insisted upon by Stockman, Murell, and Ringer. The mercurio-iodised preparation is stated to contain 28 per cent. of iodine and 13 per cent. Hg., and there are glowing reports of its virtues in advanced syphilis in doses of $1\frac{1}{2}$ to 5 grs. in pills.

Hedeoma, or Pennyroyal—The leaves and tops of *Hedeoma pulegioides* yield a volatile oil which has long been a domestic antispasmodic and carminative, like the oil of peppermint. It has a stimulating action upon the uterine functions, and has been administered to increase the scanty menstrual discharge, or to establish the absent flow in amenorrhœa not depending upon organic disease. 5-10 minims will be found to be a full dose, and generally will produce marked emmenagogue action.

Helenin is a stearoptene from *Inula Helenium* (Elecampane), used in phthisis, bronchopneumonia, pertussis, and enteric affections. It is a more powerful antiseptic than boracic, salicylic, or carbolic acids, and is unirritating. It destroys the bacilli of tubercle, cholera, and diphtheria, and has been given in doses of 1-2 grs. in these affections and in diarrhœa. Alantol, a liquid distilled from elecampane, has been administered in doses of $\frac{1}{4}$ minim in phthisis with benefit.

Helleborein is a glucoside existing in the Christmas rose—*Helleborus niger*. Venturini found that $\frac{1}{100}$ gr. in solution dropped on the conjunctiva produced a complete anæsthesia of the cornea lasting for $\frac{1}{2}$ to 1 hour, without in any way interfering with the intraocular pressure.

It has been used as a substitute for digitalin in hypodermic medication, as it possesses cardiac tonic properties in doses of $\frac{1}{40}$ — $\frac{1}{2}$ grain.

It must not be confounded with the narcotico-acrid glucoside, Helleborin, derived from the same plant.

Heroine Hydrochloride, or Diacetyl Morphine Hydrochloride, is a white crystalline powder soluble in water. It is claimed for it that its dose is smaller than that of morphine, and that it does not cause constipation, and that it acts more strongly upon the respiration than upon

the cerebrum, and that by increasing the depth of the respirations it interferes little with the gas exchange. These properties are very desirable in a drug for the treatment of the cough of phthisis and bronchial irritations and in pertussis. It also lowers the temperature. The dose is $\frac{1}{12}$ to $\frac{1}{8}$ grain, and it can be given hypodermically. Intralaryngeal injections (2 mins. of 5 per cent. solution) relieve the pain of laryngeal tubercular ulceration for several hours. Like its rival, dionine, it is vaunted as a remedy for the treatment of the opium habit. But a study of the literature of heroine shows that it is a drug only to be used with great caution, and many observers condemn it on account of its depressing action on the respiration in large doses.

Holocaine is a new local anæsthetic, being Diethoxyethenyl-diphenylamine. A 1 per cent. solution of the hydrochloride is twice as effective as the same strength of cocaine solution, and causes anæsthesia of the conjunctiva in 15 seconds. Löwenstamm concludes his reports by stating that "it is a prompt, pronounced, long-lasting anæsthetic, without any unpleasant results." It does not affect pupil, accommodation, or circulation, but it is toxic like strychnine, and cannot be injected. Nirvanin is a new local anæsthetic, being diethyl-glycocol-para-amido-ortho-oxybenzoic-methyl ester. It is a crystalline white soluble powder, possessing antiseptic and anæsthetic actions in 1 or 2 per cent. solution. It is recommended as a cocaine substitute, and it is said to have a selective action upon the sympathetic nerve when absorbed into the blood.

Hydracetin, or Acetylphenylhydrazin, is a white, inodorous, almost tasteless, crystalline powder, possessing antipyretic and antirheumatic properties. Its use is not free from serious danger; collapse, cyanosis, hæmoglobinuria, and jaundice having been observed after even small doses. $\frac{1}{4}$ gr. is a fair dose, and $\frac{3}{4}$ gr. twice daily should not be exceeded. It was vaunted as a specific in psoriasis, but has failed in this disease, and indeed it is questionable if it should be retained in the materia medica, owing to its cumulative poisonous properties.

Pyrodin is the name given to an impure hydracetin, which has been administered in 5 grain doses by Dreschfeld in scarlatina, pneumonia, typhus, and migraine.

Hydrargyri Benzoas is used as an agent for hypodermic injection. The solution is unstable, and must be prepared just before use, which is a serious drawback. The following formula is used:—Benzoate of mercury 5 grs., chloride of sodium $1\frac{1}{2}$ grs., water 10 drachms; the daily dose being one Pravaz syringeful. Cocaine may be added. It should not be used in very fat persons. 15 to 50 injections are necessary.

Hydrargyri Carbolas, prepared by precipitating a solution of perchloride with carbolate of potash, is a white, tasteless powder, given in doses of $\frac{1}{4}$ gr. four times daily in syphilis. It is especially indicated in syphilitic psoriasis and in tubercular and macular eruptions.

Hydrargyri Cyanidum has been praised in ophthalmic surgery. Sicherer uses a 1 in 500 solution in ophthalmia neonatorum, and 1 in 100 solution in ordinary ophthalmia. It is also known as the bi or oxycyanide, and is given internally in doses of $\frac{1}{8}$ gr. in syphilis, and injected in 1 per cent. solution, and in 1 in 4,000 solution has been successfully injected into the urethra in gonorrhœa. Lister used a dressing of the double cyanide of mercury and zinc. Gauze impregnated with it has been prized by surgeons as a powerful unirritating application to fresh wounds. It

contains 3 per cent. by weight of the salt, and is tinted with rosolane; before application it is moistened with ordinary carbolic lotion.

Hydrargyri Formamidum—The formamide of mercury is recommended for injection. It does not precipitate albumin or cause any irritation of the subcutaneous connective tissue. From half to a whole Pravaz syringeful of a 1 per cent. aqueous solution is injected two or three times a day, but the method has not gained in favour.

Scarenzio prefers the hypodermic administration of calomel in suspension, and Shoemaker injects $\frac{1}{10}$ gr. of the pure perchloride deeply into the tissues. It is claimed for the calomel that only 4 injections of 40 centigrammes in all is enough for ordinary cases of syphilis. Fournier uses *sublimed* calomel washed in boiling alcohol, and dried and mixed with sterilised olive oil. $\frac{5}{8}$ gr. in 17 mins. of oil is given in each injection deep into the buttock, every 7 days, for four or six times, and he reports very striking success. The hyposulphite of mercury and potassium makes a hypodermic solution which does not cause pain, but it decomposes, and must be made fresh daily, and hence should be discarded.

Bloxam uses Sal Alembroth; he injects deeply 10 minims of the solution mentioned upon page 480 once a week till mercurialism occurs, then once a fortnight, and finally once a month for 18 to 23 months, the total quantity of mercury only amounting to 6 or 8 grains during the entire treatment. Galliot in 4,000 injections of $1\frac{1}{2}$ grs. yellow oxide in 15 minims of vaseline oil had no accidents. Lang used "Grey Oil," for which there are numerous formulæ. The best consists of a weak lanoline ointment of mercury, rubbed up with olive oil and made to contain 30 per cent. mercury. The dose is .2 to .3 c.cm. Leloir's grey oil contains 80 parts oil of vaseline, 10 of ethereal tincture of benzoin, and 40 pure mercury. Colloid Mercury, or Hyrgol, has been vaunted, but it causes pain at the puncture. It can be given in pill $\frac{3}{4}$ gr., and it may be employed as an inunction 10 per cent. ointment. The red iodide dissolved in sodium iodide is sometimes injected, and Cypridol, or Hydriodol, which is 1 per cent. of this salt in olive oil, is also recommended.

Hermophenyl (mercurio-sodic phenol-disulphonate) is a white powder, soluble in water, and containing 40 per cent. mercury. One-third of a grain may be given by hypodermic or by deep injection dissolved in 1 dr. water, as it causes little pain and never suppuration. For the Glutino-peptonate see page 522. (See the subject of the hypodermic treatment of syphilis in the Author's "Dictionary of Treatment," page 921.)

Hydrargyri Gallas is a dull dark-green powder, insoluble in water, and preferred to the tannate as being more stable. It is given in doses of $\frac{1}{4}$ gr. in pill form in syphilis.

Hydrargyri Naphtholacetat is an insoluble white powder, and has been used like the thymolacetate, but it causes more pain and irritation. It may be given internally in pill, in doses of $\frac{1}{2}$ —1 gr. It is used for gauzes and mulls.

Hydrargyri Paraphenol Sulphonas cum Ammon. Tart. is known as Asterol, and is introduced as an ideal antiseptic by Steinmann. It is a soluble red powder, which may be used as a disinfectant where the perchloride is indicated.

Hydrargyri Salicylas is a white, tasteless powder, used for hypodermic injection and as a remedy for gonorrhœa. It is formed by mixing solutions of nitrate of mercury and salicylate of soda. It causes no pain, and is as

powerful an antiseptic as corrosive sublimate. Its great drawback was its insolubility, but Vacher has overcome this by using the following formula for external application:—1 part corrosive sublimate, 2 parts salicylate of soda, and 1,000 parts water. For internal use he injects 1 c.c. of the following solution:—1 part sublimate, 3 salicylate of soda, 100 water. This dose contains .154 gr. salicylate of mercury. It may be dusted like calomel over chancres.

Hydrargyri Silico-Fluoridum—This colourless, soluble salt is used as a substitute for the sublimate, being less poisonous and irritating, and equally efficacious in destroying bacteria in solution 1 in 1,000.

Hydrargyri Sozoiodol is a pale yellow powder, soluble in solution of chloride of sodium. It has been given in 1 gr. doses injected into the buttock, and as a powder (1 in 15) sprinkled on chancres and syphilitic sores.

Hydrargyri Succinimidum is recommended for hypodermic use, as it does not precipitate albumin. It is a white shining powder, soluble in water, and does not cause any suppuration at the point of injection. Wolff uses a Pravaz syringeful of a 2 per cent. solution (1 per cent. Hg.), thus each injection equals nearly $\frac{1}{2}$ gr. mercury. He states that it is preferable to mercury glycooll, and should be injected deeply in an oblique direction under the skin of the buttock into the subcutaneous fat, and the swelling stroked gently till dispersed; about 20 injections are the average number for ordinary cases.

Hydrargyri Sulphas Ethylendiaminata is a white soluble powder, which acts in dilute solution as a powerful antiseptic and disinfectant for the hands and instruments, resembling the corresponding citrate solution. Sublamin is the name given to a similar substance used in the tabular form as a disinfectant.

Hydrargyri Tannas is a tannate of the protoxide of mercury, and contains 50 per cent. of the metal. It is a green, tasteless powder, which decomposes upon the addition of weak alkalies, setting free mercurial globules, and it is believed that such a decomposition takes place in the bowel, and the minute particles of mercury rapidly find their way into the blood. $1\frac{1}{2}$ grs. are administered 3 times a day. It does not produce any unpleasant after-consequences or disarrangement of the digestion.

Hydrargyri Thymolacetas is a white, crystalline, inodorous insoluble powder, prepared by mixing solutions of acetate of mercury and thymol. It is given internally ($\frac{1}{4}$ gr.) and used as an injection (10 per cent. in liquid paraffin) into the muscles in syphilis, the injections being stated to be nearly free from pain and the danger of abscesses. Vaseline oil is the usual menstruum.

Hydrargyrum Colloidale, or Hyrgol, is a brownish solid substance introduced as a substitute for metallic mercury in making ointment for inunction (1 in 12). It has also been given internally and hypodermically, but owing to its impure condition it has been little used of late. It has been already mentioned upon the previous page.

Hydronaphthol is a powerful disinfectant and antiseptic, which is believed to be free from all toxic properties; it is said to be an impure form of, or a derivative of, B.-naphthol. It has been used in tinea (10 per cent. plaster) with good results, and it has been given internally in typhoid fever, diarrhœa, and other similar conditions in 2 gr. doses. A saturated

solution in cold water ($\frac{1}{2}$ gr. to 1 oz.) is a powerful antiseptic, free from objectionable qualities, and a solution ($1\frac{1}{2}$ grs. to 1 oz.) in *warm* water is a potent disinfectant for *foul* wounds. It may be used as a dusting powder or as a gauze.

Hydroquinone (Quinol or Hydrochinon) is a derivative of coal tar, and is isomeric with resorcin, and has been found to possess properties not inferior to quinine. It occurs in odourless, colourless crystals, and has been given in typhoid and other fevers. It reduces the fever temperature rapidly, a gramme dose causing a fall of 6 or more degrees. Its effects are more evanescent than quinine or antipyrine, a smart rigor generally issuing in a rise in 4 or 5 hours again. The respiration and pulse are lowered, and perspiration occurs. It is safe in 5 gr. doses, and does not produce buzzing in the ears, headache, &c., though it has been little used since the introduction of antipyrine, but it possesses the advantage of giving little pain when injected hypodermically. 1 in 100 is injected in gonorrhœa and ophthalmia. The drug is now chiefly used in photography.

Hydroxylamine is an odourless, colourless body, being ammonia in which one atom of hydrogen is replaced by hydroxyl. The hydrochloride is the form in which it is always used. It is a powerful reducing agent, and has been recommended as a substitute for chrysarobin, pyrogallie acid, and anthrarobin in psoriasis, lupus, and parasitic skin diseases when used as a 1 in 1,000 solution. The results are doubtful, and the agent is a powerful irritant, and when taken internally it is a dangerous poison.

Hypnal, or Monochloralantipyrine, is a crystalline body obtained by mixing strong solutions of chloral hydrate and antipyrine. It is almost tasteless; it has all the properties of chloral hydrate, and all its objectionable points, *i.e.*, it depresses the heart seriously, though in ordinary cases of insomnia it is an effective hypnotic in 20 gr. doses. It must not be given where the heart is affected. It is claimed for it that it has the analgesic qualities of antipyrine, and therefore will induce sleep in the presence of pain.

Hypnone, or Acetophenone, introduced as an hypnotic, is a strong-smelling, colourless, volatile liquid, insoluble in water, prepared by the distillation of acetate and benzoate of lime. Many authorities state that the hypnotic effects attributed to it are positively illusory in every case. It is an antiseptic, and has been used in mask inhalers, but it is an uncertain and dangerous drug. In capsules, 2—6 minims for a dose.

Ichthyol, or Ammonium Ichthyol Sulphonate, is a tarry-looking, viscid liquid, prepared from a bituminous mineral in the Tyrol, consisting of fish and animal remains. The soda, lithia, and zinc sulpho-ichthyolates are similar in appearance, action, and doses to ichthyol, which contains 15 per cent. of sulphur. It was introduced by Unna as a remedy for chronic skin diseases in 1882, and since then it has been demonstrated to possess many virtues; thus it is an antiseptic and kills most disease germs; it is a local anæsthetic; it acts upon the small vessels causing them to contract; it promotes the absorption of exudations; by saturating the system with sulphur it has been found to possess all the good qualities of that drug; it acts as a reducing agent, taking up oxygen from the tissues, it relieves itching and it retards metabolism.

It is of use in all diseases in which there is capillary engorgement, and many observers strongly testify to its power in a host of widely different ailments, as chronic rheumatism, pleuritis with effusion, syphilis, asthma,

chlorosis, scrofula, phthisis, gout, vesical, intestinal and gastric catarrhs, pelvic neuralgia, and neuralgia of bones, joints, and muscles, metritis, and uterine diseases. It is given in doses of 10 to 30 grs. in capsules, but much larger doses do no harm. In gonorrhœa a 3 per cent. injection has proved most valuable, and it has been extolled as an injection in cystitis and diseases of the uterus and Fallopian tubes. Externally a 3 to 30 vaseline ointment is employed for wounds and burns, and excellent results are obtained by a 20 per cent. collodion, or a 50 per cent. ointment in erysipelas, owing to its lethal action on the bacilli; the best formula is equal parts of lanoline and ichthyol. Since it produces so little irritation it may be used in any strength of ointment from 2 to 30 per cent. in eczema, acne, psoriasis, herpes, erythema, boils, carbuncles, and ringworm. A 10 per cent. ichthyol vasogen gives excellent results in gonorrhœal rheumatism if applied to the joint and covered over by oiled silk and wool. For A. rosacea Unna employed a paste made of equal quantities of ichthyol and starch moistened with half as much water, to this 1 per cent. solution of albumin is added. The writer has found it, when made into a suppository with conium ointment, to be a splendid agent for the relief of fissures and hæmorrhoids.

Sulpho-ichthyolates of Lithium, Soda, and Zinc are also employed. They act like ichthyol, which is often prescribed as ammonium ichthyol, but soda ichthyol or sulpho-ichthyolate of soda is often preferred for internal use, though there is practically no difference. Unna uses ichthyolate of calcium in lichen, and ichthyolate of iron in anæmic cases.

Unna has introduced a 33 per cent. solution of ichthyol-sulphonic acid under the name of Anytin. He claims for this solution that it has the power of dissolving the other constituents of ichthyol, and to their solutions he gives the name of Anytols; thus the anytol of meta-cresol, known as Metasol, is a powerful antiseptic.

Ichthalbin is a brown, tasteless powder. It is an albuminous compound prepared like tannalbin, and is tasteless, and insoluble in the stomach, splitting up in the duodenum. 4 parts are equivalent to 3 of ordinary ichthyol. It is intended for internal use, and is suitable in intestinal catarrhs, but it is valuable as a local remedy in all weeping eczemas, especially in children.

Ichthargan is a compound of ichthyol sulphonic acid and silver. It is a brown soluble powder with powerful antiseptic qualities; it is used in 2 per cent. solution injected in gonorrhœa. It contains 30 per cent. of silver, but is more potent than the nitrate.

Ichthoform is a formaldehyde compound of ichthyol, which may be used like iodoform or given in 15 or 20 gr. doses as an intestinal antiseptic in diarrhœa.

Ingluvin is a powder prepared from the gizzard of the common fowl, and it was introduced as a variety of pepsin to supplement the action of the gastric juice in atonic dyspepsia, and as a remedy for the vomiting of pregnancy in 10 gr. doses. It has been proved that ingluvin exerts a very feeble digestive action upon albuminous foods outside the body.

Iodine Trichloride is an antiseptic introduced by Langenbuch, and is a yellow powder prepared by acting on iodine with dry chlorine gas. It contains over 50 per cent. iodine. 1 dr. in 1 gallon water makes a solution which, when applied to wounds, gives off its chlorine readily, and acts as a powerful antiseptic and disinfectant without the dangers of carbolic acid, iodoform, or sublimate.

Iodipin, or **Iodinol**, is an iodine combination of sesame oil like brominol. It is a most valuable form for the administration of iodine, and can be given where ordinary iodides are not tolerated. It passes unchanged through the stomach, and is absorbed unaltered by the bowel, and in the blood and tissues slowly gives off its iodine at a steady, continuous rate. A month after its administration has ceased iodine may be found in the urine. It is indicated in every condition where iodides are useful, as in bronchitis, asthma, rheumatism, and especially in syphilis, where it has been given hypodermically with most gratifying results. It is supplied in 10 and 25 per cent. strengths. 2 to 4 drs. of the weaker liquid are given by the mouth in warm milk or coffee, and the same quantity can be injected warm through a wide needle; this latter dose represents 16 to 32 grs. iodide of potassium.

Iodized Phenol is a dark, thick liquid, or semi-solid paste, prepared by rubbing at a gentle heat, iodine 1 oz., and pure carbolic acid 4 ozs., till dissolved. It is a caustic and powerful alterative when applied to uterine ulcerations, and is the best local treatment for abrasions and granular conditions of the cervix. The writer has found that it prevents buboes when lightly painted over the inflamed glands. It is used with success in ringworm of the scalp and body.

Iodocaffeine (Sodium-caffeine Iodide) is a white powder, introduced as a diuretic in cardiac dropsy, possessing the actions of caffeine and an alkaline iodide, and closely resembles in action Iodotheobromine, which is, however, more markedly diuretic. They may be given in doses of 5 to 10 grs. in cachets.

Iodo-Caseine, or Caseo-iodine, is a white powder, containing 8 or 9 per cent. of iodine, combined in the same manner, it is supposed, as the iodine is in iodothyryn obtained from thyroid gland substance. This substance, as well as a similar one containing about 20 per cent. iodine, and introduced by Lepinois, is recommended in exophthalmic goitre.

Iodoformal is a powerful antiseptic, introduced as a substitute for iodoform, of which it is the ethyl-hexamethylene hydriodide. It is claimed to be more potent than iodoform by Reuter.

Iodoformin is a whitish crystalline powder known as "odourless iodoform." It is a compound of iodoform with hexamethylentetramine. It is used as a substitute for the foul-smelling drug. It acts in the same way, but it is claimed for it that the formol liberated on sprinkling or applying it as a gauze over chancres, tubercular ulcers, &c., acts as a stimulant to the sores, and hastens granulation without forming scabs. It has been injected in gonorrhœa.

Iodoformogen is an albumin compound of iodoform, containing 10 per cent. of the latter substance. It is a mild and odourless preparation, and has given excellent results as a dusting powder in cases of ulcers, and it never leads to a rash.

Iodoformum Bituminatum is a substance prepared by Ehrmann by mixing tar and iodoform together. It has an agreeable odour, and possesses all the virtues of iodoform without the serious drawback of its penetrating and easily-recognised odour. It is employed in the powdered form like iodoform.

Iodol (Tetraiodopyrrol) is a yellow crystalline powder, containing nearly 90 per cent. of iodine. It is odourless, soluble in ether (1 in 1) and in

water 1 in 5,000. It resembles iodoform in its action, and affects the system like iodide of potassium when taken internally, only that it is very slowly absorbed. 5 to 10 grs. may be given in pill or capsule where this latter salt is indicated. It has been used as a powder to wounds, ulcers, and sores, or as an ether (1 in 10), ointment (1 in 20), or as a paste made with a little spirit. It has been lauded in tubercular laryngitis and pharyngitis. Upon the whole, iodol cannot be said to be gaining ground. Some authorities doubt its usefulness as a surgical dressing, though it is still used as a substitute for iodoform by many surgeons.

Mazzoni's formula is—Iodol 1 dr., alcohol 2 ozs., glycerin 4 ozs.

Menthol Iodol (1 per cent. menthol), is a non-irritant antiseptic used in diseases of the nose and throat and larynx. It is a valuable antiseptic and analgesic when plugged into hollow carious teeth.

Iodolene is an albumin compound of Iodol, existing as a fine, yellow, odourless powder; it is an unirritating antiseptic used as an iodoform substitute, and the 10 per cent. preparation has been given in 30 grain doses in syphilis in the tertiary stage, and in actinomycosis.

Iodophenin is a brown, crystalline powder, containing over 50 per cent. of iodine. It is prepared by the action of phenacetin upon iodine in the presence of acids, and has been described under the name of Iodophenacetin. It should not be used internally, but is a powerful antiseptic and germ destroyer, 1 in 5,000 speedily destroying bacteria, but it is unstable and highly irritating.

Iodopyrine, or Iodantipyrin, an odourless, tasteless crystalline powder, is a compound of iodine and antipyrine; is a powerful antiseptic and antipyretic, and has been given in 10 gr. doses in all the conditions where antipyrine is indicated, and it is also recommended in rheumatism and asthma. It is best given in tabloid form.

Iodoterpine is a dark, terebinthinate-smelling liquid, prepared by the interaction of terpene and iodine, which it is proposed should take the place of liniment of iodine, as it is readily absorbed by the skin. It is used as a substitute for iodoform when mixed with 10 parts of kaolin.

Iodothyrim is the name given to an active principle containing iodine extracted from the thyroid gland. Thyrocol is another preparation from the colloid material which has been isolated by Hutchinson. It is claimed for these and other active principles of the gland that they should supersede the use of the dry gland. It is, however, by no means demonstrated that they possess all the virtues of the gland substance. (See Thyroid.) Stabel and Brian, while acknowledging the value of iodothyrim as a powerful alterative, deny its value in the cases where ordinary thyroid gland substance proves so efficacious. It acts powerfully on metabolism. It is standardised to contain 0.03 per cent. iodine, and it is given in the same dose as the dried gland.

Iodyloform is an insoluble powder containing 5 per cent. iodine. It is formed by rubbing together iodine and gelatin. It is introduced by Müller as a stable innocuous substitute for iodoform in the treatment of venereal sores. It appears to resemble Amyli Iodidum (which see).

Iris, or Blue Flag—The rhizome and rootlets of *Iris versicolor* yield a fluid extract and eclectic preparation in the form of a brown powder. This latter preparation, known as Iridin, is the one generally used. It acts as a powerful hepatic and intestinal stimulant, and closely resembles podophyl-

lin in its effects. It is believed to possess alterative properties, which have given it a reputation as an antisyphilitic and antiscorbutic. It is a diuretic; and has been found to remove jaundice of malarial origin. $1\frac{1}{2}$ to 3 grs. every night in the form of a pill, followed by a mild saline, have given good results in the vomiting of pregnancy and in torpid liver.

Itrol (*Argenti Citras*) is a light permanent powder used for insufflation. It is claimed for it that it possesses all the advantages of actol without producing irritation. It may be dusted over wounds and ulcers, and injected (1 gr. in 16 ozs.) in gonorrhœa and cystitis. 1 in 500 disinfects instruments and hands, and 1 in 1,000 may be used as a gargle for the throat. Credé maintains that this agent is "the wound antiseptic proper," and is a certain means of keeping wounds sterile if dusted very thinly over them.

Jacaranda Lancifoliata has been used as a remedy for venereal diseases amongst the natives of Columbia, and Mennell has tried it with considerable success in gonorrhœa and gleet which had resisted other treatments. He gave 15 minim doses of the tincture (2 ozs. to 1 pint), and in obstinate gleet injected 10 minims to 1 oz. water, which stopped the discharge rapidly. It has been used also with success in psoriasis and rheumatism, and it can be combined with iodides advantageously. Limousin gives the dose of the fluid extract, known as *Salud*, as 15 to 60 minims three times a day.

Jambul, or *Syzygium Jambolanum*—The seeds of this myrtaceous tree has been tried in diabetes, and in some cases with no result, whilst in others the remedy was beneficial to an unexpected extent. Fenwick reports a case where, in one week, sloughing ulcers rapidly healed, and the urine fell to one-half after $2\frac{1}{2}$ grs. powdered seeds three times a day. 30 grs. may be given. It has been proved that the drug has a marked power in diminishing phloridzin diabetes in dogs. The fruit is used in India as an astringent in dysentery and diarrhœa.

Juglans Cinerea, or Butternut—The bark of the branches has been long used as a mild purgative, and in smaller doses as a laxative in chronic constipation. Combined with calomel it has been given in intermittent fever and in dysentery.

The nuts yield a bland, unirritating oil. The dose of the fluid extract is 1 to 2 drachms. The resinous extract (*Juglandin*) may be given in doses of 2 to 5 grains as a purgative.

Kava Kava, or *Ava-Ava*, is the rhizome of *Piper Methysticum*. Kava was prepared from it by masticating the root for some time in the mouth, adding water to the fibrous pulp resulting from the chewing, and straining—(Yangona brewing). It is now generally prepared by simply pounding or grating the rhizome. After a moderate dose the effect appears to be something like that produced by a large dose of caffeine—a sharpening of the mental faculties and a feeling of freedom from fatigue.

It acts upon the cord, and causes an ataxic gait, after being very freely swallowed, the intellect remaining bright. Kesteven finds that it acts as an alterative upon the genito-urinary organs, and he uses it with success in chronic gleet and obstinate cystitis. It is a stimulating diuretic, and has been found to reduce the acidity of the urine. The α -resin obtained from it acts powerfully as a local anæsthetic like cocaine.

Cerna finds that the fluid extract, or the resin, produces anæsthesia of the mouth which lasts for hours. Internally it produces general anæsthesia by

destroying the function of the peripheries of the sensory nerves; it diminishes reflex action and causes spinal paralysis. (See Colonial Addendum.)

Keratin is an albuminous substance obtained from horn or quill shavings; it is only used for coating pills in order that they may pass through the stomach without being acted upon by the gastric juice. (See formula for its preparation, page 46.)

Kola Nut (*Sterculia Acuminata*)—This nut has been used by the natives of Central Africa as a substitute for tea and coffee, and various marvellous virtues have been attributed to it. It contains large quantities of an alkaloid identical with caffeine. Monnet found it produced insomnia, was an aphrodisiac, stimulant to the cerebrum, restrained tissue waste, was diuretic and had powerful cardiac tonic properties, and controlled diarrhoea and acted as a general tonic in doses of 1 dr. of the tincture (1 of the nut to 5) or 2 grs. of the alcoholic extract. In smaller doses it is a gastric tonic, useful in dyspepsia, and an astringent in diarrhoea on account of the tannin it contains.

Kolanin is an active glucoside obtainable from the nuts; it is administered in 3 gr. tablets.

Koumiss is a palatable, effervescing liquid, prepared by exciting fermentative changes in the milk of the cow or mare. It was originally made in Tartary from the milk of the mare, but cow's milk is the basis of all the varieties at present used in this country.

Sakovich rubs up 1 pint of a mixture of the fresh, unskimmed morning milk from the cow, and cold water (equal parts) with 15 grs. of German yeast in a mortar. To this 1 oz. of finely powdered white sugar is added, and the mixture is poured into a champagne bottle and exposed for 24 hours in a warm place (a little over 60° F.). After this it is carefully corked and tied down, and placed in a cool cellar for five days, after which time it is ready for use. The casein is *partially* digested by the fermentation which causes the sugar to be changed into lactic acid, which acts in its turn upon the casein. This precipitation of the casein by the acid relieves the stomach of some of its work.

Ponomaroff has used the cow koumiss with infants successfully. He mixed 1 glassful of unskimmed milk with 2 of water, added 1 tea-spoonful of sugar of milk, and 2 of sugar, and one and a half of beer yeast, and corked all up in a champagne bottle, and shook it frequently. At the ordinary temperature of the room the koumiss was ready in forty-eight hours, and contained $\frac{1}{2}$ per cent. of alcohol. The writer has found that the following is the simplest and best of all plans for the production of artificial koumiss, as detailed in his "Dictionary of Treatment," page 723 (Fourth Edition):—

In the absence of yeast, a palatable and highly nutritious beverage may be prepared by mixing one part of fresh rich buttermilk and one part of water with eight parts of cow's milk, adding a very little loaf sugar, putting the mixture into a loosely-corked gallon jar, leaving it in a *warm*, but not hot, place beside the fire, where it may be frequently and briskly shaken, and in 36 to 48 hours it is ready for use as a pleasant, sharp-tasted, thick liquid, which slightly effervesces. Some little skill and experience is required in producing a uniform result, and the patient should not give it up if the first and second results are unsatisfactory. After the first batch of this artificial koumiss has been successfully prepared the use of butter-

milk may be entirely dispensed with, as an equal bulk of the koumiss liquid can be used instead, in the preparation of each subsequent quantity. Some patients succeed best by leaving out the sugar entirely, and by shaking the mixture very seldom during the first 24 hours. It may be taken *ad lib.* The buttermilk referred to above is that obtained in the process where the cream and milk have been both churned together in the manufacture of butter. The article commonly known as buttermilk in England will not make koumiss.

Koumiss is undoubtedly one of the most easily assimilated and nutritious of foods and remedies. It is invaluable in the treatment of all wasting lung diseases, in which case it may be taken *ad libitum*. The weight of the body soon markedly increases under its use, and it will be appreciated when cod-liver oil cannot be tolerated. In various forms of dyspepsia, and especially in the diarrhoea of children, its use is attended with great benefit. In the protracted convalescence after fever, kidney disease, &c., and in many forms of chronic vomiting, it may be tried with every prospect of success.

Kefir—Under this name has been introduced a new fermented milk, which has been used by the natives of the plains near the Caucasus as a remedy for anæmia, struma, chest affections, and gastric troubles. It is like koumiss, and is prepared from the milk of the cow or mare by adding a minute mushroom collected near the snow-line on the Northern Caucasus; this fungus can be used over again repeatedly, and is a remarkable and powerful ferment which produces a rich, sparkling beverage in 24 hours. In the vessel in which this kefir is made small hard granules are found of a brownish-yellow colour. These can now be obtained from chemists, and as they maintain their activity unimpaired for long periods, they are very convenient for the manufacture of this beverage, but, as a rule, the above formula answers all requirements. Dose—Same as koumiss.

Kresin is a clear brown liquid with an odour like creolin, which it resembles in general properties. It contains 25 per cent. of cresols which are held in solution by sodium cresoxylacetate. It possesses all the antiseptic properties of the cresols, and is a powerful germicide. Compared with carbolic acid it is many times more powerful and much less poisonous; it mixes with water, forming a neutral solution.

Kryofin is a crystalline, colourless, sparingly soluble salt. It is methylglycolate of parphenetidin, and is recommended as a certain antipyretic and analgesic in doses of about 5 to 8 grs. in all conditions in which antipyrine is indicated. It has recently been again extolled in acute rheumatism, syphilitic neuritis, uræmic headache, and acute sciatica. 8 grains may be placed on the tongue and washed down with water. It sometimes causes profuse sweating.

Lacnanthes Tinctoria (Spirit Weed or Red Root) has recently been vaunted as a specific for tuberculosis, and as a useful agent in a host of varied ailments. The dose is 2 to 10 minims of a 1 in 10 tincture of the entire plant. Murrell, who has studied its action, states that there is not a single authenticated case to support its claims in phthisis.

Lactophenin, or Lactyl-phenetidin, is a colourless crystalline powder, being phenacetin in which the acetic is replaced by the lactic acid group. It is introduced as a substitute for phenacetin on account of its greater solubility. Numerous reports show that in typhoid fever, migraine, rheumatism, and neuralgia excellent results are obtained when given in capsules in 10 gr. doses.

Lævulose (Diabetin or Inverted Sugar) is a white crystalline sugar found in elecampane and other roots. It is very sweet and does not increase the sugar in saccharine diabetes, being, in moderate doses, all assimilated. It may be used as a sweetening agent for diabetics. It exists in large amount in the dahlia tuber after boiling, and Hale White consequently recommends this as a food for diabetics.

Lamium Album, Dead Nettle, is a labiate plant long used on the Continent by peasants as a popular expectorant. Florain has discovered that the flowers possess powerful hæmostatic properties, and can be used with advantage in hæmorrhages of all kinds, from the lungs, stomach, kidneys, and uterus. He gives a tincture of the blossoms 2 parts, syrup 1 part, and water to 6 parts, in $\frac{1}{2}$ dr. doses every 30 minutes till the hæmorrhage stops. The strength of the tincture is 1 in 5. Lamine is the alkaloid, and it is also stated to be powerfully hæmostatic.

Largin is one of the new silver compounds with albumin, and contains 11 per cent. Ag. It is used as an injection in gonorrhœa (1 gr. in 8 ozs.). The reports of its usefulness in eye surgery are most satisfactory, especially as it does not cause pain, but it is inferior to the nitrate in gonorrhœal ophthalmia.

Lecithin is a wax-like solid body, containing phosphorus prepared from germs of oats, yolk of eggs, &c. It is a constituent of brain and nerve tissue, and has been introduced as a substitute for phosphorus for internal administration in neurasthenia, tabes, brain diseases, &c. Serono's egg preparation, when fresh, is harmless. He injects 1 c.cm. daily, and finds great increase in nitrogenous metabolism, red corpuscles, and body weight. Danilewsky has recently tried 3 to 5 gr. doses of lecithin by the mouth on himself, and makes the extraordinary report that in addition to its marked power of improving the nutrition and raising the mental capacity it increased his "self-respect." It is to be hoped that this is not an error in the translation of his paper by Merck. The results of the drug in veterinary practice are very marked.

Lenigallol (Triacetate of Pyrogallol) is a white powder, introduced as an agent for the treatment of the acute stage of eczema, where it lessens hyperæmia and itching. It may be applied as a 1 in 4 paste with starch and zinc powder. The Monoacetate of Pyrogallol, or Eugallol, and the Salicylate, or Salligallol, are powerful drugs, which are used, when dissolved in acetone, as applications to psoriasis.

Leptandra, or Culver's Root—The eclectic preparation (Leptandrin) from *Veronica* or *L. virginica*, in the form of a brownish-green powder, resembling podophyllin, is the one generally used in medicine. It has been used in liver diseases, as a tonic, cholagogue, and purgative, according to the dose administered. It stimulates mildly the liver, and acts as an intestinal tonic and stimulant or irritant, and has been used in diarrhœa and dysentery, and as an adjuvant to podophyllin.

Dose—in pill, 1 to 3 grs.

Lignosulphite is a liquid containing the various balsamic and terebinthinate products and volatile oils existing in woods. It is a refuse product in the manufacture of wood pulp and cellulose for paper making. It has been introduced by Hartmann as a method of treating antiseptically phthisis and respiratory affections by inhalation. The liquid may be placed in the

sick room upon a plate with pine shavings and the vapour or exhalation breathed several times a day. The patient soon gets accustomed to it, and it is claimed for this treatment of tubercular disease of the lung that cough lessens, fever subsides, and body weight increases. It is being tried in various Continental sanatoria according to Merck with benefit.

Lithium Salts—Quite a number of new lithium compounds have been introduced chiefly as solvents for uric acid.

The Bitartrate is recommended in 10 to 20 gr. doses in a large quantity of aerated water in suppurative gingivitis and gout. The Bromide is recommended as a substitute for the potassium bromide, as being richer in bromine and being diuretic in 15 gr. doses. It is claimed for this salt that it diminishes albumin in Bright's disease. The Salicylate is given in solution in 20 gr. doses. The Benzoate (95 per cent. benzoic acid) in 15 to 30 grs. The Guaiacate in chronic rheumatism in 5 gr. pills. The Hippurate in solution, in uric acid gravel in 15 gr. doses. Lithium Diuretin, or Uropherin, is a powerful diuretic in cardiac dropsy and Bright's disease in 15 gr. doses in solution. The Ichthyol Sulphonate has the same action and dose as ichthyol. Lithium Symphoral is powerfully diuretic in 15 gr. doses in gout and dropsy. A combination with Piperazine is reported to be a powerful solvent of uric acid. Lithio-rubidio-platini Cyanide, according to Merck, becomes intensely fluorescent under the Röntgen rays. Uricedin is a brown powder containing citrate of lithium with citrates and sulphates of alkalies, prepared by acting upon strong lemon juice with acids and then neutralising. It is used in gout in doses of 1 to 2 drs. Urosine is the name given to the quinic acid salt; it is given in doses of 5—15 grs. The Glycerophosphate, a white, soluble powder, is given in 5 gr. doses. The Salolo-phosphate, or Solvosal-Lithia, is used as a disinfecting mouth wash, and as a substitute for the salicylates in rheumatism in doses of 4 or 5 grs.

Loretin is a yellow, odourless, crystalline powder, introduced as a substitute for iodoform. It is Meta-iodo-ortho-oxychinolin-ana-sulphonic acid. It may be used as a dusting powder in every condition in which iodoform has been employed, and it appears to be absolutely unirritating, as it has been used in eczema, and it is claimed for it that it has no toxic properties. It is used as a collodion 8 per cent. for erysipelas, and can be applied alone or with chalk, or in an ointment.

Losophan is Tri-iodo-metacresol in colourless, odourless, insoluble crystals. It contains nearly 80 per cent. iodine. It has been recommended as an antiparasitic agent in skin diseases in 2 per cent. alcoholic solution or 5 per cent. ointment.

Lycetol is a granular, soluble salt. It is Dimethyl-piperazine tartrate, and has been given in the uric acid diathesis in doses of 5 to 10 grs. in solution 4 times a day. It is a strong diuretic, and acts like piperazine.

Lycoperdon Giganteum, or Puff-ball—This interesting fungus, belonging to the natural order Trichogastres, is found near the fences on the margins of woods, and has been long known to possess hæmostatic properties. It forms a soft and comfortable *surgical dressing*, in addition to its hæmostatic qualities. The mature plant, which is about the size of a foetal head, is employed. On breaking the outer skin, the dusty mass, consisting of the capillitium and spores is the portion used. The writer has seen it used in formidable hæmorrhages, dusted over the bleeding

surface and plugged into deep and tortuous wounds where the open vessels could not be reached with a ligature, and the rapid and effective manner in which it arrested bleeding was most surprising. He has seen it immediately arrest copious hæmorrhages, which he believes could not have been controlled by any other hæmostatic. How it acts is unknown.

The writer, in bleeding hæmorrhoids or fissures, has had great satisfaction with this remedy, which he uses plugged into large hollow suppositories and inserted into the rectum. He has been able to satisfy himself that he has saved life in this way, in a case in which the shock of an operation would have been fatal. He finds it to be an excellent remedy for epistaxis, and he plugs the nostrils with the fungus, leaving it *in situ* for several days, and always finds it to act most satisfactorily.

Lycopodium Clavatum—Fenwick, in a *Resumé* of the drugs used in genito-urinary affections, speaks of the great value of a tincture made from white club moss in frequent micturition and irritable bladder. He gives 15 to 60 minims of an ethereal tincture (1 in 5). The drug is used also in the spasmodic retention of urine in children; it is also a carminative and laxative, and has been given in enteritis and rheumatism. Externally, it may be dusted over eczema and intertrigo in children and fat subjects.

Lysidine, or Ethylenethenyldiamine, exists in soluble, reddish crystals, which, even in dilute solutions, has marked solvent action on uric acid, but it appears probable, from the experiments of Mendelssohn, that it has little solvent power over uric acid in organic solutions. It is given in doses of 5—15 grs., but is generally supplied in 50 per cent. solution. The bitartrate promises to give better results in 15 gr. doses.

Lysoform is a clear, yellow, soapy fluid, consisting of formaldehyde and some aromatic bodies which remove the objectionable odour of this drug. It is a powerful antiseptic, and is used to disinfect the skin of the hands, which it keeps soft and flexible, and in 1 per cent. solution to disinfect the bladder and urethra.

Lysol is a thick, dark, oily liquid with a tarry odour, containing 50 per cent. of cresols, obtained by saponification of cresols by alkalies; it is soluble in water, powerfully antiseptic, and it is claimed for it that it is 5 times stronger than carbolic acid and 8 times less poisonous. It is more uniform in its composition and effects than creolin, and, in addition to its antiseptic and disinfectant properties, it is a soap, and has been much used in Germany as a disinfectant for the hands, skin, and instruments, for wounds, and for uterine and vaginal injections, in solutions varying from $\frac{1}{2}$ to 3, or even 5, per cent. It has been recommended as an application to lupus.

Lysulfol, the sulphur compound of lysol, is a black, greasy solid, used with an equal amount of glycerin as an application to scabies, acne, &c.

Malakine (Salicylparaphenetidin) is a yellowish, crystalline powder with antipyretic and analgesic actions. It acts like a weak antipyrine, and is decomposed by acids. Owing to its insolubility it is administered in cachets or tabloids. It has been given in doses of 15 to 20 grs. in neuralgias, in fevers, and in phthisis with high temperature, and it has been used as a substitute for salicylates in acute rheumatism, where it is said to produce no untoward effects. It has been found to be a reliable vermifuge.

Mallein is an extract prepared from cultures of the microbe which produces glanders. Its only use at present is in veterinary practice, where

it is injected as a test for glanders in horses. If the disease be present a smart reaction occurs like what is observed in tubercular animals after the injection of Koch's lymph. The dried mallein now supersedes all liquid preparations; the dose is $\frac{3}{4}$ gr. dissolved in 80 mins. water, and it is probably curative in mild glanders.

Malti Extractum, or Extract of Malt or Byne, contains the active principle—diastase—a digestive ferment possessing the property, even when exceedingly diluted, of changing starch into dextrin and maltose. Its efficacy depends upon the amount of diastase present, which, in many of the extracts to be met with, is very trifling, but the food value of the maltose, always present along with the ferment in large quantities in maltine, must be taken into account. It is useful in cases where the digestive power is weak and the assimilation of starchy foods is imperfect. It is a restorative, and is regarded as of more value than cod-liver oil by some. It may be given in doses ranging from a tea-spoonful to a table-spoonful in milk, wine, beer, porridge, tea, or cod-liver oil after meals. Its high nutritive value renders it an agent of great utility in phthisis, scrofula, rickets, and many wasting diseases. It is a good plan to mix it with the food before being swallowed in dyspepsia, and wherever the digestive functions seem to be seriously impaired. It should be given at the *beginning* of a meal. It will not act in acid fluids, and consequently is of most value when given at a time when the acidity of the stomach is least. The Liquid Bynin is more easily administered than the viscid extract. It contains about 7 per cent. alcohol. Combined with cod-liver oil, malt extract is of great value. Powdered Malt or Malt Flour is largely used as an addition to the various infants' foods composed of wheaten flour.

Manaca, or Vegetable Mercury—The root, with portions of the attached stem covered with bark, of *Franciscea uniflora* has been long used by the Indians as a remedy for rheumatism and syphilis. In America it has been used in *subacute* and chronic rheumatism. Its virtues have been vaunted in scrofula and a host of ailments, in which it is useless. It appears to be a diuretic and emmenagogue in dr. doses of the liquid extract i in i.

Mate, or *Ilex paraguayensis*, is the Brazilian holly which contains a considerable amount of caffeine, and is used in Brazil made into an infusion like tea. Its therapeutic properties depend upon the caffeine and tannin contained in its leaves. It has been given with benefit in failing compensation and in migrainous headaches.

Medulla Ossium Rubra—The red marrow of bone has been highly praised by Fraser as a remedy in anæmia. Various preparations are in the market, for it is most difficult for the patient or his friends to extract the red marrow from the large bones of sheep and oxen. It is possibly owing to the varying strengths of these compounds that the reports of the drug have been so contradictory and unsatisfactory. The yellow marrow, which generally makes up the bulk of the drug ordinarily supplied, is worthless. The glycerin extracts do not appear to be uniform or reliable, the ordinary palatinoid or tabloid forms or the valules are to be preferred. They are generally made to contain 5 grs., and from 2 to 6 of them may be given 4 times a day. Red marrow has been administered with success in pernicious anæmia, leukæmia, chlorosis, rickets, lymphadenoma, osteoarthritis, purpura, hæmophilia, malarial anæmia, and tuberculosis.

Menispermium (Yellow Parilla)—The eclectic extract, in the form of a brownish powder, contains the active principle of *Menispermum canadense* (Canadian Moonseed), and *M. fenestratum*. It is a weak intestinal stimulant, and possesses no power over the liver. It has tonic properties, and has been given in dyspepsia and as an alterative in constipation, 2—5 grs.

Menthoxol is a powerful antiseptic liquid, prepared by mixing an alcoholic solution of menthol with a 3 per cent. solution of peroxide of hydrogen; it is brushed over the interior of the larynx and of the nose in ozæna, or used as a 5 per cent. spray. Camphoroxol and Naphthoxol are prepared in the same way, and have similar properties. They are of 1 per cent. strength; Naphthoxol is 2 per cent. Diluted with 10 parts of water, they are used as antiseptic dressings for wounds. Oxydol is the name given to a solution of hydrogen peroxide of about one-third the strength of the official liquor; it is used undiluted as a dressing for wounds.

Mercuriol is an amorphous powder, which is an amalgam of aluminium, magnesium, and mercury. It is recommended for Welanders' method of treating syphilis by a mercurial shirt worn next the skin; by the heat of the patient's body the amalgam is volatilised, and the mercury inhaled. It may be worn as a sachet. Mercolint is the name given to aprons of cotton fabric impregnated with 90 per cent. mercuriol ointment, to be worn on the chest or abdomen. Mercuriol contains 40 per cent. metallic mercury, and decomposes readily.

Mercuriol is a brownish soluble powder, being a combination of mercury with the nucleinic acid of yeast. It is an active preparation, and is given in 1 gr. pills. A 1 per cent. *fresh* solution is injected in gonorrhœa, and a 5 per cent. solution is used in eye diseases.

Methacetin, or Para-acetanisidin, is an odourless crystalline powder, white or pinkish white, bitter, and sparingly soluble in water. It is prepared by a tedious process, starting with nitrophenol, which is changed into nitranisol, and afterwards into anisidin. It is a powerful antipyretic in doses about one-half that of antifebrin, and one-quarter that of antipyrine. It is a potent antiseptic in 1 per cent. solution. In fevers of all kinds, acute rheumatism, pneumonia, and every condition in which antipyrine has been given it has been administered, acting with promptness and certainty, though it sometimes causes most profuse sweating. It is considered especially suitable for children. 5 or 6 grs. may be given as a full dose for an adult.

Methyl Chloride, or Chlormethyl—This gas is condensed in metal cylinders, and used as a local anæsthetic for minor operations. Upon permitting it to escape it is mixed with air and obliquely thrown as a jet upon the pained part, which it freezes rapidly, depriving it of sensibility. It has been extensively used in sciatica and lumbago in the Paris hospitals, and with much success. The spray should only be used for a few seconds at a time or eschars may result. Pains and neuralgia of all kinds have been treated in this way recently by a plan called "Stypage." Pledgets of lint are steeped in methyl chloride, and when laid upon the pained part cause it to freeze. Tetanus has been treated in this way by stypage over the maxillæ and spine.

Others use it by permitting a stream of the liquid to play upon a tampon of wool and silk laid upon the part. As the gas rapidly evaporates from the wool it freezes the part beneath (Helbing).

By saturating chloroform and ether with this gas Richardson's Compound Liquid for general anæsthesia is produced.

Methyl Salicylate is a synthetical preparation identical practically with Gaultheriæ Oleum (which see). It is the best routine local treatment for the wearying pains of rheumatoid arthritis, and may be smeared over the affected joints and covered with cotton wool and oiled silk.

Methyl-Violet, or Pyoktanin, is one of the aniline dyes of very complex and possibly varying chemical composition. It is a weak antiseptic, and has been found to be free from toxic properties, as ordinarily employed, and has been extensively tried as a surgical dressing, and as an injection (1 per cent.) in gonorrhœa, ozæna, and ophthalmia. It is doubtful if the drug will ever come into general use owing to its power of staining the tissues, and reports are most unfavourable and disappointing, though quite recently it has been reported as almost a specific in its action upon the gangrenous parts in cancrum oris when applied in 1 per cent. solution. It was supposed by Mosetig to be capable of curing malignant tumours if injected into their substance, but Quenn proved that it was not diffusible. Ehrlich injected it in sciatica and neuralgia, and a powder of 2 per cent. with sugar has been used to kill the diphtheritic bacillus. Auramine is the name given to a yellow coloured preparation of the drug.

Methylal is a limpid liquid, prepared from methylic alcohol. It is an hypnotic and antispasmodic, lying between ethylic alcohol and ethylic ether; it reduces arterial tension, produces sleep, and, though it kills by paralysing the heart, it has been used as an anæsthetic when mixed with ether. It may be given by mouth in aqueous solution (30 mins.), or by hypodermic injection, or by inhalation. Personali states that it is antagonistic to strychnine. It has been used as an hypnotic in insomnia, and it is claimed to be the best hypnotic in delirium tremens; and mixed with glycerin and oil or as an ointment (15 per cent.) it has been employed to relieve pain.

Methylene (or M. Bichloride, or M. Dichloride, or M. Chloride, or Dichlormethane), CH_2Cl_2 , is a substance about which much confusion exists. It is a heavy mobile, colourless chloroform-like liquid, prepared by a variety of processes.

It has been introduced as a substitute for chloroform, and it was claimed for it to be safer, especially in abdominal or ovarian surgery. These claims have not been borne out in practice. The drug has been used locally as a spray like methyl chloride.

Helbing states that English methylene is a mixture of ethyl ether and methylene chloride. Other writers hopelessly confuse both substances, and some specimens met with consist of chloroform and pure methylene in varying proportions, and without any smell of ether. Hofmeister states that it is a mechanical mixture of chloroform with 20 per cent. methylic alcohol.

Methylene Blue (Tetramethyl thionine) is one of the aniline dyes. It exists in small greenish crystalline scales which impart a blue colour to the urine after being swallowed. This drug has been tried successfully, it is reported, in articular and muscular rheumatism, sciatica, and lumbago, in doses of 2 to 3 grains in pill. Ehrlich found that the pure salt is a valuable means of relieving all forms of pain, especially migraine, and its hypodermic use does not cause smarting. It is stated to be *curative*

in migrainous headache and to relieve the pains of ataxia. It has been tried with success in malaria in doses of $1\frac{1}{2}$ grs. 4 to 6 times daily. In similar doses it has been given with alleged success in cancer and phthisis. It has been injected into malignant tumours and enlarged glands, and used in gynæcological practice. It forms a compound with salicylate of soda, called Anti-rheumatin, which is given in rheumatic fever in 2 gr. doses. Dr. James Moore has obtained excellent results in gonorrhœa by administering 3 grs. methylene blue with 15 grs. citrate of potash in cachets *ter die*. He demonstrated the action of the drug by examining the discharge microscopically after a few doses. The acute stage was always cut short. Bonnet successfully treats ozœna by a $2\frac{1}{2}$ per cent. solution, and this solution has been successfully used in ophthalmia as a subconjunctival injection. The drug has been used hypodermically with the view of testing the condition of the renal tissue; in a healthy man the urine should be distinctly coloured in 30 minutes after the injection.

Recently Aniline Blue (Triphenyl-rosaniline) has been proved to also possess specific action in malaria by Iwanoff in 5 gr. doses in capsules or wafers.

Microcidine is a white powder, being impure naphtholate of soda, prepared by heating B-naphthol with caustic soda. A $\frac{1}{2}$ per cent. solution acts as a powerful unirritating antiseptic for wounds and ulcers, ozœna, &c. Cozzolino uses an ointment in ozœna of 2 grs., with 3 grs. cocaine and 1 oz. vaseline.

Migranin is a colourless powder, being a mixture or a chemical combination of citrate of caffeine and antipyrine (a double citrate). It contains nearly 90 per cent. antipyrine, and is extolled as a specific for migraine in 15 gr. doses dissolved in water. The writer has been in the habit of treating all forms of migraine with 10 grs. antipyrine and 5 grs. citrate of caffeine with the best possible results.

Mistletoe, or *Viscum Album*, has been used in America and in this country as a remedy possessing qualities similar to digitalis, and beneficial results have followed its use in heart affections and dropsies. It has been found that this drug possesses also strong ecboic action, which promises to give it a place amongst our emmenagogue remedies.

Dose—5 to 30 minims of a tincture (1 to 8 of spirit).

Mollin is a basis for ointments introduced by Kirsten. It is a potassium soap containing 17 per cent. of excess of fats, prepared by treating a mixture of equal weights of cocoa-nut oil and lard with 20 per cent. caustic potash, and 4 parts water. After saponification takes place, 17 per cent. fat is added, and 30 per cent. glycerin may be also added. Liebreich advises 100 of *sapo kalinus* (P.Pr.), 50 to 80 lard, and 10 glycerin; or equal parts of lanoline and *sapo kalinus*. The resulting ointment easily washes off the skin and clothes. It forms an elegant base for mercury, salicylic acid, and the tincture of iodine. This latter, iodine mollin, is a valuable application to scrofulous glands and diseased joints, and mercury mollin 33 per cent. is used as an external agent in syphilis.

Monsonia Ovata and *M. Burkei* are South African annual plants introduced by Maberly, who found them of great value in dysentery. The dose is 1 to 2 drs. of a 1 in 8 tincture. He claims that the average amount of time of 100 cases of dysentery under this treatment was only 2·3 days (90 of these cases were acute).

Morrhual is an acid, bitter, aromatic, yellow liquid, containing the active principles of cod-liver oil—*i.e.*, the phosphorus, iodine, and bromine combined, with organic fatty matters. It is prepared by treating the oil with hot alcohol and distilling off the spirit. The morrhual is very much smaller in bulk, and can be easily administered in capsules containing 3 to 5 minims each. It is not at all probable that the virtues of cod-liver oil are concentrated in this substance, but it can be used to great advantage in cases where the oil cannot be swallowed. Each capsule of 3 minims represents 80 minims of cod-liver oil. (See also under Pangaduine.)

Mucin—the active principle of animal mucous fluids as obtained from bile—is a yellowish, green, tasteless powder, soluble in water. W. S. Low gives it in 10 gr. doses mixed with the same amount of bicarbonate of soda in gastric ulcer at the beginning of a meal, with the view of coating over or shielding the abraded surface during digestion.

Muscarine is the active principle of poisonous fungi obtained from *Amanita* (or *Agaricus*) *muscaria*—Fly agaric; it can be prepared synthetically. It resembles pilocarpine closely in its action. Thus it causes profuse salivation, perspiration, lachrymation, and gives rise to rather forcible and painful micturition, and sometimes to nausea and diarrhoea. When applied in solution (10 per cent.) to the eye it dilates, and when swallowed it contracts the pupil.

It is administered in the form of a hypodermic injection of $\frac{1}{4}$ to $\frac{3}{4}$ gr. of the nitrate in 5 minims of water; it has been given in smaller doses by the mouth with success for the night sweats of phthisis. Murrell gives 5 minims hypodermically of a 1 per cent. solution for this purpose.

Muscarine is, with the exception of the local mydriatic and anhidrotic effects, a decided antagonist to every action of atropine. Atropine, thus, is the antidote in cases of poisoning with fungi, and the writer has been able to satisfy himself that he has saved several lives by the hypodermic injection of atropine upon an occasion when a large number of school children were poisoned by eating fungi.

Mydrine is a white powder, being a compound of homatropine and ephedrine—the alkaloid of *Ephedra vulgaris*. It is used (10 per cent. solution) to cause dilatation of the pupil; the main advantage of its introduction lies in the fact that it is of greatest use for diagnostic examinations, as the mydriasis passes off in a few hours. The solution acts in 30 seconds, and causes no irritation.

Mydrol (Phenyl-pyrazol-iodo-methylate) is a white, soluble powder used in 5 to 10 per cent. solution to cause dilatation of the pupil, which it does without causing irritation or increase of intra-ocular pressure. It is slower in its action than atropine, but its effects pass off much quicker. It has decided anodyne action, and can be used in various painful conditions of the eye. Albertoni states that it is absolutely non-toxic, and that it diminishes the amount of blood in the iris and conjunctiva.

Myrtol exists in the oil distilled from the leaves of *Myrtus communis*—the myrtle. It has been employed as an expectorant, in bronchial troubles, in capsules containing 5 minims. 15 minims have been given with marked benefit in gonorrhœa, leucorrhœa, cystitis, &c. Recently its power as a disinfectant of the air passages has been demonstrated by Eichhorst, who found the sputum to be disinfected in a few hours in gangrene of the lung after the internal use of myrtol.

Naftalan is an ointment basis consisting of 2·5 to 4 per cent. anhydrous soap blended with pure petroleum naphtha. It is used by Unna in dermatitis and mild eczemas, and has given good results in hæmorrhoids in the form of a suppository or plug on lint.

Naphthalan is the name given to a semi-solid compound, obtained by fractional distillation from Armenian naphtha. It has been suggested as a substitute for tar in skin diseases. It is dirty and liable to irritate, but it has proved useful in scabies.

Naphthaline, or Naphthalene, is obtained in the distillation of coal tar, and exists in the form of a white insoluble crystalline powder, which is a powerful germicide. It is dusted as a powder over ulcers, sloughing wounds, open cancers, and chancres, as well as fresh wounds and stumps, and may be used for disinfecting cavities. After application the part should be covered with oiled silk and bandaged; a ten per cent. ointment may be used. It is cheap, clean, disinfecting, produces rapid growth of granulations and cicatrices, diminishes irritability and pain, and its application is very simple and easy.

Rosbach recommends it in typhoid fever, diarrhœa, and dysentery, and it has been loudly praised as a remedy of great promise in cholera, though it must be said that most recent observers deny its value as an intestinal disinfectant. It has expectorant properties, and has been urged as a specific for phthisis. Fenwick speaks highly of it when given in cystitis with fetid urine; it is eliminated by the urine, which it colours brown. Recently it has been praised as a remedy for round-worm and tape-worm. Charren states that the administration of naphthaline may be followed by cataract and amaurosis, whilst many others have proved that it may cause renal disease and destruction of red blood cells, and the internal use of the drug requires caution, and only purest specimens should be given internally. The objectionable odour of the drug has prevented its general use. It is the substance known as Albo-carbon, Camphylene, and Alabastrine.

Dose for adults—2 to 8 grs. every 3 or 4 hours in pills coated with keratin.

Naphthol—Beta is now official (see page 249).

Camphorated B.-Naphthol, or Naphthol Camphor, is a syrupy liquid, consisting of B.-naphthol 1 part and camphor 2 parts. It is a powerful and harmless antiseptic for wounds. 2 minims have been injected in solution with oil into enlarged glands and into the lung in tubercular disease. B.-naphthol Carbonate exists as insoluble crystalline scales. It is the di-naphthylester of CO_2 . It is decomposed by the alkaline secretions in the duodenum, and it is non-irritating, and it has been introduced as a substitute for B.-naphthol.

Naphthol—Alpha- or Ortho-Naphthol, closely resembles and is isomeric with B.-Naphthol. Maximowitsch found that 1 in 10,000 made a solution which completely arrested the growth of various microbes, and he calculated that the lethal dose for a man would be about 20 ozs. Shoemaker speaks highly of it as a disinfectant and antiseptic, and he obtained good results in gonorrhœa and gleet, but he states that it lacks to a great extent the anæsthetic or sedative effects of beta-naphthol in skin affections, and that its internal action is less decided. It is certainly more irritating, and though praised in typhoid and other intestinal troubles its disagreeable taste and odour will prevent its general use. It may be given

in 10 to 15 gr. doses in cachets, pills, or dissolved in oil. It has been used as a test for sugar in urine.

The acids derived from both alpha- and beta-naphthols are powerful antiseptics. One of these is Alpha-oxynaphthoic Acid, which forms soda and potash salts. Schückling strongly recommends the acid as an odourless and cheap substitute for iodoform. He also used a solution ($\frac{1}{2}$ to 1 per cent.) in combination with phosphate of soda in leucorrhœa. (See page 473.)

Naphthol-Aristol is the Diiodide of B-naphthol, in the form of a greenish yellow powder, without odour or taste, and insoluble in water. Introduced as a substitute for iodoform, and as a remedy for various skin diseases, as psoriasis and tinea, in the form of 20 per cent. ointment, it has given promising results.

Narceine is an alkaloid obtained from opium, in white, silky, almost insoluble crystals about whose value as an hypnotic there has been much difference of opinion. When pure it may be regarded as practically inert; the reports of its narcotic properties were probably owing to an impure alkaloid having been administered. The Meconates of Narceine (*mono-*, and *bi-*) are chiefly employed and have been given hypodermically. Antispasmin is the name given to a compound of narceine and salicylate of sodium. It is used in pertussis in 1 gr. doses.

Narcotine, when in the pure state, is a crystalline alkaloid obtained from opium, which it is now proposed should be called Anarcotine. It has no narcotic action whatever, but it is a powerful antimalarial agent, and it has been found to cure malaria, which resisted both quinine and arsenic, and to relieve malarial headache, which resisted antipyrine. The dose is 2 to 4 grs. 4 to 6 times a day. In very large doses it will produce excitement with increased reflexes and convulsions like strychnine.

Stypticin, a powerful hæmostatic, is obtained by its oxidation. (See under Stypticin, which is Cotarnine hydrochloride.)

Neurodin is Acetyl-para-oxyphenylurethane in colourless, odourless crystals, slightly soluble in water. It was discovered by Merck and investigated by Mering. It is introduced as a powerful analgesic, superior to antipyrine in neuralgia, migraine, &c., in doses of 15 grs. in wafer or as a powder. Sometimes profuse perspiration follows its use; it is claimed to be otherwise harmless.

Nicotine is a colourless liquid alkaloid obtained from tobacco. The bitartrate is a soluble crystalline salt, and has been successfully used in tetanus ($\frac{1}{4}$ to 1 gr.), and as an antidote to strychnine. It has the power when given even in very small doses of enormously increasing the general blood pressure, acting like the suprarenal gland substance, and Schafer suggests that a small dose should be given before chloroform inhalation.

The Salicylate of Nicotine, or Eudermol, in 1 per cent. ointment, is introduced as an antiparasitic remedy in tinea, scabies, &c. It is without odour, and does not stain. It rapidly cures mange in dogs.

Nitrous Oxide—This colourless, inodorous gas is used as an inhalation to produce general anæsthesia like ether and chloroform. The method by which it produces its effects is still doubtful. It is, however, certain that it affects the cerebral centres, not the peripheries, and it is not decomposed in the system, as some supposed. A few deaths have

been reported from its use in many millions of administrations. It differs from chloroform and ether in the rapidity of its action and the quickness with which its effects pass off, so that it is only available for very short operations like teeth extraction. The mask must be removed from the face as soon as the cyanotic appearance is seen, and the anæsthesia, which lasts for less than a minute, is recovered from almost as rapidly. Berts' method of prolonging the anæsthesia marks a distinct advance. He administers the pure gas, and keeps up the effect by the inhalation of a mixture of the gas and oxygen by means of a simple apparatus. In this way with safety many operations can be performed where chloroform or other anæsthetic cannot be employed. Hewitt's apparatus is portable and simple.

Nosophen, or Nosophene, is a pale yellow, odourless, insoluble powder, containing 60 per cent. iodine. It is Tetraiodophenolphtalein. The bismuth salt is called Eudoxin (see page 514), and the sodium salt Antinosin. The nosophen compounds are introduced as substitutes for iodoform, and may be used in every case where that drug is indicated. They are given internally as intestinal antiseptics in doses of 5 grs.

Nuclein, or Nucleol, is a principle of varying and complex composition always containing phosphorus, and generally sulphur, obtainable from yeast, spleen, liver, milk, yolk of egg, &c. The nuclein from yeast, which is chiefly nucleinic or nucleic acid, or its soda salt, is the one most frequently employed. Nuclein has been stated to be the bactericidal element in human blood, and it has consequently been employed in various parasitic affections as typhoid, puerperal, and scarlet fevers, diphtheria, phthisis, &c. This bactericidal element is believed to be produced by the white blood corpuscles. When nuclein is administered by the mouth, hypodermically, or per rectum, a great increase in the white corpuscles rapidly follows, and the blood serum is found to be strongly toxic to most microbes. Yeast nuclein is a greyish-white powder, soluble in alkaline solutions; it may be given in doses of 10 grs. in wafer six times a day, or in doses of $\frac{1}{2}$ gr. hypodermically; much larger doses have been given. Glowing reports were published of the improvements and even cures of tubercular disease of the lung. Notwithstanding these glowing accounts, this drug, which was hailed as an "essence of life," is rapidly falling into disuse. Mourek's hypodermic solution is made by dissolving $7\frac{1}{2}$ grs. of splenic nuclein in as much 5 per cent. soda solution as will cause it to dissolve; $7\frac{1}{2}$ grs. carbolic acid are added, and water to 26 drs. Of this from $\frac{1}{4}$ to 2 drs. may be injected. A solution of yeast nuclein of 5 per cent. strength is obtainable, the dose of which is 1 dr. Yeast is given in doses of a table-spoonful in diabetes and recurring boils. Levurine is a brown powder prepared from yeast, and is given in 1 dr. doses. Nucleic Acid combines with silver, forming Nargol; with mercury, forming Mercurool; with copper, forming Cuprol; and with iron, forming Ferrinol. Cuprol in 10 % solution has proved most valuable in the treatment of various forms of conjunctivitis. Cuprargol is a double copper and silver salt of a greyish white colour, used in 1 to 5 per cent. solution in conjunctivitis.

Nutrose is a colourless, odourless, and almost tasteless powder, easily soluble in water, milk, soup, &c. It was introduced by Salkowski under its proper name of Sodium Caseinate, being formed by mixing dry casein with caustic soda and boiling with 94 per cent. alcohol. One pint of warm milk will dissolve nearly 1 oz. of the powder. It is rapidly absorbed and does not irritate the bowel, as meat peptones do, and

putrefaction does not occur in the intestines when children are fed with it. The results of experiments on animals and man prove that it contains as much nitrogen as is necessary for the body when administered in moderate amounts. It is indicated in various intestinal affections where meat cannot be borne, and it can be mixed with all other foods. It may be given in tea-spoonful to table-spoonful doses.

Odolol is one of the new coal tar derivatives closely allied in action and composition to salol. It is a thick yellow oily liquid, soluble in alcohol but not in water, and it is neutral in reaction. Upon the action of a weak alkali it readily splits up into salicylic acid and phenol as salol does. This property renders it a very suitable wash for the mouth and throat for which purpose it is dissolved in alcohol and added to water before use. It is powerfully bactericidal and speedily destroys the germs which flourish in the cavities of decayed teeth.

Orexine is the Hydrochloride of Phenylidihydrochinazolin—a bitter, disagreeable, crystalline powder, introduced as a gastric tonic and stimulant to the mucous membrane of the stomach in cases of phthisis where the appetite had entirely failed. It may be given in doses of 4–8 grs. in wafers or capsules. Continental reports testify to its power of increasing the appetite (5 grain doses) in phthisis and after operations, in the vomiting of pregnancy, and in anæmia, but the burning taste of the drug prevents its use in ulcer and acute affections. It is suggested to use the finely powdered free base (Basic Orexine) in similar doses, followed by a large draught of milk, beef tea, &c., to prevent irritation. Tannate of Orexine has been employed as a gastric tonic with success in 5–10 gr. doses. It is tasteless, and has recently been recommended in 5 gr. doses in chloroform vomiting. It is free from the objectionable qualities of pure orexine.

Ortho-monobromphenol, also called Bromo-phenol, is a violet-coloured liquid used as an application (2 per cent. ointment) in erysipelas (see under Para-Monochlorphenol).

Orthoform is a white, bulky, odourless crystalline powder (para-amido-meta-oxybenzoic acid), which is sparingly soluble in water. The hydrochloride is more soluble, but irritates somewhat. Yonge has reported at length upon this new anæsthetic, and claims for it several advantages—(1) it is sparingly soluble, hence its action is very prolonged; (2) it is non-toxic; (3) it is powerfully antiseptic. On the other hand, it has no action on the unbroken skin and little on a healthy mucous membrane, its effects being only strikingly shown where there are nerve endings exposed. Recent experience has shown that the drug is decidedly poisonous, but not when applied to mucous membranes, and it can be given internally in large doses with safety. The powdered orthoform may be sprinkled over abraded areas alone or mixed with lycopodium, and Yonge has applied it with success in ulcerations of the upper air passages not requiring operative measures. A 10 per cent. ointment, or a 10 per cent. solution of the hydrochloride, or a 5 per cent. spray of the latter may be used. Good results have been obtained by 15 grs. given in cancer and ulcer of the stomach when the relief of pain is said to have lasted from 4 to 30 hours. It has also given satisfaction in gonorrhœa, gynecological practice, cystitis, burns, and a host of other painful conditions. The so-called new Orthoform differs slightly in chemical composition, and is now chiefly in use. It is meta-amido-para-oxybenzoic acid.

Ouabain is the name of a crystalline glucoside extracted from the Somali arrow poison of Eastern Africa, obtained from *Akocanthera Ouabaio*. The glucoside is believed by Arnaud to be identical with strophanthin, and acts powerfully upon the respiratory and cardiac centres. It is, however, stated to be twice as poisonous and twice as rapid as the glucoside from strophanthus, and like strophanthin, it acts more slowly when taken by the stomach. It acts on the conjunctiva like cocaine, and produces anæsthesia.

Gemmell recommended this glucoside in whooping-cough, and he claimed for it that it shortened the first and second stages of the disease, and diminished the length of the convalescent stage, in doses of $\frac{1}{1000}$ grain to children 5 years old; in some cases he increased the dose to $\frac{1}{250}$ grain.

There is much confusion about this remedy, and Merck has changed the name of Lewin's Ouabaïn to Ouabaid, to prevent its being mistaken for this ouabaïn of Arnaud's. Commercial ouabaïn is also obtained from strophanthus glabrus from Gaboon. Fraser's crystalline glucoside is obtained from *Akocanthera Schimperi*; it is identical with Arnaud's, and he proposes to call them both *Akocantherin* instead of Ouabaïn. Pure Strophanthin should not be given in doses exceeding $\frac{1}{120}$ grain.

Oxygen as a therapeutic agent has undergone many vicissitudes of fortune, at one time being regarded as a universal panacea for all blood ailments, and at another time falling into discredit. Thanks to the brilliant researches of Lorrain Smith, of Haldane, and others, the application of the laws of the pressure of gases to pharmacological research is clearing up the question of the value of oxygen. At ordinary atmospheric pressure the addition of large quantities of pure oxygen to the air produces no symptoms when breathed for long periods by healthy subjects, but when the pressure is increased the gas acts as a poison to the nervous system, and as a fatal irritant to the lung. Under ordinary conditions of life the hæmoglobin of the blood is always practically saturated with oxygen, and the addition of this gas to the air breathed, or the substitution of the pure gas, cannot alter its composition, but the amount of oxygen in simple solution in the blood can be increased five-fold by inhalation of the pure gas at ordinary pressure. It is calculated that by breathing the pure gas an increase of 70 per cent. of oxygen is available for the supply of the cerebral tissue and 40 per cent. for the body tissues. In poisoning by carbon monoxide, coal gas, &c., the serious change in the hæmoglobin causes death. If oxygen be freely administered life may be prolonged for considerable periods in these cases, and it cannot be doubted that sometimes life can be saved. The writer has satisfied himself that he has saved life in one desperate case of coal-gas poisoning by the persistent use of oxygen for several hours. In pneumonia, bronchial catarrh, cardiac dyspnoea, and allied conditions, the effect of the gas is often very striking, the cyanosis rapidly disappearing sometimes, and by maintaining the patient's life during a severe crisis, time is given for the elimination of poisons, and life may be occasionally saved, though it must be acknowledged that the efficacy of the remedy is greatly exaggerated by many authorities. Oxygen is stated to be of great value in lowering excited reflex activity in puerperal eclampsia. It has been used with success in the treatment of strychnine and morphia poisoning, drowning, laryngeal diphtheria, and with benefit in some forms of leukæmia, extensive burns, lithiasis, and other conditions.

The compressed gas is supplied in metal cylinders, from which a rubber bag can be filled as required, and the patient slowly inhales from the bag

one or more pints at a time. In desperate conditions the gas should be given pure (by a face piece), and the expired air exhaled into an apparatus filled with soda-lime to cause the absorption of carbon dioxide. A small jet of the gas has been found to produce remarkable improvement in slowly healing ulcers, carbuncles, and foul wounds, and Stoker's plan of treating chronic ulcers with diluted oxygen has given most valuable results; he shows that the resulting cicatrix is superior to that obtained in any other way. Ulcers healed readily after 25 years' failure with other agents.

Pangaduine is the name given by Bouillot to a solid crystalline body, which he maintains represents the entire group of alkaloids found in cod liver oil. It is claimed for it that in daily doses of 5 grs. (representing 5 ozs. of the oil) it increases the amount and density of the urine owing to the increased elimination of urea. It is recommended in neurasthenia, phthisis, gout, gravel, &c.

Pao Pereiro, or *Geissospermum læve*, is a stately Brazilian Apocynaceous forest tree. An alkaloid called Pereirine or Geissospermine has been obtained from it, which has been used as a substitute for quinine in malaria. It reduces the temperature, acting at the same time as a tonic, and diminishing the frequency of the heart beats without weakening that organ. The hydrochloride may be given in doses of 30 grains in rebellious malarious fevers. A decoction of 1 oz. of the bark in a quart of water may be given in wine-glassful doses. Tiberica affirms that it has twice the therapeutic value of quinine.

Papain and Papayotin—Papain is the soluble ferment prepared from the juice of *Carica papaya* by precipitation with alcohol; it is in the form of a white powder. It possesses the remarkable power of digesting animal substances: 1 gr. will peptonise 200 grs. pressed blood fibrin. Papayotin is, strictly speaking, the milky juice obtained by incisions made into the unripe fruit, collected and dried. The words papain and papayotin are, however, often used synonymously. In the West Indies the papaw juice is used to render the toughest meat quite soft and digestible.

Finkler, with properly prepared papain, has produced far better results than with pepsin, especially in the case of concentrated foods, and markedly so when the reaction is alkaline or neutral, as it often is in diseased stomachs, in which cases pepsin would be worthless. It also acts in an acid medium. Moreover, the action of papain continues all down the intestines whilst that of pepsin ceases in contact with the alkaline juices, and the drug has a certain amount of anodyne or pain-relieving power. It has also been used as a remedy against round and tape worms, which it sometimes has destroyed by its digestive action. It has been used with varying success as a local remedy in diphtheria, where its application as a powder causes the disintegration of the false membrane. It has also been employed to destroy warts, epitheliomas, &c. Schwimmer has successfully used a solution (1 in 10) to cure fissures of the tongue. It is a powerful galactagogue when given internally, or even applied locally. The writer has satisfied himself of the great value of Finkler's papain in dyspepsia, chronic gastritis, ulcer, and cancer of the stomach in doses of 2 to 3 grains. He obtains such excellent results with the drug that he seldom now uses pepsin. He combines it with bicarbonate of soda, carbonate of bismuth, and a little morphia. There is no other combination which will give so good results in gastric affections as this :—

R. *Papain* (Finkler) gr. iii.
Sodii Bicarb. gr. xxx.
Mag. Carb. Pon. gr. xx.
Bismuthi Carb. gr. x.
Morph. Hyd. gr. $\frac{1}{16}$. *Misce.*

Fiat pulvis. St. i. ter in die ex 3ii. aquæ p. cib.

The drug can be given in tabloids with or without soda, and as Glycerinum Papain of any strength. Creosote does not interfere with its gastric action. There is also contained in the leaves a poisonous alkaloid called Carpaine. (See page 500.)

Paraform (Trioxymethylene), or Paraformic Aldehyde, or Triformal or Polymeriform, is the polymerized form of formic aldehyde or Formalin (which see). It has been recommended as an intestinal antiseptic. It exists as a white crystalline powder, and may be given in doses of 10 to 15 grs. in diarrhœa, &c., wherever salol is indicated; later observers report that it causes colic, and the use of the drug is now practically confined to the disinfecting of sick rooms and surgical appliances by heating it in a spirit lamp when formic aldehyde is formed. Paraform has been used as a disinfectant for catheters. Recently Unna uses a collodion containing paraform for disinfecting the skin in diseases like pityriasis versicolor.

Para-Monochlorphenol is a crystalline salt, which Karpow affirms is the potent antiseptic of the aromatic series. It is often called Chlorphenol,* and is used as an ointment (10 gr. to 1 oz.) applied to erysipelas. It reduces the temperature, and in a few days all redness and swelling disappear. Ortho-monobromphenol acts in the same way, and may be used in the same strength. 5—20 per cent. solutions of mono-chlorphenol in glycerin have been applied in tubercular ulcerations of the throat and larynx. Elsenberg paints the melted drug (104°F.) on lupus, and dresses the ulcer with a 25 per cent. paste or ointment, which is removed after 12 hours. Brilliantoff treats corneal ulcers and iritis by injecting a 1 per cent. solution under the conjunctiva, and Köhler obtained excellent results by plugging the putrid pulp cavities of teeth with the drug. 2 per cent. solutions are recommended as the best means of disinfecting tubercular sputa. The salicylates of parachlorphenol and orthochlorphenol, called respectively Parachlorsalol and Chlorsalol, are used as intestinal antiseptics in 20 gr. doses.

Logucki uses a mixture of parachlorphenol and menthol (5—15 per cent.) under the name of Menthosol for laryngeal and other cases. Its taste and smell are not objectionable.

Pelletierine is an alkaloid named after the great French chemist; it is obtained from the bark of the pomegranate. It was first called Punicine, a name still insisted upon by Binz. The bark contains four alkaloids or pelletierines, only two of which are possessed of any anthelmintic action, and it is chiefly Pelletierine sulphate and tannate which are used in medicine in doses of 6 grs. each. Von Schröder has demonstrated the

* Under the name Chlorphenol there is a liquid in use consisting of monochlorphenol, alcohol, eugenol, and menthol for inhalation in phthisis.

action of this remedy outside the body upon living specimens of *tænia*; he found the addition of $\frac{1}{10000}$ part of pelletierine to the fluid containing the parasites caused their death in a few minutes. When tannin is not given the soluble sulphate is absorbed in the stomach and fails to kill the worm, and giddiness, dimness of vision, muscular weakness, and twitchings are noticed, which do not follow the dose of the mixed substances.

The drug has been injected in Menière's disease, tetanus, and paralysis. A smart purge of jalap should be given after the anthelmintic dose to expel the dead worm, and the stomach and bowel should be empty before its administration.

Penghawar Djambe, or **Paku-Kidang**, consists of the silky hairs from the stems of a large variety of ferns in Sumatra, Java, China, India, and other tropical regions. It comes chiefly from Java, and has been known and used there for centuries. A portion of the hairy mass laid upon a bleeding wound almost instantly causes coagulation of the blood like the puff-ball.

Peronine is a white soluble powder, being Benzylmorphine hydrochloride introduced by Mering as a narcotic less objectionable than morphia. It induces sound sleep without previous excitement, and it relieves pain with less of the drawbacks following morphia. The dose is about that of morphia, and it is very suitable as a sedative to the respiratory centre in the cough of various diseases, especially of tuberculosis. A 1 per cent. solution applied to the conjunctiva acts like cocaine.

Peruol is a 1 in 4 solution in castor oil of Peruscabine (benzoic benzyl-ester), which is the active principle of Peruvian balsam. It is used as an inunction in scabies, and is said to be most efficacious without producing irritation of the skin.

Petroleum, or Rock Oil, found in geological strata, and resulting from the decomposition of animal matter, is chiefly of interest on account of the large number of bodies derived from it, and which have a place amongst remedial agents. Thus Naphtha is the liquid portion which distills over below 122° F.; from this are obtained by fractional distillation still more volatile liquids known as Benzin, Petroleum Ether, and Rhigolene, &c. Vaseline, Petrolatum, or Soft Paraffin, is the semi-solid mixture of hydrocarbons, which is obtained by purifying the residue after distilling off the naphtha and benzin liquids. It is known in commerce as Vaseline and White Vaseline, and by a variety of names, as Geoline, Ozokerine, Chrisma, Cosmoline, Adepsine, &c.

A fluid (vaseline oil) is obtained from it, which is used as a vehicle for hypodermic injections, and as a spray in laryngeal troubles.

Liquid paraffin is now official. The pure liquid paraffins are demulcents, and are used as the basis of various popular cough emulsions.

Commercial Petroleum is a popular counter-irritant in rheumatism, and an antiparasitic remedy in various skin diseases. It is a valuable stimulant to the scalp in baldness, alone or diluted with 2 to 5 times its volume of any oil. The writer uses a mixture of 1 part of petroleum and 3 of olive oil as a routine application to the hair of the head in Charity Schools to destroy pediculi, as well as to prevent their appearance. Sapolan is an ointment consisting of naphtha, lanoline, and soap, which may be used in the same way. It is valuable in eczema, prurigo, and urticaria.

Phenocoll (Amido-acet-para-phenetidin hydrochloride) closely resembles phenacetin, chemically and therapeutically. It is a soluble, white

crystalline powder, and has been used in all the conditions in which antipyrine has been employed. It was vaunted as absolutely safe in the fever of phthisis, typhoid, and other fevers, but it seems to occasionally produce collapse and cyanosis. Its malarial action is much disputed, and the drug is not gaining in favour; the dose is 5 to 10 grs. It has very decided action in neuralgia, rheumatism, and pertussis. It can be freely sprinkled over wounds and ulcers as a substitute for iodoform, and it is also stated to be an intestinal antiseptic, but it is probably too soluble to have any local action. Salocoll is the salicylate of phenocoll, and is recommended in rheumatism; it is less soluble, and may be taken in wafers in doses of 15 to 30 grs.

Phenosallyl is a new antiseptic, consisting of 90 parts carbolic acid, 10 salicylic acid, 20 lactic acid, and 1 menthol. It is a mixture introduced by Christmas. It is said also to contain some eucalyptol. It has been recommended as a lotion for wounds (1 per cent.) and as a carminative or gastric antiseptic, in doses of 1 to 2 minims.

Phesin is a pale, brownish-yellow, amorphous soluble powder without odour, and with a strong saline taste. It is a derivative of phenacetin, and it acts in the same way, only more promptly, and like every drug introduced as an antipyretic it is vaunted as being absolutely devoid of toxicity, in doses the same as phenacetin.

Phloridzin is a glucoside, existing in silky crystals, obtained from the bark of the apple, cherry, pear, and plum tree. It is of interest chiefly owing to its being employed in the physiological laboratory, as an agent, which readily produces glycosuria or diabetes of short duration. It is said to be antiperiodic, and has been used in ague, like quinine, in similar doses.

Phototherapy.—During the last few years deep interest has been centred in this therapeutic agent, with which the name of its introducer, Finsen, has been associated. The reader will find the method referred to in the Author's Dictionary of Treatment (page 536). It is based upon the discovery of the bactericidal action of the blue, violet, and ultra-violet chemic rays. The treatment can be carried out by the use of strong solar or electric light. The results in lupus are most satisfactory, and the scar or cicatrix all that can be desired. The Copenhagen reports show that only 11 out of 640 cases failed to respond to the treatment. Recently Turner utilizes the spark gap as a source of the ultra-violet rays and uses rock salt as a compressing medium. The treatment has been applied to epitheliomas and other skin diseases, but it is most tedious and costly, and the permanence of the cures is yet to be demonstrated.

The X-rays have also given good results, and the writer has one case under observation where this method of phototherapy has given an excellent cicatrix. It has been reported recently as successful in cases of rodent ulcer, in recurrent cancer, in favus, alopecia, hypertrichiasis, tinea, &c., though severe dermatitis sometimes follows. Kaiser has recently published extraordinary success in phthisis and other tubercular affections by exposing the patient to the rays of pure *blue* light which is powerfully bactericidal. Krukenberg reports that *red* light is most beneficial in erysipelas.

Photoxylin is introduced by Wahl as a substitute for collodion in surgical practice. It may be prepared by nitrating wood-pulp in the same way as cotton-wool is treated in its manufacture into gun-cotton; the resulting nitro-cellulose (3 to 5 parts) is dissolved in ether (100 parts). The film left when the ether evaporates is tougher and stronger than that left by

collodion. It is used as a dressing for wounds and cuts, and Guranowski has achieved much success with it in cases of perforated tympanum, by painting over the edges of the aperture till it is completely closed. It forms a film impervious to moisture.

Phytolacca Decandra, or Poke Plant, is one of the innumerable indigenous American plants vaunted as a remedy for very many diseases. Thus it is affirmed to be a specific in chronic rheumatism, scrofula, and syphilis, many skin affections, diphtheria, and inflammations of the mammary and thyroid glands. How it is supposed to act in these widely different affections no one has attempted to explain. It is in full doses narcotic and emetic, and produces purging, and has been given in bronchial troubles. It appears at the best a rather dangerous remedy, and should not be given in doses of more than 5 to 10 minims liquid extract (1 in 1). The powdered root has been applied to burns and eczema (1 to 8 lard). The powdered extractive known as Phytolaccin has been used as a cholagogue in liver diseases in doses of 2 to 3 grs.

Pichi, or *Fabiana imbricata*, consists of the young branches, which are powerfully diuretic and tonic. Its use is contra-indicated in advanced renal diseases. In chronic catarrh of the bladder and in cystitis, accompanied by calculi and gravel, this drug has been much prized in Chili, and Fenwick found it to possess considerable power over the hæmaturia and pain in renal calculus. Shoemaker states that, given in combination with an alkali, it holds uric acid in solution, and it is thought that its resin dissolves the mucus which binds together the particles of a stone, leading to disintegration and facilitating expulsion. It has been given in gonorrhœa and nocturnal enuresis. Dose of fluid extract (1 in 1), $\frac{1}{2}$ to 1 dr.; infusion (1 in 20), 2 ozs.

Piperazine is an alkaloidal body occurring in colourless, acicular crystals, very soluble in water, prepared synthetically from ethylenediamine, and was formerly known as Ethylenimine, Diethylendiamine or Dispermine. It was at first introduced under the name Spermine, having been considered to be identical with that body, but it has nothing in common with it.

It behaves in a remarkable manner with uric acid. In cold aqueous solution it dissolves *twelve* times as much uric acid as carbonate of lithium does under identical conditions, and the piperazine-uric acid compound is seven times more soluble than the lithium-uric acid combination. It is claimed that 1 part of piperazine and 1 part of uric acid dissolve in less than 1 drachm of water, whilst it requires nearly 1 ounce of water to dissolve the same quantity of uric acid lithium (the exact proportions being 50 and 368 parts). Even when the uric acid is in great excess piperazine forms the very soluble neutral salt, and never an acid salt. Notwithstanding these remarkable solvent properties, the drug has failed to support the glowing reports of its virtues in gout, calculi, rheumatism, &c. In the amount in which it is eliminated by the urine it has no solvent power over calculi as formerly stated. It is of use in gout, probably through its diuretic action.

An injection (5 per cent.) into the bladder has been recommended as a solvent of uric acid calculi, and 1 per cent. solutions have been injected in gonorrhœa and cystitis.

It is non-caustic and harmless, and may be given hypodermically in doses of 5 grs., or by the mouth 10 grs., three times a day in a large quantity of plain or aerated water. A compound containing lithium, under

the name Lithio-piperazine, is taken in doses of 10 grs. (See also under Lycetol and Lysidine.)

Pilocarpinæ Carbolæ is a colourless, oily fluid, which has been used by Edson with the view of introducing phenol into the blood. He maintains that, in addition to its expectorant qualities, it produces leucocytosis in phthisis. He uses a solution called Aseptoline, consisting of 1 gr. of carbolate of pilocarpine in 10 ozs. carbolic acid solution (2·75 per cent.) About 1 dr. of this is injected into the abdominal wall.

This treatment is vaunted to cure malaria also, and that more effectually than quinine. The Salicylate of Pilocarpine has similar action.

Piperin is obtained from *Pip. longum* and *nigrum*, in colourless or pale yellow, odourless crystals, which have been recommended as a substitute for quinine in the treatment of intermittent fevers. It has, however, been supposed that its antiperiodic virtues depend upon impurities. It is, nevertheless, decidedly antipyretic. It possesses all the therapeutic virtues of pepper, and has been given in gonorrhœa, dyspepsia, hæmorrhoids, &c., in doses of 5 to 15 grs.

Piperonal, or Piperonylic acid aldehyde, or Heliotropin, exists as fine prismatic, colourless crystals, with a strong vanilla-like odour, which are insoluble in water. It is obtained by the oxidation of piperin, and is a powerful antiseptic, though harmless, and may be given in doses of 15 grs. in wafers.

Piscidia Erythrina, or Jamaica Dogwood bark, has been used as a substitute for opium; it causes sleep in moderate doses, which is not followed by any of the after ill effects of opium. It relieves pain in sciatica and neuralgia, though it is generally experienced that its anodyne influence is less than that of opium, whilst its hypnotic power is greater. It relieves cough in phthisis, though the drug has practically fallen into disuse. 1 dr. of the liquid extract (1 in 1) is the dose.

Plasmon is one of the innumerable new nutrient preparations resembling somatose. Its name, Milk Albumin, gives its chemistry and therapeutics. Its indication seems to be defective nutrition in children at the termination of the sucking period. It may be given to infants in tea-spoonful doses, and it is said that it may replace the albumin of meat and wheat. It is also indicated in all wasting diseases of the stomach and bowels.

Propione, or Di-ethyl-ketone, is recommended as a powerful hypnotic in maniacal excitement by Giovanni, who gives it in doses up to 50 minims dissolved in 1 oz. aq. menth. pip. The ordinary hypnotic dose being, according to Merck, about 10 minims. It is a limpid liquid.

Protargol is a highly vaunted remedy for acute gonorrhœa. It is a chemical compound of silver and protein substance, and contains 8·3 per cent. silver. It is very soluble and highly penetrating, and is not precipitated by albumin, and is practically non-irritating. Many reports show that it is a very efficacious remedy when injected in $\frac{1}{2}$ per cent. solution three times a day, increased to 2 per cent. 20 per cent. solution is vaunted as a certain prophylactic against gonorrhœa. It is a powerful antiseptic, and has been employed as a dusting powder for wounds of all kinds, and it has found use extensively in eye surgery, and recent reports testify to its efficacy when injected hypodermically or by the veins in acute pneumonia, and when given by the mouth in doses of $\frac{1}{2}$ to 2 grs., and when used as an inunction (20 per cent. in lanoline) in ulcerative endocarditis.

Purgatin, Purgatol, or Anthrapurpurin diacetate, is a yellow, tasteless powder, insoluble in water, belonging to the oxyanthraquinone series. It produces semi-solid motions in about 8-12 hours after doses of 20-30 grs., and as a rule only one motion follows a single dose. It resembles in its composition and action the active principle of jalap, rhubarb, and other purgatives, and it stains the urine red.

Purgen, or Phenolphthalein, is a synthetic purgative in the form of a white crystalline powder, given in doses of $\frac{3}{4}$ to 7 grs. in tabloids. In the intestine it is converted into the soda salt which diffuses with great difficulty, and the drug acts by irritating the bowel, producing loose motions in 3 to 6 hours without being absorbed, as it is found in the fæces. 20 grs. have been frequently given to bedridden patients without any objectionable results being reported. Tunncliffe has administered the drug many times and states that it always caused painless motions. Phenolphthalein is a derivative of triphenol methane.

Pulsatilla, or Meadow Anemone—Under this name are included *Anemone Pulsatilla* and *A. pratensis*. Shapter concludes that it acts by controlling irritability and over-activity of the ganglionic nervous system, and has no claim, except indirectly, to be classed with hellebore and aconite as a vascular sedative. He has employed it in eclampsia from various causes, and found it beneficial.

It has been given in spasmodic catarrhal affections of the bronchi and other mucous surfaces and in spasmodic dysmenorrhœa. In acute epididymitis, 2 minim doses of the tincture every 2 hours have given good results. The fresh leaves are powerfully irritant, and may even blister the skin when applied to the sound cuticle. Anemonin, its active principle, may be given in doses of $\frac{1}{20}$ gr. in pill, or the tincture (1 to 8) 2 to 5 minims in water.

Pyocyaneus-Protein is a fragrant yellow liquid, obtained by treating cultures of bacillus pyocyaneus. It has recently been extolled as a remedy for ulcers of the leg when applied on lint or gauze. It is claimed to be absolutely harmless, and that it changes rapidly the action in chronic ulcers, which heal speedily after its application.

Pyramidon is a white tasteless powder, being a substitution compound of antipyrine. It is Dimethylamidophenyl-dimethylpyrazolon. Its action may be regarded as almost identical in doses of one-third of those of antipyrine. 5 grs. will dissolve in 1 dr. of water, and may be given as an average dose in migraine, neuralgia, &c. The fall in the temperature produced by it is more gradual and of longer duration than in the case of antipyrine, and in phthisis it is found that one daily dose of 8 or 10 grs. will prove enough to regulate the fever heat for considerable periods. 45 grs. may, however, be given in one day with safety. The Camphorate and Salicylate and other salts have been recently introduced; they are given in similar doses, but are said to be contra-indicated in diabetes.

Pyrantin is Para-Ethoxyphenyl-succinimide, and its sodium salt is called Soluble Pyrantin. It is an antipyretic, and, like every new member of the group, it is heralded by the statement that it reduces fever heat without any drawback. It is given, 5-10 grs. every 4 hours, in acute rheumatism, and it has been tried in tubercular disease, but with disappointing results, and will probably never come into general use.

Pyridin is a substance existing in tobacco smoke, and which may be obtained by the dry distillation of nitrogenous carbon compounds, or by the

action of sulphuric acid upon bone-oil and subsequent fractional distillation ; it is also one of the coal-tar products. It is supposed to be the active principle formed on the ignition of the various asthma cures. Merck's Pyridin is a colourless, powerfully smelling liquid. It has been used with striking benefit in asthma. The vapour being inhaled after spontaneous evaporation, in a few minutes the breathing becomes easy, the pulse falls, and sleep follows. In chronic cases the patient may spend half an hour in a small room where 3j. pyridin is placed on a plate three times a day. It is also used in angina and pertussis, and an injection (1 minim in 5 ozs.) has been used in gonorrhœa.

This substance is not to be confused with Pyrodin, which is an antipyretic containing 25 per cent. of hydracetic.

Pyrogallol Oxide (for Acid. Pyrogallic, or Pyrogallol, see page 476)—It has been proved that the action of pyrogallol depends upon the acid being first converted into an oxide, and if this be done before it is applied to psoriasis and chronic eczema, these are speedily cured without the blackening and formidable inflammation which are barriers to its use. Hence the introduction of pyrogallol oxide, which is a brown powder obtained by oxidising the acid. It is claimed for it that it is non-poisonous and non-irritating, and does not discolour the urine when applied in the form of a lotion or ointment 1 in 10. Unna has obtained most satisfactory results with the oxide of pyrogallol in leprosy. He rubs in an ointment over the entire body of 5 parts of this drug, 6 of salicylic acid, and 90 of lanoline. 40 grs. of the oxide were given internally each day in syrup, and remarkable improvement resulted.

Under the name of Oxide of Chrysarobin, Unna has introduced a black powder which he prepares from chrysarobin by acting on it with sodium peroxide. It has, however, little action upon psoriasis, and he advises its application to the face in eczema and rosacea (5 to 10 per cent. ointment).

Quinaphthol is a yellow crystalline powder, being the B.-Naphthosulphonate of quinine. Riegler finds this to be the best of all intestinal antiseptics. It passes through the stomach unaltered, and is split up in the duodenum. It is claimed for it to be perfectly harmless, and may be frequently given in cachets, in doses of 10 grs. It has been recommended in typhoid fever, tubercular peritonitis, and acute rheumatism.

Quinetum consists of a mixture of the alkaloids obtained from the red cinchona bark. It possesses all the properties of the bark ; its astringency is, however, feeble. It is a cheap substitute for quinine, and has been used in ague, fevers, and all affections in which quinine has been valuable. It is not so presentable as quinine, owing to its dirty white appearance. The sulphate of quinetum, however, is a more elegant preparation, and may be given in the same doses as quinine.

Quinine Salts—Helbing gave a list of 31 salts of quinine, and stated that it was doubtful whether more than one or two of them would obtain a permanent place in materia medica. There are probably twice as many more that have been tried and found wanting.

Quinidinæ Sulphas is the neutral sulphate of an alkaloid prepared chiefly from *C. Pitayensis*, in white silky crystals, not so bitter as quinine, and less expensive. This salt is very suitable for administration to children, who do not object to its taste so much as to quinine. The tannate has identical action, and is almost tasteless. Dose—Same as quinine, but it is chiefly

used when large doses (20 grs.) are required to bring down fever heat in rheumatism, typhus, typhoid, and pneumonia.

Quininæ Albuminas is a white amorphous substance with alkaline reaction, soluble in water, and containing, according to B-Limousin, 54 per cent of quinine and 46 of albumin.

Quininæ Citras and Q. Chloras are both very slightly soluble, and are given in pilular form in 4 gr. doses.

Quininæ Eosolate (quinat of trisulpho-acetyl-creosote) is introduced as a new neutral salt for the treatment of malaria, in 3 gr. doses in pills.

Quininæ Ferri-Chloridum exists in reddish, brown, soluble scales or powder; it is introduced as a valuable hæmostatic in hæmorrhages in doses of 3 grs. four or six times a day in wafers.

Quininæ Hydrochlorsulphas and the Hydrochlorphosphas are introduced as hypodermic salts, being soluble in their own weight of water.

The Fluoride is vaunted in 2 gr. doses for enlarged spleen, and

The Iodide, Acid Iodide, and Iodate in 2 to 5 gr. doses in tubercle and chronic rheumatism.

The Arsenate in $\frac{1}{4}$ gr. pills in malaria (contains 29 per cent. arsenic acid).

The Glycerophosphate is indicated in the obstinate neuralgia of chronic malaria in doses of 2 or 3 grs. four times a day. It is known as Kineurine.

Quinine Hydrobromide exists in colourless, lustrous needles. 4 grs. dissolve in 1 dr. of water for hypodermic injection, which may be repeated every four hours without causing irritation.

The *Acid* hydrobromide (yellow crystals) is more soluble than the above, which is neutral. 1 dr. of water will dissolve 10 grs. of it. Where quinine cannot be given by the mouth this salt can be readily employed hypodermically. A very much smaller dose is necessary when injected into the subcutaneous tissue. It produces, whether taken by the mouth or injected, less unpleasant symptoms than the other quinine salts, and Dr. G. B. Ferguson has recently published successful results in chronic malaria from hypodermic injections of 3 grs. dissolved in 20 mins. of warm water.

Quininæ Lactas is very suitable for hypodermic use in 1 in 10 of water.

Quininæ Salicylas exists as white silky needles very sparingly soluble in water; it is best prescribed in the form of pills; 4 grs. each made up with Proctor's paste.

Quininæ-Salicyl Salicylas, known as Rheumatine, is extolled as a remedy in acute rheumatism and its complications, in doses of 15 grs. three or four times a day. It is a white, tasteless, crystalline powder.

Quininæ Sulphocarbolas is a whitish powder, prepared by mixing hot solutions of sulphate of quinine and carbolic acid, and may be given in pill in doses of 2 to 8 grs.

Quininæ Tannas exists as a white, almost tasteless, amorphous insoluble powder, prepared by decomposing sulphate of quinine solution with strong solution of tannic acid. It is recommended for children. Its dose corresponds to that of the sulphate, but it is nearly insoluble.

Quininæ Valerianas exists in white, lustrous crystals, smelling slightly of valerianic acid. In addition to the valuable properties of quinine, this salt possesses superior power over *neuralgia* in hysterical patients. The dose should not exceed 3 grs., and should be given in pill.

Quininæ et Ureæ Hydrochloras, or the Hydrochlor. Carbamide, is a soluble hydrochloride of urea and quinine salt, suitable for hypodermic injection; it contains over 60 per cent. quinine. It may be easily prepared

by combining 3 parts of urea with 20 of hydrochloride of quinine and 12 of hydrochloric acid. It dissolves in its own weight of cold distilled water, and the solution can be injected in 5 to 20 minim doses.

These hypodermic salts are now superseded by the introduction of the acid hydrochloride into the new B.P.; it dissolves in less than its own weight of water. Bacelli, for his solution for intravenous injection, gives 15 grs. with $11\frac{1}{2}$ grs. sodii chlor. and 150 minims of water. The Bisulphate is only soluble 1 in 10, and hence is unsuitable. See also Sidonal, Euquinine, Acid. Quinicum, Quinotropine, Hydroquinone (Quinol), &c., &c.

Resaldol is a derivative of resorcin in the form of a brown insoluble powder, prepared by acting upon resorcin with chlormethyl-salicylic aldehyde. It is introduced by Herrmann as an ideal intestinal antiseptic, being insoluble in acids, and easily soluble in alkaline solution. The drug has been given with success in tubercular ulceration of the bowel in 15 to 20 gr. doses.

Resorcin, or Resorsinol, is Metadioxybenzene, occurring as a white crystalline powder prepared from benzol. It resembles carbolic acid in its properties, and is a powerful antiseptic. 1 in 100 prevents putrefaction; 2 in 100 is not irritating when applied to wounds. Given internally large doses (30 grs.) cause giddiness, dyspnoea, and perspiration; 60 grs. have caused collapse and coma and a fall of temperature. Its use as an antipyretic should be discontinued, as it is dangerous. 5 gr. doses have been given in ulcer of the stomach and in sea-sickness.

In the diarrhoea of children small doses (1 gr.) have achieved good results. It has been given in ague and asthma, but the large doses which are necessary are dangerous.

It acts as a local anæsthetic in laryngeal cases, and if applied in concentrated form it becomes a safe and painless caustic in tubercular laryngitis.

Externally or locally it possesses great absorptive powers over new cell infiltrations, as lupus, epitheliomas, &c. In labial epithelioma the powder causes speedy cicatrization, and even in uterine and rectal cancer benefit is for a time noticed when the powder is dusted over the growths, where it acts as an efficient painless cautery; the strong solution is also caustic. Excellent results have been obtained in whooping-cough by using a spray or painting the throat and fauces with a 1 to 2 per cent. aqueous solution. In both this disease and diphtheria it may be administered internally at the same time. A solution (1 in 50) may be injected into the bladder in cystitis, and a 1 to 2 per cent. solution may be used in ophthalmia, otitis, gonorrhoea, and leucorrhoea. Externally the same solution is of great value in chronic eczema, ulcers, wounds, and sores. 2 to 5 per cent. in erysipelas, and 20 per cent. in psoriasis and parasitic skin diseases have been valuable. It must be absolutely pure, and should be kept from the light.

Euresol is the monoacetate of resorcin; it is a soft, oily mass or paste suitable for external application in all cases where resorcin is indicated.

Resorcinol is the name given to a brown powder formed by mixing and heating equal parts of resorcin and iodoform. It is introduced as a substitute for iodoform, and may be mixed with 3 or 4 times its weight of starch, and dusted over chancres and ulcers.

Resorcin-phthalein Anhydride, or Fluorescein, is a brownish red, crystalline powder. A 2 per cent. solution, with as much soda, stains green any denuded spots on the cornea, and is therefore used as a means

of diagnosing corneal ulcers and foreign bodies. Sodium Fluorescein, or Uranin is more soluble and convenient, and may be had in tabloids. It has been also found useful in detecting the early stages of sympathetic ophthalmia.

Rhigolene, or Amyl Hydride, is a light hydrocarbon obtained from petroleum, and used by Richardson to produce local anæsthesia. He found that 1 dr. of camphor and 1 of spermaceti dissolved in 2 ozs. of rhigolene applied on cotton wool to burns produced rapid relief from pain by its evaporation, and there was left a safe protective coating upon the injured surface which acted the part of an impervious dressing. Iodine dissolved in rhigolene, making a 1 per cent. solution, is used for chancres. Stabler found that the spray produced from a mixture of rhigolene and expressed oil was absolutely unirritating, and could be sprayed into the throat. He finds that all essential oils and turpentine, salol, menthol, &c., can be sprayed in this way. The extreme inflammability and very unpleasant odour of rhigolene are the great drawbacks to its general use. It is also known under the names Hydramyl, Pentylene, and Pentyl Hydride, and enters into Amyl Colloid. The article supplied as Rhigolene is often impure.

Rhus Aromatica, or Fragrant Sumach, is an astringent, given in cystitis, hæmorrhage, night-sweats, hæmaturia, menorrhagia, diarrhœa, and dysentery. Its pharmacology is not clearly understood; it has some selective action upon the urinary tract; the resin which resides in the root-bark is eliminated by the kidneys. *R. Glabra* has similar action.

Excellent results have followed its administration for the nocturnal incontinence of urine. Unna declares that it is a specific for this condition, acting upon the muscular fibre of the bladder. Under 2 years he gives 5 minims of fluid extract night and morning, and between 2 and 10 years 10 minims; and continues its use after the symptoms disappear.

Rhus Toxicodendron, or Poison Ivy—The fresh leaves of this plant cause great cutaneous irritation and inflammation even upon slight contact in some people. Internally, in large doses similar action appears to be excited in the stomach and intestines. It possesses properties like the preceding remedy, when given in minute doses—2 minims of tincture (1 to 8) diluted, and it has been administered for incontinence of urine and atony of the bladder; it has been given in rheumatism and paralysis, but is worthless in these diseases. Externally it has been used in rheumatism and eczema, and the juice has been applied as a caustic in cancer.

Plaff has separated the active principle of rhus in the form of an oil which he calls Toxicodendrin, and it has been suggested as a counter-irritant.

Rosinol, Retinol, or Resinol, is an oily hydrocarbon, with a faint, peculiar odour, non-saponifiable, and unirritating, obtained by the dry distillation of resin. It is powerfully antiseptic, and can be applied upon lint to ulcers and putrid sores, and to cancer of the uterus, &c.

With half its weight of lanoline it has been applied to the conjunctiva in catarrhal conditions, and used in eczema, impetigo, scabies, hæmorrhoids, and pruritus, &c. It has been brushed over the false membrane in diphtheria.

Internally it has been given in tea-spoonful doses in fevers, bronchitis, rheumatism, and gonorrhœa. Capsules afford the most convenient form for administration.

Its greatest value, however, lies in the fact that it can be mixed with a great number of drugs already found useful in skin therapeutics, and it makes a stable, unirritating base for ointments. It dissolves phosphorus, Peruvian balsam, naphthol, camphor, salol, and many other agents.

Rumicin is the eclectic preparation obtained from the root of *Rumex crispus*, or Yellow Dock. It is vaunted as possessing astringent and aperient qualities like rhubarb, and alterative and tonic virtues in doses of 2 to 5 grs., in pill. It contains chrysophanic acid, and has been given internally in psoriasis, chronic laryngitis, scrofula, dyspepsia, and hepatic diseases, and as an alterative astringent in diarrhoea.

Safrole—Oil of sassafras consists of about 90 per cent. of this substance, the remaining 10 per cent. being terpene, with a little eugenol. It is obtained in large quantities from Japanese camphor oil. Safrole has been given in doses of 20 to 30 drops in acute and subacute rheumatism and sciatica. Locally it acts like menthol, and is used as a remedy for pediculi brushed over the hair.

Salacetol, or Salicyl-Acetol, is the salicylic ester of acetone alcohol in shining, flat, insoluble crystals. It is claimed to be an excellent intestinal antiseptic, and has been given in various forms of diarrhoea and in rheumatism. Bourget's method of treating diarrhoea is to give 30—45 grs. in 1 oz. castor oil before breakfast. It is stated to be non-poisonous, as the drug splits into salicylic acid after passing into the duodenum.

Aspirin or Salicylo-Acetic Acid is a white crystalline powder resembling salacetol. It is given in doses of 15 grs. in acute rheumatism, and is injected hypodermically in chronic cases, and it is an excellent anti-neuralgic. The chief advantage it has over the salicylates is that it is more slowly eliminated by the synovial membrane. It passes through the stomach unchanged, and is absorbed in the small intestine. It has given good results in pleuritis, pericarditis, and many other febrile states, and in various forms of neuralgia. Recently Georges reports highly of its value in chorea.

Salbromalid, or Antinervin, is a colourless, crystalline powder, consisting of a mixture of salicylanilide and bromacetanilide. The German preparation is obtained by mixing bromide of ammonium 1, salicylic acid 1, and anti-febrin 2. It is also known under the name of Salicylbromanilid, and it is claimed for it that it possesses the virtues of bromides, salicylic acid, and antifebrin, in tabloids or wafers of 3 to 5 grs.

Salicylamide exists in small, tasteless, colourless crystals. It is the amide of salicylic acid obtained by acting upon the oil of wintergreen by strong ammonia. It acts like a concentrated salicylic acid, and is reputed to have a much stronger analgesic action. Its dose is only 5 grs., and this amount is soluble in about three table-spoonfuls of water. It is used in acute rheumatism and in migraine.

Saliformin, or Hexa-methylene-tetramine-salicylate, is a white, soluble, crystalline powder, introduced as a powerful antiseptic, and solvent for uric acid, preferable, according to Merck, to urotropine. It is given in one dose of 20 grs. in a large amount of water once daily.

Saligenin, or Salicylic Alcohol, exists in colourless scales, obtained by treating phenol with formic aldehyde. It is introduced as a substitute for salicylic acid in the treatment of acute rheumatism and other affections, and it is stated to be free from the drawbacks of salicylic acid. It may be given in doses of 10 grs. every two hours in powder. It is also known as Orthooxybenzyl alcohol.

Saliphen is the name given to salicyl-phenetidine, which was introduced as an analgesic, but it has not pain-relieving properties. It must not be confounded with Salophen, which see under Salol, page 458.

Salipyrine is a white, crystalline, odourless powder, prepared by the action of antipyrine upon salicylic acid; it is almost insoluble in water. It has been recommended as a remedy in acute rheumatism and influenza, and has been used successfully in nearly every disease or feverish condition where antipyrine is indicated; it is said to possess only half the strength of this drug. It is vaunted in menorrhagia. It may be given in tabloids or wafers in doses of 10 to 20 grs. three or four times a day. It is known as Antipyrine Salicylate.

Salix Nigra, or Black Willow, is used by H. Fenwick as a sexual sedative. It has been given in ovarian hyperæsthesia, seminal emissions, and urethral neuralgia. Paine and Hutchinson report most favourably upon its action as a sedative in uterine and ovarian pain, and in hemicrania, and excellent results have been obtained in facial neuralgia, hysteria, and nymphomania. The bark, root, and buds are made into a fluid extract 1 in 1, of which $\frac{1}{2}$ to 1 dr. may be taken three times a day.

Salubrol is a stable powder, introduced as an iodoform substitute. It is methylene-di-antipyrine-bromide, and gives off bromine in contact with organic matter. It is stated to be non-toxic, but sometimes it causes pain. It is recommended as a 20 per cent. gauze.

Salumin is a reddish powder insoluble in water; it is a salicylate of aluminium, and is used for its astringent and antiseptic qualities as a powder insufflated in ozæna and other affections of the nasal membrane and pharynx.

There is a soluble compound salt with ammonia, which is used as an astringent gargle and lotion. These compounds act like Tannal. (See under Aluminium Aceto-tartrate.)

Sanatogen is a soluble and palatable sodium and casein glycerophosphate, containing 13 per cent. nitrogen, being an undigested albuminous food. It may be given in soup or in milk in tea-spoonful doses, and Sickinger recently reports most favourably upon it in mental diseases, and Schwartz in rickets.

Sanatol is the name given to a dark-coloured acid disinfecting liquid, which consists of the ordinary creosols held in solution by strong sulphuric acid. It is not free from poisonous qualities, and cannot be taken internally, but it is a powerful disinfecting agent suitable in those cases where crude carbolic acid is useful, as for the sterilisation of typhoid fever excreta, &c.

Sanguinal is a preparation in the pilular form of fresh, defibrinated blood evaporated. It is claimed for it that it contains oxyhæmoglobin and all the blood salts with peptonised muscle albumin. It is vaunted as a remedy of great value in anæmia and chlorosis. Each pill contains the equivalent of more than one drachm of fresh blood.

Sanguinaria Canadensis, or Blood Root—The rhizome has been found in full doses to act as a powerful emetic, causing purging, salivation, dilatation of the pupils, collapse, and death, preceded occasionally by convulsions, and a marked rise afterwards followed by a more marked fall in arterial tension and pulse. Reflex excitability, respiration, and muscular contractility are diminished. Sanguinarin, the resinoid extractive, is a

stimulating expectorant in chronic bronchitis and asthma, and in small doses ($\frac{1}{12}$ to $\frac{1}{8}$ gr.) it acts without irritating the stomach. In still smaller doses ($\frac{1}{20}$ to $\frac{1}{12}$ gr.) it may be given for atonic dyspepsia, as it increases the secretions of the stomach and intestines. It has been tried in febrile conditions for its sedative action upon the vascular system, but, as it only acts in this way in full doses ($\frac{1}{2}$ to 1 gr. or more), which cause much irritation of the stomach, it is inferior to hellebore, aconite, and other remedies. It acts as an hepatic stimulant, and increases the flow of bile.

It also acts as an emmenagogue, and has been given in functional uterine ailments, but it is dangerous, and should be discarded for this purpose. The dose of the U.S.P. tincture is 30 minims, or of the fluid extract 5 minims. Sanguinarine is the alkaloid, and its nitrate has similar action as an expectorant in doses of $\frac{1}{10}$ grain.

Sanoform, or Di-iodo-methyl-salicylic-ether, is a white, odourless powder, consisting of nearly two-thirds of its weight of iodine. It is stable and insoluble, and is introduced as a substitute for iodoform. It is stated to have wonderful desiccating properties, and is highly recommended in ophthalmic practice and as a remedy for ulcers. It is non-poisonous, and can be completely sterilised by heat without the danger of being decomposed. This property, with its absence of odour, gives it great advantages over iodoform.

Sanose is the name given to a very digestible and palatable white powder, devoid of odour, which is a mixture of 8 parts of casein and 2 parts of albumose. It can be used like nutrose as a food for typhoid and other patients, either mixed with milk or sprinkled over soup in the same way that the Italians use powdered Parmesan cheese.

Santoninoxim is a substance in white, silky crystals, soluble in alcohol, which is prepared by heating 5 parts santonin, 4 parts hydrochlorate of hydroxylamine and 4 parts carbonate of calcium with alcohol. Upon filtering the boiling liquid, and adding 5 times its bulk of boiling water and cooling, this substance crystallizes out. Cappola claims that it can be given in doses three times as great as santonin without the risk of producing any toxic symptoms, and it kills the worm whilst santonin is said to only paralyse it.

Savonal is a new basis for medicated soaps in the form of a transparent green soap, prepared by saponifying olive oil with caustic potash, and adding hydrochloric acid and evaporating. It forms clear solutions with water, alcohol, and glycerin; and Muller and Grube prefer it to all other known bases.

Scopola Carniolica has been used by Duckworth and others as a remedy for sweating and palpitation. It contains some hyoscyamine, and is less objectionable than belladonna. The fluid extract may be given in 5 minim doses. The root has been recommended instead of belladonna for all the preparations usually made with belladonna. (See under Hyoscine with which the alkaloid scopolamine is identical).

Senecio Jacobæa, or common ragwort, is recommended by Murrell and others as a drug of great value in functional amenorrhœa without anæmia. It is claimed for it that it always stimulates the menstrual function without having any tendency to produce abortion if pregnancy chances to exist in any case. The dose is 1 to 2 drs. four times daily of a 1 in 10 tincture of the entire plant, or up to 40 grs. daily of the solid extract

may be given. It was once a popular remedy for jaundice. *S. aureus* and *S. gracilis* appear to have the same action. The drug should be given for one week in every month till the function is restored. When chlorosis is present, iron must be previously given. *S. aureus* is used in America as a hæmostatic in hæmorrhages from the kidney, lung, &c., in drachm doses of the liquid extract.

Solanine is a glucosidal alkaloid obtained from many solanaceous plants. It has an action like sapotoxin. Firope found that it caused profound cerebral and spinal depression, producing anæsthesia and paralysis. It is recommended in all cases where it is necessary to reduce spinal irritability and in asthma. It should not be given hypodermically, as it causes local irritation owing to the presence of solanidine. It has no effect upon the pupil or brain. There is much uncertainty about this remedy, and it is probable that different observers have been using different glucosides or alkaloids in different degrees of purity from various members of the solanaceæ. Thus the dose is given by one as $\frac{1}{10}$ gr. and by another as 4 grs. The dose of Merck's crystalline preparation is $\frac{1}{8}$ —1 gr. The interest in the drug lies in the fact that it is contained in the tuber of the potato, especially in the skin, and it has been the cause of poisoning. It probably exists in large quantity in the small tubers which get the sunlight close to the surface of the soil and which become quite green, these have been always regarded as poisonous by the peasants in Ireland.

Solutol is an acid solution of sodium-cresol in excess of cresol (10 ozs. contain 6 ozs. cresol). It is a very valuable antiseptic. A $\frac{1}{2}$ per cent. solution is as powerful as carbolic acid solution of 5 times this strength, and may be used for the disinfection of instruments of metal.

Solveol is a neutral solution of cresol in sodium creosotate, and has the same powerful antiseptic properties as solutol, and may be used in 5 per cent. solution for similar purposes.

Somatose is a yellow powder, odourless and tasteless, and soluble in water, consisting of the albumoses of meat with traces only of peptones. It is an easily absorbed food, and a perfect substitute for albumin in cancer or ulcer of the stomach and in all wasting diseases, and it is a powerful galactagogue. It may be given in milk or soup in amounts of 1 oz. daily, or in doses of 1 or 2 drs. for children. It is very valuable in the vomiting of pregnancy. Milk Somatose with 5 per cent. tannin is vaunted as an ideal artificial food by Schmidt. Iron Somatose, which contains $4\frac{1}{2}$ per cent. of ferric oxide in combination with albumose, is used in anæmia.

Somnal, or Ethyl-Chloral-Urethane, is a colourless liquid with a faint chloral-like odour, formed by the combination of alcohol, chloral, and urethane. It was introduced by Radlauer, and has been proved to possess hypnotic qualities in doses of 30 to 40 minims in sherry or sweetened tincture.

Its effects begin in 30 minutes, and it produces sound, refreshing sleep, lasting 6 or 8 hours. It is claimed for it that it does not interfere with the digestion, respiration, or circulation. It closely resembles chloral in its therapeutic action, but it yet remains to be demonstrated that it is free from the dangerous, depressing effects upon the heart.

Soziodol, or Diiodoparaphenolsulphonic Acid, is the name given to a new antiseptic in white crystals, devoid of odour, which contains 7 per cent. sulphur, 54 per cent. iodine, and 20 per cent. phenol. The substance used in medicine as soziodol is an acid sodium salt. There are also soziodols

of potassium, of mercury, zinc, lead, ammonium, aluminium, silver, and barium; several of these have been recommended and used as substitutes for iodoform.

Lassar has used soziodol in skin diseases, in a 5 per cent. powder, paste,* or ointment, with zinc, starch, and vaseline or lanoline, and finds that it rapidly cures chronic eczema, tinea, impetigo, and ulcers. It resembles, in his opinion, salicylic acid, but is less irritating. Other observers have utilized its powerful antiseptic qualities in the treatment of lupus, gonorrhœa, syphilis, ozœna, and tubercular laryngitis. It has been employed in every case where iodoform has been tried, and may be freely dusted on all ulcerated surfaces alone or with talc; 1 per cent. solution is used for bladder irrigation and as a spray in pertussis. It has been administered internally in stomach affections in doses of 15 grs. thrice daily, and it is claimed for it that, unlike iodoform, it is perfectly safe and non-poisonous.

Sparteine is the active principle of broom; it is a colourless, liquid alkaloid, which forms crystallisable salts, and it is the sulphate which is generally administered in medicine. It is a cardiac tonic acting like digitalis, and it possesses one advantage over this drug in the *rapidity* of its action; 1 gr. hypodermically shows its power over the heart in less than 30 minutes. It may be given where digitalis disagrees, or in the intermissions of a long digitalis course, in doses of 1 to 2 grs. *ter die*. It is a fair diuretic, but not so reliable as digitalis either as a diuretic or cardiac tonic. In urgent cases of dilatation or failing compensation it may be injected with strychnine. Bradford states that though it raises the blood pressure and slows the heart, it weakens the force of the cardiac systole. It has not maintained its reputation as a cardiac tonic. The Hydrochloride of Oxysparteine—an oxidation product—is recommended for hypodermic injection. Scoparin, the other active principle of broom, has more decided diuretic action; it may be given in cachets in doses of 10 grains.

Quite a number of observers testify to the value of small doses ($\frac{1}{10}$ to $\frac{1}{2}$ gr.) of sparteine hypodermically, 15 minutes before chloroform narcosis in patients with weak or diseased hearts.

Spermine—Poehl's preparation is a 2 per cent. sterilised solution of the chemical substance, which is the active principle of Brown-Sequard's emulsion, prepared from the seminal glands of various animals, chiefly from the bull. It is given by deep injection in 15 minim doses. Poehl maintains that autointoxication arises in many conditions from the retention in the body of various decomposition products as leucomaines, &c., and that these in health are oxidised by the ferment spermine, which is produced by most glands as well as by the testicles. Hence the *rationale* of the injections in anæmia, neurasthenia, insanity, premature senile decay, phthisis, ataxy, psoriasis, diabetes, and a host of ailments. Glowing accounts of the benefits of a course of 12 or 14 daily injections in all the above diseased conditions have been published, and recently it has been reported as a valuable remedy for angina and other cardiac neuroses. The hydrochloride and phosphate of spermine have been also administered, but the soluble 2 per cent. solution of Poehl is the best for all purposes. It exercises a marked influence over the metabolic processes in the body. Dried testicular matter has been administered in the tabloid form by Schmidt.

*The substance known as Lassar's Paste does not contain soziodol. It consists of salicylic acid 2 parts, oxide of zinc 24 parts, powdered starch 24 parts, and vaseline 50 parts. It is very valuable in eczema.

There is much diversity of opinion upon the active agent in orchitic extracts. Dixon points out the importance of the nucleo-proteid which is always present in a large quantity, and of the extractives, other than spermine, which are present. The effect of the marked diminution in the polynuclear leucocytes which follows the injection is caused by the nucleo-proteid.

Spleen Pulp was used by Maragliano in anæmia and chlorosis with benefit. He administered in 24 hours 4 ozs. spleen pulp, 2 ozs. brandy, and 10 ozs. almond emulsion. Since then others have administered a splenic extract made into pills, or a dried preparation in the tabloid form, prepared from the sheep's or pig's spleen. The best dose to begin with is 3j. of the 1 in 1 glycerin extract, which may be increased to 1 oz. given fasting and followed inside an hour by an ordinary meal. Cohnstein, under the name of Eurythol, administers a watery splenic extract for chlorosis. The tabloids have been given in malarial conditions and in exophthalmic goitre. In this latter disease several favourable reports have been published showing the value of spleen substance.

Stillingia Sylvatica, or Queen's Root, has been used in America as an alterative in syphilis and struma.

It is a sialagogue, and when swallowed appears to increase the secretions of the gastric and intestinal glands by a mild irritant action; the liver is stimulated to secrete more bile, and if the dose be large, vomiting and purging supervene. The urine is increased, and the bronchial secretion is augmented.

It has been given in ascites, caused by cirrhosis, in hæmorrhoids, chronic constipation, jaundice, and struma.

Dose—Of the fluid extract (1 in 1) 20 minims to 1 dr., or of Stillingin (its eclectic extract) 2 to 4 grs.

The Compound Liquor, known as McDade's Succus Alterans, is used as an antisyphilitic agent, and, according to Martindale, consists of fluid extracts of smilax, stillingia, lappa minor (burdock), and phytolacca, of each 2 ozs.; and tincture of xanthoxylum (prickly ash), 1 oz.; it is given in doses of 1 to 4 drs. three times a day.

Strontium—The lactate of strontium was praised as a remedy for albuminuria by D.-Beaumetz. It may be given in doses of 20 to 30 grs. three times a day. The writer has tried it extensively, but failed to find that it did any good.

The bromide and iodide are introduced as substitutes for the corresponding potash and soda compounds, but there seems little to recommend them except that they produce less gastric derangement; the doses are the same. Laborde praises the phosphate as the most valuable restorative tonic. The nitrate is given in 30 gr. doses in rheumatism, and the carbonate is used as a dentifrice.

Stypticin (Cotarnine Hydrochloride) exists in yellow soluble crystals, obtained by oxidising narcotine. It is allied chemically and therapeutically with hydrastinine. It controls remote hæmorrhages, and has proved satisfactory in menorrhagia when given by the mouth in $\frac{1}{2}$ gr. doses in capsules, or hypodermically in $\frac{1}{3}$ gr. 1 gr. dissolves in 10 mins. tincture of cinnamon, and half of this may be taken on sugar. It has also marked analgesic or soothing properties, and permanently reduces subinvolution, acting like ergot, though Marfori maintains that it has no vasoconstrictor action. Its best results are obtained in uterine hæmorrhages depending on ovarian

changes. It is very valuable in uterine fibroids during the suspension of ergot, and may be employed in the hæmorrhage of uterine cancer internally and locally as a gauze.

Sulphaminol, or Thio-oxydiphenylamine, is a yellow, tasteless, odourless powder, insoluble in water. It is claimed for it that it possesses all the virtues of iodoform without its objectionable qualities, and it is, moreover, perfectly harmless in enormous doses. Kobert gave very large doses of this new antiseptic to dogs without being able to produce any unpleasant symptoms. In contact with pus and the secretions from wounds and sores it splits up into sulphur and phenic acid. Moritz used it as a dry dressing to suppurating wounds, and found it to act powerfully in diminishing the discharge. It has also been used as an insufflation in laryngeal phthisis and nasal discharges, and it is reported that internally in doses of 4 grs. it has proved beneficial in cystitis and other ailments.

Suprarenal Gland was first introduced as a remedy for Addison's disease. It powerfully increases blood pressure by causing contraction of the muscular walls of the vessels through its direct action upon unstriated fibre, and it maintains the tone of the muscles of the body and of the heart. The medulla is the active portion of the gland, but the cortex is not inert. After a full dose injected into an animal's vein, the heart is found to beat with greatly increased power, all the vessels contract, the pulsations get very slow, and the general blood pressure rises rapidly to a great height. A drop of a solution of the active principle of the gland applied to a mucous membrane renders it in a few minutes perfectly bloodless owing to the powerful contraction of its vessels, and a certain amount of local anæsthesia also results.

The activity of the gland is fortunately not destroyed by the gastric juice, and these effects follow its administration by the mouth, though several observers deny that it increases blood pressure when swallowed. Schäfer finds that it causes powerful contraction of the uterine muscle when swallowed, injected, or applied directly to the uterine walls, in 5 gr. tablets.

The dried glands are used, and a glycerin extract (1 in 2) may be given in drachm doses. For local use the tabloids may be rubbed up with hot sterilised water and the infusion applied on lint.

Adrenalin is a crystalline principle obtained from the gland, and it appears to possess all its properties. A solution of the chloride in sterilised saline solution is used for injection or local application in epistaxis, acute inflammations or hæmorrhages of the eye, nose, throat, larynx, or uterus, being the most efficient known hæmostatic for post-partum hæmorrhage, 30 grs. of the dry medullary substance may be rubbed up with a pint of water sterilised by boiling and injected whilst hot into the uterus.

The same solution is of great use in hay fever, and it may be injected into a vein in hæmorrhage from any source as hæmoptysis and hæmatemesis, and in impending death from chloroform or shock.

The adrenalin chloride solution is procurable (1 in 1,000); for the eye this is diluted with 10 parts of water, and for the nose and ear with 5 parts of water. This latter solution, when applied to the nasal membrane, will often cause an ordinary cold to abort.

In Addison's disease the results have been very disappointing, generally the fatal issue does not seem to be retarded, but a few successful cases are reported. The writer tried it in several cases without the least benefit, and

the same remark applies to his experience of it in diabetes insipidus. It is useless in epilepsy, rickets, and a host of ailments for which it has been given. It has proved useful in failing compensation, and by plugging the nasal cavity with lint soaked in a 1 per cent. solution of the dried gland, the pallor and shrivelling of the tissues is so marked that the entire cavity can be easily seen and explored. Secondary hæmorrhage is not uncommon in cutting operations following its use. 5-10 grs. of the dried gland have given good results in the hæmorrhage of typhoid fever. It is liable to cause irritation of the stomach when given in hæmatemesis, but it acts well from the rectum.

Epinephrin is the name given to an alkaloidal substance, which is also said to be the active principle of the gland; it appears to be very closely allied to Adrenalin.

Symphorol, or Caffeine Sulphonate, is introduced as a safe and reliable diuretic, which increases the amount of urine without raising the blood pressure; it stimulates the renal epithelial cells. There are three symphorols designated each by the letters N., L., S., indicating the symphorol of sodium, lithium, or strontium. 15 grs. of either salt can be given every 6 hours in capsules or wafers. The N. or soda salt, also known as Nasrol, is the one generally prescribed.

Taka-Diastase is a yellowish-white powder, being a ferment produced by a fungus (*Eurotium Oryzæ*) on heated rice or bran. It is, according to Merck, known in Japan as Koji, and has been used in the production of alcohol from maize. It changes in a few minutes 100 times its weight of starch into maltose. 2 to 5 grs. may be given in wafer form in the dyspepsia caused by starchy foods in cases of hyper-acidity of the stomach. It is in this latter condition that the best results of the drug are observed, and it may be prescribed like papain with sodium bicarbonate.

Tannalbin is a brown, tasteless, insoluble powder, being an albuminate of tannin, prepared at a high temperature so as to be insoluble in the stomach, and therefore it does not interfere in any way with digestion, whilst it is afterwards split up in the intestines, and acts as an astringent. It may be given with meals in doses up to 30 grs., and to infants in 5 gr. doses in all forms of diarrhoea alone or with cod-liver oil.

The writer has abandoned all other intestinal astringents since he commenced to use this drug. It may be no better than the following five preparations, but it answers every purpose, and the writer has little practical experience of these. Honthin is a light brown tasteless powder, being a keratinised compound of tannin with albumin, having the same dose and action as tannalbin.

Tannigen is a grey insoluble tasteless powder, being triacetyl tannin. It is introduced as an intestinal astringent; being unacted upon by the stomach, it passes into the intestines, where it is split up and exerts its astringent action. Numerous observers testify to its value, and it may be given in wafer form, in doses of 15 to 20 grs. Tannalbin will probably be found to replace it, as it has failed in the diarrhoea of phthisis.

Tannoform is a pinkish, odourless, tasteless, insoluble powder, being Methylene-di-tannin, produced by the action of formaldehyde on tannin. It is claimed for it that it is absolutely unirritating to mucous or other surfaces. Internally, it is given like tannalbin and tannigen in wafers, in doses of 15 grs., as an intestinal astringent in diarrhoea, enteritis, &c. But it is for its local action that tannoform is most praised. When sprinkled on

the skin it instantly stops all sweating, and destroys all odour in bromidrosis. It is of great value as a local agent when applied to tender or so-called scalded feet, and is recommended for troops on the march. It is recommended as a substitute for iodoform in the treatment of ulcers, wounds, eczema, burns, leucorrhœa, either sprinkled alone or with starch or talc, or used as a 10 per cent. ointment.

Tannol, or Tannopine (Bayer), is the name given to a brownish, tasteless, odourless, and insoluble powder produced by the action of tannin on hexamethylenetetramin or urotropine. It is given in diarrhœa and enteritis, and in all cases where tannin is indicated, in doses of 15 grs. three times a day. It has proved very valuable in tubercular ulceration and in typhoid diarrhœa with or without hæmorrhage. This substance is not to be confounded with Tannal, which is mentioned under Aluminium Acetotartrate. Tannol was formerly known as Tannon.

Tannosal is the Tannate of Creosote in the form of a brown hygroscopic powder. A $5\frac{1}{2}$ gr. pill will contain $3\frac{1}{2}$ grs. creosote, and it is claimed for it that it is the least irritating of the creosote preparations, and should be preferred to them in tuberculosis. It may be given in solution in water. Taphosote is a similar body only of syrupy consistence. It is the tannophosphoric ester of creosote, and is given in half dr. doses in warm milk.

Tanocol is a greyish white powder prepared like tannalbin; it is a tannate of gelatin which is decomposed in the duodenum and is used in doses similar to the other tannates as an intestinal astringent.

Terpine Hydrate occurs in colourless, prismatic crystals, obtained by acting upon a mixture of turpentine and alcohol with nitric acid. It is found to be a good expectorant, and has been used by Fereira, Lepine, and many others in bronchitis and asthma. It increases and liquefies the expectoration in doses of 3 grs. in pills. In large doses it acts as a diuretic, and has been used with success in various bladder affections and in nephritis. It is stated that it reduces the number of the attacks in whooping-cough, and that it stops hæmoptysis.

Terpinol is an oily, aromatic, liquid, colourless body, prepared by treating the previous substance with acids. It is, like it, insoluble in water, and is used as an expectorant, given in capsules or pills, or per rectum, in doses of 10 to 20 minims. It has been recently extolled in hæmoptysis, in 3 min. doses in milk. It should not be confounded with Terpincol, which is a thick, colourless alcohol contained in terpinol, and now used to mask the odour of iodoform.

Tetra-Ethylammonium Hydroxide exists in fine deliquescent crystals, which have a marked solvent power over uric acid. It has been recommended in acute rheumatism and gout, in doses of 5 to 10 minims of a 10 per cent. solution.

Tetronal, or Diethylsulphondiethylmethane, is a body existing in tabular, odourless, shining, bitter crystals, which is closely allied to sulphonal and trional. It has been administered in a large number of cases as an hypnotic, and its indications are the same as those for sulphonal, but in some very obstinate nervous conditions it has given better results, though it often failed in conditions like delirium tremens. In 220 cases its administration was not followed by any unpleasant after-consequences. Tetronal is cumulative like sulphonal, and upon the whole it has not

succeeded in coming into the same general use. It is less reliable than trional; best given in 15 to 30 gr. doses in wafers.

Teucrin is a sterilised fluid extract of *Teucrium scordium*, introduced by Mosetig-Moorhof. It is supplied in glass tubes, each containing one dose (3 c.c.m.) which is to be injected into the tissues around cold abscesses, lupus, &c., with the view of producing a local stimulating effect, and exciting healthy action in the diseased parts.

Thalline, or Thalline Sulphate, is tetrahydroparamethyloxychinoline—a synthetically prepared basic substance introduced by Skraup as an antipyretic and antiseptic. Owing to its power of destroying the red corpuscles it has almost ceased to be given internally. The sulphate and tartrate in 4 or 6 gr. doses cause marked fall in fever heat with much sweating and sometimes collapse. They were used by Goll in gonorrhœa; he gave the drug internally, and used a bougie or antrophore containing $3\frac{1}{2}$ grs. of the sulphate thrice daily; or injections of a 2 per cent. solution were employed with marked success.

Thalline Periodide is a salt in dark crystalline masses which has been given in 3 gr. pills in cancer 6 or 8 times a day by Granville, who reports that the tumours disappear under this treatment. A little musk was added, and, when the skin was dry, a little pilocarpine.

Theobromine is an alkaloid obtained from the seeds of *Theobroma cacao* in white, crystalline powder, resembling caffeine in action. It is maintained by G. Sée to be the best known diuretic, and preferable to diuretin, as it is harmless, and may be used in every kind of cardiac dropsy in doses of 8 grs. in powder four times a day. Huchard maintains that it is the best tonic for the senile heart. (See also Diuretin—its double salt.)

Thermodin (Acetyl-para-ethoxy-phenyl-urethane) exists in odourless insoluble crystals, introduced by Merck. Schmidt extols it as a safe and certain antipyretic in doses of 8 or 10 grs. in wafer. Few ill effects have been reported from its use. Mering recommends it in influenza and phthisis.

Thilandin is a brownish semi-solid substance like vaseline, prepared by the action of sulphur upon lanoline. It contains 3 per cent. of sulphur, and it is introduced as a remedy for eczema and other skin diseases. It is claimed for it that it soothes inflammation and allays all itching.

Thiol exists in dry scales, or as a strong solution of these. It is prepared from ordinary gas oil, and in its properties it closely resembles ichthyol, for which drug it has been recommended as a substitute in chronic scaly skin diseases, eczema, &c. It has been used (1 in 5 of glycerin) as an application to the ulcerated cervix uteri, and it has given good results in burns, erysipelas, &c., applied as an ointment of the same strength. It possesses the advantage over ichthyol in being odourless. It has been given internally in similar doses; thus 5 grs. of the *dry* thiol may be given three times a day in pill. 1 dr. of the *liquid* thiol to 1 oz. vaseline is the usual strength for ointments in eczema, &c. 1 part to 4 or 5 of talc may be used as a dusting powder.

Thio-Resorcin and **Di-iodo-thio-Resorcin** are amorphous substances, the former of a pale yellow, and the latter of a brown colour. They are compounds of resorcin with sulphur, insoluble in water, and have been introduced and used as substitutes for iodoform, which they closely resemble. It is claimed for them that they are innocuous and free from

unpleasant odour. They may be applied as a powder or as an ointment (1 in 8) in all conditions in which iodoform is indicated.

Thiosinamin, or Allyl-sulpho-urea or Rhodallin, exists as yellowish crystals, obtained by heating mustard oil, alcohol, and ammonia. It is recommended by Hebra as an injection (15—20 per cent.) in lupus, and into the tissues surrounding uterine indurations and urethral strictures in 5 minim doses. A soap and plaster gauze is used by Unna for application to keloids and all hypertrophic scars and scleroderma. It has been given internally with reputed success (1 grain capsules) in rheumatic enlargements of joints.

Thiuret is a crystalline powder, introduced as an iodoform substitute. It is a derivative of sulphaminol, and the phenol-sulphonate is the salt generally employed. When applied as a dusting powder to moist surfaces nascent sulphur is given off.

Thuja Occidentalis, or Arbor Vitæ, is an old American remedy, used as a powerful emmenagogue like savin, and as a local remedy for warts and condylomata. Baratoux has used a tincture (1 in 5 of the green tops) internally in doses of $\frac{1}{2}$ to 1 dr., at the same time applying a spray of 1 in 20, to growths and tumours about the nose, mouth, ear, pharynx and larynx. He claims that this treatment rapidly destroyed all feter and discharge, and ultimately reduced the vegetations and diminished the size of the new growths. Papillomata of the ear and nose were cured, and epitheliomas were considerably checked in their growth.

Thymotal is the carbonate of thymol, which exists as a crystalline, colourless powder with little taste. It is recommended as a substitute for thymol, since it is said to pass unchanged through the stomach, and hence its value in doses of 10 to 15 grs. as a vermifuge in tænia and ankylostoma.

Tolpyrine, or Toly-antipyrine, is a new analgesic closely allied to antipyrine, for which it is introduced as a substitute, and from which it only differs in containing a third methyl group in the para position of the phenyl group (Helbing). It possesses no advantage over antipyrine except cheapness. In similar doses it has the same action and effects, but it has failed to come into general use.

Tolysal is the salicylate of the preceding substance, being Para-tolyl-dimethyl-pyrazolone salicylate. In its action it resembles a combination of salicylic acid and antipyrine, and it is consequently recommended as an analgesic and antipyretic, chiefly in acute rheumatism and rheumatic neuralgia, in doses of 10 to 20 grs. four times a day.

Tonga is a preparation consisting of chopped stalks and small quantities of the leaves and inner bark of some plants imported from Fiji; believed to be derived from *Rhaphidophora vitiensis* or *Epipremnum mirabile*, and *Premna taitensis*. From these a liquid is prepared whose properties have been found to be decidedly antineuralgic. Ringer and Murrell investigated the drug, and found it to speedily cure 6 out of 8 cases of neuralgia in which they tried it.

Dose—Of the liquid tonga, 1 dr. three times a day.

Traumaticin is a thick fluid, being a solution of 1 part of gutta-percha in 9 of chloroform, and corresponding with the solution removed from the B.P. It is used as a basis for the application of chrysarobin, ichthyol, &c.,

in skin diseases. 1 part of chrysarobin to 9 of traumaticin was used by Auspitz for psoriasis.

Traumatol is Iodocresol—an insoluble, odourless, stable, and powerful antiseptic, containing 54 per cent. iodine. It is introduced as one of the thousand and one substitutes for iodoform. It is claimed for it that it is non-irritating, and has local anæsthetic properties. It can be used in every condition in which iodoform is indicated, as a powder or 10 per cent. ointment.

Trikresol is an oily, colourless liquid, consisting of the three cresols freed from all impurities. It dissolves in 40 times its bulk of cold water, and is three times the strength of carbolic acid. A 1 per cent. solution is used for instruments and for disinfecting the hands. It is claimed for it that it has little toxic action, and does not affect metals or cause numbness or slipperiness of the fingers during operations. 1 in 1,500 is used as an eye lotion.

Trimethylamine, or Secalin, is a compound ammonia, obtained by distilling herring brine (or decomposing fish) with lime. It has been used successfully in the treatment of acute rheumatism, in which disease it has been found to relieve pain, reduce temperature, and diminish the frequency of the pulse.

Its external use as a liniment (1 to 3 of glycerin), applied to the painful joints of chronic rheumatism, has given such relief as to warrant its introduction as an anodyne.

Large doses increase the frequency of the pulse, whilst small doses exert a sedative action upon the heart, and act as a stimulating expectorant.

Dose of the hydrochloride—2 grs. every 2 hours, or 20 minims of the distilled solution (20 per cent.) in peppermint water and sugar, which disguise its fishy taste and smell. This 20 per cent. solution was formerly called in error Propylamine. The name Aminol is given to an impure solution of trimethylamine prepared from herring brine and used as a disinfectant.

Trional (Diethyl-sulphone-methyl-ethyl-methane) is a substance existing in shining crystals, with a bitter taste, and slightly soluble in water. It may be regarded as sulphonal with a methyl displaced by an ethyl group. It acts like sulphonal, only more rapidly, is less cumulative, and is said to be less frequently followed by drawbacks. It should be given in cachets in doses of 15 to 30 grains. It is, perhaps, the safest of all the newer hypnotics, and has been found most reliable in mania and simple insomnia where pain is not present. The only drawback which the writer has noticed is its liability in some cases to upset the digestion when administered in fevers, but serious symptoms have been reported as following its prolonged use in a few cases; these were the presence of dark urine, hæmatoporphyrin being present, and neuritis was observed. Several observers report marked success in the treatment of chorea by 5–10 gr. doses of the drug.

Triphenin is Propionylphenetidin, and is thus allied to phenacetin. It exists in crystalline flakes, which are almost insoluble in water. Mering introduces it as an analgesic and antipyretic like phenacetin, in doses of 8 to 16 grs. in wafers or powders.

Triticum Repens, or Couch Grass—The rhizome of this common grass has been successfully used in chronic bladder ailments. It is a feeble diuretic, and appears to possess the virtues claimed for the stigmata of

maize. It has fallen into disuse, because the dried grass appears to be almost inert. It is the *fresh rhizome* which should be always used. 2 ozs. boiled in 1 pint water for half an hour, of which a wine-glassful should be taken every 4 or 6 hours. The drug is introduced into the Indian and Colonial Addendum to the B.P. under the name of *Agropyrum* with a decoction and liquid extract; this latter, from the directions given, appears to be an impossible preparation.

Tuberculin, or Koch's Lymph, which is a sterilised glycerin extract of pure cultivations of the bacilli causing tuberculosis, is still occasionally used as an agent in the treatment of phthisis and lupus. At present there appears to be a very strong objection to the use of this substance by the great majority of its former advocates. There are, however, some who still strongly advocate its use. Unna applies it locally to lupus with reported success. The initial dose is '001 c.c. It is also a valuable diagnostic agent, as tubercular disease may be accepted in all doubtful cases where marked fever or reaction follows its injection, and it is used for diagnosing tubercle in cattle. It is now introduced into the German Pharmacopœia. *Tuberculocidin*, or *Alexin*, is the name given by Klebs to a purified solution of tuberculin, which is given in doses of twice those of tuberculin. Koch now states that his old tuberculin did not affect the bacilli, but simply immunised against the toxins. He claims to have discovered a derivative which cures early cases, but this new tuberculin (T.R.) has been condemned by several very reliable authorities. It is prepared by mechanical trituration of highly virulent cultures, and afterwards by centrifugal separation from aqueous mixtures. The activity and strength of this new preparation can be judged by its initial dose—viz., 1 milgme or '015 grain gradually increased to 10 milgms. The serious statement is made upon good authority that sometimes living bacilli are found in it.

Merck's dry *Tuberculol* is the best preparation; it is of uniform strength, and contains nothing but the unchanged tuberculous toxin.

Gœtsch recently reports 71 per cent. of cures from Koch's remedy, using chiefly the old tuberculin, beginning with a dose of $\frac{1}{8000}$ minim, and only using the new solution when this small dose caused fever. The last reports of Moeller upon the combined open-air and tuberculin treatments are very encouraging, and Denys' lists of cases of tubercular peritonitis cured by filtered, unheated bouillon of the tubercle bacillus are striking.

Tumenol exists in two forms—the liquid *tumenol* or *tumenol* oil, which contains *tumenol* sulphones as well as *tumenol* sulphonic acid, and the *tumenol* powder, which consists of the acid only. These substances are extracted from mineral oils by strong sulphuric acid, after removal of their phenols and pyrrols by treatment with alkalies. Neisser, who has used these agents in eczema, pruritus, &c., thinks that they act in an entirely different way from *ichthyol*; he regards them as reducing agents, the sulphur contained in them only playing a subordinate part. The thick, dark oily liquid mixes well with zinc gelatin. It is used as a substitute for *ichthyol* in 20 per cent. ointment or tincture, or it may be painted on diseased surfaces without dilution.

Tussol (Antipyrine Amygdalate or Madelate) exists in granular crystals. It is introduced as a remedy for whooping-cough by Rehn, who states that it rapidly diminishes the paroxysms. It may be given in doses of 1 gr. to a 1 year old infant, and in 15 grs. to adults.

Ulexine is a colourless, or yellowish-white, crystalline alkaloid, obtained

from the common gorse or furze or whin (*Ulex Europæus*). It is found, in large doses, to be a powerful respiratory poison and paralyser of the motor nerves. It has a decided diuretic action, and has been given in cases of dropsy depending on heart disease, and it is maintained to be much more reliable than Sparteine. At present it is not advisable to give more than $\frac{1}{12}$ gr. The hydrobromide, which is freely soluble in water, is the salt to be recommended. It has also been advocated as an antidote to strychnine.

Ural, or Uralium, or Chloral-urethane, as its name implies, is a compound of chloral with urethane, existing in the form of colourless, bitter crystals. It is introduced as an hypnotic, and it is claimed for it to be rapid in its action, and free from unpleasant effects, as the urethane is said to counteract the depressing action of the chloral, but upon the other hand it has been found to reduce the blood pressure and produce serious drawbacks. It has been given in doses of 20 to 50 grs. in syrup, flavoured with an essential oil to disguise its bitter taste.

Uranium—The nitrate has been re-introduced as a remedy for diabetes. It lessens thirst and diminishes the amount of sugar in the urine, and consequently lessens the bulk of the urine passed; at the same time the checking of the glycosuria allows the patient to gain weight and recover strength. The ordinary dose is about 3 grs. *ter die*. Large doses cause sugar and albumin to appear in the urine of healthy persons. The uranium and quinine chloride salt is given in similar doses.

Urea, in a pure crystallised form, has been re-introduced as a diuretic under the name of Carbamide. It has been proven by the researches of Klemperer and Mering that it has the power of dissolving uric acid and enormously increasing the amount of urine. It has been strongly recommended as a preventive and as a cure for uric calculi, and as a means of obviating tapping in cirrhosis of the liver. The daily dose at first is 2 drs., increased to 4 drs., and later on to 5 drs. For the solution of calculi, half a tea-spoonful four times daily of a mixture of urea, bicarbonate of soda, and carbonate of lime is recommended. The quinine salt is mentioned upon page 558. Recently Harper recommends urea as a remedy for phthisis in hypodermic doses of 40 grs. in $\frac{1}{2}$ oz. water, and he believes that the drug acts in the same way as do the large amounts of meat given in the over-feeding plan.

Ramsden has shown that urea up to saturation prevents the coagulation by heat of proteid solutions. A dead frog placed in saturated urea solution becomes translucent, and falls to pieces in a few hours, the ligaments and tendons becoming changed into a clear jelly, and the muscles separate into their individual fibres.

Urethane (Ethyl-urethane or Ethyl-carbamate) is a substance in soluble, white, inodorous crystals, prepared by the action of nitrate of urea on ethyl alcohol. It is a mild hypnotic, not followed by any objectionable after consequences. Refreshing sleep may be induced by about 20 grs. given at bed-time, and repeated in two hours if necessary. This apparently harmless hypnotic has not fulfilled the expectations raised by the first glowing reports of its virtues. The writer has been invariably disappointed in every instance in which he has used it, though often the dose was 20 grs. It has, however, been given in doses of 45 to 60 grs., but it will probably soon cease to be employed as an hypnotic except in the case of children. It is reported as having been used in tetanus with success, and in strychnine poisoning.

Hedonal is a white crystalline powder, introduced as a mild hypnotic in doses of 10 to 20 grs. in cachets. It is methyl-propyl-carbinol-urethane, but its soporific powers seem very unsatisfactory. It is useless where there is pain. The drug should be given in cachets, and up to 40 grs. have been administered.

For Phenyl-urethane, see Euphorin; for Ethyl-chloral-urethane, see Somnal; and for Chloral-urethane, see Ural.

Urotropine (Hexamethylenetetramine, or Aminoform, or Formin) exists in colourless, soluble crystals, and was introduced as a solvent for uric acid like piperazine. It is the most valuable and reliable of all the urinary antiseptics for disinfecting the bladder and pelvis of the kidney. It is excreted in the urine, where it is decomposed into formaldehyde, or some other antiseptic substance whose nature is still unknown, which disinfects the bladder and urethra. It is maintained that it will dissolve uric acid concretions when the urine is acid. It may be given in doses of 15 to 20 grs. in water, and is indicated in every form of cystitis, especially where the urine is foul. The best effects are found in those cases of bladder disease where the urine is acid on leaving the kidney. It speedily removes phosphaturia. Dr. Jas. Moore has pointed out that in the above doses it causes irritation of the prostate when this organ is enlarged. Excellent results may be obtained from 8 grs. It is most efficacious for disinfecting the urine after typhoid fever, as the bacilli remain in the urinary tract for months and spread the disease. Recently it has been given with marked success in 20 gr. doses in the coma of diabetes.

Uresin is urotropine dilithiacitrate, whilst Urosin is the name given to lithia quinate, both of which are given in 5 gr. doses in gout.

Ustilago Maidis, or Corn Smut, or Corn Ergot, is the fungus which attacks maize, causing irregular swellings on the young ears, from the size of a pea to that of a foetal head. The blackish, dusty powder in the interior is the part employed. It appears to act like ergot, and it keeps better, and is less expensive. It is said to differ from ergot in not producing prolonged contraction of the uterus, but in increasing markedly the rhythmic contractions and relaxations, hence it is more valuable during labour than after (Hubbard). Upon the other hand Kobert maintains that it is quite inert, and several others state that it has no ergot-like properties at all.

Dose—1 dr. of the liquid extract (1 in 1).

Validol is a liquid containing 30 per cent. of free menthol in solution in valerianic acid and methyl (valerianic acid-methyl-ester). It is introduced by Schwersenski as a vehicle for the administration of menthol, as it masks in a surprising way the objectionable acrid taste of the drug, and the liquid validol has a wide scope of usefulness in 10 min. doses on sugar in gastralgia, anorexia, neurasthenia, migraine, vomiting of pregnancy, acute alcoholism, sea-sickness, &c. It is also known as Valerianate of Menthol.

Validol Camphor is a 10 per cent. solution of camphor in validol; it possesses similar properties to validol, and is a quickly acting restorative and local anaesthetic. It relieves pain when placed in the cavity of a necrosing tooth.

Valyl (Valerianic Acid-di-ethyl-amide) is a strong-smelling and acrid-tasted liquid, said to contain in a concentrated form the virtues of valerian root. It is recommended in all the conditions in which that drug is employed, and may be given in 2 to 10 grs. in capsules in hysteria. The capsules are made by combining 2 grs. valyl with mutton suet, and enclosing

the mixture in gelatin. Kionka and Liebrecht maintain that the best effects of valerian can only be constantly obtained from the use of this preparation in hysteria, migraine, neuralgia, *muscæ*, *volitantes*, &c.

Vanillin, or Vanillic Acid, exists in acicular crystals, and is the odorous and flavouring principle of vanilla pods. It is prepared from coniferin artificially, and from eugenol and from nitro-benzol. It is antiseptic, and has been recommended in 1 grain doses in various forms of dyspepsia. Its chief use, however, is as a flavouring agent.

Vasogen is the name given to a preparation of oxygenated petroleum which has been used as a basis for active drugs. Walsh has shown that it facilitates their absorption through the skin. It is used as a solvent for iodoform, and there are vasogens of ichthyol, camphor, mercury, &c., &c.

Veratrol, or Pyrocatechine-dimethyl-ether, is a colourless, liquid antiseptic, local anæsthetic, and analgesic. It is painted on the skin over neuralgic nerves, or with the view of reducing body temperature like guaiacol, or in 2 minim capsules 4 times a day in phthisis and tubercular diseases. It is also produced in the crystalline form.

Veratrum Viride, or Green Hellebore—The rhizome and rootlets are used extensively in America in the class of cases where aconite is indicated. Though the drug is powerfully toxic, the large doses in which it has been constantly given seldom cause death, as vomiting supervenes. It is a powerful cardiac depressant, and 15 min. doses of the B.P.C. tincture cause a considerable drop in the pulse rate. It has been used with considerable success in pneumonia, most sthenic fevers and inflammations, acute rheumatism, and all conditions where high arterial tension is present, and numerous reports testify to its value in puerperal convulsions. 5 mins. of the tincture are given every hour till the pulse falls to 60.

Verbascum Thapsus (The Mullein Plant) is a popular Irish remedy in pulmonary complaints, and the original method of administration, which was that recommended by Quinlan, was to boil 4 ozs. of the fresh leaves, or a corresponding quantity of the dry, for 10 minutes in a pint of milk fresh from the cow, to be drunk whilst still warm. This dose should be taken when possible three times a day.

It appears to act as a nutrient like cod-liver oil, and it also possesses expectorant properties. The virtue of three pints daily of good milk must very substantially augment the therapeutic action of the mullein plant; the milk masks its unpleasant taste, the juice may be given in porter.

Viburnum Opulus (The Snow-Ball Tree)—The dried leaves of this tree were found by Jacobovsky to relieve angina pectoris, and Manguby has tried the dry berries with very decided success. He prepares an infusion of two table-spoonfuls of the berries in water, which he causes to be administered in divided doses during the 24 hours. A fluid extract of the bark (under the name of Cramp Bark) is extensively used as an antispasmodic in colic, hysteria, &c., and has been used in America with considerable benefit in dysmenorrhœa, and as a uterine sedative in menorrhagia and threatened abortion. It appears to closely resemble in its action the following :—

Viburnum Prunifolium, or Black Haw—The bark of this tree is in great repute in America; it possesses properties closely allied to the previous remedy. The liquid extract in 1 drachm doses is given in dysmenorrhœa, and as a uterine sedative to prevent contraction of the

uterus in the early months of pregnancy, and to check uterine hæmorrhages and the vomiting of pregnancy.

Schatz affirms that it suppresses or reduces the uterine contractions liable to occur in women who have aborted. He insists upon 45 to 60 grs. of the solid extract being given for months. See Colonial Addendum.

Vioform, or Iodochloroxyquinolin, is another iodoform substitute introduced by Tavel; it is reputed to be powerfully antiseptic and non-toxic, and is especially valuable in operations upon tubercular joints, but the powder may be freely used in every condition in which iodoform has been employed.

Warburg's Tincture (Tinctura Pyrexialis)—A preparation which has gained for itself a very high reputation in the treatment of pyrexia; it is prepared from a formula published in the *Lancet* of Nov. 13th, 1875. It is undoubtedly of value in malaria and other fevers, and in malarial neuralgia. It is administered in a table-spoonful dose, after the bowels have been thoroughly emptied, no drink being permitted; it is repeated again in 3 hours, after which profuse aromatic perspiration and a marked fall of temperature set in, with rapid convalescence. It is very useful in several forms of collapse.

Its power does not appear to lie in its quinine, camphor, aloes, rhubarb, or opium, but in some of the *aromatic* plants, and in the agaric contained in it. (See Tinctura Antiperiodica B.P.C. Formulæ).

Yohimbine Hydrochloride is a new aphrodisiac obtained from the bark of corynanthe yohimbé—the Cameroon tree from West Africa. It produces a very decided hyperæmia of the male sexual organs in doses of 5—10 mins. of a 1 per cent. solution. The reports of many competent authorities who have given the drug in impotence of the neurasthenic type testify to its wonderful action, which is said to be quite free from all drawbacks. The writer used it in one case with most marked benefit. It is stated to have no effect upon normal individuals. It may be given in 10 min. doses of 1 per cent. aqueous solution hypodermically or by the mouth, or in the form of a minute pill or tabloid, $\frac{1}{10}$ gr. It has been pointed out that even in small doses the drug has the power of lowering the temperature to a remarkable extent.

Zea Mays (or Corn Silk)—The stigmata or green pistils of *Zea Mays* have been much praised in America as possessing specific or alterative action upon the bladder and genito-urinary tract. It appears to be most active when prepared fresh, and good results have followed its use in cystitis, renal calculi, and pyelitis. It is a diuretic of the mildest and least irritating type. In the nocturnal incontinence of urine it has been tried with benefit, and it has been given with success in the later stages of gonorrhœa.

Dr. St. George has obtained excellent results with the liquid extract of maize stigmata in cases of catarrh of the bladder, and in one case where the ureter was inflamed, this remedy "relieved pain and suppressed discharge as if by magic." He has also found it to diminish the anasarca and to increase the urine in cardiac dropsy.

It has been stated to have a digitalis-like action upon both heart and kidney. 1 to 4 drs. of the liquid extract (1 in 1) may be given three times a day, or 20 grs. of the extract given three or four times daily.

Zinc Salts—In addition to those in the B.P. there are several salts of zinc in constant use as :—

The Bromide, which is a soluble granular powder used in solution in 5 to 8 gr. doses in epilepsy.

The Borate—A white amorphous powder used by Kollo as a substitute for iodoform, and as an ointment in eczema.

The Citrate and the Lactate are both used in epilepsy in doses of about 12 or 15 grs.

The Phosphide possesses the properties of free phosphorus, and is given in the pill form in doses of $\frac{1}{10}$ to $\frac{1}{2}$ gr.

The Cyanide is recommended in heart disease, and cardiac tonic and sedative properties are assigned to it in doses of $\frac{1}{4}$ gr. It is a powerful antiseptic.

The Zinc and Potassium Cyanide is given in similar doses, and the Zinc and Mercuric Cyanide is chiefly used as a gauze dressing for wounds.

The Nitrate is a more powerful, but less painful, caustic than the official chloride.

The Sulphhydrate, an unstable white precipitate, is used as a 1 in 10 ointment in eczema, tinea, &c., and given internally in 1 gr. doses.

The Permanganate is employed as a substitute for the potassium salt in gonorrhœa (1 gr. in 8 ozs.).

The Soziodol (page 564), the Chrysophanate, Gynocardate, Stearate, Ichthyolate, and Oleate are indicated in the conditions in which their acids are employed.

The Subgallate is a greenish powder used as a dusting powder or ointment, and it is also given internally in 2 gr. doses as an astringent and antiseptic in diarrhœa.

The Sulphite is a powerful antiseptic, used chiefly like the mercurio-zinc cyanide in the form of a gauze dressing.

INDIAN AND COLONIAL ADDENDUM

TO THE B.P.

Government of India Edition, 1901.

The Divisions of the Empire within which each Drug and Preparation now acquires official sanction are indicated after each.

Acacia Cortex—The dried bark of *A. arabica* and *A. decurrens*. (Black Wattle). *Astringent*. Decoction (1 in 16). Dose— $\frac{1}{2}$ to 2 ozs.

INDIA, AUSTRALASIAN AND EASTERN COLONIES.

Acalypha—The fresh and dried herb of *A. indica*. *Expectorant* and *Laxative*—Ext. Liq. (1 in 1). Dose—5–30 mins. Succus—1–4 drs.

INDIA, EASTERN COLONIES.

Adhatoda—The fresh and dried leaves of *A. Vasica*. *Expectorant*. Ext. Liq. (1 in 1). Dose—20–60 mins. Succus—1–4 drs. Tincture (1 in 8). $\frac{1}{2}$ –1 dr.

INDIA, EASTERN COLONIES.

Agropyrum—The dried rhizome of *A. or Triticum repens*. (Couch Grass). *Diuretic*. Decoction (1 in 20). Dose— $\frac{1}{2}$ –2 ozs. Liq. Ext. (1 in 1). 1–2 drs.

AUSTRALASIAN, EASTERN, AND NORTH AMERICAN COLONIES.

Alstonia—The dried bark of *A. scholaris* (Dita bark) and *A. constricta*. *Astringent in Dysentery*. Infusion (1 in 20). Dose— $\frac{1}{2}$ –1 oz. Tincture (1 in 8). $\frac{1}{2}$ –1 dr.

INDIA, AUSTRALASIAN AND EASTERN COLONIES.

Andrographis—The dried plant of *A. paniculata*. *Bitter Tonic*. Infusion (1 in 20). Dose— $\frac{1}{2}$ –1 oz. Liq. Conc. (1 in 2). $\frac{1}{2}$ 1 dr. Tincture (1 in 10). $\frac{1}{2}$ –1 dr.

INDIA AND EASTERN COLONIES.

Aristolochia—The dried stem and root of *A. indica*. *Alterative* and *Diaphoretic*. Liq. Conc. (1 in 2). Dose— $\frac{1}{2}$ –2 drs. Tincture (1 in 5). $\frac{1}{2}$ –1 dr.

INDIA AND EASTERN COLONIES.

Arnicae Flores—The dried flower-heads of *A. montana*. *Resolvent*. Tincture (1 in 10). Dose— $\frac{1}{2}$ –1 dr.

NORTH AMERICAN COLONIES.

Aurantii Cortex Indicus—The fresh and dried outer part of the pericarp of varieties of *Citrus Aurantium* grown in India and Ceylon. *Bitter Tonic*. May be used in making the B.P. preparations containing Bitter Orange Peel in

INDIA AND THE EASTERN COLONIES.

Azadirachta Indica—The dried bark of the stem of *Melia Az.* (Neem or Margosa Bark). *An Astringent Bitter*. Infusion (88 grs. to 1 pint). Dose— $\frac{1}{2}$ –1 oz. Tincture (1 in 10). $\frac{1}{2}$ –1 dr.

INDIA AND EASTERN COLONIES.

Belæ Fructus—The fresh half-ripe fruit of *Ægle Marmelos* (Bael). *Astringent*. Ext. Liq. (1 in 1). Dose—1–2 drs.

INDIA AND EASTERN COLONIES.

Berberis—The dried stem of *B. aristata*. *Antiperiodic*. Liq. Conc. (1 in 2). Dose— $\frac{1}{2}$ –1 dr. Tincture (1 in 10). $\frac{1}{2}$ –1 dr.

INDIA AND EASTERN COLONIES.

Betel—The leaves of *Piper Betle*. *Sialagogue*.

INDIA AND EASTERN COLONIES.

Buteæ Gummi—The inspissated juice from the stem of *B. frondosa* (Bengal Kino) and *Buteæ Semina*—the seeds of the same. *Astringent*. The seeds are *anthelmintic* and *laxative*. Powder. Dose—10–20 grs.

INDIA AND EASTERN COLONIES.

Calotropis—The dried root-bark of *C. procera* and of *C. gigantea*. (Mudar). Dose—3–10 grs. as a *Tonic*, and 30–60 as an *Emetic*. Tincture (1 in 10). $\frac{1}{2}$ –1 dr.

INDIA AND EASTERN COLONIES.

Cambogia Indica—The gum-resin from *Garcinia Morella*. *Drastic Purgative*. Dose— $\frac{1}{2}$ –2 grs.

INDIA AND EASTERN COLONIES.

Catechu Nigrum—An extract from the wood of *Acacia Catechu*. *Astringent*. Dose—5–15 grs.

INDIA, EASTERN AND NORTH AMERICAN COLONIES

Cissampelos—The dried root of *C. Pareira*. (False Pareira Brava). *Diuretic*. Decoction (1 in 8). Dose— $\frac{1}{2}$ –2 ozs. Ext. Liq. $\frac{1}{2}$ –2 drs.

INDIA AND EASTERN COLONIES.

Coscinium—The dried stem of *C. fenestratum*. *Bitter Tonic* like calumba. Infusion (1 in 20). Dose— $\frac{1}{2}$ –1 oz. Liq. Conc. (1 in 2). $\frac{1}{2}$ –1 dr. Tincture (1 in 10). $\frac{1}{2}$ –1 dr.

INDIA AND EASTERN COLONIES.

Cucurbitæ Semina Præparata—The prepared fresh, ripe seeds of cultivated plants of *C. maxima*. (Melon Pumpkin Seeds). *Anthelmintic*. Dose—3–4 ozs., rubbed with a little water or milk.

MEDITERRANEAN COLONIES.

Datura Folia—The dried leaves of *D. fastuosa* var. *alba* and of *D. Metel*, and **Daturæ Semina**—the dried seeds of *D. fastuosa* var. *alba*. Tincture (1 in 4). Dose—5–15 mins. *Narcotic* and *Antispasmodic* like stramonium. The former in

INDIA, EASTERN AND WEST INDIAN COLONIES,

And the Seeds in

INDIA AND THE EASTERN COLONIES.

Embelia—The fruit of *E. Ribes* and of *E. robusta*. *Anthelmintic*. Dose—1–4 drs.

INDIA AND EASTERN COLONIES.

Extractum Glycyrrhizæ Spirituosum—Extract of Liquorice (1 in 2) dissolved in spirit and water. *Demulcent*. Dose— $\frac{1}{2}$ –1 dr.

INDIA AND EASTERN COLONIES.

Gossypii Radicis Cortex—The dried root-bark of *G. herbaceum*. (Cotton Root Bark). *Emmenagogue*. Decoction (1 in 5). Dose— $\frac{1}{2}$ –2 ozs. Ext. Liq. (1 in 1). $\frac{1}{2}$ –1 dr.

INDIA, EASTERN, NORTH AMERICAN, AND WEST INDIAN COLONIES.

Grindelia—The dried leaves and flowering tops of *G. squarrosa* and of *G. robusta*. *Antispasmodic*. See page 523. Ext. Liq. (1 in 1). Dose—10–20 mins.

AUSTRALASIAN AND NORTH AMERICAN COLONIES.

Gummi Indicum—A gummy exudation from the wood of *Anogeissus latifolia*. *Demulcent* like gum acacia. Mucilage (2 and 6).

INDIA AND EASTERN COLONIES.

Hirudo Australis—*Hirudo quinquestriata*, the five-striped or Australian Leech.

AUSTRALASIAN COLONIES.

Hygrophila—The dried herb and root of *H. spinosa*. *Diuretic*. Decoction (1 in 10). Dose— $\frac{1}{2}$ –2 ozs.

INDIA AND EASTERN COLONIES.

Ispaghula—The dried seeds of *Plantago ovata*. (Spogel seeds). *Demulcent*. Decoction (120 grs. to 1 pint.) Dose— $\frac{1}{2}$ –2 ozs.

INDIA AND EASTERN COLONIES.

Jalapæ Tinctura Composita—A tincture of jalap (1 in 13), containing also scammony and turpeth. *Purgative*. Dose— $\frac{1}{2}$ –1 dr.

INDIA, EASTERN AND NORTH AMERICAN COLONIES.

Kaladana or **Pharbitis Nil**—The dried seeds of *Ipomœa hederacea*. *Purgative* like jalap. Dose—30–50 grs. Compound Powder (1 in 3). 20–60 grs. Tincture (1 in 5). $\frac{1}{2}$ –1 dr.

INDIA AND EASTERN COLONIES.

Kaladanæ Resina or **Pharbitisin**—The resin from *Ipomœa hederacea*. *Purgative* like jalap resin. Dose—2–8 grs.

INDIA AND EASTERN COLONIES.

Kavæ Rhizoma—The dried decorticated rhizome of *Piper methysticum* without the roots. *Spinal Depressant*. See page 534. Ext. Liq. (1 in 1). Dose—30–60 mins.

AUSTRALASIAN COLONIES.

Kino Eucalypti—An exudation from the stem of various species of *Eucalyptus* (Botany Bay Kino), identical with B.P. Kino. *Astringent*. Dose—5–20 grs.

AUSTRALASIAN COLONIES.

Mylabris—The dried beetle *M. phalerata* or other species of *M. Vesicant* like cantharides. Plaster (1 in 3 nearly). Warming Plaster (1 in 24). Blistering Liquid (1 in 2). Ointment (1 in 10). Vinegar (1 in 10). Corresponding to the B.P. Cantharides preparations.

INDIA, AFRICAN AND EASTERN COLONIES.

Myrobalanum—The dried immature fruits of *Terminalia Chebula*. (Chebolic myrobalans). *Astringent* like galls. Dose— $\frac{1}{2}$ –1 dr. Ointment (1 in 5). Ointment with opium (7·5 per cent. opium).

INDIA AND EASTERN COLONIES.

Oleum Ajowan—The oil distilled from the fruit of *Carum copticum*. (Ajowan or *Ptychotis* Oil). *Carminative*. Dose— $\frac{1}{2}$ –3 mins., contains one-third its weight of Thymol.

INDIA AND EASTERN COLONIES.

Oleum Arachis—The oil expressed from the seeds of *A. hypogæa* (Earth-nut, Ground-nut, or Pea-nut Oil) resembling olive oil, for which it may be substituted in India, African Colonies, Eastern Colonies, and Australian Colonies in making the B.P. Liniments, Ointments, Plasters, and Soaps.

Oleum Gaultheriæ—The oil distilled from the leaves of *G. procumbens* or from the bark of *Betula lenta*; contains upwards of 90 per cent. methyl salicylate. *Antirheumatic*. Dose—3–10 mins., and *Local Sedative*. See page 519.

NORTH AMERICAN COLONIES.

Oleum Graminis Citrati—The oil distilled from *Andropogon Citratus*. (Oil of Lemon Grass or Indian Oil of Verbena). *Carminative*. Dose— $\frac{1}{2}$ –3 mins., and *Local Anodyne*.

INDIA, EASTERN AND WEST INDIAN COLONIES.

Oleum Gynocardia—The fatty oil expressed from the seeds of *G. odorata*, or of *Taraktogenos Kurzii*. (Chaulmoogra Oil). Dose—10 mins., increased to 1 dr. Used in Leprosy. See page 501. Ointment (1 in 10).

INDIA AND EASTERN COLONIES.

Oleum Sesami—The oil expressed from the seeds of *Sesamum indicum*. Resembles olive oil, for which it may be substituted for the B.P. Liniments, Plasters, Ointments, and Soaps in

INDIA, THE AFRICAN, EASTERN, AND NORTH AMERICAN COLONIES.

Oliveri Cortex—The dried bark of *Cinnamomum Oliveri*. (Black Sassafras). *Carminative* like Cinnamon. Tincture (1 in 10). Dose— $\frac{1}{2}$ –1 dr.

AUSTRALASIAN COLONIES.

Picrorhiza—The dried rhizome of *P. Kurroa*. *Tonic*. Dose—10–20 grs. *Antiperiodic*. 40–50 grs. Tincture (1 in 8). $\frac{1}{2}$ –1 dr. Ext. Liq. (1 in 1). 20–60 mins.

INDIA AND EASTERN COLONIES.

Podophylli Indici Resina—The powdered resin from the following drug:—*Purgative* and *Cholagogue*. Dose— $\frac{1}{4}$ –1 gr. Tincture (2 grs. to 1 dr.). 5–15 mins.

INDIA AND EASTERN COLONIES.

Podophylli Indici Rhizoma—The dried rhizome and roots of *P. Emodi*; resembles the B.P. drug in action.

INDIA AND EASTERN COLONIES.

Sappan—The heart-wood of *Cæsalpinia Sappan*. It is an *Astringent* like logwood, and is also used as a dye. Decoction (1 in 20). Dose— $\frac{1}{2}$ -2 ozs.

INDIA AND EASTERN COLONIES.

Tinospora—The dried stem of *T. cordifolia* collected in the hot season. *Tonic* and *Alterative*. Infusion (1 in 10). Dose— $\frac{1}{2}$ -1 oz. Liq. Conc. (1 in 2). $\frac{1}{2}$ -1 dr. Tincture (1 in 5). $\frac{1}{2}$ -1 dr.

INDIA AND EASTERN COLONIES.

Toddalia—The dried root-bark of *T. aculeata*. *Bitter Tonic* like calumba. Infusion (1 in 10). Dose—1-2 ozs. Liq. Conc. (1 in 2). $\frac{1}{2}$ -1 dr.

INDIA AND EASTERN COLONIES.

Turpethum—The dried root and stem of *Ipomœa Turpethum*. *Purgative* like jalap. Dose—5-20 grs. Enters into *Tr. Jalapæ Co.*

INDIA, EASTERN AND NORTH AMERICAN COLONIES.

Tylophoræ Folia—The dried leaves of *T. asthmatica*. *Expectorant*. Dose— $\frac{1}{4}$ -2 grs. *Emetic*. 15-30 grs.

INDIA AND EASTERN COLONIES.

Urginea—The younger bulbs of *U. indica* and of *Scilla indica*. (Indian Squill). *Expectorant* like squill. Vinegar (1 in 8). Dose—10-30 mins. Oxymel (1 in 15). $\frac{1}{2}$ -1 dr. Compound Pill (1 in 4). 4-8 grs. Pill with *Ipecac.* (5 per cent. opium). 4-8 grs. Tincture (1 in 5). 5-15 mins. Syrupus (1 in 17). $\frac{1}{2}$ -1 dr.

INDIA AND EASTERN COLONIES.

Valerianæ Indicæ Rhizoma—The dried rootlets and rhizome of *V. Wallichii*. *Antispasmodic*. Ammoniated Tincture (1 in 5). Dose— $\frac{1}{2}$ -1 dr.

INDIA AND EASTERN COLONIES.

Viburnum—The dried bark of *V. prunifolium* (Black Haw). *Uterine Sedative*. Ext. Liq. (1 in 1). Dose—1-2 drs. See page 576.

INDIA, EASTERN AND NORTH AMERICAN COLONIES.

In the Appendix to the Addendum it is permitted that the waters of Anise, Dill, Carraway, Cinnamon, Fennel, Pimento, Peppermint, and

Spearmint may be made by triturating the oils with twice their weight of calcium phosphate and adding 500 times their weight of distilled water and filtering.

Hard Soap, Suet, Resin, or Beeswax may be used in the making of Plasters to counteract the softening caused by high temperatures, but the strength of active substance must always remain as in the B.P.

Alcohol may be added to the Liquid Extracts to prevent fermentation in India and the Tropics.

Dried Lemon Peel may be used where the fresh cannot be obtained.

Hard Soap in India may be made with Sesame or Arachis Oil.

Benzoated Suet and Prepared Suet in India may be substituted for Benzoated Lard and Prepared Lard in the B.P. ointments, and the Suppositories may have some White Beeswax introduced instead of a portion of the Ol. Theobroma, and some of the ointments may be treated in the same way.

Syr. Rhœados may have its quantity of alcohol doubled to prevent fermentation.

B.P.C. FORMULÆ.

1901.

THE British Pharmaceutical Conference, in 1886, appointed a Committee to prepare a Formulary of Unofficial Remedies. The following is a brief summary of their results. Physicians are requested in ordering any of the formulæ to add the letters B.P.C. (British Pharmaceutical Conference).

Acidum Hydrocyanicum (Scheele) (4 per cent.) is Prussic acid of double the B.P. strength, since it contains 4 per cent. of HCN. It is prepared by the B.P. process. Dose—1 to 3 minims.

Acidum Hydrofluoricum Dil. 2 per cent. prepared by diluting with water re-distilled hydrofluoric acid containing 30 per cent. of true acid. Dose—5 to 20 mins.

Acidum Hypophosphorosum 30 per cent. is prepared by adding H_2SO_4 to a hot solution of hypophosphite of barium, filtering, and evaporating the filtrate till the S.G. 1.1367 is reached. Dose—2 to 5 minims.

Caffeinæ Hydrobromidum Effervesc. 1 in 25 is a granulated preparation containing sodium bicarb. 46, acid. tart. 24, acid. cit. 18, sugar 18, and caff. hydrobr. 4. Dose—60 to 120 grs.

Chloral Camphoratum 1 in 2 is prepared by rubbing 1 oz. camphor and 1 oz. hydrate of chloral in a warm mortar till liquefied.

Chloroformum Aconiti 1 in $1\frac{1}{2}$ is prepared by the following process—aconite root 20 ozs., after maceration with $1\frac{1}{2}$ ozs. stronger solution of ammonia and 20 ozs. distilled water, is dried and powdered, and finally percolated with 30 ozs. chloroform.

Chloroformum Belladonnæ 1 in $1\frac{1}{2}$ is prepared as chloroform of aconite by substituting belladonna root for aconite.

Chloroformum Camphoratum (2 to 1) is 2 ozs. camphor dissolved in 1 oz. chloroform.

Collodium Belladonnæ 1 in 10 (Synonym—Emp. Belladonnæ Fluidum) is prepared by dissolving enough alcoholic extract of belladonna leaf to contain 44 grs. alkaloids in 9 ozs. rectified spirit, adding 9 ozs. pure ether, decanting after 12 hours, and dissolving in the mixture 130 grs. camphor and $\frac{1}{2}$ oz. pyroxylin, and finally making up to 1 pint with equal volumes of rectified spirit and pure ether.

Collodium Stypticum is prepared by dissolving 1 oz. tannic acid in a filtered solution of 44 grs. benzoin in 1 oz. absolute alcohol, adding 4 ozs. pure ether and 44 grs. pyroxylin, and decanting after 3 days.

Elixir Aletridis 1 in 4 consists of liquid extract of aletris 5 ozs., liquid extract of liquorice $1\frac{1}{2}$ ozs., tincture of orange $1\frac{1}{4}$ ozs., syrup $7\frac{1}{2}$ ozs., water to 20 ozs. Dose— $\frac{1}{2}$ to 1 dr.

Elixir Glusidi 3 grs. to 1 dr. is prepared by dissolving 480 grs. saccharin and 240 grs. sodii bicarb. in 10 ozs. water, adding $2\frac{1}{2}$ ozs. alcohol, 90 per cent. filtering and washing the filter with water to produce 20 ozs. Dose—5 to 20 mins.

Elixir Guaranæ 1 in 5 is prepared by the following process—guarana in No. 60 powder, 4 ozs., mixed with light magnesia $\frac{1}{2}$ oz. and proof spirit 3 ozs., is macerated for 24 hours, mixed with 8 ozs. sand and percolated with proof spirit till 16 ozs. are obtained, and the residue pressed. To the percolate add oil of cinnamon 6 minims and 2 ozs. syrup, and make up to 20 ozs. by addition of the expressed liquid. Dose— $\frac{1}{2}$ to 2 drs.

Elixir Phosphori $\frac{1}{30}$ gr. in 1 dr. consists of compound tincture of phosphorus 4 ozs. mixed with glycerin 16 ozs. Dose—15 to 60 minims.

Elixir Rhei 1 in 4 is prepared by the following process—5 ozs. rhubarb and 2 ozs. fennel are repeatedly exhausted with spirit and water (1 in 3) q.s., to the resulting tincture 3 ozs. glycerin and 4 ozs. sugar are added, and the whole made to measure 20 ozs. Dose—1 to 3 drs.

Elixir Sennæ 1 in $1\frac{1}{2}$ is prepared by repeated exhaustion of 16 ozs. senna by rectified spirit and water, till 16 ozs. of product be obtained; this is heated with 12 ozs. sugar, and when cold, 24 minims chloroform and $2\frac{1}{2}$ minims oil of coriander, $\frac{1}{2}$ dr. tincture of capsicum, and 3 drs. rectified spirit, are added, and the product made to measure 24 ozs. Dose—1 to 3 drs.

Emplastrum Belladonnæ Viride 25 per cent. alkaloids is prepared by mixing enough of the alcoholic extract of belladonna leaf to contain 11 grs. of the alkaloids with resin plaster to produce 10 ozs.

Emulsio Olei Morrhuæ 1 in 2 consists of cod-liver oil 8 ozs., yolks of 2 eggs, powdered tragacanth 16 grs., elixir of saccharin 1 dr., simple tincture of benzoin 1 dr., spirit of chloroform 4 drs., essential oil of bitter almonds 8 minims, distilled water to 16 ozs. Triturate the tragacanth with a little of the oil, add the yolks and stir, gradually adding water and oil alternately; transfer to a pint bottle, adding the remaining ingredients previously mixed together, shake well and make up to 16 ozs. Dose—2 to 8 drachms.

Emulsio Petrolei cum Hypophosphitibus 1 in $1\frac{1}{2}$ consists of liquid paraffin 8 ozs., gum acacia 4 ozs., oil of cinnamon 24 mins., tragacanth in powder 120 grs., calcium hypophosphite 192 grs. and sodium hypophosphite 192 grs., and water to 24 ozs. Mix the first 4 ingredients in a mortar, add all at once 6 ozs. water and make an emulsion. Add gradually the salts dissolved in 4 oz. water and make up to 24 ozs. with water. Dose—1 to 4 drs.

Extractum Aletridis Liquidum 1 in 1 is prepared by percolating 20 ozs. *aletris farinosa* rhizome and rootlets with q.s. 45 per cent. alcohol to produce 20 ozs. Dose—5 to 15 mins.

Extractum Belladonnæ Folii Alcoholicum is prepared by exhausting belladonna leaves by maceration and percolation with rectified spirit, and evaporating over a water-bath to the consistence of an extract

Extractum Cascaræ Sagradæ Liquidum Insuperum 1 in 1. This *tasteless* extract is prepared by mixing 20 ozs. cascara bark in No. 40 powder with 2 ozs. light magnesia, moistening with water for 24 hours, drying over a water-bath and powdering the residue. This is exhausted with 60 per cent. alcohol, reserving the first 17 ozs. of percolate. The alcohol is distilled from the remainder which is evaporated to the consistency of a soft extract, when it is dissolved in the 17 ozs. and made to measure 20 ozs. with alcohol 60 per cent. Dose— $\frac{1}{2}$ to 2 drs.

Extractum Condurango Liquidum 1 in 1 is prepared by exhausting the bark of *Marsdenia Condurango* 20 ozs. with 60 per cent. alcohol by the process employed for the preceding extract so that the finished product measures 20 oz. Dose—10 to 60 mins.

Extractum Conii Liquidum 1 per cent. alkaloids prepared by exhausting with 60 per cent. alcohol and 2 drs. acetic acid, 20 ozs. powdered hemlock fruit by the process employed in the two previous extracts, but making the final product of the alkaloidal strength of one per cent. Dose—5 to 15 mins.

Extractum Damianæ Liquidum 1 in 1 is prepared by exhausting 20 ozs. of the leaves and twigs of *Turnera diffusa* by 60 per cent. alcohol as in former process and making the finished product to measure 20 ozs. Dose— $\frac{1}{2}$ to 1 dr.

Extractum Eucalypti Gummi Liquidum 1 in 4 is prepared by dissolving 5 ozs. red gum in 13 ozs. water, adding 2 ozs. 90 per cent. alcohol and water to 20 ozs. Dose—30 to 60 mins.

Extractum Fuci Vesiculosi is prepared by exhausting dried *Fucus Vesiculosus* with 45 per cent. alcohol and evaporating to the consistence of a firm extract. Dose—3 to 10 grs.

Extractum Fuci Vesiculosi Liquidum is prepared by dissolving 4 ozs. of the extract in alcohol 45 per cent. to produce 20 ozs. Dose—1 to 2 drs.

Extractum Hæmatoxyli Liquidum 1 in 1 is prepared by exhausting 20 ozs. unfermented logwood by repeated boilings in water, and evaporating the resulting decoction to 17 ozs., adding 3 ozs. 90 per cent. alcohol, and decanting after 7 days. Dose— $\frac{1}{2}$ to 2 drs.

Extractum Kolæ Liquidum 1 in 1 is prepared by exhausting 20 ozs. of the seeds of *Cola vera* by the process used in making the liquid extract of cascara so that the finished product measures 20 ozs. Dose—10–20 mins.

Extractum Malti is prepared by mashing freshly crushed barley malt with about six times its weight of water at 150° F. for 2 hours and evaporating the resulting liquid to the consistence of thick honey. It should convert twice its weight of Bermuda arrowroot in 30 minutes at 100° F. Dose—1 to 4 drs.

Extractum Malti cum Oleo Morrhue is prepared by triturating extract of malt 17 ozs. at 110° F. with 3 ozs. cod-liver oil in a warm mortar. Dose—1 to 4 drs.

Extractum Sennæ Leguminorum Liquidum 1 in 1 is prepared by exhausting 20 ozs. bruised senna pods with alcohol 90 per cent. and water, and after exhausting the marc so as to produce in all 20 ozs. of liquid, it is heated for 10 minutes at 200° F. and filtered. Dose—1 dr.

Gelatinum Zinci 1 in 10 is prepared by dissolving 3 ozs. gelatin in 9 ozs. water with heat, and adding 2 ozs. oxide of zinc rubbed up with $5\frac{1}{2}$ ozs. glycerin.

Glycerinum Belladonnæ 1 in 2 consists of 1 oz. extract of belladonna rubbed in a warm mortar with 1 dr. boiling water, and glycerin added to make the product measure 2 fluid ozs.

Hydrastinum is prepared by exhausting hydrastis rhizome with 60 per cent. alcohol, and evaporating to dryness, and powdering the residue. Dose— $\frac{1}{2}$ to 2 grs.

Infusum Digitalis Concentratum 8 times the strength of the B.P. infusion is prepared by macerating 480 grs. digitalis leaves in 15 ozs. water for 24 hours, and, after straining, adding 5 ozs. 90 per cent. alcohol to 10 ozs. of the liquid. The remaining 5 ozs. are added to the product of a second and third maceration of the leaves with water, which is evaporated at low temperature to 5 ozs. and added to the 15 ozs. of spirituous liquid. Dose—15 to 30 mins.

Infusum Gentianæ Co. Concentratum 8 times the B.P. strength is prepared from gentian, bitter orange peel, dried lemon peel, fresh lemon peel tincture (2 in 5), alcohol and water by a process similar to that used in preparing the previous infusion. Dose— $\frac{1}{2}$ to 1 dr.

Injectio Curare Hypodermica 1 in 12 is prepared by rubbing 5 grs. curare into a paste, which is transferred to a small funnel plugged with cotton wool, which is washed with water till 60 mins. are produced. Dose—1 to 6 mins.

Iridin is prepared by exhausting the rhizome of *Iris versicolor* with 90 per cent. alcohol, and evaporating the resulting tincture to dryness and powdering the residue. Dose—1 to 3 grs.

Linimentum Opii Ammoniatum 9·9 grs. per oz. is prepared by mixing and filtering after standing 7 days, tincture of opium 6 ozs., liniment of soap 6 ozs., liniment of belladonna 1 oz., ammoniated camphor liniment 6 ozs., and strong solution of ammonia 1 oz.

Liquor Bismuthi Concentratus about 1 in 7 is prepared by dissolving 7 ozs. bismuth subnitrate in 5 ozs. nitric acid and 5 ozs. water, adding 5 ozs. citric acid dissolved in 7 ozs. water, and again adding $8\frac{1}{4}$ ozs. sodium bicarbonate dissolved in 7 ozs. water. The resulting ppt. is washed and dissolved in 6 ozs. or q.s. of solution of ammonia, to which are added 12 ozs. solution of ammonium citrate and water to produce 50 ozs.

Liquor Bromo-Chloral Compositus 10 grs. each in 1 dr. is prepared by adding a solution of 1,600 grs. potassium bromide in 7 ozs. water to a solution of 1,600 grs. chloral hydrate, 400 minims tincture of Indian hemp, 400 minims tincture of fresh orange peel, 1,600 minims juice of henbane, $3\frac{1}{4}$ ozs. syrup, and $\frac{1}{2}$ oz. liquid extract of liquorice, filtering and washing the filter with water to produce 1 pint. Dose— $\frac{1}{2}$ to 2 drs.

Liquor Ferri Hypophosphitis Fortis 40 grs. to 1 oz. is prepared by dissolving 1,000 grs. ferric chloride in 10 ozs. water, and adding it gradually to 1,100 grs. sodium hypophosphite previously dissolved in 10 ozs. water. The well-washed ppt. is dissolved in a solution of 800 grs. citric acid and 360 mins. strong solution of ammonia and 5 ozs. water and filtered,

and made to contain iron equal to 40 grs. of the hypophosphite per oz.
Dose—10 to 30 mins.

Liquor Hypophosphitum Compositus (Synonym—Liq. Ferri Hypophosph. Co.) is prepared by dissolving in 12 ozs. water, hypophosphites of calcium 320 grs., of sodium 320 grs., and of magnesium 160 grs., and adding 6 ozs. of last preparation and water to 20 ozs.

1 dr. contains 2 grs. each of hypophosphites of sodium and calcium, and 1 gr. of magnesium and $1\frac{1}{2}$ grs. of iron. Dose— $\frac{1}{2}$ to 2 drs.

Mistura Bismuthi Composita is prepared by dissolving 8 grs. morphia hydrochloride in 4 drs. water, adding 3 ozs. tinct. card. co., 70 mins. chloroform, 135 mins. liquid extract of nux vomica, and 320 mins. dilute prussic acid, mixing and adding 15 ozs. liq. bismuthi conc. and water to 20 ozs.

Each drachm contains 2 mins. dilute prussic acid, $\frac{1}{10}$ gr. morph. hydr., and 5 mins. tinct. nucis vom. Dose—20 to 30 mins.

Phenacetinum cum Caffeina Effervescens 5 and $2\frac{1}{2}$ in 100 is prepared by mixing sodium bicarbonate 46, tartaric acid 24, citric acid 16, sugar $16\frac{1}{2}$, phenacetin 5, and citrate of caffeine $2\frac{1}{2}$, and granulating by heat. Dose—60 to 120 grs.

Phenazonum Effervescens 1 in $12\frac{1}{2}$ is prepared by granulating a mixture of sodium bicarbonate 46, tartaric acid 24, citric acid 16, sugar 16, and antipyrine 8. Dose—60 to 120 grs.

Pulvis Acetanilidi Co. is prepared by mixing antifebrin 7, caffeine 1, and sodium bicarbonate 2. Dose—3 to 5 grs.

Pulvis Salis Carolini Factitii Effervescens (Effervescent powder of artificial Carlsbad salt) is prepared by drying, powdering, and mixing sodii sulph. exsic. 11 ozs., pot. sulph. $\frac{1}{2}$ oz., sodii chlor. $4\frac{1}{2}$ ozs., sodii bicarb. 54 ozs., acid. tart. 40 ozs., and saccharin 28 grs. Dose—60 to 120 grs.

Succus Digitalis is prepared by bruising and pressing out the juice of fresh digitalis leaves, and adding 1 part 90 per cent. of alcohol to 3 of juice, setting aside for 7 days, and filtering. Dose—5 to 10 mins.

Syrupus Acidi Hydriodici 1 per cent. is prepared by mixing a solution of 152 grs. potassium iodide and 12 grs. potassium hypophosphite in 200 minims water, with one of 140 grs. tartaric acid in 5 drs. proof spirit, filtering, washing with proof spirit and evaporating the filtrate till it weighs 600 grs., and mixing it with syrup q.s. to produce 1 pint. Dose—20 to 60 minims.

Syrupus Apomorphinæ Hydrochloridi 5 grs. to 1 pint is prepared by dissolving 5 grs. apomorphine hyd. in 15 mins. acid. hydroch. dil., 7 drs., 90 per cent. alcohol, and 7 drs. water, and adding syrup to 1 pint. Dose— $\frac{1}{2}$ to 1 dr. (It is a worthless preparation—it should be at least 4 times stronger.)

Syrupus Butyl-Chloral Hydras 2 grs. in 1 dr. is prepared by dissolving 320 grs. hydrate of butyl-chloral dissolved in q.s. syrup (hot) to make 20 ozs. Dose—1 to 4 drs.

Syrupus Calcii Hypophosphitis 1 gr. in 1 dr. is prepared by dissolving 160 grs. hypophosphite of calcium in 9 ozs. distilled water, filtering and adding 16 ozs. sugar, and, after cooling, adding 20 minims hypophosphorous acid and distilled water to 20 ozs. Dose—1 to 4 drs.

Syrupus Ferri Bromidi $4\frac{1}{2}$ grs. in 1 dr. is prepared by shaking $\frac{1}{2}$ oz. iron wire, free from oxide, with 533 grs. bromine and 4 ozs. water, and filtering the liquid into a hot syrup composed of sugar 14 ozs., and water 6 ozs. Dose— $\frac{1}{2}$ to 1 dr.

Syrupus Ferri Bromidi cum Quinina 4 grs. and 1 gr. in 1 dr. is prepared by dissolving acid hydrobromide of quinine 160 grs. in 3 drs. acid hydrobrom. dil. and 13 drs. water, and adding syr. ferri bromidi to 20 ozs. Dose— $\frac{1}{2}$ to 1 dr.

Syrupus Ferri Bromidi cum Quinina et Strychnina is prepared by dissolving $2\frac{1}{2}$ grs. strychnine, 160 grs. acid hydrobromide of quinine in 3 drs. acid. hydrobrom. dil., and 13 drs. water, and adding syr. ferri brom. to 20 ozs. Each drachm contains 4 grs. ferrous bromide, $\frac{1}{84}$ gr. strychnine and 1 gr. acid. hydrobromide of quinine. Dose— $\frac{1}{2}$ to 1 dr.

Syrupus Ferri Hypophosphitis 1 gr. in each dr. is prepared by mixing 4 ozs. strong solution of hypophosphite of iron with 16 ozs. syrup. Dose— $\frac{1}{2}$ to 2 drs.

Syrupus Ferri Phosphatis Compositus is prepared by dissolving $37\frac{1}{2}$ grs. iron wire, free from oxide, in 1 oz. concentrated phosphoric acid and 5 drs. water, and, when cold, adding to a solution of 120 grs. precipitated carbonate of calcium in 4 drs. concentrated phosphoric acid, and 2 ozs. water; after mixing, add 9 grs. bicarbonate of potassium and 9 grs. phosphate of sodium, filter and add a filtered decoction of 30 grs. cochineal in 7 ozs. water in which 14 ozs. sugar have been dissolved and add q.s. water to 20 ozs. Each dr. contains a $\frac{1}{2}$ gr. phosphate of iron and $\frac{4}{5}$ gr. phosphate of calcium. Dose— $\frac{1}{2}$ to 2 drs.

Syrupus Glycerophosphatum Compositus is prepared by boiling $\frac{1}{4}$ oz. cudbear (a dye) in 10 ozs. water, and, after filtering, dissolving in the filtrate the following glycerophosphates—*i.e.*, calcium 160 grs., potassium 80 grs., sodium 80 grs., magnesium 80 grs., iron 40 grs., with citric acid 30 grs., citrate of caffeine 80 grs., and 2 grs. of strychnine hydrochloride; 14 ozs. are added and the mixture heated; when cooled, 20 mins. chloroform mixed with 40 mins. spirit are added, and the whole made up to 20 ozs. with water. Dose—1 to 2 drs.

Syrupus Hypophosphitum Compositus is prepared by dissolving 1 gr. strychnine in 2 drs. hypophosphorous acid and adding it to a solution of hypophosphite of calcium 80 grs., of manganese 40 grs., of potassium 40 grs., of quinine 20 grs., in water 8 ozs.; after filtering, 1 oz. of strong solution of ferric hypophosphite and 14 ozs. sugar are added, and afterwards 20 mins. chloroform mixed with 40 mins. spirit, and the whole made up to 20 ozs. with water. Each dr. contains $\frac{1}{160}$ gr. strychnine and $\frac{1}{8}$ grain quinine. Dose— $\frac{1}{2}$ to 2 drs.

Syrupus Ipecacuanhæ Aceticus 1 in 42 is prepared by dissolving $2\frac{1}{4}$ lbs. sugar in 20 ozs. vinegar of ipecacuanha. Dose— $\frac{1}{4}$ to 2 drs.

Syrupus Picis Liquidæ 1 in $13\frac{1}{3}$ is prepared by mixing $1\frac{1}{2}$ oz. tar and 1 oz. sand with water for 12 hours, and, after pouring off the liquid, stirring the residue with 8 ozs. boiling water for 15 minutes, adding 2 ozs. glycerin, and after 24 hours filtering and dissolving 16 ozs. sugar, and making up to 20 ozs. with water. Dose—1 to 2 drs.

Syrupus Sodii Hypophosphitis 1 gr. in 1 dr. is prepared by dissolving 160 grs. hypophosphite of sodium in 3 drs. water, filtering, and

washing the filter with 1 dr. water, and adding q.s. syrup to measure 20 ozs. Dose—1 to 4 drs.

Tinctura Antiperiodica (Warburg's Tincture) is prepared by macerating the following for 7 days in 20 ozs., 60 per cent., alcohol and filtering—socotrine aloes 240 grs., rhubarb 80 grs., angelica fruit 80 grs., elecampane root 40 grs., saffron and fennel and prepared chalk of each 40 grs., gentian 20 grs., zedoary root 20 grs., cubebs 20 grs., myrrh 20 grs., white agaric 20 grs., opium $2\frac{1}{2}$ grs., black pepper 4 grs., cinnamon 8 grs., ginger 8 grs., 175 grs. quinine sulphate and 20 grs. camphor are added, and the whole made to finally measure 20 ozs. Dose—1 to 4 drs.

Tinctura Benzoini Simplex 1 in 10 is prepared by macerating 2 ozs. benzoin in 20 ozs. rectified spirit, and filtering.

Tinctura Bryoniæ 1 in 10 is prepared from *fresh* bryony root by calculating the moisture contained in it, and producing a 60 per cent. alcohol tincture by maceration for seven days of such a strength as that 10 ozs. shall represent 1 oz. of *dried* root. Dose—1 to 10 mins.

Tinctura Calendulæ Florum 1 in 5 is prepared by macerating and percolating 4 ozs. dried marigold flowers with 20 ozs. alcohol, 60 per cent. Dose—5 to 20 mins.

Tinctura Capsici Fortior 1 in 3 is prepared by macerating and percolating 10 ozs. capsicum fruit in No. 40 powder with 30 ozs. rectified spirit. Dose—1 to 3 minims.

Tinctura Carminativa is prepared by macerating 600 grs. bruised cardamom seeds in 15 ozs. rectified spirit for 7 days, and adding to the resulting tincture $1\frac{1}{4}$ ozs. stronger tincture of ginger and 100 minims each of oils of cinnamon, caraway, and clove, and making up with rectified spirit to 20 ozs. Dose—2 to 10 minims.

Tinctura Chloroformi Composita 1 in 10 is prepared by mixing 2 ozs. chloroform, 8 ozs. rectified spirit, and 10 ozs. tr. card. co. Dose—5 to 60 mins.

Tinctura Convallariæ 1 in 8 is prepared by macerating and percolating $2\frac{1}{2}$ ozs. lily of the valley flowers and stalks dried, in No. 20 powder, with 20 ozs. alcohol 60 per cent. Dose—5 to 20 minims.

Tinctura Coto 1 in 10 is prepared by macerating 2 ozs. bruised coto bark in 20 ozs. rectified spirit for 7 days. Dose—10 to 30 minims.

Tinctura Eucalypti 1 in 5 is prepared by macerating and percolating 4 ozs. eucalyptus leaves in No. 20 powder with 20 ozs. rectified spirit. Dose—15 minims to 2 drachms.

Tinctura Euonymi 1 in 5 is prepared by macerating and percolating 4 ozs. euonymus bark in No. 20 powder with 20 ozs. rectified spirit. Dose 10 to 40 minims.

Tinctura Euphorbiæ Piluliferæ 1 in 5 is prepared by macerating and percolating 4 ozs. euphorbia in No. 20 powder with 20 ozs., 60 per cent., alcohol. Dose—10 to 30 minims.

Tinctura Guaiaci 1 in 5 is prepared by dissolving 4 ozs. guaiacum resin in rectified spirit to produce 20 ozs. Dose— $\frac{1}{2}$ to 1 dr.

Tinctura Iodi Decolorata $12\frac{1}{2}$ grs. to 1 oz. is prepared by dissolving 250 grs. iodine in $5\frac{1}{2}$ ozs. rectified spirit, and adding 10 drs. strong solution

of ammonia. After decolorisation, to be diluted with rectified spirit q.s. to measure 20 ozs.

☞ Before dilution the preparation may be prescribed as *Tinctura Iodi Decolorata Fortior*.

Tinctura Lobeliæ 1 in 8 is prepared by macerating and percolating $2\frac{1}{2}$ ozs. lobelia in No. 40 powder with 60 per cent. alcohol to produce 20 ozs. Dose—10 to 30 mins.

Tinctura Phosphori Composita $\frac{1}{10}$ gr. in 1 dr. is prepared by dissolving 12 grs. phosphorus in $2\frac{1}{2}$ ozs. chloroform and adding $12\frac{1}{2}$ ozs. absolute alcohol. Dose—3 to 12 minims.

Tinctura Physostigmatis 1 in 5 is prepared by macerating and percolating 4 ozs. calabar bean in No. 40 powder with rectified spirit to produce 20 ozs. Dose—5 to 15 mins.

Tinctura Pulsatillæ 1 in 10 is prepared by macerating and percolating 2 ozs. *Anemone pulsatilla* with alcohol 60 per cent. to produce 20 ozs. Dose—1 to 5 or more minims.

Tinctura Valerianæ 1 in 8 is prepared by macerating and percolating $2\frac{1}{2}$ ozs. valerian rhizome with 60 per cent. alcohol to produce 20 ozs. Dose—1 to 2 drs.

Tinctura Veratri Viridis 1 in 5 is prepared by macerating and percolating 4 ozs. green hellebore rhizome in No. 40 powder with rectified spirit to produce 20 ozs. Dose—5 to 15 mins.

Tinctura Zingiberis Fortior 1 in 2 (Essence of Ginger) is prepared by percolating powdered ginger 10 ozs. with rectified spirit to produce 20 ozs. Dose—5 to 20 mins.

Unguentum Hydrargyri Mitius 1 in 3 is prepared by mixing 1 oz. mercurial ointment with 2 ozs. lard.

Unguentum Oleo-Resinæ Capsici 1 in $5\frac{1}{2}$ is prepared by adding 1 oz. oleo-resin of capsicum, to a melted mixture of $\frac{1}{2}$ oz. yellow wax and 4 ozs. benzoated lard. As a mild counter-irritant, this ointment will bear dilution from 3 to 6 times.

Vinum Aurantii Detannatum is prepared by macerating $\frac{1}{4}$ oz. gelatin (cut small) with 1 gallon orange wine for 14 days, and decanting.

Vinum Pepsinæ 2 grs. to 1 dr. is prepared by dissolving 320 grs. pepsin, 2 drs. hydrochloric acid, 1 oz. glycerin, in sherry, to produce 20 ozs. Dose—1 to 2 drs.

Vinum Xericum Detannatum is prepared by macerating $\frac{1}{4}$ oz. gelatin (cut small) in 1 gallon sherry for 14 days, and decanting.

INDEX

OF

POISONS AND THEIR ANTIDOTES.

(From the Author's "Dictionary of Treatment," page 768.)

POISONING.—In the treatment of poisoning, the first consideration in the great majority of cases will be to evacuate the contents of the stomach when this is possible. This may be accomplished by emetics or by the stomach-pump, or by tickling the fauces when these agents are not at hand. In poisoning by the strong mineral acids and all corrosive substances the stomach-pump is contra-indicated, but in the case of corrosive substances like carbolic acid this may be used cautiously if a soft tube be employed. Indeed, the soft India-rubber tube of the stomach-pump can scarcely do any harm except in the most destructive instances of poisoning by concentrated sulphuric or nitric acid, and the pump should always be fitted with such a tube in at least two sizes. When at hand the pump should be preferred to every other means of emptying the stomach, and except in the limited number of cases just mentioned, it may be used even when there is room for considerable doubt in the diagnosis of poisoning in patients found in insensible or comatose conditions. The coroner's court will justly censure the practitioner who has been in attendance upon a patient picked up in an insensible condition if the evidence afterwards produced proves that a narcotic poison had been swallowed, though when seen by the physician no such evidence had been forthcoming and the symptoms pointed to head injury, uræmia, or apoplexy. The cautious use of the pump with the rubber tube, when scientifically carried out, can in no way injure the patient's chances of recovery should the case ultimately turn out not to be one of poisoning; and as every minute's delay may be serious for the patient, and as there is thus short time for counsel and debate, he should be prepared to act accordingly and make his error upon the safe side.

The first time of using the stomach-pump is sure to be a bungling affair if the operator feels timorous or nervous. The tongue being depressed by the left index finger as the patient is seated in a chair, with the head well steadied by an assistant, and the gag in position, the tube is to be pushed steadily, boldly, and rapidly through the mouth, pharynx, and œsophagus till the stomach is reached. Though it is more difficult to pass the soft rubber tube, the confidence in its perfect harmlessness will be of great importance to the novice. He should not be deterred by the sound which may be produced by air passing through the tube as its extremity glides past the epiglottis; this ceases as the rubber is passed home into the stomach. During the pumping, by reversing the action of the levers, a little water may from time to time be sent into the stomach to clear the tube of any solid obstruction, and before withdrawing it finally, tepid water should be injected into the organ, and this should be pumped out again, the operation being

continued till the washings return clear. The antidote may be mixed with the water, and in many instances a quantity of this should be left in the stomach. In pumping opium or alcohol cases, after the washings return clear and free from odour, the stomach may be partially filled with strong infusion of tea or coffee.

The Syphon Tube may take the place of the stomach-pump in most cases.

30 grains of Sulphate of Zinc or 10 grains of Sulphate of Copper in a tumblerful of tepid water will prove efficient emetics; and Apomorphine, $\frac{1}{10}$ grain injected hypodermically, acts with great certainty and rapidity when the patient is unable to swallow. Notice should be taken of the fact that though patients may often take Apomorphine in doses of $\frac{1}{4}$ to $\frac{1}{2}$ grain by the mouth without experiencing nausea, this dose would probably prove fatal if given by the hypodermic method, owing to its rapid depressant effect upon the heart.

Mustard in dessert-spoonful doses, in copious quantities of tepid water, may be used when the above emetics are not at hand. Ipecacuanha and Antimony are too slow in their action to be depended upon.

The contents of the stomach when ejected (or when obtained afterwards upon opening the body) should be carefully preserved for further investigation. This is often overlooked in the exciting period of treatment.

The writer has several times successfully pumped and washed out the stomachs of infants and very young children with a soft India-rubber male catheter, attached to the nozzle of an ordinary large glass or metal syringe.

The following formula may be employed as a *general Antidote for any poison of unknown nature* :—

Calcined Magnesia	}	<i>Equal quantities.</i>
Powdered Wood Charcoal		
Hydrous Peroxide of Iron		

Half an ounce of each of these may be given in a tumblerful of water every half-hour till three doses be taken.

The following brief alphabetical list of poisons, and their antidotes and treatment, is taken from the 4th Edition of the Author's "Dictionary of Treatment," and may prove useful for reference in emergency :—

Acetanilid or Antifebrin—The stomach-pump or an emetic of Carbonate of Ammonia should be used, followed by Strychnine, $\frac{1}{25}$ grain hypodermically, and external warmth. Where cyanosis is marked, inhalations of Oxygen may be given, and free stimulation with Alcohol.

Acids, Mineral—The stomach-pump should *not* be used. Alkalies—Lime, Soap, Chalk, Potash, Soda, or Magnesia—moderately diluted with water, may be freely given. In the absence of these, plaster off a wall (softened by hot water), oils (Almond or Olive), and small doses of Morphine hypodermically should be administered; all food should be given by the rectum. At a later stage, when the danger of perforation has passed off, bland mucilaginous foods, like barley water, linseed tea, and white of eggs, may be freely given.

Acid, Prussic (or Hydrocyanic)—The stomach, if possible, should be emptied by the stomach-pump or by a rapid emetic ($\frac{1}{2}$ dr. Sulphate of Zinc); hypodermic injections of Atropine ($\frac{1}{60}$ gr.); 2 minims of the 1 in 100 Solution of Atropine may be given, and repeated in 30 minutes if necessary.

Ammonia, or Whiskey, inhalation of Oxygen, Ammonia, or Chlorine, cold and hot affusions alternately, and *artificial respiration*, are the best agents to resort to.

Freshly precipitated Oxide of Iron, followed by a solution of Carbonate of Potassium, is to some extent a chemical antidote, but *free stimulation* after the evacuation of the stomach must be alone relied upon.

Kobert's new method appears to give the best results. It consists in hypodermic injections at various points of 3 per cent. Peroxide of Hydrogen every 3 to 5 minutes, and washing out the stomach with 15 per cent. solution of the same drug. The rationale of the treatment consists in the change of the prussic acid into oxamide in the blood and stomach.

Aconite (and Hellebore or Veratrine)—The stomach-pump or emetics should be used; $\frac{1}{10}$ gr. Apomorphine hypodermically, or a table-spoonful of mustard in warm water, or $\frac{1}{2}$ to 1 dr. Sulphate of Zinc should be given as soon as possible. Stimulants—Whiskey and Ammonia hypodermically, with 20 to 30 minims of *Tincture of Digitalis* or 2 minims Liquor Atropinæ should be then administered. Strychnine may be given ($\frac{1}{20}$ gr.) by mouth, rectum, or hypodermically.

The patient should be kept horizontally on his back with his head lowered, and in a state of absolute rest, and sinapisms applied to the heart and extremities; and dry heat, friction, and artificial respiration kept up unceasingly. Murrell recommends inhalations of Nitrite of Amyl.

Alcohol—The stomach-pump should be promptly used, and the stomach filled through it with strong coffee, to which a little Ammonia should be added; or a hypodermic injection of 10 minims Apomorphine Solution may be given in the absence of the pump; sinapisms, cold affusion, Nitrite of Amyl inhalation, or Electricity may be tried, and in *desperate* cases, boiling water may be used to cause immediate vesication of the skin over the soles of the feet. The hypodermic injection of $\frac{1}{20}$ gr. Strychnine is of unquestionable value, and Mindererus Spirit in 2 oz. doses may be given. Warmth to the surface is essential.

Ammonia and Alkalies—The stomach-pump should *not* be used. Weak acids (Acetic preferable) may be given, largely diluted, and followed by draughts of Almond or Olive Oil or of melted butter, and demulcent drinks.

Tracheotomy may be required for the œdema of the glottis, and Morphine hypodermically for the shock.

Aniline—The stomach-pump should be used and free washing out of the organ accomplished, after which artificial respiration and Oxygen inhalations, and Strychnine injected hypodermically ($\frac{1}{20}$ gr.), and the treatment detailed under Acid Prussic may be tried.

Antimony (Tartar Emetic)—Stomach-pump or emetics are not generally required, as vomiting sets in soon. Tannin, strong tea, or Gallic Acid, or any diluted astringent tincture or infusion containing tannin may be freely given, followed up by the hypodermic or rectal administration of Alcohol, to which small doses of Digitalis or Strychnine may be added. White of egg, barley water, or linseed tea may be given freely, and the patient kept in the prone position.

Butter of Antimony—The treatment of poisoning by this preparation of Antimony should be the same as for Mineral Acids—viz., Magnesia, Soap Suds, Chalk, Potash, or Soda, followed by Oil and Milk.

Antipyrine—After stomach-pump, free stimulation by Alcohol, followed by hypodermics of Strychnine ($\frac{1}{20}$ gr.). External warmth and Oxygen inhalations where there is much cyanosis.

Arsenic—The stomach-pump or emetics, or 10 minims of Apomorphine injection, should be employed even when vomiting has already taken place. Freshly-prepared moist Peroxide of Iron (prepared by adding Soda or Ammonia to the Tincture of Iron, and filtering rapidly through muslin or cambric) or Dialysed Iron in ounce doses, diluted, or, in the absence of these, Magnesia freely, or Animal Charcoal, Olive Oil, or Lime Water, must be freely given; demulcent drinks and stimulants by mouth or rectum are also indicated. Large doses of Castor Oil are essential to clear out the intestinal tract and to prevent further absorption.

The following method of using the iron antidote is convenient:—3 oz. of the strong Liq. Ferri Perchloridi is poured into a pint measure, which is filled up with water; 1 oz. of Calcined Magnesia is then mixed with another pint of water; both solutions or mixtures are then to be thoroughly shaken together, and a dose of one table-spoonful should be given every 5 or 10 minutes.

Atropine and Belladonna—The stomach-pump or emetics, and afterwards the following are to be given:—Tannin or Tea, Charcoal, Morphine ($\frac{1}{2}$ grain) by subcutaneous injection, or Laudanum by the mouth, or Pilocarpine ($\frac{1}{3}$ grain) subcutaneously, followed by purgatives.

The poison being excreted by the kidneys, the bladder should be emptied by the catheter to prevent reabsorption. Eserine in small doses has been advocated as an antagonist, but pilocarpine is better. Free stimulation, counter-irritation, and artificial respiration may be necessary.

Cannabis Indica—The stomach-pump or emetics, especially Apomorphine hypodermically (10 minims of B.P. injection), are to be given, and the symptoms treated as they present themselves. It will generally be found necessary to both purge and stimulate.

Camphor—Stomach-pump or emetics, and copious draughts of water, with brisk Saline cathartics, and general counter-irritation, or cold and hot douches alternately, afford the best means of dealing with this poison.

Cantharides—Stomach-pump or emetics, mucilaginous drinks, or, in their absence, Oils, Chalk, a little Opium by the mouth, and a Morphine suppository by the rectum, should be used.

Carbolic Acid—The stomach-pump with its soft rubber tube should be used, after which the organ should be thoroughly washed out with pure Glycerin. Alkaline or Soluble Sulphates, as Epsom or Glauber's Salt, are antidotal, and Schobert gives Saccharated Solution of Lime if the poison is still in the stomach. Give oils, egg albumin, and warm mucilaginous drinks, with any soluble sulphate, and finally, freely stimulate, counter-irritate, and inject $\frac{1}{20}$ grain of Atropine. Though there is no known antidote, the writer—in a case where half a cupful of the strong acid was taken in a fit of drunkenness—after the contents of the stomach were evacuated, washed that organ out repeatedly with pure Glycerin, using half a gallon of it, the Glycerin dissolving the excess of acid out of the swollen mucous membrane, and the patient made a good recovery. He has since satisfied himself that this is the best treatment whenever the strong acid has been swallowed; it does not interfere with the administration of soluble sulphates.

Carbon Monoxide (Carbonic Oxide)—Water gas and coal gas owe their poisonous properties to the amount of this agent in their composition. Artificial respiration must be kept up after the removal of the patient from the poisoned atmosphere, and this must be continued for hours. Inhalation of Oxygen is to be used at the same time freely, and if the heart shows signs of failure, Strychnine may be given, and Faradisation of the phrenic nerves and rhythmic traction of the tongue should be resorted to. If all these fail, and the patient's case appears desperate, venesection should be resorted to; fresh, healthy blood may be transfused.

Chloral Hydrate—The stomach-pump or emetics, especially 10 minim injections of Apomorphine Solution, should be used, and these must be followed by injections of Strychnine ($\frac{1}{20}$ grain) or of Atropine ($\frac{1}{3}$ grain), Caffeine (5 grains), or free stimulation with Ammonia, Whiskey, or Ether, and Sinapisms. *Particularly external warmth*, Electricity, and artificial respiration; inhalation of Amyl Nitrite may be tried. The patient should be roused and prevented from sleeping, and, as death may occur from the diminution of the body heat, warmth is essential. A pint of strong, warm coffee into the rectum, as advised by Murrell, may save life.

Dougall pointed out that Potash is an antidote to chloral, $\frac{1}{2}$ dr. completely decomposing 80 grs. of chloral. He recommends drachm doses of B.P. Liquor Potassæ, largely diluted, every hour for several doses.

Chlorine, when inhaled, must be treated by inhalations of Ammonia or Sulphuretted Hydrogen. If the poison has been swallowed it should be neutralised by large quantities of Albumin and mucilaginous drinks.

Chloroform—When symptoms of an alarming interference with the breathing or circulation come on during anæsthesia, the tongue should be drawn forward, artificial respiration, cold affusion, free ventilation by a current of air, turning over the patient upon his left side, or inversion of the body, may be tried. For the König-Maas and Laborde methods see further on.

Hypodermically—Whiskey, Ammonia, Strychnine, or Digitalis, or inhalation of Nitrite of Amyl, may be given. Strychnine is unquestionably the best of these, and may be given hypodermically in one dose of 5 to 10 minims B.P. liquor. Galvanism is doubtful. If the chloroform has been swallowed use the pump, or give 10 minims of Apomorphine Solution, and proceed as if inhaled.

The following practical rules are appended to the report of the Hyderabad Commission, and the reporters state "that the Commission has no doubt whatever that, if these rules be followed, chloroform may be given in any case requiring an operation with perfect ease and absolute safety, so as to do good without the risk of evil":—

1. The recumbent position on the back and absolute freedom of respiration are essential.
2. If during an operation the recumbent position on the back cannot, from any cause, be maintained during chloroform administration, the utmost attention to the respiration is necessary to prevent asphyxia or an overdose. If there is any doubt whatever about the state of respiration, the patient should be at once restored to the recumbent position on the back.
3. To ensure absolute freedom of respiration, tight clothing of every kind, either on the neck, chest, or abdomen, is to be strictly avoided; and no assistants or by-standers should be allowed to exert any pressure on any part of the patient's thorax or abdomen, even though the patient be

struggling violently. If struggling does occur, it is always possible to hold the patient down by pressure on the shoulders, pelvis, or legs without doing anything which can by any possibility interfere with the free movements of respiration.

4. An apparatus is not essential, and ought not to be used, as, being made to fit the face, it must tend to produce a certain amount of asphyxia. Moreover, it is apt to take up part of the attention which is required elsewhere. In short, no matter how it is made, it introduces an element of danger into the administration. A convenient form of inhaler is an open cone or cap, with a little absorbent cotton inside at the apex.

5. At the commencement of the inhalation care should be taken, by not holding the cap too close over the mouth and nose, to avoid exciting struggling or holding the breath. If struggling or holding the breath do occur, great care is necessary to avoid an overdose during the deep inspirations which follow. When quiet breathing is ensured, as the patient begins to go over, there is no reason why the inhaler should not be applied close to the face, and all that is then necessary is to watch the cornea, and to see that respiration is not interfered with.

6. In children, crying ensures free admission of chloroform into the lung; but, as struggling and holding the breath can scarcely be avoided, and one or two whiffs of chloroform may be sufficient to produce complete insensibility, they should always be allowed to inhale a little fresh air during the first deep inspirations which follow. In any struggling persons, but especially in children, it is essential to remove the inhaler after the first or second deep inspiration, as enough chloroform may have been inhaled to produce deep anæsthesia, and this may only appear, or may deepen, after the chloroform is stopped. Struggling is best avoided in adults by making them blow out hard after each inspiration during the inhalation.

7. The patient is, as a rule, anæsthetised and ready for the operation to be commenced when unconscious winking is no longer produced by touching the surface of the eye with the tip of the finger. The anæsthetic should never, under any circumstances, be pushed till the respiration stops; but when once the cornea is insensitive, the patient should be kept gently under by occasional inhalations, and not be allowed to come out and renew the stage of struggling and resistance.

8. As a rule, no operation should be commenced until the patient is fully under the influence of the anæsthetic, so as to avoid all chance of death from surgical shock or fright.

9. The administrator should be guided as to the effect entirely by the respiration. His only object, while producing anæsthesia, is to see that the respiration is not interfered with.

10. If possible, the patient's chest and abdomen should be exposed during chloroform inhalation, so that the respiratory movements can be seen by the administrator. If anything interferes with the respiration in any way, however slightly, even if this occurs at the very commencement of the administration; if breath is held, or if there is stertor, the inhalation should be stopped until the breathing is natural again. This may sometimes create delay and inconvenience with inexperienced administrators, but experience will make any administrator so familiar with the respiratory functions under chloroform that he will in a short time know almost by intuition whether anything is going wrong, and be able to put it right without delay, before any danger arises.

11. If the breathing becomes embarrassed, the lower jaw should be pulled, or pushed from behind the angles, forward, so that the lower teeth protrude in front of the upper. This raises the epiglottis, and frees the larynx. At the same time, it is well to assist the respiration artificially until the embarrassment passes off.

12. If by any accident the respiration stops, artificial respiration should be commenced at once, while an assistant lowers the head and draws forward the tongue with catch-forceps, by Howard's method, assisted by compression and relaxation of the thoracic walls. Artificial respiration should be continued until there is no doubt whatever that natural respiration is completely re-established.

13. A small dose of Morphia may be injected subcutaneously before chloroform inhalation, as it helps to keep the patient in a state of anæsthesia in prolonged operations. There is nothing to show that Atropine does any good in connection with the administration of chloroform, and it may do a very great deal of harm.*

14. Alcohol may be given with advantage before operations under chloroform, provided it does not cause excitement, and merely has the effect of giving the patient confidence and steadying the circulation.

Several valuable additions have been recently made to our means of dealing with chloroform narcosis. The hypodermic injection of $\frac{1}{2}$ gr. Sparteine alone or with a little morphia, 15 to 30 minutes before anæsthesia, keeps up the blood pressure during the deepest narcosis, and certainly minimises, if it does not prevent, risk. (Strychnine may act in a similar way, and it is preferable to Sparteine if heart failure threatens.) Rosenberg maintains that the lethal action of chloroform is due to reflex irritation originating in the mucous membrane, and he therefore sprays the nose with Cocaine solution before anæsthesia by chloroform, and claims that he thus prevents the risk of cardiac failure. Where death has apparently taken place Liedham-Green has shown that restoration may be effected by the Konig-Maas method. This has succeeded when artificial respiration and all other methods have failed. It is performed by placing the ball of the thumb of the operator's right (open) hand upon the patient's chest between the apex beat region and the sternum, and pressing rapidly (120 per minute) the thoracic wall with considerable force, so as to cause direct pressure upon the cardiac muscle. Laborde's method of forcibly pulling forward the tongue and keeping up rhythmical traction upon it at the rate of 15 or 20 per minute, is a most valuable procedure, and has succeeded recently in many hopeless cases.

Alessandri has drawn attention to the danger of prolonged administration of chloroform to patients suffering from renal disease.

Hare draws attention to the importance of the posture of the patient's head when serious symptoms supervene during chloroform narcosis. If the head be not in the right position artificial respiration is impossible. He insists that the head *should be extended and simultaneously projected forward*. If this be done the tongue and epiglottis are raised, and the soft palate caused to permit free breathing by nose and mouth.

Cocaine—After the stomach-pump or emetics, fill the stomach with hot strong Coffee and a little Alcohol, and give $\frac{1}{10}$ gr. Strychnine.

Coal Gas.—See Carbon Monoxide.

* Embley has recently shown that death in chloroform poisoning is due to irritation of the vagus, and he suggests Atropine as a remedy.

Colchicum—Stomach-pump or emetics, mucilaginous drinks, Albumin, or strong Tea or Tannin, should be given, and these should be followed by a purgative, after which free stimulation may be required, and symptoms met as they arise.

Conium—The stomach-pump or emetics, Tannin, and Castor Oil should be used. Stimulate freely by Ammonia. Hypodermics of Strychnine or Atropine may be tried, and artificial respiration persevered with.

Copper Salts—The stomach-pump or emetics must be resorted to if free vomiting has not occurred; yellow Prussiate of Potassium, egg Albumin and Milk, which form insoluble Copper Salts, are to be given; mucilaginous drinks, and wheaten flour or water in which yolks of eggs are suspended, and the free use of Opium to allay irritation, are called for.

Corrosive Sublimate.—See Mercury.

Creosote.—The same treatment as for Carbolic Acid.

Croton Oil—The general treatment for irritant poisons may be used, viz.:—Emetics, or, if in the early stage, the gentle use of the stomach-pump, demulcent drinks, soothing enemata, and Opium. Free stimulation and counter-irritation may be necessary.

Cyanide of Potassium—Poisoning is to be treated as if Hydrocyanic Acid had been swallowed; and, if seen at once, give Solution of Ferri Sulph., and use the alternate hot and cold douche, whilst Atropine is given by hypodermic injection. Whilst the poison is in the stomach Permanganate of Potassium may be given. Antal has proved that Cobaltum Nitricum Oxydulatum has properties powerfully antidotal to the cyanides. A solution of this salt should be given by the mouth if the poison is in the stomach, and if absorption has taken place he injects from 3 drs. to 1 oz. of a half per cent. solution subcutaneously.

Digitalis—The stomach-pump or emetics, especially Sulphate of Zinc, $\frac{1}{2}$ drachm, or 10 minims of Apomorphine Solution hypodermically, Tannin, or animal charcoal, free stimulation, and the hypodermic injection of $\frac{1}{120}$ gr. Aconitine, and the free use of Opium, are required. Muscarin ($\frac{1}{3}$ gr.) is antagonistic, and Alcohol should be given. The patient should be kept absolutely quiet, and in the horizontal position.

Elaterium—Emetics or the stomach-pump must be used. Demulcent drinks and Opium are to be administered freely, and the general treatment of the symptoms of gastro-intestinal irritation is to be followed.

Eserine (or Calabar Bean)—Emetics or the pump, with Tannin or any Tannin-containing liquid, may be employed, but hypodermic injections of Atropine ($\frac{1}{30}$ gr.), till the pupils widely dilate, afford the best chance. Strychnine and Chloral have been recommended.

Artificial respiration should be assiduously tried, with friction and warmth externally.

Ether (Inhalation)—Pull forward the tongue, give free current of air, commence artificial respiration, and try the Konig-Maas method, and treat as if Chloroform poisoning.

Formalin—Ammonia is decidedly antidotal. Formaldehyde is changed into the comparatively harmless urotropine upon the addition of free ammonia. The best method to pursue in poisoning is to give small doses of ammonia largely diluted with water; or large quantities of Mindererus Spirit, *i.e.*, the liquor ammon. acetatis every half-hour.

Fungi (or Muscarin)—Emetics or the pump should be used, and Atropine given hypodermically ($\frac{1}{40}$ gr.), and repeated till the pupils dilate, or Digitalis, or Morphine, may be given. Free stimulation, sinapisms, and friction may be required.

The writer has had to treat a large charity school of children who had eaten fungi. Many were very bad, and about six of them appeared to be dying when first seen. Atropine appeared to act like magic, and all made a good recovery.

Gelsemium—The stomach-pump and emetics are to be used, and Bicarbonate of Potassium and Tannin freely given; warmth, free stimulation with Alcohol, electricity, and artificial respiration are to be kept up.

Hypodermics of Ammonia or Atropine, or Digitalis, are partially antagonistic. The best result will follow 3 minims of Atropine Solution.

Hydrocyanic (or Prussic) **Acid**—Antidote and treatment are described under Acid Prussic.

Hyoscyamus—Same as for Atropine.

Iodine—Emetics or the *cautious* use of the rubber tube of the stomach-pump should be employed, together with the free administration of starch, arrowroot, bread, boiled potatoes, or flour, lime water, and demulcent drinks.

Iodoform—Emetics or the stomach-pump, and large diluted doses of Bicarbonate of Soda, followed by free stimulation and a hot pack. Saline solution injected hypodermically in large doses is recommended by Kocher.

Laburnum—The stomach-pump, if possible, should be always used, even if vomiting has occurred, as portions of seeds, &c., may remain in the stomach. Free stimulation, and, in bad cases, hypodermic injection of Ammonia. Counter-irritation, friction, and the cold douche are necessary.

Lead Salts—The stomach-pump, or preferably, a large emetic of Sulphate of Zinc, which is also an antidote, should be given, and followed by milk, white of egg, diluted Sulphuric Acid, Epsom or Glauber's Salt, or Phosphate of Sodium, Sulphuretted Hydrogen, or Harrogate water. Demulcent drinks, with mild Opiates to allay pain and spasm, may be administered. (See also under Plumbism.)

Lime—Carbonic Acid—any Aërated water, as soda water or lemonade—is very useful; or weak Acetic Acid or Vinegar, freely diluted, and followed by Oil or demulcent drinks, may be swallowed.

Lobelia and Tobacco—Emetics or the pump should be employed, as should also Tannin, and free stimulation externally by sinapisms, friction, and dry heat; internally or hypodermically by Alcohol, Ammonia, and Ether, with Strychnine ($\frac{1}{40}$ gr.), and small doses of Opium. The patient must be kept strictly in the horizontal position.

Mercury (Corrosive Sublimate)—Emetics, or the very cautious use of the pump will be required. (The pump should not be used except in the very early stages of the poisoning.) Albumin, or Gluten (prepared by washing flour in a muslin bag), demulcent drinks, milk, and oil are to be given by the mouth, and Morphine and Alcohol subcutaneously.

Morphine.—See Opium.

Muscarin (or Mushrooms)—Same treatment as in poisoning by Fungi—viz., the subcutaneous administration of Atropine after the use of an emetic or the pump.

Nitric Acid.—See under Acids, Mineral.

Nitro-Benzole—The stomach-pump should be used, and a stream of warm water passed through it. Alcohol and fats must not be used—the main reliance being placed upon counter-irritation by Mustard, artificial respiration, and Galvanism, and measures useful in Prussic Acid poisoning.

Nux Vomica.—See Strychnine.

Opium (or Morphine)—The stomach-pump, or, in its absence, emetics (if capable of swallowing), must be resorted to, or $\frac{1}{10}$ gr. of Apomorphine injected hypodermically. The stomach should be washed out with tepid water, and filled with strong coffee or tea, or any infusion or liquid containing Tannin. Owing to the fact that the mucous membrane of the stomach continues to excrete the poison, it has been advocated that it is of the greatest importance in all severe cases that the stomach be repeatedly washed out at short intervals during the treatment.

Permanganate of Potash has been demonstrated by Moor to be a chemical antidote to morphine, weight for weight, and as it can do no harm it should be given immediately without waiting for vomiting (1 gr. in 2 ozs. water). He argues that it should be also given after the poison has passed out of the stomach as it is excreted again by the mucous membrane later on, and he advises that the stomach should be repeatedly washed out with the solution. Binet, as the result of much experimentation, has, however, proved that no excretion takes place except in infinitesimal quantity, and hence the repeated washings out are valueless. There cannot, however, be any doubt about the great value of washing out the stomach by a solution of the drug at first.

Caffeine, Atropine, or Strychnine hypodermically is to be administered. This latter should be repeated frequently as long as there are dangerous cardiac or respiratory symptoms; $\frac{1}{30}$ grain may be given every 2 or 3 hours. Flagellations, cold and hot affusions alternately, electricity, extensive sinapisms, or very hot water, to cause vesication in desperate cases, must be employed to rouse the patient, and when once roused he should never be allowed to fall asleep again, but should be kept continually on the move, though every care must be exercised lest this should be carried too far so as to induce exhaustion, as is, unfortunately, often done. Artificial respiration may be required. The dose of Atropine should not exceed $2\frac{1}{2}$ minims of the liquor, and should not be repeated. A larger dose only reinforces the action of the morphia.

Oxalic Acid—The pump or emetics must be used. Lime (lime water, putty of lime, or chalk) is the best antidote; one good dose of Castor Oil, counter-irritation, free stimulation, and the treatment for gastro-enteric inflammation should be followed.

Phosphorus—The pump or emetics will be necessary. Sulphate of Copper, 5 grains every 15 minutes, is both antidote and emetic. Permanganate of Potassium, 5 grs. in 1 oz. water, will act as an efficient antidote, or Peroxide of Hydrogen. French Oil of Turpentine, or any *old* Oil of Turpentine, purgatives, and demulcent drinks containing Magnesia and Albumin should be swallowed. Oils and butter should be avoided.

Pilocarpine—The stomach-pump or emetics will be required, together with the free administration of Tannin and the hypodermic use of its antagonist, Atropine, in $\frac{1}{40}$ to $\frac{1}{20}$ gr. doses.

Physostigma.—See under Eserine.

Potash, Caustic—Emetics must be administered. The pump should *not* be used. Weak Acids (Vegetable preferred, and largely diluted), Oils, and butter may be freely administered. The after-treatment will consist in rectal feeding, and, after the danger of perforation has passed away, the free use of barley water, linseed tea, and other demulcents.

Potassium Chlorate—The pump or emetics and profuse demulcent drinks and purgatives are indicated, along with hot blanket baths and the treatment for Acute Bright's Disease.

Silver Nitrate (or Lunar Caustic)—Large doses of common Salt or Sea Water should be swallowed. Emetics and the pump (India-rubber tube) should be used, and white of eggs injected into the stomach after the poison is removed. Yolk of egg, wheaten flour, or milk mixed with water should be freely administered.

Soda, Caustic—Acids and Oils will be required (as for Potash).

Stramonium—Emetics, Tannin, free stimulation, and hypodermic use of Morphine are the necessary treatment (same as for Atropine and Belladonna).

Strychnine—The pump or emetics, especially a hypodermic injection of $\frac{1}{10}$ gr. Apomorphine, must be given, followed by Charcoal or Tannin in large quantities. Tobacco by rectum (with great caution—not more than 20 grains at once), Bromide of Potassium in large doses (2 drs. to 2 ozs.), Chloral, Chloroform, Calabar Bean, Conium, Morphine, Ether, &c., are recommended. The writer has found by experience that poisonous doses of *Alcohol* afford the best treatment, given both by mouth and rectum. Artificial respiration may be tried. Chloroform inhalation may be kept up as long as the convulsions are severe. Permanganate of Potassium, if given immediately after a poisonous dose, would probably act as an antidote.

Sugar of Lead—Sulphate of Zinc, Albumin, &c. (See Lead.)

Sulphurets and Sulphuretted Hydrogen—Inhalation of air containing a small percentage of Chlorine in it, and the free administration of a very weak solution of Chlorinated Lime or Soda, constitute the necessary treatment.

Sulphuric Acid.—See under Acids, Mineral.

Tartar Emetic—Tannin, Green Tea, &c. (See Antimony.)

Tobacco—Emetics, Tannin, free stimulation, and hypodermic injection of Strychnine ($\frac{1}{10}$ grain) are indicated, and the recumbent position must be strictly maintained (as for Lobelia).

Veratrine—The pump or emetics must be used, followed by Alcohol, Opium, &c. (as for Aconite, which see).

Zinc Salts (chiefly the Chloride, as Burnett's Fluid)—The rubber tube of the stomach-pump should be used with caution, or emetics, especially Apomorphine ($\frac{1}{10}$ grain), may be injected hypodermically. Egg Albumin, Tea, Tannin, Milk, Alkalies or their Carbonates, demulcent drinks, and soothing enemata containing a little Laudanum, are to be administered.

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BY THE SAME AUTHOR.

CROWN OCTAVO, CLOTH, PP. 1,055. FOURTH EDITION. 16/-. 1902.

LONDON : HENRY RENSHAW, 356, STRAND.

A Dictionary of Treatment

OR

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Press Opinions.

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