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Materia Medica

For Nurses

By
JOHN E. GROFF, Ph.G.
APOTHECARY IN THE RHODE ISLAND HOSPITAL, PROFESSOR OF MATERIA MEDICA, BOTANY AND PHARMACOGNOSY IN THE RHODE ISLAND COLLEGE OF PHARMACY

THIRD EDITION REVISED, WITH AN APPENDIX GIVING LIST OF QUESTIONS FOR SELF-EXAMINATION

BASED UPON EIGHTH DECENNIAL REVISION OF THE U. S. PHARMACOPŒIA

PHILADELPHIA
P. BLAKISTON'S SON & CO.
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Preface to Third Edition.

THE publication of the eighth decennial revision of the United States Pharmacopœia in which many important changes in strength of preparations, etc., were made rendered a new edition of this book necessary. The author has endeavored to otherwise improve its usefulness and has added a series of questions for self examination.

JOHN E. GROFF, PH.G.

September 4, 1905.

Preface to Second Edition.

IN preparing the second edition of this work, it has been thought best to not only revise and rearrange, but to rewrite a large part of it.

As in the first edition, the subject is presented in an abridged form, but in a sufficiently comprehensive one to answer all the requirements of the nurse.

The arrangement of subjects has been quite changed and as the author believes, presented in a form much more suitable for the end in view.

The chapter on dosage immediately follows those on weights and measures, and is in turn followed by chapters upon pharmaceutical and chemical terms, the latter taking the place entirely of the chemical section in the first edition.

The vegetable drugs and the preparations of them and the chemicals, have all been placed under their respective therapeutical headings.

The chapter on poisons has been revised. A chapter on the newer remedies, and on the serums and other animal products has been added and the entire work brought up to date.

Providence, R. I.

JOHN E. GROFF, PH.G.

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Received

Materia Medica

For Nurses

of therapeutic terms. She must know something about the poisons, the symptoms produced by poisonous drugs and their antidotes.

The following pages have been arranged to enable the nurse to acquire this knowledge a little more easily than she could acquire it from the larger works upon the same subject. Its accomplishment requires close application and much memorizing. But as the profession demands women of a high order of intelligence, it is believed they will find no insurmountable difficulties in mastering the subject of Materia Medica as it is put forth in these pages.

CHAPTER II.

WEIGHTS AND MEASURES.

THERE are several systems of both liquid and solid measure, in use at the present day. It is a question of but five years before the French or metric system of weight and measure shall become the standard and only one in use. In the meantime, it is necessary to know both the old and the new and their relative values.

There are at present two systems in use for weighing medicines, viz. : the avoirdupois and the apothecaries weight.

The avoirdupois weight is used by all buyers and sellers.

The apothecaries weight is used solely in weighing drugs for mixing for medicinal use.

The unit of both systems is the grain, represented by the sign gr., which is the abbreviated word. The nurse, in common with all people, is familiar with the ounce, pound and fractional parts of the pound of the avoirdupois weight, and it needs no comment.

The apothecaries weight is not so familiar and will be considered first.

The first multiple above the grain is the scruple.

The scruple (℈) weighs twenty grains and the sign for it is an arbitrary one.

The dram (ʒ) weighs sixty grains.

The ounce (℥) weighs 480 grains.

The scruple, weighing 20 grains, is ⅓ the weight of the

dram and $\frac{1}{24}$ the weight of the ounce. The dram, weighing 60 grains, is $\frac{1}{8}$ the weight of the ounce.

The table therefore is:

20 gr. make one scruple (℈).

3 scruples make one dram (ʒ).

8 drams make one ounce (℥).

The Roman numerals are commonly used to designate the number of gr., ʒ or ℥ to be used, and they follow the signs, thus: gr.i, ℈ii, ʒiii, ℥iv.

The abbreviation f placed before the signs ʒ and ℥ indicate the *fluid* drams and *fluid* ounces are to be *measured*, not weighed.

Fluid measure:

The minim or standardized drop is the unit of the liquid measure, the sign being ♏.

Next higher comes the fluid dram (fʒ) of 60 minims.

Next the fluid ounce (f℥) of 8 fluid drams or 480 minims.

(Although the gill is not a part of this system, it is sometimes used and measures four fluid ounces.)

The pint, of 16 fluid ounces, is represented by the sign O, standing for octavus or $\frac{1}{8}$, in allusion to the fact that a pint is $\frac{1}{8}$ of a gallon.

The quart, measuring two pints or 32 fluid ounces, represented by the sign qt., the abbreviated Latin word quartuus meaning the quarter part of a gallon. The gallon, measuring four quarts or eight pints, or 128 fluid ounces. The sign cong., being the abbreviated Latin word congius, meaning gallon.

It should be borne in mind that drops and minims are not the same. Drops vary according to the shape and nature of the surface of the container from which they are dropped. A drop of water is smaller than a drop of molasses, and larger

than a drop of ether. A minim is *measured* and no matter what the liquid may be or the vessel from which it is poured, the size of the minim is the same.

To illustrate:

60 drops of water will measure . . . . . 60 ♏
50 drops of syrup of acacia will measure . . . . . 60 ♏
250 drops of chloroform will measure . . . . . 60 ♏

As a rule, where drops *must* be used, as in the absence of a minim measuring glass.

Aqueous fluids . . . . . 1 drop = 1 minim.
Alcoholic fluids . . . . . 2 " = 1 minim.
Chloroform or ether . . . . . 4 " = 1 minim.

Or, to put more sharply,

Aqueous fluids . . . . . 60 drops = 60 minims.
Alcoholic fluids . . . . . 120 " = 60 minims.
Chloroform, ether . . . . . 240 " = 60 minims.

Approximate Measures.

The commonly used household measures are:

One teaspoonful . . equals about f℥i.
One dessertspoonful . " " f℥ii.
One tablespoonful . . " " f℥iv.
One wine-glassful . . " " f℥ii.
One teacupful . . . " " f℥iv.
One tumblerful . . . " " f℥viii.

They must of necessity vary greatly and should not be used except under stress of circumstances. A good graduated glass measuring f℥ii and another measuring 120 ♏ should form a part of every nurse's equipment.

The use of the measuring glass: While measuring medicine,

the nurse should never allow herself to be disturbed, and her medicines should be carefully and accurately measured. The glass should always be carefully washed and wiped immediately after using.

On all properly made graduates, the lines marking the measurements of fluid drams and fluid ounces, run entirely around the glass. In using the glass, bring it to the level of the eye, and slowly pour in the fluid to be measured, until the surface of it is even with the line *all around* the glass. When you are about to measure a dose of medicine, look for your bottle, read its label and then reach for it. As you raise the glass to your eye, look at the label on the bottle again. Measure the medicine and as you return the bottle to its place, *again* read the label. Get into the habit of doing this and the chances of error will be greatly lessened. If in measuring a medicine you get too much in the glass, measure it over again. And never let a mistake remain uncorrected or unreported.

QUESTIONS TO WEIGHTS AND MEASURES.

What are the names of the weights used in the apothecary table?

If a dram of Dover's Powder is divided into 12 powders, how many grains will there be in each powder?

How many 10 ♏ doses in f℥ij?

Twelve powders, containing a scruple and a half of Sodium Bicarbonate in each powder, will require how many drams of Sod. Bicarb.?

How many teaspoonfuls in a tumblerful?

How many f℥ in 16 f℥?

How many tablespoonful doses in a six ounce mixture?

In four fluid ounces, how many teaspoonsfuls?

In 32 drams how many dessertspoonfuls?

What household measure would you use to measure f℥j? f℥ij?. .j?

CHAPTER III.

THE FRENCH OR METRIC SYSTEM OF WEIGHT AND MEASURE.

THE unit of this system is the forty-millionth part of the earth's polar circumference. It approaches very closely in length our common yard measure and is called the metre from *metron*, a Greek word meaning measure.

The metre is divided into fractional lengths of tenths, hundredths and thousandths.

The tenth of a metre is called the *deci*-metre; the prefix deci meaning $\frac{1}{10}$.

The hundredth of a metre is called the *centi*-metre; the prefix centi meaning $\frac{1}{100}$.

The thousandth of a metre is called the *milli*-metre; the prefix milli meaning $\frac{1}{1000}$.

If $\frac{1}{10}$ of a metre is one decimetre, then ten decimetres must make one metre.

One one-hundredth of a metre being one centimetre, then 100 centimetres must make one metre.

One one-thousandth of a metre being one millimetre, 1,000 millimetres must make one metre.

The terms expressive of the multiples of the metric system are: Deka, Hecto, Kilo and Myria.

Ten metres make one Dekametre; the prefix Deka meaning ten.

One hundred metres make one Hectometre; the prefix Hecto meaning one hundred.

One thousand metres make one Kilometre; the prefix Kilo meaning one thousand.

Ten thousand metres make one Myriametre; the prefix Myria meaning ten thousand.

It is seen that the measurements, both subdivisions and multiples decrease and increase by tens.

From the measure of length, the metre, all other measures of capacity, weight and surface are obtained.

The origin of the unit of liquid measure may be explained thus:

A hollow cube is constructed $\frac{1}{10}$ of a metre or one decimetre in all of its dimensions of length, breadth and depth. This vessel is the unit of liquid measure and is called the *cubic* decimetre or more commonly the litre.

This measure is about equivalent to one quart and is too large to be convenient in measuring medicines. While we do find use for pints, quarts and gallons in *preparing* medicines and will in the same way make use of litres; in practice, for measuring medicines we make use of the minim, the fluid dram and the fluid ounce. In a similar way we need a measure in the metric system, smaller than the litre. Therefore, in place of the cubic *deci*-metre or litre, we construct a hollow cube $\frac{1}{100}$ of a metre or one *centi*-metre, in all of its dimensions of length, breadth and depth and call it the cubic centi-metre, representing it by the abbreviated sign C. c.

The unit of weight is called the gram. Its origin may be thus explained. A cubic centimetre vessel, when filled with water weighs one gram. It is represented by the sign Gm.

To sum up the units of the several forms of measurement,

of length, capacity and weight, we have the metre, the cubic-centimetre and the gram. The metre being the measure of length; the cubic centimetre the measure for liquids and the gram the measure of weight.

The prefixes used in signifying the subdivisions and multiples of the measures of capacity and weight are just the same as those used in the measure of length. We say milli-metre, centi-metre, deci-metre, deka-metre, hecto-metre and kilo-metre. So we say milli-*litre*, deka-*litre*, centi-*gram*, hecto-*gram*, etc.

The number of prefixes is rather confusing to beginners. Fortunately they are not all in common use. Officially, that is in the United States Pharmacopœia, the terms gram and milligram and the term cubic centimetre are the only ones used and will be the only ones used throughout this work. The following diagram may serve to show how the figures are placed, relatively to the terms used and *also* how they *may* be and how they usually *are* read:

Myria- = 10,000	Kilo- = 1,000	Hecto- = 100	Deka- = 10	Gram	deci- = $\frac{1}{10}$	centi- = $\frac{1}{100}$	milli- = $\frac{1}{1000}$
M	K	H	D	Gm	d	c	m
×	×	×	×		×	×	
8	7	6	5	4	3	2	1

These figures may be read as 87.654 gm. and 321 milligrams. All the other prefixes being discarded as indicated by the × marks. The proper method of writing in the metric system, is that of the Pharmacopœia, that being our standard work. In

our old system the signs precede the figures and the figures are the Roman numerals. Thus:

Magnesium sulphate, - - - - - ℥i.
Spirit of peppermint, - - - - - ♏. ×.
Water, - - - - - - - fℨii.

In the metric system the figures precede the sign and the figures are the commonly used Arabic numerals. Thus:

Magnesium sulphate, - - - - - 30 Gm.
Spirit of peppermint. - - - - - 0.600 C.c.
Water, - - - - - - - - 30 C.c.

As the metric system of weight and measure will eventually come into universal use and as there are certain points at which the new and the old will come in contact, it becomes necessary to know their approximate relative values. They are as follows:

500 C.c. in place of one pint.
500 Gm. " " " one pound.
30 C.c. " " " one fluid ounce.
30 Gm. " " " one ounce weight.
4 C.c. " " " one fluid dram.
4 Gm. " " " one dram weight.
1 C.c. " " " 15 minims.
1 Gm. " " " 15 grains.

Reversing:

Oi in place of 500 C.c.
1 lb " " " 500 Gm.
fℨi " " " 30 C.c.
℥i " " " 30 Gm.
fℨi " " " 4 C.c.
ℨi " " " 4 Gm.
♏xv " " " 1 C.c.
Grs. xv " " " 1 Gm.

The approximates to the household measures:

f ʒ i	or one	teaspoonful,	or	4 C.c.
f ʒ ii	" "	dessertspoonful,	or	8 C.c.
f ʒ iv	" "	tablespoonful,	or	16 C.c.
f ℥ ii	" "	wine-glassful,	or	60 C.c.
f ℥ iv	" "	cupful,	or	120 C.c.
f ʒ viii	" "	tumblerful,	or	240 C.c.

The approximate equivalents of the fractional parts of the grain, need give no trouble if the equivalent of one grain be memorized.

One grain is about 0.065 Gm. ($\frac{65}{1000}$ of a gram or 65 *milli*-grams), or, 0.065 Gm. is about 1 grain.

Sixty-five milligrams being one grain, then half a grain will be half that number, or in round numbers 33 milligrams, 0.033 Gm.

¼ gr.	is ¼ of	0.065 Gm.	or 0.016 Gm.
⅛ gr.	" ⅛ "	0.065 Gm.	" 0.008 Gm.
$\frac{1}{80}$ gr.	" $\frac{1}{80}$ "	0.065 Gm.	" 0.002 Gm.
$\frac{1}{60}$ gr.	" $\frac{1}{60}$ "	0.065 Gm.	" 0.001 Gm.
⅓ gr.	" ⅓ "	0.065 Gm.	" 0.020 Gm.

Reversing:

0.001 Gm.	is $\frac{1}{65}$ of	0.065 Gm.	and therefore	$\frac{1}{65}$ gr.
0.012 Gm.	" $\frac{1}{5}$ "	0.065 Gm.	" "	$\frac{1}{5}$ gr.
0.020 Gm.	" ⅓ "	0.065 Gm.	" "	⅓ gr.

Familiarity with and the ability to make use of, the metric system, comes, with the majority of people at least, only from enforced practice. And when physicians begin to write their prescriptions in that system and bottles and other packages are labelled so, it will be mastered because it *must* be.

CHAPTER IV.

DOSAGE.

THE medicinal dose of drugs is learned by experience. Experiences of course vary. The doses of drugs being founded on experience, also vary. The best that can be done, with a dose table, is to strike the average. Starting off with a dose as given in a table, it is decreased or increased as circumstances indicate.

The plan arranged for the first edition of this work has been found practical and easily learned.

The vegetable drugs are placed in three classes. Those in the first class are given in doses of from ½ to 2 grains or from 0.030 to 0.130 Gm.

They are: **Aconite, cantharides, digitalis, opium, physostigma** and **strophanthus.**

Those of the second class are given in doses of from 1 to 3 grains, or from 0.065 to 0.195 Gm.

They are: **Aloes, belladonna, camboge, cannabis indica, capsicum, colocynth, conium, gelsemium, hyoscyamus, ipecac, lobelia, musk, nux vomica, pulsatilla, savin, squill, stramonium** and **veratrum.**

All the rest of the vegetable drugs are given in doses of from 5 to 30 gr. or from 0.325 to 2 Gm.

They include such familiar drugs as **gentian, cinchona, cardamom, columbo, benzoin, cinnamon, guaiacum, hops, myrrh, rhubarb, senna, valerian.**

If the question were simply as to the dose of the crude drug, this would be the end of the dose subject, so far as the vegetable drugs are concerned.

But they are very little used. They are made into tinctures, syrups, fluid extracts, solid extracts and other forms more suitable for the human stomach.

And that we may not give these preparations blindly, it becomes necessary to know their relative drug value. That is, how much drug is represented by a minim or a teaspoonful of any tincture, fluid extract or what not.

That this may be readily learned two rules have been devised. One which gives the *exact* quantity of drug in each minim of any preparation of it, and including the preparations of poisonous or very energetic drugs. The other which gives the *approximate* number of grains of drug in each fluid ounce of any preparation of it and from that, to the quantity in a teaspoonful, is a simple matter.

Rule for finding the quantity of drug in each minim of any preparation, the percentage strength of which is known. Any preparation which is ½ of 1, or 1, or 5, or 10, (or any other percentage strength), contains ½ or 1, or 5, or 10, (or some other number of grains corresponding to the percentage strength), to each one hundred minims. *One* minim then will contain $\frac{1}{100}$ of that quantity.

For example: What is the dose of tincture of aconite? It is a 10 per cent. tincture. That is, in every 10 minims of it there are 10 grains of aconite. In one minim there is $\frac{1}{100}$ of 10 grains, or $\frac{1}{10}$ of a grain. Ten minims will contain 1 grain. If the dose of the drug is from ½ to 2 grains, the corresponding dose of the tincture will be from 5 to 20 minims.

Tincture of digitalis is a 10 per cent. tincture. Every 100 minims of it contain 10 grains of digitalis. *One* minim, $\frac{1}{100}$ of that quantity or $\frac{1}{10}$ of a grain—10 minims therefore will contain 1 grain. The dose will be from 5 to 20 minims, corresponding to from ½ to 2 grains.

There is another class of preparations of non-poisonous drugs, which are given in teaspoonful or even larger doses. For these another and only approximate rule is necessary.

To find the number of grains of drug in f℥i of a preparation, multiply its percentage strength by 5. The product will be the *approximate* number of grains to the ounce.

Paregoric is $\frac{4}{10}$ of 1 per cent. Five times $\frac{4}{10}$ are $\frac{20}{10}$ or 2 grains. A teaspoonful will contain ⅛ of 2 grains of opium or $\frac{2}{8}$ or ¼. The dose then is from 1 to 8 teaspoonfuls, corresponding to from ¼ to 2 grains of opium.

In this way, the correct dose of all the preparations may be figured out.

For such purposes use the following table:

Name of Tincture	Strength.
Paregoric	$\frac{4}{10}$ of 1 per cent.
Tr. nux vomica	10 "
Tr. strophanthus	10 "
Tinct. opium	10 "
Deodorized tinct. opium	10 "
Tinct. belladonna Tinct. hyoscyamus Tinct. digitalis Tinct. cannabis indica } āā	10 "
Tinct. aconite	10 "
All fluid extracts	100 "

All solid extracts may be considered four times the strength of the drug—and the doses ¼ that of the drug itself.

All tinctures of non-poisonous drugs are 20 per cent. in strength except tincture of orange peel and tincture of lemon peel, which are 50 per cent. respectively.

All tinctures of poisonous drugs are 10 per cent. in strength.

CHAPTER V.

DEFINITIONS OF PHARMACEUTICAL TERMS.

VEGETABLE drugs, in the form of leaves, barks, woods, seeds and roots, are not fit for administration to the sick. They consist in great part of woody fibre which is indigestible in the human stomach, but a small portion of their constituents being soluble and active as medicines. They are therefore converted into the various preparations, with which we are familiar, to render them more acceptable to the palate and stomach both.

Many of the *chemicals* also, must first be brought to the form of solution before they can be acceptably administered to a sick person.

This being the case it becomes necessary to know what these preparations are and why there is such a variety of them.

Abstracts are powdered extracts, mixed with sugar of milk in such proportions, that when finished, they are just double the strength of the drug from which they are made.

Aceta or vinegars, are solutions of the soluble medicinal portions of vegetable drugs in vinegar or acetic acid.

Aquæ or waters are solutions of volatile substances, or substances which evaporate at ordinary temperatures, in water.*

* A vegetable drug often contains more than one active principle. One may be soluble in water, another requiring alcohol or some other liquid—while others may require a different liquid to preserve them. Hence the different classes of preparations.

Cataplasma and poultices are the same—various medicines mixed into paste form with flaxseed meal or bread crumbs and hot water, for external application.

Ceratæ, or cerates are mixtures of fats and wax with oils; the wax being in such proportions, that the cerate when applied to the surface of the body, will not melt at the body temperature.

Chartæ or papers are sheets of porous paper, either soaked in a solution of a drug and dried or else covered with a coating of the drug and are intended for external application.

Confectiones or confections are pastes or jelly like compounds of drugs and spices with sugar and honey. The idea being to render nauseating medicines more palatable.

Decocta or decoctions are solutions made by boiling vegetable drugs with water and straining.

Elixiria are sweetened and spiced, dilute-alcoholic solutions of bitter or otherwise disagreeable drugs.

Emplastra or plasters are medicinal substances mixed with some adhesive material and spread upon kid or cloth to apply to the surface of the body. Sometimes they are used for mechanical purposes as in bringing together the edges of a wound.

Extracta or solid extracts are fluid extracts evaporated down to such a consistence that they can be readily rolled into permanent pill form.

Extracta fluida or fluid extracts are alcoholic or dilute-alcoholic solutions of the medicinal portion of vegetable drugs; one minim of the fluid extract being the equivalent of one grain of the drug.

Glycerita or glycerites are solutions of medicinal substances in glycerine.

Infusa or infusions are solutions made by steeping vegetable

drugs in either hot or cold water—volatile drugs requiring cold water—others, hot water.

Pilulæ or pills are globular or oval bodies, sufficiently hard to hold their form and yet be soluble in the warm fluids of the stomach and designed to present medicines in a slow acting form.

Suppositoriæ or suppositories are suitably shaped masses of cocoa butter, mixed with medicinal material. Of a conical form for rectal use; pencil form for urethral use and globular form for vaginal use.

Tabellæ or tablets are disc shaped bodies, usually consisting of sugar of milk with which the medicine is mixed and then stamped into shape. The prime object being to give appreciable size to an otherwise inappreciably small dose.

Tincturæ or tinctures are alcoholic or dilute-alcoholic solutions of the soluble medicinal parts of vegetable drugs, of various strength.

Triturates are mixtures of medicines and sugar of milk, containing 10 per cent. of the medicinal material. In powder form.

Unguentæ or ointments are mixtures of fats, wax and oils of such a consistence, that when applied to the skin, they melt and are absorbed.

Vinæ or wines are preparations of the same nature as tinctures, but made with sherry instead of alcohol.

Syrupi or syrups are sweetened aqueous solutions of medicinal substances.

Mucilagines or mucilages are aqueous solutions of gums or substances of a gummy nature.

Misturæ or mixtures are aqueous preparations of insoluble substances, held in suspension by the aid of some viscid sub-

stance like gum or sugar, so that they can be poured from the bottle before the substance has time to settle.

Emulsiones or emulsions are mixtures of oils and water, held together by gum arabic, yolk of egg or other suitable substance.

Spiritus or spirits or essences, are solutions of volatile substances in alcohol.

Linimenta or liniments are mixtures of aromatic and anodyne substances with alcohol, oil or other suitable vehicle, for external application.

DEFINITIONS OF CHEMICAL TERMS.

"**Chemistry** is that branch of science which treats of the composition of substances and the changes which they undergo." *

An Element is any substance in nature, which cannot be decomposed by any of the forces which man can bring to bear upon it.

A mechanical mixture is one in which the ingredients have not undergone any change and can be separated again in their original form.

A chemical compound is one in which the ingredients have been united by chemical force, by which they have become hidden from the common senses of sight, taste and smell, and formed into a new substance, having altogether different properties from the substances of which it is composed. Sugar for example, the properties of which are familiar to all, consists of 12 parts of carbon, 22 of hydrogen gas and 11 of oxygen gas. The ingredients however cannot be discovered by sight.

* Webster.

A chemical symbol is a short hand sign for the name of an element. As O. for oxygen, Fe for ferrum or iron.

A formula is also a short hand sign for the name of a compound made up of several elements—C_{12} H_{22} O_{11} is the formula for sugar and signifies that it is composed of 12 parts carbon, 22 of hydrogen and 11 of oxygen. They are convenient as any other system of short hand is, viz., in quickly and shortly expressing chemical reactions.

An equatiton is a short hand account of a chemical reaction. For example, $Ca\ O + H_2\ O = Ca\ (O\ H)_2$, shortly expresses the change which takes place when lime and water are brought together to form lime water.

Salts.—Chemical compounds are spoken of as salts. Very likely because in the beginning of the science of chemistry a number of the salts then known, resembled common salt.

Acids.—The salts or compounds of hydrogen have a sharp sour taste and in allusion to that fact were called acids from the Latin word acer, meaning sharp.

Alkalies.—Potassium, sodium, ammonium and lithium are known as the alkali metals and the carbonates and hydrates of them are called alkalies.

Alkaloids are active principles from both the vegetable and animal kingdom. They are mostly poisonous or very energetic in their action. Alkaloids end in ine, as morph*ine*.

Glucosides are also active principles from vegetable drugs. Glucosides end in in, as digital*in*.

CHAPTER VI.

CLASSIFICATION AND DESCRIPTION OF DRUGS AND CHEMICALS.

ALTERATIVES.

They are:

Cod liver oil,	Arsenic,
Ichthyol,	Colchicum,
Iodoform,	Iodine,
Mercury,	Iodides of potassium and sodium,
Taraxacum,	Merzereum.

Mercury, or hydrargyrum or quicksilver, is a heavy, fluid metal of a dull silvery appearance. It is used in its metallic state in the forms of blue ointment, blue mass and gray powder.

Mercury ointment or unguentum hydrargyri is a mixture of mercury, lard and suet.

Use.—It is used in some skin affections, in some forms of syphilis and for enlarged glands. It is applied externally.

It is also used to destroy parasites.

Massa hydrargyri or blue mass is a mixture of mercury with suitable material for bringing it into a paste like form, suitable for rolling into pills. It is one-third mercury, and may be given in doses of three to twenty grains.

Hydrargyrum cum Creta or mercury with chalk, is a mixture of mercury, chalk and honey, worked into powder form. This also is ⅓ metallic mercury.

Physiological action.—The first evidence of the presence of mercury in the system, is tenderness about the teeth, and fœtid breath with spongy gums. If its use is continued, the skin of the neck and chest becomes affected and salivation follows. The nervous system becomes affected, with tremors and paralysis.

Uses.—It is used in syphilis, as an antiseptic and germicide, as a purge and as an antiphlogistic. For the first, second and last purposes the salts of mercury are used. But as a purge, the metal in the form of blue mass and gray powder are used.

Dose.—The mass in pill form is given in doses or from 3 to 20 grains. The gray powder in the same quantity, with a little water.

Potassium iodide. This salt occurs in white cubical crystals or as a white granular powder, easily dissolved in water and usually given in solution. It is a compound of the two substances iodine and potassium.

Physiological action.—Small doses raise the blood pressure. Large doses lower it. It lowers arterial pressure. Its action may be likened to that of iodine itself, but it is not as irritant and more suitable for internal use.

Uses.—It is used in syphilis, in metallic poisoning, as an antirheumatic, in asthma, bronchitis, enlarged glands, and for many of the purposes for which iodine is used.

Dose.—Ordinarily it is used in doses of from 1 to 10 grains or 0.065 to 0.650 Gm. In syphilitic diseases it is borne in doses as high as 200 grains a day.

Sodium iodide, occurring as a white granular powder, is used for the same purposes and in the same doses as potassium iodide. But is less irritant to the stomach and less depressant to the system.

Iodine—or Iodum. Iodine occurs in the form of shining, black scales, which give off violet colored vapors. It is obtained from sea weeds. It has a penetrating, irritant odor and a burning taste. It is but slightly soluble in water. Freely soluble in alcohol.

Physiological action.—Its action as an alterative is not known. Externally used, it stains the skin yellow and if freely applied, black. By continued application or by the application of a strong solution, it causes blistering. It is powerfully irritating to mucous membranes.

Characteristic effects of iodine and the iodides, called "iodism." The first sign of it is usually a metallic taste. A sense of heat in the stomach, tenderness in the mouth with increased flow of saliva and coryza. Headache and irritation of the skin follow its excessive or prolonged use.

Uses.—In scrofulous troubles, in bone diseases, in anæmia, in goitre, in enlarged glands and externally as a counter-irritant for many purposes, such as pleurisy, irritative coughs, chronic bronchitis, rheumatism of the joints, lupus, etc.

Iodine is not much used internally, the *iodides* being preferred as less irritant. But it is given sometimes in the form of tincture, in doses of from 1 to 5 minims or 0.065 to 0.325 C.c., largely diluted.

Preparations.—**Tincture of Iodine.** A black tincture having the odor of iodine, each minim containing $\frac{1}{14}$ of a grain. **Compound tincture** or Lugol's solution, a mixture of iodine and potassium iodide, each minim containing $\frac{1}{20}$ grain of iodine and $\frac{1}{10}$ grain potassium iodide and **Ointment of Iodine** a 4 per cent. mixture of iodine with lard.

Iodoform occurs as fine yellow crystals or as an impalpable yellow powder, with a characteristic, somewhat aromatic odor.

It dissolves in alcohol, ether and chloroform, and in oils. It is insoluble in and will not mix well with water, without first being mixed with soapsuds or glycerin. It is a compound of iodine.

Physiological action.—It acts as an anæsthetic upon mucous surfaces, and produces "alterative" changes in those parts with which it comes in contact.

It is capable of producing poisonous effects through absorption.

Uses.—It is used chiefly as an antiseptic, in surgical dressings. It is *not* a germicide.

Preparations.—Ointment of iodoform is a 10 per cent. mixture of iodoform and lard.

Iodoform Gauze. Iodoform is first mixed with glycerine enough to form a smooth, cream-like liquid and then with as much water as the gauze will hold. After sterilizing the gauze, it is kneaded with the iodoform mixture, until it is all absorbed and evenly distributed.

Arsenic or Arsenous Acid.

Acidum arsenosum. Arsenic itself is a metal and is never employed as a medicine. The acid is the compound most frequently used, occurring as a fine white powder.

In small doses, arsenic acts as a nervous stimulant and excitant.

It acts also as a heart depressant, decreasing the force and frequency of the pulse. It stimulates respiration.

Use.—It is used in chorea, in malarial anæmia, acting in malaria as a prophylactic.

Preparations.—Solution of arsenous acid, Fowler's Solution of Potassium Arsenite, Donovan's Solution of Arsenic and Mercuric Iodide and Solution of Sodium Arsenate. All these solu-

tions are of the same strength, viz. : 1 per cent., each minim representing $\frac{1}{100}$ of a grain of arsenic.

Dose.—The dose of the acid is $\frac{1}{10}$ of a grain—5 minims of either of the solutions being equivalent to that quantity.

Cod liver oil.—Oleum morrhuæ; sometimes called oleum jecoris ascelli, is obtained from the fresh livers of the common codfish. The paler, straw-colored oils are more popular, because of their comparative freedom from taste and odor. But the dark colored oils are undoubtedly more active.

Physiological Action.—Cod liver oil depends upon a number of substances for its action. Iodine is an important constituent in it and produces definite alterative effects. As it passes through animal membranes, it is easily absorbed. It maintains the body temperature and causes an increase of fat. It increases the number of red corpuscles. Besides iodine it contains phosphorous and bromine, all of which aid in its general beneficial effects.

Uses.—It is used in the pre-tubercular stage of phthisis—acting as a food. It is used in chronic rheumatism, in enlarged glands, in syphilis and in rickets.

Dose.—From a teaspoonful to a tablespoonful or more. It may be taken clear, in the form of emulsion, with thick malt extract and in numerous other vehicles. In the form, predigested with pancreatin it has been found very acceptable. And in this form it may be given by rectum.

Colchicum.—The corm, a kind of root, and the seeds are the parts of the plant used.

Physiological Action.—Applied locally to the skin, it acts as an irritant. In medicinal doses, it increases the flow of bile, often causing vomiting of biliary matter, and sometimes purging.

Use.—It is used in gout and chronic rheumatism.

Dose.—The dose of the drug is from 1 to 10 grains, or 0.065 to 0.650 Gm.

Preparations.—Wine of Colchicum Seed, 15 per cent. Dose.—5 to 60 minims.

Wine of Colchicum Root, 45 per cent. Dose.—2 to 20 minims.

There are also the solid Extract of the Root, dose ¼ to 2 grains, the Fluid Extract of the Root, dose 1 to 10 ♏, the Tincture of the Seed, dose 5 to 60 ♏, and the Fluid Extract of the Seed, dose 1 to 10 ♏.

Active Principle.—The active principle of Colchicum is the alkaloid Colchicine. The dose of it from $\frac{1}{100}$ to $\frac{1}{50}$ grain, or 0.00065 to 0.00130 Gm.

Ichthyol.—This is not an official drug, although extensively used by physicians. It is a black liquid of the consistence of molasses, which on exposure to the air loses weight and gradually becomes reduced to a brittle solid. It is formed by chemical treatment of an oil, obtained by distilling the fossil fish deposits found in the Tyrol Mountains. It contains a large percentage of sulphur. It is soluble in water. It has an odor remotely suggesting sulphur and fish brine, quite characteristic.

Use.—It is remarkable for its therapeutic value in a great variety of disorders. It is used externally for rheumatism, in skin diseases, for frost bites, chilblains and burns. Also for enlarged glands.

When used internally, it is given in doses of from 1 to 10 grains or 0.065 to 0.650 Gm., either in pill form or in capsules.

Taraxacum—Dandelion.—The root of the common plant of that name.

Use.—As a "spring medicine." For torpid liver and the form of dyspepsia resulting from it.

Preparations.—The solid extract from the fresh root, gathered in autumn, is the common form. Dose.—5 to 30 grains or 0.325 to 2 Gm. The dose of the Fluid Extract is from f℥i. to f℥iv. or from 4 to 16 C. c.

Mezereum is a bark. It is said to possess alterative power. The only official use made of it, is as an ingredient in the decoction of sarsaparilla and in the compound fluid extract of the same drug, with which it exerts such general alterative effect as it may possess. Externally applied, it acts as a counter-irritant and enters into Compound Mustard Liniment for that purpose.

CHAPTER VII.

ANÆSTHETICS.

Ether,	**Nitrous Oxide Gas,**
Chloroform,	**Cocaine,**
Bromide of Ethyl,	**Chloride of Ethyl,**
Bromoform,	**Eucaine,**
Carbolic Acid,	**Antipyrin.**
Menthol,	

ETHER.—Sometimes known as stronger ether. This substance is obtained by treating alcohol with sulphuric acid. It is a colorless, very volatile, inflammable liquid, with a peculiar odor and a burning taste. *Its vapor is heavier than air*, and if this is borne in mind, *it may be safely used in a room where there are fire lights if the lights are high.* Pure ether is 96 per cent. ether with 4 per cent. alcohol.

Physiological Action.—Its action on human beings is rapid, but temporary; when applied to the skin as a vapor, it causes intense cold by its rapid evaporation, causing numbness in the part to which it is applied.

It is irritating to the mucous membranes. It reddens the face. Under its action, the breathing is generally full and deep and the pulse rapid and strong. Violent struggling occurs, followed soon by complete anæsthesia.

It acts as a heart stimulant, increasing the rate and force of the pulse and increases arterial pressure.

In excessive doses it causes respiratory failure and depression of the heart. It lowers the bodily temperature.

Since Ether is not wholly devoid of all dangerous effects, its administration should never be attempted except by one well instructed in its dangers.

Use.—It is used almost exclusively as an anæsthetic by inhalation.

It is used as a local anæsthetic by spraying the part, until it becomes insensible to pain.

It is sometimes used internally in colic and flatulency. It may be given with cold water or in capsules in doses of from 30 ♏ to f℥iv. or from 2 to 16 C.c.

Nitrous Oxide Gas (Nitrogen Monoxide or Laughing Gas).—It generally reaches us in steel cylinders of convenient size and shape for easily carrying and handling at the bedside.

Physiological Action.—When taken in long, deep inspirations, the face becomes flushed, then pale, the muscles of the jaw relaxing, when anæsthesia is complete. When pure, it is devoid of irritant properties and may be used when ether or chloroform may not. It rarely produces any disagreeable after-effects. It is largely used by dentists in extracting teeth.

Chloroform—Chloroformum.—It is a clear, colorless liquid with a hot, sweet taste and a sweetish odor. It is very volatile. It is prepared from alcohol by treatment with chlorinated lime.

Physiological Action.—Applied locally, on the skin, it causes tingling and burning and if confined, as under a watch-glass or a close bandage, will cause a blister and act as a counter-irritant.

Inhaled, it produces a sensation of warmth in the mouth and

air passages, a luxurious feeling of relaxation and unconsciousness. The respirations being full and deep at first; afterwards rapid and shallow. The pulse though perhaps stronger at first, fails in strength and becomes more rapid. The pupils dilate at first but are contracted during anæsthesia. *If the pupils dilate, after contraction has settled, danger is near.*

Chloroform affects the brain and spinal cord and may cause death through failure of the respiratory nerves or through the heart.

Professor Wood says: "My conclusions are, that while chloroform in its general depressing power, depresses all vital functions, it is the question of blood pressure which is most important. The primary action is, to depress blood pressure, and while it exercises a depressant effect on the respiratory centre, the failure of this centre is chiefly due to anæmia."

Use.—Its most important use is as an anæsthetic. It is used in puerperal convulsions. In whooping cough, a few drops inhaled from the hand afford relief.

In the form of spirit and water of chloroform it is used in cough mixtures.

In gastric or intestinal flatulence it affords relief. Combined with opium and camphor it is used in diarrhœa.

In stimulating liniments it is used for sore and stiff muscles, for lumbago, gout and neuralgia. Dose.—From 1 to 20 ♏ or 0.065 to 1.300 C. c.

Preparations.—Spirit of chloroform, 6 per cent. Dose.—15 ♏ to f℥ij. Chloroform water, ½ of 1 per cent. Dose.—f℥½. to f℥ij., or 2 to 60 C. c. Emulsion of chloroform, 4 per cent. Dose.—f℥ij. to f℥iv. or 8 to 16 C. c.

Chloroform Liniment.—A Mixture of about ⅓ chloroform and ⅔ soap liniment.

Cocaine.—Cocaine is an alkaloid or active principle obtained from coca leaves. Coca should not be confounded with cocoa. Cocoa is a fruit from which we make a drink. Coca is a South American tree, the leaves of which yield this alkaloid cocaine.

Physiological Action.—Coca or its active principle, cocaine, when taken into the stomach, causes a sense of exhilaration. Under its influence the mental and physical powers are temporarily excited. It is stimulating to the heart, stimulating to the respiration and raises the bodily temperature.

Cocaine acts as a powerful local anæsthetic and is used in operations on the eye and other minor surgical operations.

Use.—As an anæsthetic cocaine is used in the form of solutions containing from 1 per cent. to 8 per cent. of the alkaloid. It is sometimes used on cracked or otherwise abraded surfaces to relieve pain. In the form of fluid extract or wine, it is used as a stimulant and when severe mental strain is to be borne.

Preparations and Doses.—Cocaine Hydrochlorate.—The alkaloid is given in doses of from ¼ to ½ grain or 0.015 to 0.030 Gm.

Fluid Extract of Coca.—Dose 5 to 30 ♏ or 0.325 C. c. to 2 C. c.

There is a wine of coca recognized by the National Formulary and given in doses of f ʒ i to f ʒ iv. or from 4 to 16 C. c.

Ethyl Chloride.—This is a colorless, mobile, highly volatile and inflammable liquid obtained by treating alcohol with hydrochloric acid. It comes to us in glass bulbs or tubes with a nozzle pierced by a fine orifice, closing automatically, and which delivers the liquid in the form of a fine spray.

Use.—It is used exclusively as a local anæsthetic, the part to be operated on being sprayed until sensation is lost.

Bromoform.—This is a colorless, clear, mobile liquid, having a peculiar sweet odor and taste.

Use.—It is chiefly used in the treatment of whooping cough. The dose is from 1 to 5 minims or 0.065 to 0.325 C. c., given either in cold water or with an emulsion of some bland oil.

Carbolic Acid.—This substance is variously known as phenol, phenylic alcohol, and phenyl hydrate. In its pure form it is a colorless, oily like liquid becoming crystalline at low temperatures. To keep it in liquid form it should be diluted with 5 per cent. of water.

Its properties are more fully described under Disinfectants.

As an anæsthetic it is sometimes employed locally in such operations as ingrowing nails, felons, etc.

Antipyrin is a coal tar derivative. It occurs as a white, crystalline powder having a slightly bitter taste and no odor. It is soluble in water—less so in alcohol.

Physiological Action.—Taken internally it creates a sensation of buzzing in the ears. The normal temperature is somewhat depressed. It causes some blueness of the lips and chilliness followed by sweating. It sometimes causes nausea and vomiting.

Uses.—It is used for the reduction of fever and the relief of pain.

As an antipyretic it is given in doses of from 5 to 20 grains or 0.325 to 1.320 Gm. And for the relief of pain, from 5 to 10 grains may be used.

Menthol is obtained by separating the crystals which form in oil of peppermint leaves, when it is chilled. It comes in small, transparent, brittle crystals having the odor of peppermint. It is but slightly soluble in water; freely so in alcohol and the oils.

It is used locally as an anæsthetic, on mucous surfaces and is used externally for neuralgic pains.

It is also used as a carminative in doses of from 1 to 2 grains or from 0.065 to 0.130 Gm.

It is applied to the surface of the nose and throat, dissolved in bland oils as a spray.

CHAPTER VIII.

ANTACIDS.

Sodium Bicarbonate,	**Ammonia,**
Lime Water,	**Magnesium Carbonate.**

Ammonia, in the form of gas, is one of the products of the distillation of coal, and from it all the salts of ammonia are made. The gas on being passed into water, is dissolved, and in this form is officially known as ammonia water. In this form it is never used internally.

The ammonium carbonate, which usually occurs in the form of cubical lumps about the size of a lump of sugar, is the form most commonly used as an antacid.

The Aromatic Spirit of Ammonia, a mixture of ammonia water, ammonium carbonate and alcohol, flavored with aromatics, is another and the most common official form.

There is an unofficial, compressed tablet, known as soda mint tablets, a mixture of ammonium carbonate, sodium bicarbonate and oil of spearmint. This is the most popular form of ammonia, when used for its antacid properties.

The aromatic spirit, when used for this purpose, is given in doses of from ½ to 2 fluid drams or 2 to 8 C. c., considerably diluted with cold water.

The tablets are taken either dissolved in a little water or by dissolving them slowly in the mouth. Care must be taken to keep these compounds well stoppered in glass bottles and in a

cool place as they are very volatile and lose their ammoniacal strength very rapidly otherwise.

Sodium Bicarbonate (Baking soda).—This familiar substance usually comes to us in the form of a fine, white powder.

Use.—It is used as an antacid in gastric fermentation and in the so called sick headaches which follow that trouble. The dose is from 5 to 30 grains or from 0.325 to 2 Gm., in water.

Lime Water—Solution of Lime—Liquor Calcis.—This is a solution of lime in water. Care is *necessary*, in order to preserve the medicinal properties of lime water. Lime in this form is rapidly decomposed by exposure to the air. The solution only contains about 12 grains or so to the pint and it can be seen that a very little decomposition robs the solution of all its lime. It may be easily prepared by slaking a piece of quick lime as large as an egg, by pouring a cupful of water upon it, and allowing it to stand, until the heat which is generated has passed off and the mixture has become cold. Carefully pour off *this* water from the milky sediment and then add a quart or a gallon, it matters not which, so long as a gallon is not exceeded, as the water will only dissolve so much, no matter how much lime is used. Allow the coarse lumps to settle to the bottom and pour off the milky liquid. This latter, as soon as it has settled clear, is lime water. It must not be filtered. The white sediment of undissolved lime must be left at the bottom of the solution, to keep up its strength, and when wanted for use, it should be poured off clear.

Use.—Internally as an antacid, it is given in doses of a tablespoonful or even more, usually mixed with milk.

ANTHELMINTICS.

For round worms.

Santonine,	**Spigelia.**
American Worm Seed,	

For Tape Worm.

Pelletierine,	**Aspidium,**
Pepo,	**Pomegranate,**
Brayera,	**Kamala.**
Turpentine,	

Santonine.—This is an active principle, obtained from a seed, known as Levant Worm Seed. It is really a small, unexpanded flower, looking very much *like* a seed, which grows in Asia. From it santonine is obtained. Santonine is one of the active principles called glucosides. It occurs as fine, colorless crystals, having no odor and at first no taste, but followed by a slight bitter taste.

Use.—It is used entirely for the removal of the round worm, having no effect upon the tape worm.

It is given in powder form, usually with sugar of milk. It is supplied also in tablet form.

The dose is 1 or 2 grains or 0.065 to 0.130 Gm. followed by a purge, usually calomel.

Untoward Effects.—It causes in over dose tremor and convulsive movements. It affects the eyes, causing things to appear yellow. It also sometimes causes incontinence of urine.

Spigelia—Pink Root.—The root of a plant growing in the southern states.

Use.—It is one of the most efficient remedies for the removal of the round worm. It is not dangerous in medicinal doses.

It is given usually in the form of fluid extract, the dose being from ½ to 2 fluid drams or 2 to 8 C. c.

It should be given with or followed by a purge, a favorite mixture being a dram of the fluid extract of spigelia with one of fluid extract of senna.

For a child, from ½ dram upward.

Chenopodium—American Worm Seed.—The seed of the plant furnishes an oil, having a characteristic, rather disagreeable and nauseating odor.

Use.—The seeds themselves are sometimes rubbed to a coarse powder and mixed with syrup or molasses and used as an electuary for the round worm, the dose being from 5 to 30 grains or 0.325 to 2 Gm.

The dose of the oil for a five year old child is 10 minims or 0.650 C. c. given preferably in a spoonful of sugar. Sometimes it is given in the form of emulsion.

Pelletierine.—This is an alkaloid, an active principle obtained from Pomegranate Bark. The latter is never or seldom used. Pelletierine is one of the liquid alkaloids, occurring as a colorless liquid. When combined with the acids, it forms crystalline salts and it is in these forms that it is used. The sulphate is a yellowish powder having an astringent taste.

Use.—It is very efficient in removing the tape worm. If the bark is to be used, it is first infused for several hours in cold water and then boiled down, an ounce to the pint being boiled down to half a pint. This is given in wine-glassful doses. Nausea and vomiting are likely to follow its use as well as purging.

The dose of Pelletierine tannate is from 3 to 5 grains.

Aspidium—Male Fern.—Male Fern furnishes a root as

its medicinal part. From the root is prepared an oleo-resin sometimes spoken of as an extract.

In over doses it is capable of producing poisonous symptoms and even death.

Use.—It is used for the destruction of the tape worm, in doses of from ½ to 1 f℥.

This refers to the oleo resin, the root itself not being suitable for use.

It comes as a thick, oily, dark green liquid, which slowly deposits a pale green precipitate. It has a peculiar somewhat nauseating taste. It is usually given in capsules or in the form of a mixture or emulsion, disguised by some simple bitter, like gentian.

Pepo—Pumpkin Seed.—The seed of the common yellow pumpkin.

Use.—It is used against tape worm. Being a domestic remedy, the following method of preparing it for use is given. The dose is 2 oz. or 60 Gm.

The outer covering may or may not be removed. The seeds are to be beaten up in a mortar or ground in a coffee mill, until reduced to a coarse powder. This is then thoroughly stirred, with a small quantity of water at first, adding enough to make a tumbler full of drink. The whole is then strained through coarse gauze and taken on an empty stomach. To be followed in a few hours by a brisk purge.

Brayera—Cusso—Kousso.—The flower of an Abyssinian plant.

There is an official fluid extract of it, which is given in doses of from 5 to 30 ♏, or 0.325 to 2 C. c. But it is given usually in the form of infusion, made with 1 oz. of the drug to a pint of water.

Use.—It is used against tape worm. Half a pint of the above infusion may be given in the morning, fasting.

Kamala or Rottlera.—This is a hairy-like product of a plant growing in Africa, India and Australia. There are no official preparations of it.

Use.—It is given for tapeworm, acting at the same time as a purge. It is usually mixed with molasses or heavy syrup and given in doses of from 1 to 2 drams or from 4 to 8 Gms.

Turpentine.—Turpentine is a soft, yellowish-white oleo-resin obtained from several varieties of pine. From it is obtained the so-called *spirit* of turpentine, which is known officially as *oil* of turpentine or oleum terebinthinæ; and this it is, that is meant, when turpentine is spoken of for use as an internal remedy, the solid form being used as a plaster.

For internal use, the official *rectified* turpentine should be secured. It occurs as a colorless, mobile liquid, having the well-known turpentine odor.

Physiological action.—It is warming to the stomach, quickens the pulse, and causes warmth to the skin.

Use.—It is used externally as a counter-irritant. Internally in fevers, and in some forms of internal hemorrhages.

It is used against the tapeworm in the dose of from 1 to 8 f℥, or from 4 to 30 C.c., mixed with castor oil.

In small doses it may be given on sugar or in the form of emulsion with any of the bland oils.

Preparations.—Linimentum Terebinthinæ—Turpentine liniment.

Besides the remedies mentioned as being used against the round worm and the tapeworm, the following are used against the seat-worm.

Quassia, · **Turpentine.**
Tannic Acid,

Quassia is the wood, in the form of chips, from a tree growing in the West Indies. It is familiar also in the form of quassia cups. It is an intensely bitter drug.

Uses.—It is a very efficient bitter tonic and is said to possess antiperiodic power. It is useful in the simpler forms of dyspepsia.

It is used against seat-worms as an injection. After well washing the bowel, half a pint of the infusion may be used. This may be made by infusing an ounce or more of the chips in a pint of hot water, until it is cold and then straining. It should be retained in the bowel for several minutes.

As a tonic, a cup of quassia wood is turned out. This is filled with water and allowed to stand a few minutes, when it is drank as a dose before meals.

Preparations.—Extractum quassiæ (extract of quassia). Dose.—1 to 10 grains or 0.065 to 0.650 Gm. Extractum Quassiæ Fluidum (fluid extract of quassia). Dose.—5 to 30 ♏, or 0.325 to 2 C.c. Tinctura Quassiæ (tincture of quassia). Dose.—1 to 4 ʒ. or from 4 to 16 C.c.

Tannic Acid—Acidum Tannicum.—This is a yellowish-white substance, in powder form, obtained by treating what are known as nut galls (an excrescence growing upon the leaves of certain varieties of oak), with ether and water. It is the active principle common to almost all astringent vegetable drugs.

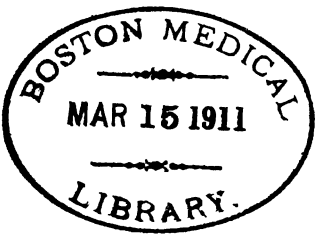
Physiological action.—When brought into contact with the tissues it constricts them, causing the contraction of their blood-vessels. In this way it checks bleeding and secretions. It forms a clot with blood. It checks bleeding *only* when *directly* applied.

Uses.—It is used in controlling hemorrhages and as an astringent to relaxed tissues, in diarrhœa and sweating.

The glycerite of tannin is used as an application to slow ulcers. In hemorrhoids, bleeding, it is used in the form of ointment. It is also used in vaginal lucorrhœa. It is used externally in toughening the nipples and the feet when sore from profuse sweating.

In the form of weak infusion, with glycerine and water, it may be used against seat-worms.

Preparations.—Glyceritum acidi tannici. Glycerite of tannic acid.



CHAPTER IX.

ANTISEPTICS.

Corrosive Sublimate,	**Carbolic Acid,**
Hydrogen Dioxide,	**Boric Acid,**
Sulphate of Iron,	**Potassium Permanganate.**

Corrosive Sublimate.—Hydrargyrum Chloridum Corrosivum, Corrosive Mercuric Chloride, Bichloride of Mercury and Perchloride of Mercury are different names for one substance. It is made by the chemical reaction which takes place when sulphate of mercury and sodium chloride are mixed together and distilled in dry form.

It occurs as colorless crystals or more commonly as a white crystalline powder. It is found at the bedside sometimes, in the form of tablets or in solution—the latter being stained to prevent its being misused for some harmless preparation.

Physiological action.—Taken internally it causes violent pains in the stomach, vomiting, purging, collapse and death. When taken in poisonous quantity the patient should be given the whites of several eggs, which arrests the action of the poison, by making it insoluble and very soon this should be followed by the stomach-pump or emetic of mustard and warm water.

Uses.—It is used in syphilis and in chronic Bright's disease.

In small doses it is used in anæmia. It is used for the ill-smelling green stools of infants in summer diarrhœa and in mucous diarrhœa.

As an antiseptic, it is used in solution varying in strength from 1 to 10,000 to 1 to 1,000, the solutions as before mentioned being stained for safety. The most convenient form for this purpose is the tablet—each tablet being of a size to produce a certain quantity of solution of a strength indicated by the label. Distilled water should always be used. It is not freely soluble in water alone. An equal part of either sodium chloride (common salt) or ammonium chloride, mixed with it, is always used to make it soluble.

The dose is from $\frac{1}{60}$ to $\frac{1}{8}$ of a grain or from 0.001 to 0.010 Gm. And it is best given in the form of tablet triturates.

Carbolic Acid (Acidum carbolicum, phenol, phenyle hydrate).—This is a product of the distillation of coal tar. There are several varieties or grades of it—two of which may be mentioned, the others differing from them in purity. The crude form is a black, oily liquid, having quite a distinct tarry odor. The pure form is a colorless, or slightly pinkish, and transparent, oily liquid, possessing the characteristic odor of carbolic acid.

It is handled as a liquid, this being a mixture of the acid with not less than 5 per cent. of water. It naturally occurs in colorless masses of needle-like crystals, which liquify in warm, moist air. The 5 per cent. of water is necessary to preserve its liquid form at low temperatures.

Physiological action.—Applied locally to the skin, a burning sensation is felt, followed by a white spot, which becomes temporarily numb, and if the acid has been allowed to remain on the skin several minutes, it acts as a superficial caustic, the

skin falling off. In its general effect upon the system it acts as a depressant, extending to the temperature.

As a poison, in large doses, it has a rapid, fatal action due to failure of the respiration. Aside from this, in smaller doses, it not only painfully corrodes the surfaces of the alimentary tract, but causes violent vomiting and purging.

Uses.—It is but little used internally. In vomiting due to gastric irritation it is used in doses of from ½ to 2 ♏, or from 0.030 to 0.130 C.c. In the diarrhœa due to fermentation, in the same dose. As an anæsthetic it has been already mentioned under that heading.

It is given generally in admixture with chalk mixture, bismuth mixtures, etc.

Preparations.—Unguentum acidi carbolici, ointment of carbolic acid, 5 per cent.

Glyceritum acidi carbolici, glycerite of carbolic acid, 2 per cent. with glycerine.

Solutions.—Carbolic acid is soluble in 20 parts of water. A 5 per cent. solution holds all that will dissolve and is a *saturated* solution. If it is desirable to use a stronger solution, the acid may be first mixed with an equal quantity of glycerine, when it will dissolve in water in *any* proportion.

Antidote.—For internal poisoning a physician's care is at once demanded. When spilled upon the skin, if the parts be *thoroughly* washed in alcohol and afterwards with water, its effect will be entirely neutralized.

Peroxide of Hydrogen (Aqua hydrogenii dioxidi, hydrogen dioxide water).—An odorless, colorless, transparent solution of hydrogen dioxide gas, in water, containing 3 per cent. of the gas, all that it can permanently hold in solution.

It should be kept in a cool place. It is a product of the

large manufacturers, and as it easily loses strength, care should be taken while procuring it, to take none but that of some well known, reliable maker.

Uses.—It is valuable for the destruction and removal of the membrane in diphtheria. It does not injure the tissues in their normal state. It decomposes pus, with effervescence and will often detect its presence in among the tissue folds when it can be discovered in no other way. It is used largely in cleansing sores, wounds and inflamed surfaces of all kinds. It is used in cleansing the mouth and in gargling the throat. Taken internally, it is not poisonous, but is seldom used in that way as it has no medicinal action.

Boric Acid—Acidum Boricum.—This substance is obtained by decomposing borax (sodium biborate) with hydrochloric acid.

It occurs in two forms. The cruder form is in colorless scales, of a pearly lustre, and a soapy feeling to the touch. The pure form comes to us as an impalpably fine white powder. It has a faintly bitter taste.

Uses.—It is used as an antiseptic in eye washes, in which its antiseptic powers serve also to preserve cocaine and other alkaloids used about the eyes, from decomposition.

Lints and bandages are often saturated with boric acid, for its antiseptic power. And it is used freely whenever a simple antiseptic may be needed, both on internal and external sores or wounds.

Preparations.—It is used in the form of solution in water. It dissolves in 25 parts of water, forming a saturated 4 per cent. solution.

Borax, and Glycerite of Boroglycerine are both used for the same purposes for which boric acid is used, as an anti-

septic, distinction being made with regard to the eye, in the case of the latter. Borax is found naturally in certain parts of the world, and is chemically known as sodium biborate.

Glycerite of Boroglycerine or Glycerinum Boroglycerinum is made by heating together a mixture of boric acid and glycerine, until a clear solution results.

Sulphate of Iron—Ferrous Sulphate—Ferri Sulphas —Copperas or Green Vitriol.—This salt, occurring in the form of green crystals, is made by the action of sulphuric acid upon metallic iron. There are three forms of it. The crystalline or crude form, the granulated, which is in fine granular form and purer, and the dried sulphate of iron, in powder form.

The crude form is that used as an antiseptic. It is used in the form of solution, made by dissolving a pound of the salt in a gallon of water. Its chief use is in destroying foul, offensive, noxious odors, by saturating cloths with it and suspending them in the room; by placing it in shallow vessels about the room and by pouring into bed pans, urinals, etc.

Potassium Permanganate—Potassii Permanganas.—This salt is of a dark purple color, occurring in small crystals.

Uses.—As an antiseptic it is very extensively used by surgeons in preparing the parts to be operated upon, and the hands of the operator. It is used by dissolving in water (1 part to 16), thoroughly immersing and soaking for a minute or more, the previously washed and rinsed hands. The stain to the skin which it causes is most conveniently removed by immediately washing in oxalic acid.

Internally it is used in dyspepsia, flatulence and obesity. It is used as an antidote to the poison from snake bites. Also as an antidote to morphine poisoning.

It is given internally in the form of compressed tablets of from ½ to 2 grains or from 0.030 to 0.130 Gm.

In making it into solution, distilled water ought to be used. If this is not obtainable, river or rain water, strained through folds of cloth or filtered should be used. The organic matter in common water decomposes the salt very rapidly and the effectiveness of the solution is greatly weakened thereby.

CHAPTER X.

ANTIPERIODICS OR ANTIMALARIALS.

Cinchona, Eucalyptus, Arsenic.

Cinchona.—This is the bark obtained from a tree native to South America, and cultivated in India. It contains the alkaloids, quinine and cinchonidine which are its active principles.

Physiological Action.—Cinchona or quinine when taken in large doses causes ringing in the ears, some deafness, dizziness and disturbs the taste, smell and vision.

Fullness in the head and even headache are also the results of its excessive use.

It slightly stimulates the respiration.

In malarial fevers it acts as a powerful antipyretic.

Cinchona and quinine act also as tonics.

Uses.—These drugs, cinchona and its alkaloids, are largely used as antiperiodics, or antimalarials, as antipyretics, as tonics and as a stimulant to the uterus. Quinine acts as a poison to the malaria germ.

Used as a tonic, it acts as a simple bitter and by increasing the number of red corpuscles.

The dose of cinchona in the form of some of its preparations, is from 5 to 30 grains or from 0.325 to 2 Gm. The dose of quinine is from 1 to 5 grains or more.

Preparations.—Tincture of cinchona, Tinctura cinchonæ,

Compound tincture of cinchona, Tinctura cinchonæ composita, Extract of cinchona, Extractum cinchonæ, Fluid extract of cinchona, Extractum cinchonæ fluidum, Decoction of cinchona, Decoctum cinchonæ. The alkaloids and their salts are:

Quinine, Quinine Sulphate, Quinine Hydrochlorate, Quinine Bisulphate, Quinine Hydrobromate, and Quinine Valerianate.—The salts are not freely soluble in water with the exception of the bisulphate, which *is* so.

The Cinchonidine Salts are: Cinchonidine sulphate and the unofficial one, cinchonidine salicylate. The dose of the cinchonidine salts is from 1 to 5 grains.

Quinine Sulphate, which is most largely used occurs in white, silky needles, cohering together in soft masses. The bisulphate in fine white crystals, soft to the touch. All the alkaloids but one are odorless but possess an exceedingly bitter taste. The single exception as to odor is the valerianate, which has a strong, peculiar, penetrating, highly diffusive odor.

Eucalyptus.—This drug is the leaf of an Australian tree. The active constituent of this drug, is the volatile oil of eucalyptus.

From the latter a principle called eucalyptol, is obtained. The oil and the derivative resemble each other very much, both being colorless to straw colored, transparent liquids, having an odor resembling that of oil of turpentine.

Physiological action.—Externally applied, it is an irritant. Taken internally it acts as a stimulant, increasing the force and frequency of the pulse.

The oil and the eucalyptol are both extensively used in antiseptic washes and solutions.

Uses.—It is used in malarial fever. Also in bronchitis, in gonorrhœa and in rheumatic headache.

The eucalyptol is used as a nasal and throat application.

Preparation.—Extractum Eucalyptus Fluidum, Fluid Extract of Eucalyptus.

Dose.—5 to 30 ♏, or 0.325 to C.c.

The dose of the oil or of eucalyptol is from 1 to 5 ♏, or 0.065 to 0.325 C.c., usually given in capsule form. As an application to the nose or throat, it is commonly mixed with some bland mineral oil like Albolene and used by means of an atomizer as a spray.

Arsenic—Acidum Arsenosum or Arsenous Acid, has already been described under Alteratives.

Warburg's Tincture.—A tincture containing the active principles of 12 antiperiodic drugs, and given in doses of 1 to 2 fluid drams.

CHAPTER XI.

ANTIPYRETICS.

Antipyrin, **Guaiacol,**
Phenacetin, **Salicylic Acid.**
Acetanilid (Antifebrin),

Antipyrin is not an official drug. It is recognized by the British Pharmacopœia, * as Phenozone. It is one of the derivatives of coal tar.

In this connection some explanation is offered as to coal tar products. Coal is said by geologists to be of vegetable origin —as is also coal oil or petroleum.

When coal is subjected to distillation, one of the products is coal tar. This is a complex substance made up of many things. They are separated from each other, in a crude form, by what is known as fractional distillation. That is, being heated to 200° a certain product is collected. At 250° another, at 300° another and so on. And from each of these products, by treatment with different chemicals, the so-called coal tar products are obtained. As for example Carbolic Acid exists naturally in coal tar and is one of the products of its distillation. The well known colors known as aniline dyes,

NOTE.—Pharmacopœia:—This name is given the book, in which is a list of drugs, medicines and preparations, recognized by the government and the medical and pharmaceutical associations as the standard. Everything in it is official.

do not exist in coal tar, neither does the well known drug Acetanilid. The carbolic acid on treatment with ammonia yields aniline. And if the aniline be boiled with acetic acid, acetanilid is formed. Thus, while this and other so-called coal tar products may not exist *as* such in the tar, they all have in *part* at least, their origin there.

Antipyrin has already been treated of under local Anæsthetics.

Acetanilid—Acetanilidum.—The patented name being **Antifebrin.**—Acetanilid is one of the derivatives of coal tar. It is an odorless, white, crystalline powder, slightly soluble in water, but soluble in alcoholic liquids.

Physiological action.—It acts upon the nervous system as a sedative. Upon the circulation, little effect is produced except in over doses, in which case it has a toxic effect, causing depression to the heart's action. Upon the respiration no effect is produced in ordinary doses.

Overdoses quicken the respiration and it becomes labored, death being caused by paralysis of the respiratory centre.

In full doses it lowers the normal temperature of the body. In fevers it acts as an antipyretic by decreasing heat production and increasing the dissipation of heat.

Poisoning.—Under poisonous doses, the lips become blue, the face livid and expressionless. The face becomes sweaty. The pulse is compressible, slow and weak. The respiration is slow.

Uses.—It is used in typhoid fever, as an antipyretic. It is used in all forms of nerve pain: In ataxia, gastralgia, sciatica and headaches. It is used also in rheumatism.

It is used as an antiseptic dressing by sprinkling upon the surface. It is given in doses of from 1 to 10 grains or from

0.065 to 0.650 Gm., swallowed with a draught of water, dissolved in wine or spirituous liquors or in capsules.

It is often associated with monobromated camphor in the treatment of neuralgia.

Phenacetin.—This is one of the coal tar products, occurring as an odorless, tasteless, white crystalline powder.

Physiological action.—It acts as a nervous sedative.

Uses.—It is used not only as an antipyretic, but as an analgesic also.

It may be used in all cases of fever where antipyrin may be used.

As an antineuralgic it is used in migraine, headache from over-wrought eyes, in neuralgia and in rheumatism. In lumbago and muscular pains it is often used.

It is given in powder form, dry upon the tongue followed by water, in capsules and in tablet form. The dose is from 5 to 10 grains or from 0.325 to 0.650 Gm. three times a day.

Guaiacol is obtained by distillation from beechwood creosote; creosote in fact being about 90 or 95 per cent. guaiacol, with other wood products.

A word about wood products. When wood is distilled, that is, placed in a suitable vessel and heated, so that all the vapors may pass into a receiving vessel and be collected, we get wood tar, just as we get coal tar by distilling coal. This wood tar consists of a mixture of substances among which are, acetic acid, turpentine, wood alcohol, creosote and other things. All woods yield these same things. The pines yield the greatest amount of tar. Oak woods yield the greatest amount of acetic acid. Beechwood yields the greatest amount and the best quality of creosote and therefore beechwood creosote is given the preference by the pharmacopœia.

Guaiacol is a nearly colorless or very pale straw colored or pinkish liquid having the odor peculiar to wood creosote. It is but slightly soluble in water, freely so in alcochol and miscible with glycerine.

Uses.—It has been recommended both internally and externally in tuberculosis.

It is used the same way in which creosote is used, in wine or other alcoholic liquid, in capsule, with cod liver oil or Maltine. It has a powerful antipyretic action, when painted upon the skin of the chest or abdomen. The dose is from 1 to 10 ♏, or from 0.065 to 0.650 C.c.

Guaiacol Carbonate, a chemical compound from guaiacol comes as a white crystalline powder having a slight odor of creosote. It is used for the same purposes as an antipyretic as guaiacol is, and is said to be less irritating to the stomach. Being insoluble in the stomach, dissolving only on entering the intestine, it is used as an *intestinal* antiseptic. It may be given in powder, capsule, pill or tablet form in doses of from 1 to 10 grains or from 0.065 to 0.650 Gm.

Salicylic Acid—Acidum Salicylicum.—This substance is derived from carbolic acid by chemical treatment and occurs as a fine, white crystalline powder. It has a slightly acid taste, leaving an impression of sweetness also, and a slight carbolic acid odor. It is produced also by chemical treatment from oil of wintergreen. It is but slightly soluble in water.

Physiological action.—In medicinal doses it causes some buzzing in the ears. It has no marked effect upon the circulation. It acts as a distinct antipyretic in fevers, and slightly depresses the normal temperature.

Poisoning.—In overdoses it causes profuse sweating, buzzing

in the ears, dimness of vision, headache, deafness and a fall in temperature, a weak pulse and paralysis.

Uses.—It has an antipyretic and antiperiodic action, but its chief use is in rheumatism, for which it is used in all its forms, in acute gonorrhœa, in lumbago, sciatica and neuralgia. It is also used in conjunction with bromides in nervous irritability. Externally, combined with cannabis indica, either extract or tincture, and dissolved in collodion, it is used as an application to corns, with very beneficial results. A solution of salicylate of sodium is applied to inflamed rheumatic joints.

It may be given with heavy syrups, in capsules or in tablet form, in 5 grain doses or 0.325 Gm.

Allied compounds, used for the same purposes internally and with similar results.

Oil of Wintergreen, Oleum Gaultheria, a volatile oil obtained by distillation from wintergreen leaves.

Oil of Sweet Birch, Oleum Betulæ.—By distillation from birch bark. **Methyl Salicylate,** an artificial compound.—All three of these substances, though of different origin are of the same chemical composition, and identical in every way.

Sodium Salicylate, a compound occurring as a white powder, made by acting with salicylic acid upon Sodium Bicarbonate.

The dose of Sodium Salicylate is from 5 to 10 grains or 0.325 to 0.650 Gm. The Methyl Salicylate in either of its three forms is given in doses of from 1 to 10 ♏ or from 0.065 to 0.650 C.c.

It is said to be more effectual, because less irritating, if given in small doses of ½ a minim largely diluted, by mixture with Syrup of Tolu or other heavy syrup, the dose to be repeated more often than when given largely.

CHAPTER XII.

ANTISPASMODICS.

Chloral,	**Camphor,**
Hoffman's Anodyne,	**Belladonna,**
Opium,	**Musk,**
Assafœtida,	**Valerian,**
Camphor-Monobromate,	**Amber,**
Cimicifuga,	**Hops.**
Bromides,	

Chloral—Chloral Hydrate.—This chemical, occurring in small transparent, glassy-looking crystals easily soluble in water, is a compound formed by long treatment of alcohol with chlorine gas. It has a burning, bitter taste and a peculiar pungent, stinging odor.

Physiological Action.—It acts externally as an irritant.

In medicinal doses, it produces sleep. It lowers the body temperature and large doses produce a decided fall thereof.

Poisoning.—In poisonous doses it produces sleep and coma, slow, labored, feeble and shallow respirations, slow at first and then rapid and feeble pulsations. The face becomes white and livid and covered with perspiration. The pupils, first contracting afterward become widely dilated.

In treating a person poisoned by chloral the stomach-pump should be used and external heat applied.

Uses.—It is hypnotic and is used in nervous insomnia.

It is used as an antispasmodic in tetanus and strychnine poisoning, in infantile convulsions and colic, and in delirium

tremens. It is used in uræmic and puerperal convulsions. Also in hiccoughs, epilepsy and whooping cough.

Chloral is best given in some of the heavy syrups, such as orange, tolu or ginger, and should be largely diluted, or followed by large draughts of water. Dose from 1 to 30 grains or from 0.065 to 2 Gm.

Bromides.—These are the **Bromides of Potassium, Sodium, Ammonium** and **Strontium. Potassium** and **Sodium Bromides** occur as white cubical crystals or as white granular powders. The bromides of Ammonium and Strontium *always* in the form of white granular powder. They are all odorless and possess a salty taste, the Strontium and to some extent the Potassium bromides, having a slightly bitter taste. Besides those mentioned there is Lithium Bromide and Hydrobromic Acid. They are all salts containing bromine in combination with a metal.

Physiological Action.—When taken internally, the bromides produce drowsiness and sleep and decrease all the reflex actions.

Potassium Bromide is depressant and sedative to the nervous system.

It causes a fall in arterial pressure by direct action upon the heart.

It is depressant to the respiratory centre. It may irritate the mucous membrane of the stomach causing indigestion. In small doses, it does not affect the body temperature.

Uses.—It is used in treating diseases of the nervous system. In epilepsy, in spasmodic contractions of hysterical females and nervousness in children.

In headaches due to uterine trouble, for convulsions in children, it is useful.

It is used in whooping cough, insomnia, chronic alcoholism and morphinomania, and in migraine and neuralgia.

It may be given in doses of from 5 to 120 grains or from 0.325 to 4 Gm. in solution or in tablet form.

Ammonium Bromide may be used for the same purposes and in the same doses as Potassium Bromide and has the advantage of being less depressant, although more liable to disorder the stomach.

Bromide of Lithia is feebler in its action and must be given in larger doses.

Sodium Bromide is not as depressant nor as irritating to the stomach as Potassium Bromide.

Strontium Bromide is likewise less depressant and non-irritating to the stomach, being used to relieve gastric pains.

Hydrobromic Acid or Hydrogen Bromide in its diluted form of a 10 per cent. solution is not as much used internally. When so used, it is given in doses of from ½ to 2 drams or from 2 to 8 C.c. largely diluted.

Hoffman's Anodyne—Spiritus Ætheris Compositus—Compound Spirit of Ether.—This is a mixture of Ether, Ethereal Oil and Alcohol, and is a transparent, pale straw colored liquid, having the odor of Ether.

Uses.—It is an excellent carminative and is one of the best remedies, diluted with ice water, for hiccoughs. It is used also for palpitation of the heart, more especially in tobacco heart.

Camphor—Camphora.—This is a vegetable product, obtained from a tree growing in China, Japan and other tropical countries of the far east. It is obtained in a crude fashion, by distillation from the wood of the tree.

Physiological Action.—In large doses it produces convulsions, vertigo, roaring in the head and ears, a rapid feeble pulse, livid

skin and cold sweating. In small doses it acts as a stimulant, quickening and strengthening the pulse. It acts as a general sedative also.

Uses.—It is used as a sedative and antispasmodic for nervous women, and as a carminative in intestinal flatulency. It is used in cholera morbus and diarrhœa, in sudden nervous depression, in hiccough and in cardiac palpitation. It is given in doses of from ½ to 3 grains or from 0.030 to 0.195 Gm.

Externally, as a liniment, it is used as a stimulant over inflamed joints, for sprains, rheumatism, neuralgia, etc.

Preparations.—Spiritus camphoræ, tincture or spirit of camphor, a 10 per cent. solution. 1 ♏=$\frac{1}{10}$ of a grain of camphor. Aqua camphoræ, camphor water, $\frac{1}{10}$ of 1 per cent. in strength or 4 grains in each fluid ounce.

Tinctura opii camphorata—Camphorated tincture of opium —or Paregoric. Containing ¼ grain of camphor and opium to each teaspoonful.

Linimentum camphoræ, Camphor liniment. Camphor dissolved in cotton seed oil. Containing 20 per cent. of camphor or 100 grains to each fluid ounce.

Opium.—This very ancient and important drug is the dried milk juice obtained from a species of poppy growing in the tropical east.

The official descriptive definition is: The dried milk juice obtained from the unripe capsules of the Papaver Somniferum, and containing in its normal moist condition not less than 9 per cent. of morphine.

As found in the market, it occurs in roughly shaped globular lumps, covered on the surface with the remains of the leaves in which it is rolled. It is, if it has been kept close, in a moist, soft condition, about the consistence of putty. But if

exposed to the air it soon dries and becomes hard and brittle, although tough. Broken, it looks like a mixture of vegetable remains, of a dark brown color and a peculiar odor, unlike anything else.

Opium is very complex, containing no less than seventeen active principles or alkaloids. The ones most in use are morphine and codeine.

Physiological Action.—Upon the nervous system, in small doses, it acts as a sedative; upon the circulation, small doses have no effect; larger doses slow the pulse and increase its force.

Upon the respiration small doses act as a slight stimulant. Larger doses paralyze the respiratory centre.

Full doses slightly raise the temperature while poisonous doses lower it.

Opium contracts the pupils of the eye. It lessens the muscular movement of the stomach and intestines, causing constipation. And it checks every secretion of the body except that of the skin.

Poisoning.—In an overdose, it causes drowsiness, heavy sleep, followed by stertorous breathing, slow full pulse, dry skin, contracted, pin-point pupils, and accompanying these signs, reddened face followed by pallor. If means are not taken to restore the patient, coma and death follow.

Treatment of Opium Poisoning.—Every effort should be made to rouse the patient by enforced exertion, such as walking about. Cold water is sometimes thrown on the patient. Slapping and other vigorous means are employed to keep the patient awake. Stimulants of all sorts, such as black coffee, brandy, etc., are to be given.

Uses.—It is used to relieve pain, insomnia, inflammation,

over-secretion and systemic strain. It is used for pain in neuralgia, meningitis, colic and dysmenorrhœa. It is used in cases when insomnia is caused by pain, in such inflammatory conditions as peritonitis, meningitis and pericarditis. It is used in irritable coughs and externally for sprains and bruises.

Administration.—Choice may be made from a great variety of preparations of opium.

Opium in its crude state is given in the form of pills in doses of from ½ to 2 grains or from 0.030 to 0.130 Gm.

Opii pulvis or powdered opium and Opii pulvis denarconizatum or denarcotized opium are powdered forms of opium, the latter being free from narcotine, the active principle which causes nausea. The dose is the same as that of crude opium.

Tincture of opium (Laudanum). Deodorized tincture of opium, Tincture of ipecac and opium, Vinegar of opium and Wine of opium are all 10 per cent. in strength, each minim containing $\frac{1}{10}$ of a grain of the drug. The dose of them is therefore from 5 to 20 ♏ or from 0.325 to 1.300 C. c.

Camphorated tincture of opium or Paregoric is $\frac{1}{10}$ of 1 per cent. in strength and contains 2 grains of opium to the fluid ounce or ¼ grain to the dram. The dose then is from 1 to 8 fluid drams or from 4 to 30 C. c.

Powdered ipecac and opium, (Dover powder), $\frac{1}{10}$ opium, $\frac{1}{10}$ ipecac and $\frac{8}{10}$ sugar of milk. Dose from 5 to 20 gr., or from 0.325 to 1.300 Gm.

Extract of opium given in pill form in doses of from ¼ to 1 grain or from 0.016 to 0.065 Gm.

Compound morphine powder or Tully's powder, containing 1 grain of morphine to the dram. Dose 10 grains, equalling ⅛ gr. of morphine.

Morphine Sulphate, Morphine acetate and morphine

hydrochlorate. Dose ⅛ to ½ grain or from 0.008 to 0.030 Gm. Codeine sulphate, dose ½ to 2 grains or from 0.030 to 0.130 Gm.

The action of morphine is the same as that of opium. Codeine is much milder in its action.

Magendies Solution of Morphine.—This solution is for hypodermic use and has been almost entirely superceded by the hypodermic tablet. It contains 2 grains of morphine in each fluid dram of water or about $\frac{1}{30}$ of a grain to the minim.

There was formerly an official solution of morphine containing 1 grain to the fluid ounce or ⅛ of a grain to the fluid dram. Care should be taken not to confound the two.

Belladonna.—The leaf and root of a vegetable drug growing in temperate climates.

Physiological Action.—It produces in full doses, flushed face, redness and dryness of the fauces and dilated pupils. In large doses it produces some delirium. The pulse becomes rapid.

Uses.—It is used to allay secretions, as an antispasmodic for palpitation of the heart and in neuralgic pains.

It is used in checking night sweats, in whooping cough. Externally it is used in spasm of the sphincter ani and of the urethra and bladder.

The dose of the drug is from 1 to 3 grains or from 0.065 to 0.195 Gm., and it is usually given in the form of some of its preparations.

Tincture of belladonna leaf is a 10 per cent. tincture, each minim containing $\frac{1}{10}$ of a grain to the minim, the dose being from 10 to 30 ♏ or from 0.650 to 2 C.c.

Fluid extract of belladonna root, 100 per cent. in strength, each minim containing 1 grain of the drug. The dose is from 1 to 3 ♏ or from 0.065 to 0.195 C.c.

Extract of belladonna leaf (the solid or powdered extract).

As a rule, the solid extracts, unless otherwise stated, may be reckoned as four times the medicinal strength of the drug from which they are made. The dose therefore will be ¼ the dose of the drug. The dose of the extract of belladonna leaf is from ¼ to ¾ of a grain or from 0.016 to 0.048 Gm., and it and all other *solid* extracts are generally given in pill form.

Assafœtida.—This is a gummy, resinous substance obtained from the root of a tree growing in Asia and Northern Africa. It comes in masses of irregular shape, consisting of a mixture of white, yellowish and reddish lumps or tears, embedded in the softer portions. It has an odor very much resembling that of the onion and garlic. In a cold atmosphere, it is hard and somewhat brittle. In a warmer exposure it becomes soft and pliable.

Use.—It is used as a carminative in intestinal indigestion, in flatulency and colic. It is also used as a stimulating expectorant and as a sedative in some forms of nervous disorders.

It may be given in doses of 1 to 10 grains or from 0.065 to 0.650 Gm. in pill form. It forms an emulsion upon being triturated with water and is often given in that form.

There is also a tincture of assafœtida containing ½ of a grain to the minim, 20 minims equalling one grain of the drug itself. It is used also in suppository form.

Musk.—This is a secretion taken from the animal known as the musk-deer, found in certain parts of Asia.

It reaches us in pods of what appear to be animal membrane. It is in the form of a black, granular mass, easily falling to pieces on becoming dry. The best quality always comes in this form and it always has a lot of little white particles in it—particles like hair or bristles, cut short. It has the character-

istic odor known only in musk. It is very expensive, selling at times for as much as 25 cents per grain. And because of its value, it is largely adulterated with worthless impurities, which has been largely the cause of its falling into disrepute.

Uses.—It is used as a stimulant and antispasmodic and as a nerve sedative. It is valuable in cases of nervous excitement or collapse. In cases of obstinate hiccough it has proved valuable.

As its properties are fugitive, it is best given in its natural form. As it is not soluble in water or alcohol, it is usually mixed with some viscid liquid like mucilage or syrup of acacia. It may be given with starch water, if to be used in the form of enema. The dose is from 5 to 10 grains or from 0.325 to 0.650 Gm.

There is an official tincture of musk, twenty minims of which equal a grain of the drug. But it has not been found to be efficient.

Valerian.—This is a root growing in all temperate climates. Its medicinal action is due to a volatile oil and the valerianic acid which it contains. It has a peculiar odor, unlike anything else.

Physiological Action.—It produces a feeling of warmth in the stomach, a quickened pulse, and occasionally nausea and headache. It is depressant to the nervous system, acting as a sedative.

Uses.—It is used in the nervous conditions of women and for insomnia. It is also useful in hysteria and delirium tremens.

Preparations.—Tincture of Valerian, Tincturæ Valerianæ—a 10 per cent. tincture, each minim containing $\frac{1}{10}$ of a grain of drug, 10 minims being equal to 1 grain. The ammoniated tincture, Tincturæ Valerianæ Ammoniata—of the

same strength. Fluid Extract of Valerian, Extractum Valerianæ Fluidum. One minim equals one grain of drug. Dose of the drug, from 5 to 30 ♏.

Besides the drug Valerian, there are the salts of Valerianic acid, called the Valerianates. They are: Valerianate of Zinc, dose ¼ to 2 grains. Valerianate of Quinine, dose ¼ to 2 grains. Valerianate of Ammonia, dose ¼ to 2 grains. Their medicinal action is that of Valerian and its preparations. The three valerianates of iron, quinine and zinc are used together in pill form, containing one grain each to each pill. They are much used in nervousness and hysterics.

Monobromated Camphor is a compound of camphor and bromine. It occurs in colorless crystalline form, having the odor of camphor and a slight musty taste. It is insoluble in water.

Physiological Action.—It has the combined action of bromine and camphor. The pulse first becomes rapid, then slow and weak, under large doses.

Uses.—Combined with other drugs, it is much used for pain. It is used in lumbago, neuralgia, some forms of headache and in the nervous depression and pains accompanying influenza. It may be given in powder or pill form or in capsules, in doses of from 1 to 5 grains or from 0.065 to 0.325 Gm.

Amber.—This substance is a fossil resin found in Prussia and some other parts of the world. By distillation, it yields a volatile oil, and this is the medicinal form. It occurs as a rather heavy pale yellow liquid with a turpentiny odor.

Uses.—It is sometimes used with sugar as a remedy for whooping cough, also in asthma and hysteria. It is also used externally over rheumatic joints. The dose is from 1 to 5 ♏, or from 0.065 to 0.325 C. c.

Cimicifuga—Black-Snake Root is a root.

Physiological Action.—It acts by depressing the heart and vasomotor system.

Uses.—It is used in chorea, in bronchitis and in rheumatism. The dose is from 1 to 5 grains.

Preparations.—Tincture of Cimicifuga, Tinctura Cimicifugæ, 20 per cent. in strength, each minim containing ¼ of a grain of the drug. Dose 5 to 30 ♏. Extract of Cimicifuga, Extractum Cimicifugæ, dose from 1 to 5 grains, in pill form. Fluid Extract of Cimicifuga, Extractum Cimicifugæ fluidum. Dose from 1 to 25 ♏.

Hops—Humulus.—The strobiles or peculiar form of flower of the common hop vine.

Uses.—It is used as an antispasmodic and nervous sedative in hysteria and nervousness. Also in delirium tremens. It is applied as a poultice for painful inflammations, and is used in the form of a pillow for insomnia. The dose is from 5 to 30 grains.

Preparations.—Tincture of Hops, Tinctura Humuli, containing about 12 grains of the drug to the fluid dram. Dose ½ to 2 teaspoonfuls. An infusion may be made by adding 1 oz. of hops to a pint of hot water, covering the vessel and allowing it to infuse for half an hour.

Lupulin is a powder naturally present at the bases of the petals of the hop flower. After the flower has dried, the lupulin is easily separated by beating the flowers over the open mouth of a bag. It is the active portion of the hop plant. The dose of it is from 1 to 10 grains and it is usually given in pill form. There is a fluid extract of lupulin, dose 1 to 10 ♏, and an oleo-resin, dose 1 to 2 ♏. Lupulin is used for the same purposes as hops and is more constant in its strength.

CHAPTER XIII.

ASTRINGENTS.

THERE are two classes of astringents, the vegetable and mineral.

The astringents of vegetable origin and which depend for their astringent action, to the tannic acid there is in them, are:

Tannic Acid,	**Hæmatoxylon,**
Kino,	**Rhatany,**
Catechu,	**Rhus Glabra,**
White Oak,	**Geranium,**
Gallic Acid,	**Rose Leaves.**

Those of mineral origin are:

Sulphuric Acid,	**Lead Acetate,**
Alum,	**Nitric Acid,**
Silver Nitrate,	**Sulphate of Copper,**
Bismuth Subnitrate,	**Bismuth Subcarbonate.**

Tannic Acid or Tannin, is described under Anthelmintics.

Hæmatoxylon or Logwood is the heart wood of a South American tree. It comes into the drug market as a coarse sawdust of a reddish brown color.

Action and Uses.—As a mild astringent it is very useful in diarrhœa especially as it occurs among children. *It colors the urine red.*

Preparations.—Extractum Hæmatoxyli, Extract of Logwood. Dose 1 to 10 grains. It may be given in pill form, but is usually dissolved in water and sweetened or otherwise

flavored, cinnamon being a common addition. It is given also in the form of decoction, made by boiling an ounce of the drug for 15 minutes with a pint of water. To be given in wineglass doses.

Kino.—This is a solid extract obtained from an East Indian tree, by the natives of the country. It is black or very dark brown, coming in lumps which are brittle and shiny like coal.

Uses.—It is used altogether as an astringent, chiefly in diarrhœa mixtures. Dose 5 to 30 grains.

Preparations.—Tincture of Kino, containing 50 grains of Kino to each fluid ounce, or about 6 grains to the teaspoonful.

Rhatany (Latin name, **Krameria**).—It is a root. The drug itself, being tough and fibrous, and difficult of digestion, is never given internally.

It is used exclusively with other vegetable astringents, in diarrhœa, either in the form of fluid extract, dose 5 to 30 ♏, or as tincture. Dose 1 to 4 drams or from 4 to 16 C.c.

Catechu is a dried extract obtained from the wood of an African tree. Like the two preceding drugs, it is astringent and used alone or with them in diarrhœa. Besides it is used as an astringent wash for the throat. Dose 5 to 30 grains.

It is used in the form of tincture which contains 10 per cent. of the drug or 50 grains to the fluid ounce—about 6 grains to the teaspoonful. Dose one to four teaspoonfuls.

Rhus Glabra—Sumac.—The berries of the sumac bush.

It is used principally as an acid astringent wash in sore throat. There is a fluid extract, extractum rhus glabræ fluidum. Dose 1 to 5 ♏.

White Oak.—The bark of that common tree. This is an astringent bark and is used as a vaginal astringent, in the form of infusion.

Geranium is the root of a plant of all temperate climates. It is a pure astringent containing tannic acid, and is used in diarrhœa. It may be given in the form of infusion. The dose of the drug is from 5 to 30 grains or 0.325 to 2 Gm. Fluid extract of geranium, Extractum geranii fluidum. Dose 5 to 30 ♏ or from 0.325 to 2 C.c.

Gallic Acid.—This is prepared by fermenting tannic acid. It occurs in colorless or pale yellowish, needle-like crystals.

Physiological Action.—It is astringent to mucous surfaces. It does not form a clot with the blood. Internally used it acts as a hæmostatic, by contracting the blood vessels.

Uses.—It is used in chronic bronchitis, and in diabetes. It is used in diarrhœa and externally as an application to sores and ulcers, and external hæmorrhoids. The dose is from 1 to 30 grains or from 0.065 to 2 Gm., in pill form. Externally it is used in the form of ointment and as a glycerite, the latter being a 20 per cent. solution of the acid in glycerine. The ointment is a 10 per cent. mixture of the acid with benzoinated lard, vaseline or other suitable base.

Pale Rose—Rosa Centifola and Red Rose—Rosa Gallica.—The rose petals are the portions of the plant used, and they both act as simple astringents. Aside from their medicinal action, they are used in the form of confection to disguise the presence of or overcome the taste of nauseous or otherwise disagreeable drugs.

Preparations.—Rose-water, Aqua rosæ, made by distilling the leaves with water.

It is used as a simple astringent or as the vehicle for dissolving other astringents.

Unguentum Aquæ Rosæ (Rose-water ointment, or cold cream).—This is a mixture of wax, spermaceti, almond oil and

rose-water, a little borax being added to whiten the product. It is used as an application to all forms of broken surfaces, burns, cuts, chapped lips and hands, etc.

Confectio Rosæ (Confection of Rose).—A mixture of rose leaves and honey for preparing pills.

Fluid extract of Rose.—Extractum rosæ fluidum, used for its astringent properties in throat washes.

Syrupus Rosæ.—Syrup of rose. Used altogether as a flavor, more especially to astringent throat washes.

Sulphuric Acid—Acidum Sulphuricum—Oil of Vitrol.—This is a heavy colorless, oily looking liquid, obtained by exposing sulphur fumes to oxygen gas and steam. It is a powerful irritant and escharotic, causing, when spilled on the skin, painful sores. It destroys the skin, turning it quite black.

Uses.—Externally it is sometimes used as a caustic in venereal sores, warts and slow ulcers. Combined with vegetable astringents it is very useful in diarrhœa. It is also useful in preventing and arresting the course of cholera.

Internally it may be given in its diluted form, Acidum sulphuricum dilutum, in doses of from 5 to 20 ♏, each minim containing $\frac{1}{10}$ of a minim of strong acid.

Acidum Sulphuricum Aromaticum—Aromatic Sulphuric Acid.—A 10 per cent. flavored solution of sulphuric acid in alcohol. Dose 5 to 20 ♏ or 0.325 to 1.3 C.c. The latter contains oil of ginger and cinnamon and is the form most commonly used in diarrhœa. It is made into a sort of lemonade by adding 5 to 20 ♏ to a wineglass of water.

Alum.—This salt occurs in colorless crystals and as a fine white powder. It has no odor, but a sharply astringent, somewhat acid taste.

Physiological Action.—It whitens mucous surfaces, constrict-

ing and puckering them. It also thickens and toughens the skin. It decreases secretions and contracts the blood vessels and capillaries.

Uses.—It is used locally, as an application in sore throats. It arrests hemorrhage by coagulating the albumen and by constricting the vessels. It is used for sweating hands and feet. It is used for chilblains and for vaginal douches.

In the form of dried alum (Alumen exsiccatum) or Burned Alum, it is used as a caustic application by sprinkling over old sores and indolent ulcers and as an application to swollen gums.

Acetate of Lead (Plumbi Acetas)—Sugar of Lead and Solution of Lead Subacetate (Liquor Plumbi Subacetas).

Lead Acetate usually occurs in the form of a white crystalline powder, having a sweet, astringent taste.

Uses.—It is much used with opium in diarrhœa and dysentery. It is used as an injection in gonorrhœa. Dissolved in alcohol it is used as a lotion in ivy poisoning. Internally it may be used in doses of from ½ to 2 grains or from 0.030 to 0.130 Gm.

Solution of lead subacetate, or Goulard's extract. A 25 per cent. solution of the salt in water. When first prepared, it is a colorless solution. But on standing exposed to the air, it gradually decomposes and the solution becomes milky. In this state it is no longer suitable for use.

Uses.—It is used externally as an application to felons, some forms of eczema, and when combined with olive oil is used as an application to burns.

Silver Nitrate—Argenti Nitras.—There are three official forms of silver nitrate. The unmodified salt occurs in

flat or scale-like, colorless crystals. This is the form used both internally and in solutions for external application. Then there is the Fused or Moulded silver nitrate also called Lunar caustic, which comes in sticks of the size of a slate pencil. Lastly the Diluted silver nitrate or Mitigated caustic, which also comes in stick form and is a mixture of ⅓ silver nitrate and two-thirds potassium nitrate.

Physiological Action.—It acts as a non-irritating astringent to mucous surfaces. Applied locally it acts as a caustic to the surface, having no penetrating power. Its internal use is occasionally followed by a permanent tingeing of the skin to a bluish hue.

Uses.—Internally silver nitrate is given for gastric ulcer, gastric catarrh and gastritis. It is used in intestinal ulcerations and chronic dysentery. It has also been used in typhoid fever.

Externally it is used in inflammations of the nose, mouth and throat. As a spray into the throat in whooping cough. It is used in gonorrhœa, as an injection for uterine ulceration and leucorrhœa and in various affections of the eyes.

The stains to the skin, caused by nitrate of silver may be removed by washing the spots with a solution of 1 part of iodine, 10 parts of potassium cyanide in 100 parts of water. The solution is a very poisonous one and should be made when needed and after using should be thrown away.

The dose of silver nitrate is from ⅛ to ¼ grain in pill form.

Silver Nitrate is decomposed by contact with all forms of organic matter. It should therefore be kept in well-stoppered bottles to prevent the entrance of dust. The latter if allowed to settle upon the surface of the crystals, decomposes the surface and forms an insoluble black oxide of silver, unfit for use.

The solutions of the salt should be made in distilled water and stoppered with glass. Cork, camel-hair, swabs or vegetable or animal substance of any kind decomposing the salt and rendering the solution cloudy and forming a black sediment. As a protection from these changes, a blue glass bottle may be used to shut out the light, which hastens the decomposition.

Nitric Acid—Acidum Nitricum. *Physiological Action.*—This acid is a colorless, fuming liquid, having an irritating odor and is one of the most corrosive of the acids. In a diluted state it has an extremely sour taste. It becomes yellowish on long standing. Nitric acid in its purity acts as a powerful caustic to the tissues of the body. Diluted and applied to membranous surfaces, it acts as an irritant and astringent.

Internally it stimulates the secretions of the stomach.

Uses.—It is used externally for the purposes for which powerful caustics are used. It destroys chancres and warts, and is applied to indolent ulcers as a stimulant.

In its diluted form it is used internally as a tonic and astringent. It is used in indigestion and dyspepsia, and in some forms of diarrhœa.

The dose of the diluted acid is from 3 to 15 ♏, or from 0.195 to 1 C.c.

Preparation.—Diluted Nitric Acid, Acidum Nitricum dilutum—a 10 per cent. solution of Nitric Acid in distilled water, each minim representing $\frac{1}{10}$ ♏ of the strong acid.

Copper Sulphate—Cupri Sulphas—or Blue Vitriol.—It occurs in the form of transparent blue crystals.

Physiological Action.—Externally it acts as an astringent and as a superficial caustic. Internally it causes vomiting.

Uses.—In doses of 5 to 10 grains—(0.325 to 0.650 Gm.) it

is used as an emetic, being given as such only in cases of phosphorous poisoning.

It is used sometimes in diarrhœa. Applied locally in powdered form to the surfaces of indolent ulcers, it has been found useful. In crystalline form and in solution, it is used in the treatment of some diseases of the eyes.

It is also used in weak solution as a gargle in sore throat.

The dose is from ½ to 1 grain, or from 0.010 to 0.065 Gm.

Bismuth Subcarbonate and **Bismuth Subnitrate.**—Bismuth is a metal and never used in that form for medicinal purposes. The Subcarbonate and Subnitrate both occur in the form of fine white powder with neither odor nor taste and quite indistinguishable one from the other.

Uses.—In either form it is used as an astringent. It is useful in vomiting and in diarrhœa. Also in dyspepsia, gastric ulcer and gastritis. The use of bismuth internally causes a garlic-like taste in the mouth and odor in the breath. It also blackens the stools.

They are given in powder form in doses of from 5 to 15 grains or 0.325 to 1 Gm.

They may also be given in water, suspended by mucilage or syrup of acacia.

Bismuth Subgallate or **Dermatol** is not an official salt but is quite largely used for the same purposes and in the same doses as the salts already mentioned.

Zinc Sulphate.—Zinci Sulphatis.—White Vitriol.—This salt of zinc occurs in the form of fine white crystals, resembling to the superficial observer, crystals of epsom salt. It is odorless and has an acid and puckery taste.

Uses.—It acts as an irritant and is used as an irritant emetic in the dose of 10 to 30 grains—0.650 to 2 Gm. In

weak solution it is used as an astringent for gonorrhœal injection. In pill form or in concentrated solution and combined with opium, it is used in some forms of diarrhœa. It is also used in affections of the eyes. The dose is from ½ to 2 grains—0.030 to 0.130 Gm.

CHAPTER XIV.

CARDIAC SEDATIVES.

Aconite,	**Veratrum Viride,**
Antimony,	**Hydrocyanic Acid.**

Aconite.—The root of a plant growing in the temperate zones of Europe and America, commonly known as monkshood.

Physiological Action.—When placed upon the tongue, it produces a sensation of tingling which extends to the throat.

It is depressant to the nervous system. Applied to mucous surfaces it causes local anæsthesia.

It acts as a heart sedative, decreasing arterial pressure. It reduces the temperature in fevers, and increases the flow of urine.

Uses.—Its chief uses are as a heart and circulatory sedative and for its effect upon the peripheral sensory nerves. It is used in the vomiting of pregnancy; in acute inflammatory conditions. Locally, applied to the surface, it is used in neuralgia. It is useful in croup, quinsy, sore throat, colds, bronchitis, in their first stages.

The dose of the drug in powder form is from ½ to 2 grains, or 0.030 to 0.130 Gm. But it is generally used in the form of tincture in doses of from 1 to 6 minims, in divided doses.

Preparations.—Tincture of Aconite, Tinctura Aconiti—each minim containing $\frac{1}{10}$ of a grain of the drug. Fluid Ex-

tract of Aconite, Extractum Aconiti fluidum—one minim equals one grain of the drug. Extract of Aconite, Extractum Aconiti—four times the strength of the drug, dose ¼ as great —viz., ⅛ to ½ grains, usually given in pill form.

The active principle of Aconite is an alkaloid called Aconitine. Owing to the great difficulties attending its separation in pure form, and the consequent uncertainty of its action, it is not very largely used.

There is a brand known as Duquesnel's which is always preferred by physicians, because of its reliability. The dose is from $\frac{1}{200}$ to $\frac{1}{100}$ of a grain, in tablet form, or from $\frac{55}{1000}$ to $\frac{66}{1000}$ of a milligram (0.00033 to 0.00065 Gm.).

Veratrum, commonly known as Hellebore root is an American root.

It is used in domestic medicine to allay inflammation. It owes its medicinal value to the presence of two alkaloids, Jervine and Veratroidine.

Physiological Action.—"It slows the pulse by direct depressant action upon the muscle of the heart (action of the Jervine) and by stimulating the pneumogastric nerves (action of the Veratroidine). It lowers blood pressure by an action upon the heart muscle (action of the Jervine) and by depression of the vasomotor centre (action of the Jervine)."

Uses.—Its chief use is as a circulatory sedative. It is of great value in pneumonia, pleurisy, acute hepatitis, peritonitis and cerebritis. It is generally used in the form of tincture, one drop being given every half hour until the skin becomes moist or relaxed, the pulse slower and slight nausea ensues.

Preparations.—Tincture of veratrum viride, Tinctura veratrum viride. Each minim contains $\frac{1}{10}$ of a grain of the drug. Fluid extract of veratrum viride, Extractum veratrum viride

fluidum. Each minim contains 1 grain of the drug. The dose of the drug itself is from ½ to 2 grains.

Antimony is a mineral and is not employed in its native state as a medicine. While there are several salts of antimony used, there is but one of them used frequently. This is the compound commonly known as tartar emetic. The official titles are: Antimony and potassium tartrate, Antimonii et potassii tartras. It occurs as a fine, white, crystalline powder, without odor and very little taste.

Physiological Action.—It produces a sensation of burning when applied to mucous membranes. Applied to the skin it is irritating and if long applied causes pustules, ulcers and sloughing. It is depressant to the nervous system. It lowers the pulse rate and decreases arterial tension.

The respiration is rendered feeble. The secretion of the bronchial tubes is increased.

In full doses it acts as an emetic and in larger doses, purges.

Uses.—It is useful in the treatment of colds and bronchitis. It is given in solution with syrup, either in repeated doses of $\frac{1}{60}$ grain (0.001 Gm.) or in a single dose of ½ a grain (0.030 Gm.).

As a counter-irritant it may be used in the form of ointment, sprinkled over the surface of plasters, and by sprinkling the powder directly upon the surface of the skin.

Preparations.—Wine of antimony, Vinum antimonii, containing 2 grains of the salt, (0.130 Gm.) to the fluid ounce or ¼ grain (0.016 Gm.) to the teaspoonful.

Compound syrup of squill, Syrupus scillæ compositus, contains 1 grain (0.065 Gm.) to each fluid ounce.

Among the preparations of other compounds of antimony are Plummer's pill or Compound pill of antimony, containing ½

grain each of sulphurated antimony and calomel and 1 grain of jalap. James' powder or Compound powder of antimony or Pulvis antimonialis which contains oxide of antimony. Sulphurated antimony or Kermes mineral, a reddish powder, used but rarely for similar purposes as tartar emetic.

Diluted Hydrocyanic Acid—Acidum Hydrocyanicum Dilutum—Prussic Acid.—This is a colorless, transparent 2 per cent. solution of hydrocyanic acid gas in water.

It is very volatile and since it holds but 10 minims of the gas to the fluid ounce, when of full strength, care should be taken to keep it well stoppered and in a cold place. It is a most rapid and violent poison. Care must be used while handling it, lest the vapor be inhaled and poisoning follow.

Physiological Action.—It is one of the most rapid acting poisons and is absorbed with great avidity, acting upon the respiratory centre and the heart. It exerts a lethal effect upon every part of the body; the nervous system, brain, heart and respiration all being killed by large doses, death occurring almost at once.

Uses.—It is useful in gastralgia and nervous vomiting. It is used in irritable coughs. It is sometimes used in washes for itching skin diseases.

The dose of the diluted acid is from 1 to 5 minims (0.065 to 0.325 C.c.) and it is usually given in admixture with other remedies. The pure, strong acid is never used.

Sabadilla is the seed of an European drug. It contains the active alkaloid called veratrine. It should not be confounded with veratrum viride which is another drug altogether.

The alkaloid, not the seed, is used.

Physiological Action.—Its leading action is paralytic. The

heart beats slower under its action; the respiration fails and the body temperature falls.

Uses.—It is never used internally. It is used externally, either as an oleate of veratrine or as veratrine ointment for rheumatism and neuralgia.

It should be cautiously used, as absorption may be great enough to produce poisonous effects.

CHAPTER XV.

CARDIAC STIMULANTS.

Digitalis,	**Alcohol,**
Ether,	**Nux Vomica,**
Caffeine,	**Strophanthus,**
Convallaria,	**Sparteine,**
Amyl Nitrite,	**Opium.**
Ammonia,	

Digitalis—Foxglove.—The leaves collected from plants of the second year's growth.

Digitalis contains two active principles, digitalin and digitoxin.

Physiological Action.—Its action upon the nervous system is not perceptible except in poisonous doses.

It is upon the circulation that its chief action is to be seen. It increases the pulse force and the arterial pressure, and slows the pulse.

It has no effect upon either the respiration or the body temperature, except in poisonous doses.

NOTE.—Vegetable drugs, and consequently the preparations made from them, must from their nature, be variable in value. They all deteriorate in time. In the cases where powerfully acting drugs are to be used, from which immediate effect is of vital importance, the nurse should always inquire as to the freshness or otherwise, and the quality of the drug she is purchasing.

Uses.—Digitalis is a cardiac stimulant. It is of value in all cases when the heart fails to do its full amount of work.

It is serviceable in irritable and palpitating heart, *not* due to indigestion.

It is used in some stages of pneumonia, as a tonic in fevers, and in congestion of the lungs.

It is useful in cardiac weakness from collapse or shock, and from poisoning. As a diuretic it is used when the kidneys are congested.

The dose of the drug is from ½ to 2 grains (0.030 to 0.130 Gm.).

Preparations.—Infusion of digitalis, Infusum digitalis—1½ per cent. in strength, about a grain of drug to the teaspoonful. This preparation should be made from the leaves and *not* by diluting either the fluid extract or the tincture.

Tincture of digitalis, Tinctura digitalis—10 per cent. in strength. One minim equals $\frac{1}{10}$ of a grain and. 10 minims 1 grain of the drug.

Fluid extract of digitalis, Extractum digitalis fluidum—100 per cent. in strength. One minim equals 1 grain of the drug.

Extract of digitalis, Extractum digitalis. ¼ grain equals 1 grain of the drug. This latter is used in pill form.

The glucosides, digitalin and digitoxin are not official. The dose of either is $\frac{1}{100}$ of a grain and they are used in tablet form, dissolved, and administered hypodermically.

Ammonia has been already described under Antacids.

Ether has been described under Anæsthetics.

Alcohol.—This valuable and extensively used liquid is obtained by distillation from whiskey. Chemically it is the hydrate of ethyl. There are four official forms: **Alcohol,** the so-called 95 per cent. containing about 90 per cent. of

alcohol and 10 of water, **Deodorized alcohol,** containing 92 per cent. alcohol and 8 of water, **Absolute alcohol,** 100 per cent., and **Diluted alcohol,** a mixture of equal parts of alcohol and water. Alcohol has a great affinity for water and the 90 per cent. variety is as permanent as can be kept under ordinary conditions of exposure. To keep absolute alcohol constant in strength, it must be in well-filled bottles, securely stoppered.

Physiological Action.—It acts as a powerful excitant at first, afterwards as a depressant and paralyzant of the nervous system. It stimulates the heart muscle and increases the rapidity and force of the pulse; in toxic doses, acting as a depressant and finally as a paralyzant of the heart. It stimulates the respiration and while it produces a sensation of warmth it does not raise the body temperature. In moderate use, it assists digestion.

Uses.—Its chief use is as a rapidly acting stimulant in heart failure of all forms, as in fainting, snake bite, surgical shock, etc. It is used also in exhausting fevers, such as typhoid and typhus.

Externally, it is used as a wash or evaporating lotion for bruises, inflamed joints and contused wounds.

Internally, the alcoholic liquids, brandy or whiskey are used in place of pure alcohol, both being about half alcohol.

Brandy, Spiritus Vini Gallici is the alcoholic liquid obtained by distillation from fermented grape juice. It contains an ether which gives it a *quick* stimulating power, not possessed by whiskey.

Whiskey—Spiritus Frumenti.—An alcoholic liquid distilled from fermented grain.

Gin.—An alcoholic liquid distilled from fermented grain

mixed with juniper berries, which gives it its flavor and its name, Spiritus Juniperus.

Rum (Spiritus Saccharatus).—An alcoholic liquid distilled from fermented molasses.

The dose of alcohol is from ½ to 4 fluid drams. Of the other alcoholic spirits from 1 dram to 2 ounces or 4 to 60 C.c.

Caffeine—Citrated Caffeine.—An active principle obtained from tea and coffee and from the South American drug, Guarana. Caffeine itself is insoluble in water. Mixed with an equal quantity of citric acid, it forms Citrated Caffeine and becomes soluble. It occurs as a fine white powder with an acid and bitter taste.

Physiological Action.—It acts as a rapid stimulant to the nervous system. By its action upon the nervous system, it increases the pulse rate and blood pressure. It increases diuresis, and stimulates the respiration.

Uses.—It is used as a cardiac and renal stimulant in cardiac and renal dropsies. Combined with antipyrine and the bromides it is used in headaches. *Dose.*—1 to 5 grains or 0.065 to 0.325 Gm.

Nux Vomica.—The seed from an East Indian tree. Its active alkaloid is strychnine.

Physiological Action.—It acts as an excitant to the nervous system. It increases the force of the pulse beat and the pulse rate and raises the arterial pressure. It stimulates respiration, and has no effect, in medicinal doses, on the body temperature.

Uses.—Nux Vomica or its alkaloid is used as a bitter tonic, especially to the nervous system. In functional nervous atony, in amaurosis from excessive use of tobacco or alcohol, it is useful.

In the collapse of pneumonia, it has been found useful. Added to purgatives it is used in atony of the bowels.

The dose of the drug is from 1 to 3 grains or from 0.065 to 0.195 Gm.

The dose of strychnine is from $\frac{1}{60}$ to $\frac{1}{30}$ of a grain—0.001 to 0.003 Gm.

Preparations.—Tincture of Nux Vomica, Tinctura Nucis Vomicæ—containing 2 per cent. of the extract, each minim equalling $\frac{1}{60}$ of a grain. Dose.—6 to 20 ♏.

Fluid extract of Nux Vomica, Extractum Nucis Vomicæ Fluidum, 1½ per cent. of strychnine. Each minim represents about $\frac{1}{60}$ grain of strychnine. Dose.—1 to 3 minims.

Extract of Nux Vomica, Extractum Nucis Vomicæ—used in pill form, containing 15 per cent. of strychnine, each grain containing about $\frac{1}{8}$ of a grain of strychnine. Dose.—¼ grain.

Strophanthus.—The seed of a plant growing in Africa. It contains the active principle strophanthin.

Uses.—It is used in all the forms of heart disease in place of digitalis, which see.

It is used in the form of Tincture, Tinctura Strophanthus, a 10 per cent. tincture, each minim being the equal of $\frac{1}{10}$ grain of the drug. Dose.—5 to 20 minims, being the same as ½ and 2 grains, respectively, of the drug.

Convallaria.—This is the root of the lily of the valley.

Uses.—While it is not as highly valued as digitalis, it is used for the same purposes as a cardiac tonic.

The dose of the drug is from 1 to 10 grains or 0.065 to 0.650 Gm.

Preparation.—Fluid Extract of Convallaria, Extractum Convallariæ Fluidum—each minim representing 1 grain of drug. Dose.—1 to 10 ♏, or 0.065 to 0.650 C.c.

Scoparius—Broom.—The part of the plant used is the tops. It is sometimes used in the form of infusion. It con-

tains an active alkaloid known as sparteine, and it is this which is used, rather than the drug.

Sparteine Sulphate is a crystalline salt.

Physiological Action.—It acts as a depressant to the nervous system, stimulates the circulation, quickens the pulse rate and raises the arterial pressure.

Uses.—This drug is used in all those heart troubles in which digitalis is found serviceable. The dose is ⅛ to ¼ grain or 0.008 to 0.016 Gm.

Amyl Nitrite.—This is a colorless or pale straw-colored, volatile liquid, with a peculiar, fruity odor. It generally comes to the market in thin glass globules called pearls, hermetically sealed to prevent its loss by evaporation, each pearl containing 3 or 5 minims.

Physiological Action.—When swallowed or inhaled, it quickly, even rapidly produces its effect of fullness and throbbing in the head, roaring in the ears, sharp reports in the head and muscular relaxation. The heart beats quickly and with increased force and the respiration becomes gasping. It acts as a nerve depressant and sedative, increases the pulse, and lowers arterial tension and is depressant to the heart. If long continued, its use causes a fall in the body temperature.

Uses.—It is used to relax general or local muscular spasms as in epilepsy, strychnia poisoning, tetanus and angina pectoris. In heart failure from fright or the use of anæsthetics, in whooping-cough, asthma and infantile convulsions, it is also of service. It is usually given by inhalation. One pearl is crushed in a napkin and held to the nostrils, one pearl quickly producing its effect. Sometimes the same quantities, 3 to 5 drops on sugar, are given by mouth.

Opium has been already considered under Antispasmodics.

CHAPTER XVI.

CATHARTICS.

Laxatives, **Simple Purgatives,**
Drastic Purgatives, **Saline Purgatives.**

LAXATIVES.

Sulphur,	**Tamarind,**
Fig,	**Prune,**
Cassia Fistula,	**Manna,**
Castor Oil,	**Olive Oil.**

SIMPLE PURGATIVES.

Aloes,	**Senna,**
Cascara,	**Buckthorn,**
Rhubarb,	**Ox Gall.**

DRASTIC PURGATIVES.

Calomel,	**Colocynth,**
Antimony,	**Croton Oil,**
Oil Turpentine,	**Podophyllum,**
Aloes,	**Gamboge,**
Leptandra,	**Elaterium.**

SALINE PURGATIVES.

Rochelle Salt,	**Cream Tartar,**
Sodium Sulphate,	**Sodium Phosphate.**
Magnesium Salts,	

Sulphur is found in an almost pure state in several of the volcanic regions of the world. There are three official forms, Sublimed sulphur, or Flowers of sulphur (sulphur sublimatum),

a yellow crystalline powder; Washed sulphur (sulphur lotum) presenting the same appearance but freed from crude natural impurities, and Precipitated sulphur (sulphur præcipitatum) a lighter colored, finer, quite impalpable powder, more suitable for all medicinal purposes than either of the others. It has but little odor, unless rubbed, when it gives the odor of burning sulphur, irritating, somewhat acid. It is insoluble in water.

Physiological Action.—Taken internally it produces soft stools, yellow in color and with the odor of sulphureted hydrogen or rotten eggs.

Uses.—It is used as a mild laxative. It is used in constipation and also in rheumatism. It finds great domestic favor as a "spring medicine" combined with cream tartar and mixed to a paste with molasses. Externally in the form of ointment, it is a remedy for scabies or itch. It is used also in lotion form for acne. The dose of sulphur is from 10 grains to 2 drams or from 0.650 to 4 Gm.

Tamarinds—Tamarindus.—It is the preserved pulp of the fruit of a West Indian tree. It has a mixed, bitter, sweet and acid taste. It acts as a mild laxative.

Fig—Ficus.—A sub-tropical fruit, laxative in its action.

Prune—Prunum.—The fruit of a tree of the warmer climates, laxative in its action. Fig, prune and tamarind all enter into the compound, officially known as confection of senna, which is laxative in its action.

Cassia Fistula or **Purging Cassia** is a long, narrow, dark brown pod, containing a soft black pulp. The pulp is the portion used and it acts as a laxative. As it causes pain in doses large enough to act alone, it is generally given in small doses in conjunction with other laxatives, in doses of ½ to 1 dram, 2 to 4 Gms.

Manna.—This is the saccharine substance found upon a tree of Europe. It occurs in irregularly shaped flakes or fingers, varying in form and size, of a yellowish white color and a sweet somewhat sickish taste.

It is a feebly acting laxative. It is given to children, dissolved in milk, for constipation in doses of ½ to 2 drams.

Magnesium is a soft silvery looking metal, never used as a medicine, but from which the several salts of magnesium used, are made.

The salts are: Magnesia or calcined Magnesia or Magnesium oxide, Magnesium carbonate, Magnesium citrate (salt and solution), Magnesium sulphate (epsom salt).

Magnesia—Calcined Magnesia, is a fine, light, white powder, without odor or taste and made by burning magnesium metal and other processes.

It is slowly changed by exposure to the carbonate. It acts as an antacid and feeble laxative. The dose is from 1 to 4 drams or 4 to 16 Gm.

Magnesium Carbonate usually occurs in the form of white cubes, having the appearance of chalk, only much lighter and softer and is easily crushed in the hand. While it has a laxative action it is more commonly used as an antacid in the sick headaches which follow gastric acidity. The dose is 5 to 60 grains taken dry or mixed with water.

Magnesium Citrate.—A compound formed by bringing magnesium carbonate and citric acid together. There are two official forms of it, the granular powder, Magnesii citras effervescens, and the solution of Magnesium citrate or Liquor magnesii citras effervescens.

The salt in order that its effervescing properties may be preserved, must be kept tightly corked and in a dry place.

The dose of the salt is 1 to 4 drams, mixed in water stirred and drank during effervescence.

The solution comes in strong 12 ounce bottles. The contents of the bottle may be taken at a dose, if brisk action is desired. Or it may be used in divided doses of a wine glassful or two until the desired effect is produced.

Magnesium Sulphate—Epsom Salt.—This salt occurs as an ingredient in many mineral spring waters. That in use, however, is artificially produced by the action of sulphuric acid upon magnesium carbonate.

It is used as a laxative, dissolved in water. It is also used in form of enema. It is given in dropsy, in enteritis and peritonitis. The dose is from ½ to 2 ʒ, or from 15 to 60 Gm.

Castor Oil—Oleum Ricini.—A heavy pale straw colored oil from the bean of the castor oil plant. The oil contains an acrid substance called ricinoleic acid.

Physiological Action.—Its purging power is probably due to the acid mentioned. It acts as a stimulant to both the large and small intestine, so developing peristaltic action.

Uses.—It is one of the mildest, non-irritating purges. It is used to cleanse the intestine opirritating foods, such as putrid meats, decaying vegetables or unrife fruit. It also aids in removing hard substances accidentally or mischievously swallowed. It is a favorite remedy in the constipation of children. Its use is followed by a period of constipation and for this it is used in irritative diarrhœa.

Its taste is nauseating and various essences, syrups and fruit juices are used to disguise the taste and overcome the nauseating effect of it. If it is convenient, the oil, poured into a glass of foaming sarsaparilla soda water and drank at one draught, will be completely covered. Coffee and lemon juice,

also iced water are used to float it to the throat quickly. It may also be given in capsules.

SIMPLE PURGATIVES.

Aloes.—This is the sun dried juice of the large, thick and fleshy leaves of the tropical aloe plant. The leaves being cut at the base are arranged concentrically about a hole in the sand, into which a vessel of skin or a gourd is placed. The juice slowly oozes out and dries in the receptacle, in which form it enters the market. Broken, it is black-brown or greenish brown in color with a shining fracture. Powdered, it is of a dull yellow color, having an aromatic, rather pungent odor and a bitter taste. It is soluble in water.

Physiological Action.—It acts slowly unless given in large toxic doses.

If the doses are small, the stools will be thick. If large, they will be watery.

Uses.—It is a valuable remedy in acute constipation and is used as a bitter tonic with iron. It is quite liable to produce griping and is usually combined with carminatives. It possesses some emmenagogue power.

The dose is from 1 to 20 grains. It is most commonly used in small, repeated doses.

Preparations.—Tincture of aloes containing about 12 grains to the fluid dram. Tincture of aloes and myrrh, 12 grains of each drug to the fluid dram.

There are also the Pill of aloes, Pill of aloes and myrrh, Pill of aloes and iron, Pill of aloes and mastiche and Pill of aloes and assafœtida.

The active principle of aloes is a glucoside called aloin. It

occurs as a yellow powder very much like the drug itself in appearance, odor and taste.

The dose of it in tablet form is from ¼ to 2 grains or from 0.016 to 0.130 Gm. Small repeated doses seem to be in greatest favor.

Rhubarb—Rheum.—This is a root from a plant growing in Asia and eastern Europe.

Physiological Action.—It stimulates the secretion of bile, acts as a purgative, the purgative action being followed by an astringent action.

Uses.—It is useful in simple constipation, especially in the diarrhœa *following* constipation, which it overcomes by its twofold action. It is very useful in the summer diarrhœa of children. The dose of the drug in powder form is from 5 to 30 grains or 0.325 to 2 Gm.

Preparations.—Tincture of Rhubarb, Tinctura Rhei, 12 grains of drug to the fluid dram. Sweet Tincture of Rhubarb, Tinctura Rhei Dulcis, 12 grains of the drug to the fluid dram. Aromatic Tincture of Rhubarb, Tinctura Rhei Aromatica, 12 grains of the drug to the fluid dram. Extract of Rhubarb, Extractum Rhei, used in pill form in 1 to 10 grain doses.

Fluid Extract of Rhubarb, Extractum Rhei Fluidum, 1 gr. to 1 ℳ. Dose 5 to 30 ℳ. Syrup of Rhubarb, Syrupus Rhei, 6 grains, and Aromatic Syrup of Rhubarb, Syrupus Rhei Aromaticus, 2 grains of drug to the dram. Besides these there is the Rhubarb Pill, the Compound Rhubarb Pill and the Compound Rhubarb Powder.

The pill contains 3 grains of rhubarb.

The compound pill contains 2 grains of rhubarb combined with aloes and myrrh, and oil of peppermint. The compound

rhubarb powder is a mixture of rhubarb, magnesia and ginger, ¼ part rhubarb.

Cascara Sagrada—Rhamnus Curshiana.—This is the bark of a tree growing on the Pacific coast of America, principally in California.

Uses.—Cascara should be used as a laxative, not as a purge. It is one of the best remedies for emptying the intestines in constipation, its laxative action being accompanied by a tonic action which prevents constipation afterward. Large doses produce irritation unless mixed with carminatives. The dose of the drug is from 5 to 30 grains or more, and it is generally used in the form of the fluid extract. The drug has an unpleasant bitter taste and there is in the market a bitterless fluid extract. There are also various aromatic and cordial preparations. The age of the drug is of some consequence. It should be 2 years old or more before it is in the best condition to use. Some variation in its action is due to unavoidable differences in the drug from different localities.

Senna.—The leaves of a plant growing in Africa and East India.

Physiological Action.—The drug acts as a purge, producing copious stools with considerable pain, unless combined with aromatics. It is not much used as a cholagogue, although it increases the flow of the bile.

Uses.—It is used for the relief of constipation mostly combined with other drugs. The dose of it is from 5 to 30 grains or more, from 0.325 to 2 Gm.

Preparations.—Fluid Extract of Senna, Extractum Sennæ Fluidum—1 gr. to 1 ♏. Compound Infusion of Senna, Infusum Sennæ Compositum—a mixture of Senna, Magnesium Sulphate, Manna, and oil of coriander seed. It contains 30

grains of Senna and 60 grains of Magnesium Sulphate to the fluid ounce.—Dose ½ to 2 fluid ounces, as a hydragogue cathartic.

Syrup of Senna, Syrupus Sennæ, containing 15 grains of Senna to each fluid dram. Confection of Senna, Confectio Sennæ—a pasty mixture of Senna, Purging Cassia, Figs, Prunes, Tamarinds and Oil of Coriander mixed with sugar and syrup, $\frac{1}{10}$ part senna. Dose ½ to 2 drams or from 2 to 8 Gm. Compound Glycyrrhiza Powder, Pulvis Glycyrrhizæ Compositus or Compound Licorice Powder—a mixture of Senna, Sulphur, Licorice, Sugar and Fennel Seed. *About* ⅛ part Senna. Dose ½ to 2 drams or 2 to 8 Gm.

Ox Gall—Fel Bovis.—The bile from the gall bladder of the ox. It comes to us in two forms. The semi-solid greenish mass, made by filtering and evaporating the fresh bile, and in powder form, by continuing the evaporation to dryness and reducing to powder. Being of a perishable nature, it should be kept from the air and in a dry place.

Uses.—It is used to relieve the indigestion of fatty substances. It is given to produce movement of the bowels. It should be given some time after meals. Owing to the fact that it interferes with digestion it is frequently given as an enema.

The dose is from 5 to 15 grains or 0.325 to 1 Gm.

DRASTIC PURGATIVES.

Calomel—Hydrargyrum Chloridum Mite—Mild Mercurous Chloride—Mild Chloride of Mercury—Subchloride of Mercury.—A heavy, white, inodorous, tasteless powder, made by the action between Mercurous Sulphate and Sodium Chloride.

Uses.—As a laxative purge it is usually given in small oft repeated doses. For example ⅛ to ½ grain every half hour or hour, until from 1 to 5 grains have been taken. It is given in doses of 10 grains at one dose combined with an equal amount of Jalap powder. In dysentery it is used with ipecac in small doses. It is used in flatulency and fœtid breath and bad stools of children in $\frac{1}{10}$ grain doses, repeated. It is used in Jaundice. Combined with sodium bicarbonate, its activity is increased. In dropsy as a diuretic it is used, combined with squill and digitalis. Also in the constipation of typhoid fever.

Podophyllin.—This is a resinous substance obtained from the root of the May Apple. The root, podophyllum, and the resin, podophyllin, are both employed.

Uses.—It is a slow acting purge, laxative in small doses, purgative in large doses. It excites the flow of bile and is used as a cholagogue. It is used for relief in hard lumpy stools and in summer diarrhœa in children. Also in chronic diarrhœa in adults.

Preparations.—Extractum Podophyllum, Extract of Podophyllum. Dose 1 to 5 grains in pill form. Fluid Extract of Podophyllum, Extractum Podophyllum Fluidum—1 gr. to 1 ℳ. Dose 1 to 30 ℳ. Resin of Podophyllum Resina Podophylli. Dose $\frac{1}{20}$ to $\frac{1}{10}$ grain as a laxative, $\frac{1}{10}$ to ½ grain as a purgative. There is a tincture of podophyllum but it is not official.

Jalap.—This is the root of a plant growing in South America. From it is obtained the Resin of Jalap.

Uses.—It is used as a hydragogue purge in the relief of dropsy, and as a cathartic combined with other drugs of a similar activity. It is a favorite purge in torpid liver. The dose is from 5 to 30 grains.

Preparations.—Alcoholic Extract of Jalap, Extractum Jalapæ Alcoholicum—used in pill form in doses of from 1 to 10 grains.

Resin of Jalap, Resina Jalapæ, in pill form. Dose 1 to 5 grains. Compound Jalap Powder, Pulvis Jalapæ Compositus—a mixture of ⅓ Jalap and ⅔ Cream Tartar. Dose, 5 to 30 grains. It is one of the ingredients of the compound cathartic pill, which contains Calomel, Jalap, Colocynth and Gamboge.

Leptandra is the root of an American drug.

Physiological Action.—In moderate doses it increases the flow of bile. In large doses it acts as a violent purge.

Uses.—It is of great value in intestinal indigestion called duodenal atony. It is used for many of the purposes for which calomel is used as a purge. Dose 5 to 30 gr.

Preparations.—Extract of Leptandra, Fluid Extract of Leptandra—the former used in pill form in doses of from 1 to 10 grains. The latter is given in doses of 5 to 30 ♏. The extract is one of the ingredients in the Vegetable cathartic pill, Piluæ Catharticæ Vegetabilis. They contain Extract of Colocynth Compound, Extract of Hyoscyamus, Extract of Jalap, Extract of Leptandra, Resin of Podophyllin and Oil of Peppermint.

Scammony.—This is a resinous substance which flows from the root of a plant of Asia.

Uses.—It is an irritant, drastic, hydragogue purge and a cholagogue. The dose is from 2 to 5 grains. It is usually combined with other drugs, such as colocynth and calomel in pill form.

Preparation.—Resin of Scammony, Resina Scammonii.

Gamboge—Gambogia.—A resinous substance of tropical

origin. It occurs in moulded sticks half an inch or more in thickness of a reddish yellow color.

It is a powerful hydragogue cathartic and is seldom if ever used alone, but with other cathartic drugs as in the combination forming the compound cathartic pill.

Dose ½ to 3 grains or 0.030 to 0.195 Gm.

Colocynth—Bitter Apple.—This is a fruit growing in all temperate zones. It usually reaches the market in the form of a snuff-colored powder. It has a bitter odor and taste.

Uses.—It is rarely used alone, but combined with other drugs as a hydragogue cathartic. It is used in chronic dropsy. Dose, 2 to 10 grains.

Preparations.—Extract of Colocynth, Extractum Colocynthidis, Compound Extract of Colocynth, Extractum Colocynthidis Compositus. The latter is a mixture of Extract of Colocynth, Aloes, Resin of scammony, Castile soap and Cardamom seed and is the form in which the drug is most generally used, the dose of either being from 1 to 5 grains, or 0.065 to 0.325 Gm.

Elaterium is a sediment collected from the juice of a plant known as the squirting cucumber. It occurs in irregular-shaped, curved fragments of a light dirt color, having on its convex surface the imprint of the cloth upon which it has been dried.

Physiological Action.—It is irritant to all the mucous membranes. It produces watery stools.

Uses.—It is a valuable hydragogue cathartic, producing profuse watery stools. It is used in pericarditis, pleurisy and dropsy. It is also used in cerebral congestions. The dose, best given in pill or tablet form, is $\frac{1}{8}$ grain, or 0.010 Gm.

Its active principle is Elaterin, the dose of which is $\frac{1}{20}$ grain, or 0.003 Gm.

The only official preparation is the Trituration of Elaterin, a trituration being a mixture of any drug with 10 times as much sugar of milk, the object being to give convenient size to the dose of the drug.

Croton Oil is obtained from the seed of an East Indian tree. It is a heavy oil varying in color from pale straw to the color of brown sherry wine.

Action and Uses.—Applied to the skin it acts as an irritant, producing pustules or blisters. One drop placed on the tongue with several drops of sweet oil acts as a violent purge producing a watery stool. It is used in cerebral congestion and obstinate constipation. It is applied to the chest as a counter-irritant in bronchitis.

SALINE PURGATIVES.

Rochelle Salt—Potassium and Sodium Tartrate—Potassii et Sodii Tartras.—It occurs as a fine white powder having a somewhat salty taste. It is used as a saline purgative in doses of half an ounce or more, dissolved in water.

It is the active agent in the well known seidlitz powder, or Pulvis Effervescentes Compositus, or Compound Effervescing Powder. The white paper contains 120 grains of Rochelle Salt, and 40 grains of Sodium bicarbonate, and the blue paper 35 grains of Tartaric acid. The sodium bicarbonate and the tartaric acid bring about effervescence or foaming, when the two are mixed with water, making the taste less unpleasant.

Potassium Bitartrate, or Cream Tartar.—This is a substance found deposited on the sides and bottom of the vats in which grape juice has been fermented in the making of wine.

It is a fine white powder having an acid taste, not very soluble in cold water but quite so in hot water.

Action and Uses.—Cream Tartar is diuretic and cathartic in its action. It is used in nephritis and in dropsy. In large doses it acts as a watery purge. It is used also when the urine is thick and alkaline. Dose, 1 to 4 drams, or 4 to 16 Gm.

Sodium Sulphate—Glauber's Salt.—This comes in colorless crystals freely soluble in water.

It acts as an irritant saline purge, producing watery stools and griping.

It is present in many of the purgative mineral waters. Dose, 1 to 4 drams, or 4 to 16 Gm.

Sodium Phosphate occurs as a crystalline salt but more often as a white granular powder. It is more soluble in warm than in cold water.

It is used as a saline cathartic more especially in jaundice. Dose, 1 to 4 drams.

Magnesum Sulphate, or Epsom salt, is already described under the head of Magnesium salts among the laxatives.

CHAPTER XVII.

COUNTER-IRRITANTS.

THE blistering counter-irritants, or epispastics:

Cantharides,	**Ammonia.**
Thapsia,	

Those that redden the skin: or Rubifacients:

Mustard,	**Chloroform,**
Ammonia,	**Spices,**
Burgandy Pitch,	**Turpentine.**
Capsicum,	

Cantharides, or **Spanish Fly,** comes from the south of Europe. It is a bronze green insect about an inch in length. Its active blistering principle is cantharidin.

Physiological Action.—Applied locally it causes irritation and vesication.

Internally it produces warmth in the stomach and stimulation of the kidneys and urinary tract.

Uses.—It is given as a uterine stimulant, and in amenorrhœa. It is used internally in some skin diseases, such as psoriasis, eczema and prurigo. For internal use the tincture is used in 1 or 2 drop doses, each drop containing $\frac{1}{10}$ grain of the fly. Externally it is used to produce blisters, as a counter-irritant in deep-seated inflammation.

Preparations.—Tincture of Cantharides, Tinctura Cantharidis, each minim equal to $\frac{1}{10}$ grain of the drug.

Cantharidal Collodion, Collodium Cantharidatum—a mixture of cantharides with flexible collodion.

Cantharides Cerate, Ceratum Cantharidis—containing about ⅓ its weight of cantharides. This is of such a consistence as to remain unmelted when applied to the skin.

Thapsia is a plant of southern Europe. A resin is obtained from its root and is much used in Europe for blistering purposes. The favorite form of use is that of blistering paper. The resin being evenly spread upon the surface of a specially devised paper, is applied to and adheres to the skin, irritating or blistering, according to the length of time applied.

Ammonia Water.—The stronger water of ammonia is sometimes used for blistering purposes, by applying it to the skin and covering the spot with a watch glass.

Mustard—Sinapis Alba and **Nigra.**—Black and white mustard seed. They both contain an irritant oil.

Uses.—As used medicinally, it is ground to a fine flour-like powder. It is sometimes used internally as an emetic, in the form of a creamy mixture with warm water, a tablespoonful of the powdered mustard being mixed with sufficient water. It is used as a counter-irritant to relieve the pain of colic, inflamed joints and neuralgia. It may be applied to the back of the neck for some forms of headache and cerebral congestion. Applied to the skin it reddens and blisters. It may be applied mixed to a thick paste, with flour or meal. A much neater and quite as effectual a method is that of the so-called mustard leaves. These are made by spreading a mustard paste upon specially prepared paper. They are to be had of the druggists. Strong for adults. Mild for children.

Preparations.—Mustard Paper, Charta Sinapis, an official form of the leaves already described. Compound mustard

liniment, Linimentum sinapis composita. A mixture of oil of mustard, merzereum, camphor, castor oil, and alcohol, for external use. Volatile oil of mustard. The active ingredient of mustard, obtained from the black seed.

Capsicum, Cayenne Pepper, Bird Pepper, Red or African Pepper.—The fruit of a tropical tree of Africa and Central America. It occurs as small pods an inch or less in length, reaching the market most frequently in powdered form. A yellowish red powder with a hot burning taste. Its active principle is an oleo resin, a dark red, oily liquid, having the properties of the seed in a concentrated form.

Physiological action.—Applied to the skin, it causes warmth and redness. Internally, in excess, it causes gastritis. It acts as a stimulant.

Uses.—It is a valuable remedy in atony of the stomach. It is used in flatulent colic. In washes for tonsilitis and as a gargle for sore throat, it is useful. Externally it acts as a counter-irritant, not blistering ordinarily. It is useful in lumbago, rheumatism and some forms of headache. For external application, there is a porous capsicum paper, sold under the name of Capscine Drafts which afford a neat and effectual method of using it. It may be easily prepared by dipping sheets of blotting paper into a strong tincture of capsicum, made by soaking an ounce of the seed in 4 oz. of alcohol, and allowing it to dry. This is to be moistened, shaped over the spot to which it is to be applied and bound on with a napkin.

The dose of capsicum is from 1 to 3 grains or 0.065 to 0.195 Gm.

Preparations.—Tincture of capsicum, Tinctura capsici, 10 ♏ equal 1 grain. Fluid extract of capsicum, Extractum capsici fluidum, 1 ♏ equals 1 grain. Oleo resin of capsi-

cum, the active principle of the drug. Used externally in mixtures and liniments.

Turpentine, Oleum Terebinthinæ.—This has already been described under anthelmintics.

Chloroform—Chloroformum.—This has been described under anæsthetics.

Externally it is much employed as chloroform liniment, a mixture of soap liniment and chloroform, for painful affections.

Burgundy Pitch—Pix Burgundica.—Burgundy pitch, and other varieties of pitch are resinous substances gathered from various kinds of evergreen trees, such as spruce, pine, hemlock, etc. They are all similar in composition and properties to turpentine and are used for similar purposes. They melt or soften at the temperature of the surface of the body and are used in preparing plasters. They constitute, with enough rubber to give them flexibility, the body of the plaster. They act as stimulants and counter-irritants.

ESCHAROTICS.

Chromic acid,	**Nitric acid,**
Sulphuric acid,	**Nitrate of mercury (in solution),**
Arsenous acid,	**Chloride of zinc,**
Potassa,	**Soda.**

Chromic Acid—Acidum Chromicum.—This acid occurs in blood red crystals, which rapidly absorb water and liquify. Applied to living tissue, it destroys it rapidly, producing deep ulcers, slow to heal.

Uses.—It is used for the destruction of growths of various kinds upon the surface of the body. The liquid resulting from the deliquescence of the crystals, is applied by means of a

glass rod, care being taken not to touch the surrounding skin.

Nitric Acid—Acidum Nitricum.—Described under mineral astringents.

Sulphuric Acid—Acidum Sulphuricum.—Described under mineral astringents.

Nitrate of Mercury—Liquor Hydrargyri Nitratis—Solution of Mercuric Nitrate.—A solution made from metallic mercury or quicksilver, and nitric acid. It is a colorless liquid, with an odor like nitric acid and an exceedingly sour taste.

Action and uses.—It is a powerfully acting caustic, its action being very penetrating. It is used for the removal of growths upon the surface, by direct application. Its action is painful and care must be observed not to touch the surrounding surface with the solution.

Arsenous Acid—Acidum Arsenosum—White Arsenic.—A compound formed by roasting metallic arsenic.

It has been described under the head of alteratives.

Chloride of Zinc—Zinci Chloridi.—This is a moist, white, granular powder or in irregularly shaped, flat fragments. It is very deliquescent, soon assuming a liquid form on exposure to air. It has a caustic taste and an acid reaction. It has considerable disinfecting power in form of solution, and is used with other substances in the form of paste, as a caustic.

Caustic Potash or Potassa—Caustic Soda or Soda.—Both these come in the form of sticks the size of a pencil. For caustic purposes, they are made into a paste with flour and water or other suitable material and spread upon the affected parts.

CHAPTER XVIII.

DIAPHORETICS.

Pilocarpus, **Warburg's Tincture,**
Dover's Powder, **Nitrous Ether.**

Pilocarpus or Jaborandi is the leaf of a tree growing in South America. It contains an alkaloid known as Pilocarpine.

Physiological action.—It causes flushed and sweating face, the sweating extending to the whole body. It also causes salivation and sometimes vomiting.

It acts as a cardiac depressant. It lowers the temperature of the body and contracts the pupil of the eye.

Uses.—It is of some use in relieving dropsy. It is used in uræmic poisoning and in Bright's disease.

The dose of the drug is from 5 to 30 grains or 0.325 to 2 Gm.

Preparation.—Extractum Jaborandi or Pilocarpi Fluidum, Fluid Extract of Jaborandi, 1 ♏ equals 1 grain of drug. The dose of the alkaloid, Pilocarpine is from $\frac{1}{10}$ to $\frac{1}{10}$ of a grain or 0.003 to 0.006 Gm.

Warburg's Tincture has been described under antiperiodics.

Dover's Powder—Pulvis Ipecacuanhæ et Opii.—Already described under Opium among the Antispasmodics. Ten grains of it contain one grain each of Ipecac and Opium.

Spirit of Nitrous Ether—Spiritus Ætheris Nitrosi—Sweet Spirit of Nitre.—This is an alcoholic solution of

Nitrous Ether, a compound formed by the action of Nitrous Acid upon Alcohol. It is very volatile and unless kept cool and securely stoppered, rapidly loses all its strength, becoming worthless. Care should be used when purchasing it, to ask for a freshly made spirit.

Physiological action.—It is sedative, diuretic, and diaphoretic.

Uses.—It is largely used in domestic medicine for allaying feverish conditions of all kinds. It is used in incontinence of urine in children. As a diuretic it is best given in iced water; while as a diaphoretic it is given with hot drinks like lemonade. It is used in colds and fevers. Owing to its antispasmodic power, it is used in the nervous condition of fevers. The dose is from ½ to 2 drams or 1 to 4 C. c.

DIGESTANTS.

Pancreatin,	**Pepsin,**
Hydrochloric Acid,	**Papain.**
Diastase,	

Pancreatin—Pancreatinum.—A digestive ferment obtained from the fresh pancreas of the hog and the calf. It occurs as a fine yellowish powder, having a meaty odor and an alkaline taste. It should contain four ferments, viz.: Trypsin, which digests proteids (meat and eggs). Steapsin, which digests oils and fats. Amylopsin, which converts starch into sugar previous to assimilation, and a ferment which curdles milk.

It may be prepared by soaking the cleaned and chopped fresh pancreas of the pig, in diluted alcohol for 24 hours; pouring off the alcohol, adding ten times its weight of glycerin

and after 24 hours standing, pouring off and straining the liquid. This may be used in the place of the commercial powder and is always effectual, while the latter, through ignorance in making or carelessness in keeping may be quite worthless.

The powder is used in doses of 2 to 20 grains or 0.130 to 1.300 Gm.

It is generally given with sodium bicarbonate as it works in alkaline media. It is used for all forms of pancreatic failure.

Pepsin—Pepsinum.—A digestive ferment obtained from the inner coating of the stomach of the pig. It occurs in the form of pale straw-colored powder or scales.

Uses.—It is used for indigestion either in powder form or in solution, in doses of from 5 to 30 grains or 0.325 to 2 Gm.

Preparations.—Saccharated Pepsin, a ten per cent. mixture of pepsin with sugar of milk. There is also a Solution of Pepsin. The dose is 1 or 2 fluid drams or 4 to 8 C. c. It should be taken immediately after the meal.

Hydrochloric Acid—Acidum Hydrochloricum.—This acid is formed from common salt or Sodium Chloride by the action upon it of Sulphuric Acid. The crude acid is yellow and impure. For medicinal use, none but the chemically pure, colorless, fuming acid should be used and generally in the diluted form of a ten per cent. mixture with distilled water, Acidum Hydrochloricum Dilutum.

Uses.—It is much used in dyspepsia mixtures. It aids digestion in those conditions when the gastric juice is deficient in acid as after fevers and in cancer of the stomach.

The dose of the diluted acid is from 5 to 10 drops or 0.325 to 0.650 C.c.

Papain, Papoid or Caroid are the several names given to a vegetable digestive ferment obtained from the Carica Papaya,

a South American tree. It occurs in the form of a straw-colored powder. It is not official. It changes proteids to peptones whether in acid, alkaline or neutral surroundings, thereby differing from ferments of animal origin. The dose is from 1 to 10 grains or 0.065 to 0.650 Gm. It is used externally to destroy objectionable growths.

Diastase is a ferment which has the power of converting starch into sugar. It is therefore of value in indigestion of starchy foods. It is formed naturally during the fermentation of grain. The fermented or sprouted grain is called Malt and the various forms of thick and thin liquid extracts of malt of the market are made by exhausting malt with water. They all contain diastase and it is this which gives them the value they have in indigestion of starchy foods. Besides the Extracts of Malt containing diastase, the latter has been separated and may be had of the druggists in powder form. The dose of it is from 1 to 5 grains or 0.065 to 0.325 Gm.

DISINFECTANTS.

Corrosive Sublimate,	**Chlorinated Lime,**
Carbolic Acid,	**Chloride of Zinc.**

Of these, **Corrosive Sublimate** and **Carbolic Acid,** have been already described under Antiseptics, and Chloride of Zinc under counter-irritants.

Chlorinated Lime—Calx Chlorinata or Chloride of Lime.—This is a mixture in powder form of slaked lime and chlorine gas. It should contain, if kept tightly boxed and dry, 35 per cent. of chlorine gas.

Uses.—It is a disinfectant for vaults, drains, sinks, closets,

etc. It is one of the best disinfectants known. It is used sprinkling it plentifully about. It is very useful for disinfecting bed-pans. As it is a powerful bleaching agent care should be taken that it does not come into contact with clothing, carpets, etc. It should not be freely used in sleeping chambers as the chlorine is poisonous.

DIURETICS.

Caffeine,	**Squill,**
Cantharides,	**Buchu,**
Juniper,	**Turpentine,**
Uva Ursi,	**Chimaphila,**
Cubeb,	**Pareira Brava,**
Digitalis,	**Vegetable Salts of Potassium,**
Nitrous Ether,	**Lithia.**

Caffeine.—The alkaloid obtained from tea and coffee and already described under Cardiac Stimulants.

Squill—Scilla.—The bulb of an onion-like plant of temperate countries.

Although very commonly used in families, squill in its more concentrated forms has poisonous properties, producing vomiting, purging and convulsions.

Uses.—It is used as a stimulant or irritant diuretic in Bright's disease. It is used with digitalis in cardiac dropsy and in effusions of the pleura and abdomen. It is also used in bronchitis. The dose of the powdered drug in pill form is from 1 to 3 grains or 0.065 to 0.195 Gm.

Preparations.—Vinegar of Squill, Acetum scillæ, 10 ♏ equal 1 grain of the drug. Syrup of squill, Syrupus scillæ, 1 ʒ contains about 3 grains of the drug. Compound syrup of

squill—containing tartar emetic as well as squill. Tincture of squill, Tinctura scillæ, 6 ♏ equal 1 grain of drug. Fluid extract of squill, Extractum scillæ fluidum, 1 ♏ equal 1 grain of drug.

Cantharides.—See counter-irritants.

Buchu.—This is a leaf derived from an African plant. They have a peculiar turpentine odor and a camphory taste.

Uses.—It is used as a tonic diuretic. It does not greatly increase the secretion of urine. It is used in cystitis and vesical irritation, and when the urine is acid, muddy and heavily laden with salts.

The dose of the drug is 5 to 30 grains. It is often used in the form of infusion.

Preparation.—Fluid extract of buchu, Extractum buchu fluidum, 1 ♏ equals one grain of the drug. Dose 5 to 30 ♏ or from 0.325 to 2 C. c. Being strongly alcoholic it should be well diluted before administration.

Juniper—Juniperus.—The fruit or berry of the common juniper tree of the northern hemisphere. Its active principle is a volatile oil.

Physiological Action.—It acts as a gastric stimulant and tonic, diuretic and diaphoretic.

Uses.—It is used as a stimulant to the genitory urinary tract. It is used in nephritis and chronic catarrh of the bladder. It is also useful in congestion of the kidneys, and in Bright's disease.

The dose is 5 to 30 grains or 0.325 to 2 C. c.

Preparations.—(The berry is not official). Oil of juniper, distilled from the berries. Dose 1 to 10 ♏. Spirit of juniper, Spiritus juniperi, a 5 per cent. solution of the oil in alcohol—20 ♏ equal to 1 ♏ of the oil. Dose 20 ♏ to ʒij.

Compound spirit of juniper, spiritus juniperi compositus—a mixture of oil of juniper, oil of caraway seed, oil of fennel seed and alcohol. Dose ½ to f℥ij. Gin sometimes called spirit of juniper, is obtained just as whiskey is, by distilling the alcoholic liquor from fermented grain. Juniper berries are first added and oil of juniper distills over with the gin, giving to it such diuretic and diaphoretic properties as it possesses and giving it also its peculiar flavor.

Turpentine.—Oil of turpentine is described under anthelmintics.

Uva Ursi—Bearberry or Upland Cranberry is the leaf from a very common evergreen herb.

Uses.—It is used as an astringent diuretic; also as an alterative to the genito urinary organs. It is used in cystitis and chronic diarrhœa. Dose, 5 to 30 grains.

Preparations.—It is commonly given in infusion of 1 oz. to a pint of water. Fluid extract of uva ursi, Extractum uvæ ursi fluidum. Dose 5 to 30 ♏, each minim equaling one grain of drug.

Its active principle is arbutin. Dose 1 to 5 grains.

Chimaphila, or Pipsissewa is the leaf of an evergreen shrub of northern countries.

Uses.—It is used principally in the form of infusion as a stimulating diuretic, acting upon the kidneys and genito urinary tract. Dose 5 to 30 grains.

Preparation.—Fluid extract of chimaphila, Extractum chimaphila fluidum, 1 ♏ equals 1 grain of the drug. Dose 5 to 30 ♏.

Cubeb—Cubeba.—This is the unripe fruit of a plant growing in Java. It is round, shriveled on the surface and of the size of a pea. The chief active principle is the volatile oil.

Uses.—It is used in the advanced stage of gonorrhœa. It is used in the advanced stage of head colds, as a snuff and also in the treatment of bronchitis. The dose is from 5 to 30 grains or 0.325 to 2 Gm.

Preparations.—Oleo resin of cubeb. Dose 5 to 30 ♏. Tincture of Cubeb, Tinctura cubebæ, five minims equal to 1 grain of the drug. Fluid extract of cubeb, Extractum cubebæ fluidum, 1 ♏ equals 1 grain of drug.

Pareira Brava.—This is the root of a South American plant.

It is used as a diuretic, alterative and stimulant, in chronic inflammations of the genito urinary tract, such as pyelitis and cystitis. It is much given in infusion.

Preparation.—Extractum Pareira fluidum, each minim equals one grain.

Digitalis has been described under heart stimulants.

Vegetable Salts of Potassium.—Under this heading are embraced the potassium acetate and potassium citrate.

Potassium Acetate is a compound formed by the action of acetic acid upon potassium carbonate. It occurs as a damp, white, soft, crystalline powder, very deliquescent, soon becoming liquified on exposure to air and having an alkaline, salty taste.

Potassium Citrate is a compound formed by the action of citric acid upon potassium carbonate. This occurs as a white crystalline powder, deliquescent in moist air.

Uses.—Potassium acetate is used in rheumatic affections, in torpor of the liver, in uric acid diathesis, rendering acid urine, alkaline. Dose 1 to 4 drams largely diluted with water.

Potassium citrate is used in bronchitis, incontinence of urine and as a febrifuge. Dose 10 to 60 grains or 0.650 to 4 Gm.

Preparation.—Liquor potassii citras, effervescens—Effervescing solution of potassium citrate. This consists of a solution of potassium bicarbonate and one of citric acid, in water. The two are mixed and drank during effervescence, the somewhat nauseating taste being thus overcome.

Nitrous Ether or sweet spirit of nitre has been described under diaphoretics.

Lithium.—The mineral itself has no use in medicine. The following are its official salts: Lithium benzoate, lithium bromide, lithium carbonate, lithium citrate and lithium salicylate. The salts of lithium are present in several natural mineral waters. The carbonate and citrate of lithia are used in gout and rheumatism. They combine with uric acid to prevent deposits. The diabetes of gouty taint is combated by lithium salts. The other salts of lithia act as the acids from which they are formed—the bromide acting with some sedative effect—the benzoate and salicylate in rheumatic cases.

They are given, generally, dissolved in large quantities of water or carbonic acid water. The dose is from 5 to 15 grains or more. Most of them come in tablet form, made soluble in water.

CHAPTER XIX.

ELIMINATIVES.

The Iodides,	**The Salicylates,**
The Vegetable Salts of Potassium,	**The Lithium Salts,**
Jaborandi,	**Colchicum.**

Of these all but the last, colchicum, have been described under other headings.

Colchicum.—This is the root and seed of a European plant, commonly known as meadow saffron.

Physiological action.—Applied locally, it acts as an irritant to the skin. Internally it irritates the whole intestinal and digestive tract. Except in large doses it has but little effect upon the general system.

Uses.—It is used in gout and chronic rheumatism. The dose is from 5 to 30 grains. The active principle, colchicine, is given in doses of from $\frac{1}{100}$ to $\frac{1}{80}$ of a grain or 0.00065 to 0.00130 Gm.

Preparations.—The Extract, Fluid extract and Wine of the root. The Fluid extract, Tincture and Wine of the seed. The extract is used in pill form in doses of from 1 to 5 grains. The wine of the root contains about half of a grain of drug to the minim and the dose is from 10 ♏ to f℥j. The wine of the seed contains 1 grain of drug in every six minims. The dose is from 30 ♏ to f℥iij.

EMMENAGOGUES.

Manganese Dioxide,	**Potassium Permanganate,**
Cantharides,	**Aloes,**
Myrrh,	**Savine,**
Tansy,	**Pennyroyal,**
Guaiac,	**Iron.**
Arsenic,	

Manganese is one of the metals. The black oxide of manganese or dioxide is the only salt of the metal in common use. It occurs in the form of a black powder.

Use.—It is used in amenorrhœa and anæmia. The dose is from 1 to 5 grains, and the compressed tablet is the most desirable and easy to administer.

Potassium Permanganate has been described under antiseptics.

Cantharides.—Described under diuretics.

Aloes.—Described under cathartics.

Myrrh.—This is a gum resin obtained from a tree growing in Arabia. It occurs in irregularly shaped masses, of a reddish color, intermingled with which are white masses or tears of a cleaner, purer condition. It has a peculiar, fragrant odor, which is made more evident while being burned.

Uses.—It is a stimulant to the uterine and bronchial mucous membranes.

With sulphate of iron, it is much used in the anæmia of females.

Externally it is valuable as an antiseptic and stimulating wash for ulcers and in gargles for sore mouth and throat, and spongy gums. It has also some expectorant power. The dose is from 1 to 10 grains.

Preparations.—Tincture of myrrh, Tincturæ myrrhæ, 5 minims equal one grain of the drug. It is one of the ingredients in Compound iron mixture, the Pill of aloes and myrrh, Tincture of aloes and myrrh.

A word as to the compound iron mixture. It must be freshly prepared. When so prepared it is of a greenish-brown color. After 24 or 48 hours it assumes an iron-rust color and is no longer suitable for the purpose for which it is intended. The nurse should familiarize herself, while she has the opportunity at the hospital, with the changeable preparations. She should know the appearance of a well-preserved drug or preparation and of a spoiled one. And when purchasing for her patient, refuse to take that which is not as it should be.

Savine—Sabinum.—The tops of an evergreen shrub, growing in northern countries.

Its active constituent is a volatile oil. Applied externally, it is irritating. Taken internally it causes nausea, vomiting, suppression of urine, unconsciousness and death.

Uses.—It acts as a powerful stimulant to the uterus and ovaries. It is given in amenorrhœa and menorrhagia.

It is given in capsule or pill form or as an emulsion. The dose of the drug is from 1 to 3 grains.

Preparations.—Fluid extract of Savine. Extractum sabinæ fluidum. Dose 1 to 5 ♏. Oil of savine. Oleum sabinæ. Dose 1 to 3 ♏.

Tansy—Tanacetum.—The leaves and tops of a plant, common to temperate climates.

Its active constituent is the volatile oil.

It possesses emmenagogue properties and is used as a uterine stimulant. The dose, in the form of infusion, is from 5 to 30 grains.

The oil is not official. But it is given in doses of 1 to 3 ♏ or 0.065 to 0.195 C.c.

Pennyroyal—Hedeoma.—The leaves and tops of a common field plant. Its active principle is the volatile oil. The plant has the peculiar odor due to the oil. It is used as an emmenagogue, generally in the form of tea. It is used also to produce perspiration in domestic practice. The dose of the drug is from 5 to 30 grains.

Guaiac—Lignum Vitæ is the wood of a West India tree. It contains a resin which is also official as Guaiacum resin, or Resina Guaiaci.

Uses.—It is used in syphilis. It is used in acute tonsilitis and in rheumatic affections, and in sore throat, in the form of a wash or spray. Dose, 5 to 30 grains.

Preparations.—Tincture of guaiacum, Tinctura guaiaci, 5 minims being equal to one grain of the drug. Ammoniated tincture of guaiacum, Tinctura guaiaci ammoniati, of the same strength. Resins being insoluble in water, the tincture, which is made with alcohol, when mixed with water, deposits the resin as a sticky mass, upon the sides and bottom of the bottle. It also smears the teeth and tongue in a very disagreeable way. In the Ammoniated tincture, the resin is made more soluble and miscible with water, by the ammonia used in making it, and whenever guaiacum is to be mixed with water, the ammoniated tincture should be used.

Guaiacum is one of the ingredients in Plummer's Pill or the Compound Pill of Antimony.

Iron Salts.—The salts of iron will receive full attention under the head of tonics. Those of them used as emmenagogues are, Ferrous Carbonate, in its several forms, viz., Pill of Ferrous Carbonate or Blaud's Pill, Mixture of Ferrous Car-

bonate or Griffith's Mixture, Vallet's Mass of Ferrous Carbonate, given in pill form, but kept in mass to preserve it from change, and the Saccharated Ferrous Carbonate in powder form. All these are very unstable. The pill should always be coated and the mixture should be freshly made.

The Sulphate of iron is also used as an emmenagogue in conjunction with aloes and myrrh.

Arsenic has been described under alteratives. As an emmenagogue it is combined with carbonate of iron in a pill known as the modified Blaud's pill, each pill containing $\frac{1}{10}$ grain of arsenic in the form of arsenous acid.

EMETICS.

Apomorphine,	**Ipecac,**
Tartar Emetic,	**Zinc Sulphate,**
Mustard,	**Turpeth Mineral.**

Apomorphine.—This substance is not, as its name might lead one to think, one of the alkaloids of opium, but is an artificial alkaloid made by treating morphine with Hydrochloric Acid, under pressure. It occurs as a whitish or greenish gray powder. It is easily decomposed. Perhaps the most stable form is that of the hypodermic tablet.

Physiological action.—It acts as a stimulant to the nerve centres of the brain. It increases the rapidity and force of the pulse in moderate doses. In large doses it acts as a circulatory depressant. It causes vomiting by its direct action upon the vomiting centre, and not by any action upon the stomach.

Uses.—It is used in nearly all cases calling for an emetic. It is also useful in catarrh of the air passages and in acute bronchitis.

The emetic dose, given hypodermically is $\frac{1}{10}$ of a grain or 0.006 Gm. As an expectorant the usual dose by the mouth is $\frac{1}{10}$ grain.

Ipecac is a root found in Brazil. It contains an active alkaloid called Emetine.

Physiological action.—Applied to the skin, ipecac acts as an irritant. Large doses produce nausea, relaxation, vomiting, secretion in the bronchial tubes and an increase of saliva. The vomiting is produced both by the action upon the stomach and the vomiting centre.

Uses.—Ipecac is used as an emetic and is rapid in its action. It is used when the stomach is overloaded with food and drink. In obstinate vomiting small doses of ¼ or ½ grain repeated will effect a cure. As an expectorant it is used in bronchitis.

Preparations.—Powdered Ipecac. Dose as an expectorant, 1 to 3 grains or 0.065 to 0.195 Gm. As an emetic, from 5 to 30 grains or 0.325 to 2 Gm. Fluid Extract of Ipecac. Each minim equals 1 grain of the drug. Wine of Ipecac, 10 per cent., each minim equaling $\frac{1}{10}$ of a grain, ten minims equaling 1 grain of the drug. Syrup of Ipecac, 7 per cent., each fluid dram containing about 4 grains of the drug. Powdered Ipecac and Opium, or Dover's Powder, a mixture of $\frac{1}{10}$ opium, $\frac{1}{10}$ ipecac and $\frac{8}{10}$ sugar of milk.

Tartar Emetic has been described under Cardiac sedatives. As an emetic it is slow but forcible.

Zinc Sulphate.—This salt is described under Astringents. In large amounts it acts as an irritant emetic, in doses of 10 to 30 grains.

Mustard has been described under counter-irritants. As an irritant emetic it is best administered in the form of a mix-

ture of the consistence of cream, made by mixing the powdered drug with warm water.

Turpeth Mineral.—This salt of mercury is known also as the yellow subsulphate of mercury. It occurs as a fine yellow powder.

It acts as a prompt emetic in croup. The dose as an emetic is from 1 to 5 grains. It should be used with caution.

CHAPTER XX.

EXPECTORANTS.

Potassium Citrate and Acetate,	**Ipecac,**
Antimony,	**Ammonium Chloride,**
Apomorphine,	**Creosote,**
Eucalyptus,	**Tar,**
Terebene,	**Terpine Hydrate,**
Lobelia,	**Grindelia Robusta,**
Garlic,	**Squill.**

Potassium Citrate and Acetate have been described. Combined with ipecac, in bronchitis, they are given in doses of 5 to 20 grains.

Ipecac has been fully described under Emetics. As an expectorant it is most commonly used in the form of syrup.

Antimony.—The form of antimony used as an expectorant is commonly known as Tartar Emetic, the chemical name of it being Antimony and Potassium Tartrate. There are two preparations of it, the Compound syrup of squill, which contains $\frac{1}{10}$ per cent. of the salt, or 1 grain to the fluid ounce, and the Wine of Antimony which contains $\frac{1}{10}$ per cent. of the salt or 2 grains to the ounce. They are usually given in conjunction with other expectorants.

Ammonium Chloride occurs as a white granular powder, with no odor and having a salty taste. It has very little action upon the heart or respiration but exerts a stimulant effect upon the mucous membranes, causing an increased flow. It is used

in expectorant mixtures such as squill, ipecac, etc., in doses of from 1 to 5 grains or 0.065 to 0.325 Gm. It has a strong, salty taste and is rejected by some stomachs, in which case it should be largely diluted before being swallowed.

Apomorphine as an expectorant, in acute bronchitis, is usually given in expectorant mixtures, in doses of $\frac{1}{10}$ grain or even smaller.

Creosote.—The official creosote is the product of the destructive distillation of Beech wood. Much of the creosote of the market is adulterated with carbolic acid or coal tar creosote. Sometimes the latter is ignorantly or wilfully supplied in place of it. They may be easily distinguished. If creosote be mixed with collodion, the two will form a clear liquid mixture, while if carbolic acid, or creosote which has been mixed with carbolic acid, is mixed with collodion, the latter will become transformed into a jelly like mass. Creosote does not injure the surface of the lips or tongue, while carbolic acid whitens them. In its pure state it is colorless, becoming yellowish or pinkish, of an oily consistence and a pungent, smoky, peculiar odor quite different from that of carbolic acid.

Uses.—It is used in phthisis and bronchitis. It is also useful in some forms of indigestion. By its anæsthetic action it will often relieve toothache, if applied to the gum or tooth cavity on cotton. Owing to its pronounced taste and odor and to the tendency to produce irritation in the stomach, many ways have been devised of administering it. It may be given in doses of from 1 to 3 minims on sugar. It is sometimes mixed in emulsion form. It is given in capsules and also mixed with a large draught of water. Whiskey and wines also are employed to cover its taste.

There is but one official preparation of it: Creosote water

or Aqua Creosoti, containing $\frac{1}{10}$ of 1 per cent. or ½ ♏ to the fluid ounce.

Eucalyptus.—This is the leaf from an Australian tree. It has been described under antiperiodics. The form most frequently used is eucalyptol, a liquid obtained from the oil of the leaf.

Tar—Pix Liquida.—This is an oleo-resin obtained by the destructive distillation of various species of pine. It is a thick, dark-colored, oily liquid, having a peculiar well-known odor.

By distillation of tar at a low temperature, the *oil* of tar is separated. Both are used in medicine.

Uses.—It is used in bronchitis and gastro-intestinal catarrh. It is used externally in some forms of skin disease.

Preparations.—Syrupus Picis, Syrup of tar and Aqua Picis Liquida or Tar Water. Both these are saturated solutions made by infusing the tar in water for several hours and then decanting and filtering the solution. There is also the Unguentum Picis Liquida or Tar Ointment and an unofficial Wine of Tar which is very popular in cough mixtures.

Terebene is a clear, colorless liquid having an aromatic turpentiney odor. It is made by the action of sulphuric acid upon turpentine.

Uses.—Its action is that of a stimulant expectorant. It is used in bronchitis, in genito-urinary inflammation and in fermentative dyspepsia. The dose is from 5 to 10 ♏ or 0.325 to 0.650 Gm. given in sugar.

Terpine Hydrate occurs in the form of colorless crystals. It is produced by treating turpentine with a mixture of Alcohol and Nitric Acid.

Uses.—It is used to increase the secretion of the bronchial

mucous membrane in bronchitis. It is used also in hay fever. It is not very soluble in water. It is usually presented in the form of a glycerine and alcohol elixir, holding 1 or 2 grains to each fluid dram. The dose is from 1 to 3 grains.

Oleum Santali (Oil of Sandal Wood).—An oil obtained from the wood of an East Indian tree. It is a pale, straw-colored, rather heavy oil, having an agreeably aromatic odor and a hot, burning taste.

Uses.—It is much used in chronic gonorrhœa and gleet as a stimulant to the mucous membrane. Also in chronic cystitis. It is also used in bronchitis, asthma and in cough mixtures. The dose is from 5 to 20 drops in sugar or in emulsion.

Lobelia.—The leaf and tops of a plant growing in all temperate climates.

Physiological action.—In large doses it causes emesis, prostration, feeble pulse, pale skin, muscular relaxation and cold sweats.

Uses.—It has been much used in asthma, chiefly by inhaling the vapors from the slow-burning drug. It is used to some extent in cough mixtures along with the common expectorants.

The dose of the powdered drug is from 1 to 3 grains or from 0.065 to 0.195 Gm.

Preparations.—Tincture of Lobelia, 10 per cent. in strength, 10 minims of it being equal to 1 grain of the drug, and the Fluid Extract of Lobelia, 100 per cent. in strength, 1 ♏ representing 1 grain of the drug.

Grindelia Robusta, or Grindelia, as it is commonly called, is the leaf of an American plant.

Physiological action.—It slows the beating of the heart and raises the blood pressure.

Uses.—It is very useful in asthma and bronchitis. Some-

times it is mixed with saltpetre, ignited, and the fumes inhaled for asthma. It is stimulating to the bladder and useful in cystitis.

Preparation.—The Fluid Extract of Grindelia is the only official preparation.

The dose of it is from 5 to 30 ♏, or 0.325 to 2 C.c.

Garlic—Allium Sativum.—This is the bulb of an onion-like plant. It is used in the form of Syrup of garlic, the only official preparation of it, in expectorant mixtures. Especially useful in persistent colds and colds in children. It is used sometimes also in the form of poultice over the spine or feet for cerebral or spinal convulsions.

The dose of the syrup is from 1 to 4 f℥ or from 4 to 16 C.c.

Squill—Scillæ.—The sliced bulb of an onion-like plant.

Physiological action.—In large doses it produces vomiting and purging, followed by stupor and convulsions.

In bronchitis, the Syrup of Squill is used, combined with other expectorants.

Preparations.—Tincture of Squill, 10 per cent., ten minims equaling one grain of the drug. Actum Scillæ or Vinegar of Squill, 10 per cent., 10 minims equaling 1 grain of drug. Syrupus Scillæ or Syrup of Squill, dose ½ to 2 f℥, and Fluid Extract of Squill, 1 ♏ equaling 1 grain of the drug. The dose of powdered squill is from 1 to 3 grains or 0.065 to 0.195 Gm.

HYPNOTICS.

Chloral,	**Potassium, Sodium and Strontium Bromide,**
Opium,	**Sulfonal,**
Paraldehyd,	**Urethan,**
Hyoscine (in mania),	**Cannabis Indica.**

Chloral has been already described under Antispasmodics.

Bromides.—See Antispasmodics.

Opium.—See Antispasmodics.

Sulfonal.—There are many substances spoken of as Coal Tar products and as Synthetic remedies. A coal tar product, so called, may not be a constituent of coal tar. A Synthetic substance is one which is artificially, not naturally, produced. Marsh gas is a product found in coal tar. By chemical treatment of Marsh gas, a synthetic or artificial compound is formed and so it is *rightly* spoken of as a derivative of coal tar. Sulfonal is a white, odorless, almost tasteless, crystalline powder. It is not very soluble in cold water, more so in hot water and quite so in alcohol.

Physiological Action.—Its effect is that of a hypnotic. It has but little effect upon the circulation. Upon the respiration it acts as a depressant.

Uses.—It is used as a hypnotic in insomnia. It produces sleep in insanity and mental disturbances from loss of sleep, and often succeeds where other hypnotics fail.

It may be given in hot water, in powder form, followed by water; in capsules or konseals, and should be given two or three hours before the hour for sleep.

The dose is from 5 to 30 grains, or from 0.325 to 2 Gm.

Paraldehyd is a derivative of Alcohol. It is a clear, colorless liquid, having an ethery odor and a burning taste.

Use.—It is used as a sedative and hypnotic. It has a disagreeable taste and odor, and the dose being large, is unpleasant to take. The dose is from 20 ♏ to f℥j, and it is best given in capsules.

In overdoses it acts as a poison.

Urethane is one of the derivatives of Alcohol. It occurs in small colorless crystals.

Use.—It is used as a hypnotic in doses of from 5 to 30 grains.

Hyoscine.—This is one of the alkaloids from Hyoscyamus leaves. It occurs as a white crystalline powder, but more often it is used in tablet form hypodermically.

Physiological Action.—It acts upon the brain and produces deep sleep in certain classes of patients.

Uses.—It is valuable as a hypnotic in acute mania, alcoholic mania, and hysteria, when insomnia is caused by them.

The dose is $\frac{1}{100}$ of a grain or 0.00065 Gm. Untoward effects from its use are common. The form commonly used is Hyocine Hydrobromate, it being soluble in water.

Cannabis Indica, or Indian Hemp.—The flowering tops of the female plant of the Indian Hemp.

Physiological Action.—In full doses, it causes exhilaration in some; in others the sensations are disagreeable. After a while it causes deep sleep. The respirations become slower. Its most marked characteristic is the prolongation of time, minutes seeming to be hours.

Uses.—It is used in cough mixtures to allay irritation and tickling in the throat. It is used for the relief of pain. It does not constipate nor cause any after depression or nausea.

The dose is from 1 to 3 grains or 0.065 to 0.195 Gm.

Care should be taken to purchase the preparations of this drug from reliable sources, as it rapidly deteriorates through careless curing and keeping.

Preparations.—Tincture of Cannabis Indica, 10 per cent., ten minims equalling 1 grain of the drug. Fluid Extract of Cannabis Indica, 1 ♏ equal to 1 grain. Extracts of Cannabis Indica (solid Ext.), dose ¼ to 2 grains.

CHAPTER XXI.

NERVOUS SEDATIVES.

Of these, **Chloral, Opium, The Bromides, Chloroform, Ether, Hydrocyanic Acid, Bromoform, Cannabis Indica, Belladonna, Antipyrin, Acetanilid, Lobelia, Sulfonal, Paraldehyd, Camphor, Monobromated Camphor, Amber, Hoffman's Anodyne, Cimicifuga, Musk, Valerian, Hops Urethane, and Assafœtida,** have been described in other places.

There remain:

Phenacetin,	**Calabar Bean,**
Conium,	**Castor.**

Phenacetin.—This is one of the coal tar derivatives, occurring as a white crystalline powder, having no odor and very little taste.

Physiological Action.—It is a distinct nervous sedative. It has little or no effect upon the circulation. It decreases the production and increases the dissipation of heat.

Uses.—It is used as an antipyretic and analgesic.

The dose is from 5 to 10 grains, or 0.325 to 0.650 Gm.

It is of service as an anti-neuralgic, in headaches and in rheumatism.

Calabar Bean—Physostigma.—This is a seed from a tree of Africa. It contains the active alkaloid officially known as Physostigmine and commercially as Eserine.

Physiological Action.—It produces pains in the stomach, oppression and weakness. The pulse becomes slow, respiration depressed and the pupils contracted. In poisonous doses it acts as a general paralyzant.

Uses.—It is used in atony of the bladder and intestines, also in bronchial asthma.

The dose of the drug is from 1 to 3 grains.

Preparations.—Extract of Physostigma (solid Ext.), dose ¼ to ¾ grain. Tincture of Physostigma, 10 per cent., 10 ♏ equaling 1 grain of the drug.

The dose of Eserine is $\frac{1}{100}$ of a grain. When dissolved in water, it forms a colorless solution, which becomes straw colored, growing to a dark claret color. It is used in this form to contract the pupil and in the treatment of several diseases of the eye.

Conium.—The green fruit of the Hemlock of Temperate zones.

Physiological Action.—It is depressant to the nervous system, to the circulation and to the respiration.

Uses.—The drug is not much used. It is given for spasms, and it is sometimes used in some form, either as liniment or poultice, externally, for the relief of pain.

The dose of the drug is from 1 to 3 grains.

Preparations.—Extract and Fluid Extract of Conium. The dose of the solid extract, is from ¼ to ¾ of a grain, that of the fluid extract from 1 to 3 ♏.

Castor.—This drug consists of the preputial follicles of the animal called the beaver. It is a peculiar, strong, goaty odor and a nauseating taste.

Action and Use.—It is stimulant, anti-spasmodic and emmenagogue. It is used in hysteria, chorea and epilepsy.

It is best given in pill form in doses of from 5 to 30 grains.

NERVOUS STIMULANTS.

Nux Vomica, **Coffee,** **Coca.**

Nux Vomica has been elsewhere described.

Coffee has been sufficiently considered under Caffeine, its active principle. The decoction of coffee is one of the stimulants commonly made use of in narcotic poisoning.

Coca has been described under cocaine, its active alkaloid.

OXYTOCICS.

Ergot, **Ustilago,** **Cotton Root.**

Ergot—Ergota.—This is a fungus which grows among the kernels upon the ears of wheat, rye, barley and seed-bearing grasses. They are about an inch in length, curved, smaller at the ends than in the middle. They are hard, seal brown outside, grayish within. It is very unstable and should be used in the form of fluid extract.

Physiological action.—It has but little effect upon the nervous system. Injected, it causes a fall of arterial pressure, followed by a rise. By the stomach it causes a rise of arterial pressure. It causes contraction of the uterus by stimulating its muscular fibre. It stimulates all unstriped muscular fibres.

Uses.—It is used to prevent post-partum hemorrhages. It is sometimes used in hemorrhage of the lungs and kidneys. It is also given in vertigo and some forms of headache. It is used also externally in the treatment of bleeding hemorrhoids.

The dose of the powdered drug is from 5 to 30 grains.

Preparations.—Fluid Extract of Ergot, each minim equaling

1 grain of the drug. Wine of Ergot, 15 per cent., six minims being equal to one grain of the drug.

There are also two concentrated preparations which are much used, one being known as Ergotin and another as Ergotole. Both are of the consistence of thick molasses. They are not official.

Ustilago or Corn Smut.—A fungus growth upon the common Indian corn. It occurs in black, irregularly shaped masses of a disagreeable odor and taste. It is used as a parturient and emmenagogue in doses of 5 to 30 grains.

Cotton Root, or Gossypium.—This is the bark of the root of the cotton plant.

Action and uses.—It is emmenagogue and oxytocic. It stimulates uterine contractions. It is said to be more safe than ergot and quite as effectual.

Dose, 5 to 30 grains.

Preparation.—Fluid Extract of Cotton Root Bark.

TONICS.

Of these, **Cinchona, Nux Vomica, Arsenic, Iron, and Hydrochloric Acid,** have been already described.

There remain:

Columbo, **Phosphorus,**
Nitro-hydrochloric Acid, **Nitric Acid,**
Phosphoric Acid,

and the vegetable bitters generally, such as

Gentian, **Chirata,** **Cinchona,**

etc.

Columbo is the root of an African plant. It has a bitter taste and is a simple bitter.

Uses.—It is one of the best tonics known. It is used in gastro-intestinal atony following fevers, and in the convalescent stage following summer complaint.

The dose of the drug is from 5 to 30 grains.

Preparations.—Fluid Extract of Columbo, 1 ♏ equals 1 grain. Tincture of Columbo, 20 per cent., 20 ♏ equal to 1 grain of the drug.

Phosphorus.—This is a substance obtained from bones. It occurs in stick form of a white or wax-like color and consistency. It takes fire on exposure to air at ordinary temperatures and to prevent its burning it must be kept covered with water.

Physiological action.—Phosphorus is a stimulant to bone and nerve growth, being a constituent of both. It acts as a depressant upon tissue waste.

Uses.—It is used in rachitis and in nervous debility and exhaustion. It is employed in sexual exhaustion and is useful in boils and carbuncles. Also in neuralgia from nerve depression.

The dose of Phosphorus in $\frac{1}{100}$ of a grain.

Preparations.—Oleum Phosphoratum or Phosphorized Oil, containing 1 per cent. of phosphorus, 1 minim equaling $\frac{1}{100}$ of a grain. Pilulæ Phosphori, Pills of Phosphorus, each pill containing $\frac{1}{100}$ of a grain. Spiritus Phosphori, Spirit of Phosphorus, each fluid ounce contains $\frac{1}{8}$ of a grain.

Nitro Hydrochloric Acid, sometimes called **Aqua Regia.**—This compound is made by mixing together Nitric and Hydrochloric Acids, and allowing them to stand until effervescence ceases. The product is a golden yellow, fuming liquid, containing chlorine gas and chloride of nitrosyl. It rapidly loses its strength and color, becoming at last about straw color. It should be obtained freshly made, to get the results expected from it.

It is exceedingly caustic to the skin, staining it yellow. It should be kept in a cool place, in partly filled bottles, to allow for the pressure of the constantly escaping gases.

Uses.—It is used in indigestion, usually combined with other tonics. It excites the flow of bile, and is used in torpor of the liver. Its beneficial effects are sometimes procured by using it in the form of a bath, with water, in the proportion of a pint of the acid to a pailful of water. A wooden bath tub should be used. The feet and legs are bathed in it.

The dose of the strong acid is from 1 to 3 ♏ largely diluted. The diluted acid may be given in doses of 10 ♏.

Nitric Acid when pure, is a colorless, fuming caustic liquid, having a very sharp acid taste.

Physiological action.—It acts as a caustic upon the tissues. Internally it is stimulating to the glands of the stomach and small intestines.

Uses.—As a caustic it is used for chancres and chancroids, and as a stimulant to indolent ulcers, in diluted form. Internally it is tonic and astringent. It is used in dyspepsia. The diluted acid is used internally in doses of 3 to 15 ♏.

Phosphoric Acid.—This is a colorless liquid having a very acid but not corrosive taste. The strong acid is not much used. The diluted acid, containing 10 per cent., is generally the one used.

It is used in nervous exhaustion and acts by stimulating the stomach.

The dose of the diluted acid is 20 ♏ to f℥i, or 0.130 to 4 C.c., diluted largely with water.

The vegetable bitters, Gentian and Chirata, are used mostly in the form of tincture. Gentian is a root. Chirata is the entire plant.

Preparations.—Compound tincture and Fluid Extract of Gentian, Extract of Gentian, and the Tincture of Chirata and Fluid Extract. The dose of the tinctures is from 1 to 2 drams. Of the fluid extracts, from 5 to 30 ♏.

VASOMOTOR DEPRESSANTS.

All these except one have been elsewhere described. They are:

Amyl-Nitrite,	**Veratrum,**
Antimony,	**Aconite,**
Alcohol (in large doses).	**Jaborandi.**

The single exception is:

Nitroglycerin.—This is a compound formed by treating glycerin with nitric acid at a low temperature.

In its original state it is a terrific explosive. It is official in the form of a one per cent. solution in alcohol. In this form it is known as Spiritus Glonoini or Spirit of Nitro Glycerin, one per cent. in strength, one minim being equal to $\frac{1}{100}$ of a grain of the drug. It is mostly used in the tablet triturate or hypodermic tablet form of $\frac{1}{100}$ of a grain each, which is a dose.

Uses.—It is used in Angina pectoris, in epilepsy, corea and gastralgia. It is also used in some forms of asthma.

VASOMOTOR STIMULANTS.

All the vasomotor stimulants have been described in other places.

They are:

Belladonna,	**Hyoscyamus,**
Digitalis,	**Nux Vomica,**
Ergot,	**Stramonium,**
Caffeine,	**Convallaria.**

CHAPTER XXII.

NEW REMEDIES.

THIS is a list of the more commonly used synthetic and other new remedies, not hitherto mentioned. It does not include all of them. That would be unnecessary as well as practically impossible, since they increase at the rate of about 250 each year. But all those which can be said to be permanently established, are included.[1]

Albolene.—This is a refined product of American petroleum. It does not become rancid and is valuable as a base for the preparation of cerates, ointments, etc.

There is also a liquid albolene which is much used as a vehicle for antiseptic substances, for spraying the nose and throat. Neither of them possess any physiological properties and they are not readily absorbed by the skin.

Alumnol.—This is a Beta-naphtol compounded with aluminum. It is a white powder, soluble in water.

It is used as an astringent and antiseptic.

Anethol or Anise Camphor.—It occurs as colorless crystals, melting above 75° F.

It is a constituent of oil of anise.

It is used principally as a carminative.

Antidolorine.—A proprietary form of Ethyl Chloride, which see.

[1] Coblentz's "Newer Remedies" has been freely made use of in making this list.

Antifebrin.—A trade name for acetanilid.

Antikamnia is a patented name. It occurs as a light, white powder, effervescing in moist air. It is said to be composed of Acetanilid, Sodium Bicarbonate and Citrated Caffeine, and is recommended for headaches.

Aristol.—Chemical name: Di-iodide Di-thymol. This compound is formed from Thymol, Sodium Hydrate, Iodine and Potassium Iodide. It occurs as a fine chocolate colored powder with an iodine like odor. It was introduced as a substitute for iodoform, having no bad odor and is used for the same purposes. It is much used in the form of ointment for burns.

Asepsin.—This is a white powder, having a strong odor of oil of wintergreen. It is a proprietary article and is used as an antiseptic.

Benzo-naphtol—Beta-naphtol Benzoate.—This is a compound of beta-naphtol and benzoic acid. It occurs as a soft white, fine-crystalline powder, almost odorless and tasteless.

It is used as an intestinal antiseptic in doses of from 5 to 10 grains or 0.325 to 0.650 Gm.

Bovinine.—This is Ox Blood and dried egg albumen, preserved with brandy.

It is used in anemia, nervous exhaustion and defective nutrition.

It is also applied externally to indolent ulcers.

Bromidia.—This is a proprietary, which according to analysis, contains Potassium Bromide, Chloral, Extract Hyoscyamus and Extract Cannabis Indica.

It is used as a sedative.

Bromoform.—This is an analogue of chloroform, the latter

being the tri-*chloride*, while the former is the tri-*bromide* of methane. It is a transparent, mobile liquid with an odor and taste like chloroform. It is much used in the treatment of whooping cough in doses of from 1 to 5 ♏. It may be given in sugar or in emulsion.

Butyl-chloral Hydrate or Croton Chloral.—This is a derivative of alcohol. It occurs in colorless crystalline scales.

It is used as a hypnotic in doses of from 5 to 20 grains.

Caffeine and Sodium Benzoate.—This is a mixture of the two substances designated by the title. It occurs as a white powder with a bitter, acid taste.

It is freely soluble in water and is more fit for subcutaneous use than the official caffeine citrate and is used for the same purposes.

Camphoric Acid.—This is obtained by acting upon camphor with nitric acid.

It occurs in small colorless crystals having a camphory odor and taste.

It is used in night sweats and diseases of the respiratory tract. The dose is from 5 to 20 grains.

Chloralamid.—This is an alcohol derivative occurring in colorless crystals.

It is used as a substitute for chloral hydrate. Dose, 5 to 20 grains.

Chloralose.—This is a compound of chloral with grape sugar. It occurs in fine, colorless, crystalline needles.

It is used as a hypnotic in doses of from 1 to 10 grains.

Chloretone is a derivative of chloroform. According to the proprietors, it is a fine, white crystalline powder, with an odor like camphor. It is used as a hypnotic. It is non-irritating and non-toxic, without effect upon the heart. The dose

is 5 to 20 grains. It has a quieting effect in nausea and gastric pains, and is said to prevent seasickness.

Cresols.—The cresols are products obtained by the fractional distillation of coal tar. That is, distillation at different temperatures to separate several ingredients.

They are not soluble in water, but are so in solutions of Potash, Soda and soap and when so dissolved, they form valuable disinfecting liquids.

Among them are:

Creolin.—This is said to be a mixture of cresols with resin soap. It is a black, oily liquid, having a tarry odor. It is used in solution with water, as an ointment and on cotton.

Lysol is supposed to be a mixture of crude cresol, the variety known as cresylic acid, made soluble by mixture with soap. It has not the tarry odor of most of them, nor does it have the destructive action upon the hands that carbolic acid has.

Sulpho naphtol is one of these preparations. Most of them are patented compounds, the *exact* composition of which is kept secret.

Dermatol or Bismuth Subgallate.—This compound is formed from bismuth acetate and gallic acid. It occurs as a fine, light yellow powder without odor or taste.

It is used as a dry antiseptic in surgical cases. It is used also internally in gastric troubles.

The dose is from 5 to 10 grains or 0.325 to 0.650 Gm.

Diuretin.—Theobromin is an active principle obtained from cocoa. Combined with sodium salicylate it forms this compound known as diuretin. It occurs as a fine white powder. It is used as a diuretic in doses of 5 to 30 grains.

Eucaine.—There are two compounds, alpha and beta.

eucaine. These are very complex synthetic compounds of a number of coal tar products. Their action is anæsthetic and they are much employed for that purpose about the eye. Beta-eucaine is considered less irritating than alpha-eucaine, while both are considered safer than cocaine. For general use a 2 per cent. solution is used.

Euphthalmin.—This is a synthetic compound, occurring as a white, crystalline powder. It is used as a mydriatic in 2 per cent. solution.

Europhen, a synthetic product, occurs as a yellowish, amorphorous powder. It is used as an antiseptic in the form of dusting powder.

Exalgin is a modified acetanilid. It occurs as colorless crystals, and is used as an anti-neuralgic, in doses of from 1 to 10 grains.

Fluorescin.—This is a resorcin compound occurring as a yellowish red crystalline powder. It is used in alkaline solution to detect foreign bodies imbedded in the tissue of the cornea. The foreign body, on treatment with the solution, will be surrounded by a green ring.

Formalin is the trade name of a 40 per cent. solution of formaldehyd gas, the latter being a product of the decomposition of wood alcohol. It is a colorless solution, having a pungent, irritating, mustard-like odor.

It is a powerful bactericide and antiseptic. The gas itself, or the vapor of the solution, is used to disinfect contagious wards. As a preservative a solution of $\frac{1}{10}$ to $\frac{4}{10}$ per cent. is used.

Formin or Urotropin.—Cystogen is the trade name of what is said to be a purified formin.

It is a synthetic derivative of formaldehyd. It is used in

uric acid diathesis and cystitis. The dose is from 5 to 15 grains. It occurs as a white crystalline powder.

Gaduol is an alcoholic extract of cod liver oil, supposed to contain the active mineral constitutents of the oil. It is used for the same purposes as cod liver oil, generally dissolved in wine.

Germol is one of the prepared cresols already mentioned.

Glycero Phosphoric Acid and the **Glycero Phosphates.**—Prepared from phosphoric acid and glycerin. It and its salts are employed in neurasthenia.

The salts are calcium, iron, potassium, sodium and lithium glycero-phosphates. They are given in doses of from 5 to 15 grains.

Hemogallol.—This is a blood and iron preparation, occurring as a brown powder, used in chlorosis and anemia, in doses of 5 to 30 grains.

Heroin.—This is an acetic acid compound of morphine. It occurs as a white powder and is used in place of codeia for coughs, pains in the chest and catarrhal inflammation of the respiratory tract. It is said not to produce the secondary effects nor habit of morphia. The usual dose is $\frac{1}{12}$ grain in tablet form.

Holocain is a synthetic derivative of phenacetin. It is used in a 1 per cent. solution, to produce local anæsthesia.

Homatropin is an artificial alkaloid derived indirectly from atropia. It is used to dilate the pupil of the eye, its action being rapid and its effect passing quickly away.

Koumyss, Kefir, Matzoon, Zoolak are various names for fermented milk. Various forms of ferments are used, yeast being employed in this country, and a formula for its production may be found in the National Formulary. They are

valuable in all debilitating diseases and are well borne in cases of obstinate vomiting. They are readily assimilated.

Lanolin is the fatty substance separated from sheep's wool on washing it. Purified and mixed with not less than 30 per cent. of water it constitutes the official lanolin.

Melachol is the trade name for a liquid form of sodium phosphate. It is a mixture of sodium phosphate, sodium nitrate and citric acid.

It is used as a laxative in disorders of the liver.

Beta-naphtol, Benzo-beta-naphtol, and **Bismuth-beta-naphtol** are all derivatives of the coal tar product, naphthalene. They are used as intestinal antiseptics.

Papain—Papoid—Caroid.—Names for a vegetable digestive ferment obtained from the tropical plant, Carica Papaya. It is active in both acid and alkaline as well as neutral solutions.

It is employed as a digestant and to destroy false membranes.

The dose is 1 to 5 grains, used externally as a powder or in solution.

Piperazin.—This is a synthetic compound, occurring in white scales.

It forms a soluble compound with uric acid and is used in uremia, rheumatism and gout.

Dose, 15 grains dissolved in a pint or more of water and drank freely.

Protargol is an albuminous compound with silver. It occurs as a yellowish powder, soluble in water.

It is used in the treatment of gonorrhœa and in some diseases of the eye. Solutions of from 1 to 30 per cent. are used.

Pyoktanin, Blue and Yellow.—These are both synthetic compounds used in solution as antiseptics.

Pyrozone is a trade name for Hydrogen Dioxide.

Resorcin is obtained naturally from resinous substances and synthetically from carbolic acid compounds.

It occurs as a white crystalline substance and is used in gastritis, gastric ulcer and similar affections of the intestine. It is also employed externally as an antiseptic.

Saccharin.—This is a synthetic substance, derived from carbolic acid. It is a white crystalline powder, possessing 500 times the sweetening power of sugar.

Its chief use is as a sweetening agent for diabetic patients.

Salol is a compound formed by causing the union of carbolic and salicylic acids. It is a soft white crystalline powder and is used as an intestinal antiseptic in doses of 5 grains.

Salophen is a compound somewhat similar to Salol, but possessing the advantage of *not* setting free any carbolic acid in the system as the latter does, and is therefore not as toxic.

Tri-Chlor Acetic Acid is obtained by acting upon strong acetic acid with chlorine gas.

It occurs in colorless crystals.

It is used as a caustic. There is also the mono- and the di-chlor acetic acid used for the same purposes.

Vanillin.—The odorous principle found in the vanilla bean, but which is also prepared synthetically.

Used as a flavor.

Xylol.—A variety of benzene obtained from coal tar, by fractional distillation.

It is used chiefly as a solvent.

CHAPTER XXIII.

REMEDIAL PREPARATIONS OF ANIMAL ORIGIN.

ONE of the most pronounced advances has been made in therapeutics, in recent years, by the introduction of animal extracts and serums, or antitoxines.

Among the former we have, Thyroid, Thymus, Brain, Suprarenal, Red Bone-marrow and Ovarian extracts.

They differ from antitoxines. The extracts are derived, as their names imply, from the glands of healthy, untreated animals, while the antitoxines are derived from animals which have undergone a prolonged course of treatment, by which the blood serum acquires new and remarkable properties.

These extracts are used on the principle that the glands of the body, whether they have excretory ducts or not, secrete and give to the blood, in some way, principles which perform some function and disturbance is caused if the glands are injured or removed.

Extracts of such organs serve therefore as remedies, in bodies where a similar organ is diseased.

There are two forms, liquid and powdered extracts, and because they undergo putrefactive change very easily, great care must be taken in their preparation. The powdered extracts are prepared by expressing the juices from the glands, using every aseptic precaution as to instruments and hands. The expressed juice is mixed with sufficient sugar of milk, previously sterilized, the thick liquid spread upon plates of glass to

dry and harden, from which it is collected and reduced to powder. They are so finished as to represent a definite weight of fresh gland.

Another method is to dry and grind the fresh glands to powder.

The liquid extracts are made by steeping the cleansed and chopped glands in glycerine and water or glycerine and alcohol, boric acid or some other suitable antiseptic being added, and the solutions being finished to a definite strength.

Thyroid is used in treating eczema, psoriasis, and lupus.

Thymus is used for similar diseases.

Brain Extract is used in neurasthenia.

Supra-renal Extract causes contraction of blood vessels of mucous surfaces. The active principle of the Supra-renal capsule, Adrenalin, has been separated and acts as a blood pressure raising agent.

Bone Marrow develops red blood corpuscles in anemia and chlorosis.

Ovarian Extract is used in amenorrhœa and after ovariotomy and hysterectomy.

Serums—Antitoxins.—Curative Serum is the blood serum of animals which have been rendered immune from contagious diseases, by injection of the toxins of those diseases. All infectious diseases are produced by bacteria, which secrete very poisonous substances called toxins, which eventually cause death. By the use of certain agents, these toxins may be counteracted, rendering the organism insensible to their poisonous effect.

This insensibility or immunity may be acquired by a gradual habituation to a given poison. During this habituation an antitoxin is produced in the blood, which when isolated and

injected into the blood of a patient, effects a change in the susceptibility of the living organs, to the action of the poison or *toxin.*

The Antitoxin is prepared as follows, the diphtheria preparation being selected as an example:

"A colony of diphtheria bacilli being placed in a suitable medium and under favorable conditions, multiply with great rapidity, secreting at the same time their poison or toxin. After a few weeks, when sufficient of the toxin has formed, the bacilli are destroyed by means of carbolic acid, and by filtering through porous plates of clay, the dead bacilli are removed from the solution of toxin.

Of this solution small amounts are injected into the blood of a healthy horse, producing a mild attack of the disease. This procedure is then repeated for several months, the doses of toxin being steadily increased until the animal becomes habituated to the poison.

Then a quantity of blood is withdrawn from the animal, and the serum, or aqueous portion, is separated from the red blood-corpuscles, this serum constituting a light yellow liquid which contains the antitoxin of diphtheria.

The serum is standardized by determining the quantity required for injection, to neutralize a fatal dose of diphtheritic poison in a guinea pig; the ratio between the *quantity* of antitoxin and the *body weight* of the animal, furnishes a means of indicating in definite units, the strength of the solution."

TOXICOLOGY.

Toxicology is the study of that branch of science which concerns poisons and their effects and antidotes.

By a poison is meant any substance which, if introduced into the animal system, will produce painful or dangerous disorder or death. The study is more especially directed to the effects and antidotes to the effects of those drugs which, from the smallness of their fatal dose, the rapidity with which they act, and the difficulties encountered in their detection, are used with criminal intent by murderers and suicides, besides their occasional mistaken administration by physicians, pharmacists or nurses.

Nurses should be able to distinguish in a general way the symptoms caused by poisoning.

The action of a poison is sudden. The symptoms of irritation of the stomach are violent. The disturbance to the heart, lungs and brain are more profound or else become so more suddenly than in the course of ordinary disease. Muscular contortions are more violent, and all the symptoms reach a higher point, and very much more rapidly than they do in the course of ordinary disease.

Poisons are divided into two classes, irritants and narcotics.

The irritant poison takes effect immediately on coming in contact with the digestive tract. They cause burning pains in the mouth, throat and stomach, the effect in the case of volatile poisons like ammonia, extending even to the nasal passages. The coatings of those parts are partly or wholly destroyed.

Such severe treatment of vital parts causes faintness and shock. And all together the ill effects are such and so plainly to be seen, that the question springs instinctively to the lips of the observer, "What have you been taking?" The contrary is the case with narcotic poisons. They do not act until they have entered the circulatory system, and the symptoms do not appear until some time after the poison has been swallowed.

Narcotic poisons produce drowsiness, which rapidly increases and passes beyond the control of the patient, unconsciousness, coma and death following in rapid order, unless relief is obtained.

The following classification of poisons is as convenient a one as the writer has ever seen.[1]

1. Drugs causing death in a few minutes :

Bromine, Chlorine, Carbonic Oxide Gas, Cyanids, Oxalic Acid, Prussic Acid, Strychnine and the strong Mineral Acids.

2. Drugs known as Corrosive Irritants :

(*a*) Corrosives causing local destruction of tissues with nausea and vomiting: Ammonia Water, Solutions of Potassa and Soda, Lye, Lime, Carbolic, Chromic, Hydrochloric, Nitric, Nitrohydrochloric and Sulphuric Acids.

(*b*) Irritants causing pain, vomiting and purging: Cantharides, Antimony Salts, Arsenic, Copper Salts, Lead Salts, Zinc Salts, Mushrooms, Phosphorus.

3. Drugs affecting the nervous system :

(*a*) Narcotics, producing insensibility as the chief symptom, preceded by more or less cerebral excitement: Alcohol, Chloral, Chloroform, Ether and Opium.

(*b*) Deliriants producing delirium as a prominent symptom: Belladonna, Camphor, Cannabis Indica, Cocaine, Hyoscyamus and Stramonium.

(*c*) Convulsives, producing violent muscular paroxysms: Narcotine, Nux Vomica, Picrotoxine and Strychnine.

(*d*) Multiple disturbers, producing complex nervous phenomena: Aconite, Conium, Digitalis, Lobelia, Physostigma and Tobacco.

[1] Prof. D. M. R. Culbreth, M. D., in Dr.'s Circular.

Owing to the very great uncertainty of poisoning cases, the nurse should carry in mind the more commonly used antidotes, and the following are recommended as convenient things for the nurse to carry with her:

1. Stomach pump (6 feet of ½ inch tubing).
2. Hypodermic syringe.
3. Bleeding lancet.
4. 4 oz. can of powdered mustard.
5. 1 doz. 20 grain powders of Zinc Sulphate.
6. 1 doz. 30 grain powders of Ipecac.
7. Solution or tablets of Apomorphia.
8. 2 oz. Magnesium Oxide, and in a bottle 2½ ozs. solution of Tersulphate of Iron. These are to be kept separate until wanted for arsenical poisoning, when the magnesia is to be mixed with about a pint of water and shaken. Then add the iron solution and again shake, when the mixture is ready for use and to be freely given the patient.

A physician should be sent for immediately upon the discovery of a poisoned person. In order to intelligently treat a poisoned person, the nature of the poison should be ascertained first, if possible. Oftentimes through unwillingness or unconsciousness on the part of the patient, this is impossible.

It is the custom, except when corrosive poisons have been swallowed, to empty the stomach by an emetic or the stomach pump.

The most common emetic and one usually at hand, is mustard. This is mixed with hot water to the consistence of cream and given freely.

Chemicals are used as antidotes when one can be found which will form with the poison, an insoluble and therefore inactive, compound with it. But aside from the arsenical anti-

dote already mentioned, a knowledge of chemistry is necessary, such as the average nurse does not possess.

Physiological antidotes are to be given to counteract the effects of a drug which has passed into the system, and their administration is the business of the physician.

In narcotic poisoning, beside the usual emetic, such common stimulants as strong coffee, ammonia, and brandy, may be used. Also untiring efforts to prevent the patient from yielding to the irresistible drowsiness which threatens.

Appendix.

QUESTIONS TO WEIGHTS AND MEASURES.

What are the names of the weights used in the apothecary table?
If a dram of Dover's Powder is divided into 12 powders, how many grains will there be in each powder?
How many 10 ♏ doses in f℥ij?
Twelve powders, containing a scruple and a half of Sodium Bicarbonate in each powder, will require how many drams of Sod. Bicarb.?
How many teaspoonfuls in a tumblerful?
How many f℥ in 16 f℥?
How many tablespoonful doses in a six ounce mixture?
In four fluid ounces how many teaspoonfuls?
In 32 drams how many desertspoonfuls?
What household measure would you use to measure f℥j? f℥ij? ..j?

QUESTIONS TO WEIGHTS AND MEASURES OF THE METRIC SYSTEM.

What is the origin of the metre?
Give the names of the units of length, capacity and weight.
Origin of cubic centimetre.
Origin of the gram.
How many centigrams in a gram?
How many milligrams in a gram?
How many C.c's. in f℥j? in f℥j? in f℥xvj?
How many teaspoonfuls in f℥ji? in f℥ij? in f℥xvj?
How many C.c's. in ½ wineglassful?
How many milligrams of opium in a one grain opium pill?
How many milligrams of nitroglycerin in a tablet containing $\frac{1}{100}$ of a grain?
The dose of strychnine being $\frac{1}{30}$ gr. is 0.030 Gm. too much to give?

QUESTIONS ON DOSAGE.

Name the drugs given in doses from ½ to 2 grains.
Dose of Ipecac, Belladonna, Opium, Gentian, Digitalis, Hyoscyamus, Cinchona, Gelsemium, Jalap and Nux Vomica?
Dose of Tinct. Opium and Camphorated tincture of opium?
How much opium in a teaspoonful of Paregoric?
How much in 10 ♏ of Laudanum?
How much in 10 ♏ of Tinct. Opii?
What is the rule for finding out how much drug there may be in a fluid ounce of a preparation of it, when the percentage strength is known?
Name the 10 per cent. poisonous tinctures.

QUESTIONS ON CLASSIFICATION AND DESCRIPTION OF DRUGS AND CHEMICALS.

Name the alterative drugs, giving their doses.
Give the uses of Metallic Mercury.
In what three forms is it used?
What is the dose of Mercury?
Physiological action and uses of the iodides?
Describe some of the effects of poisoning by Iodine and the iodides.
Give the action and uses of Arsenous Acid. Name the official solutions containing it, with their strength and dose.
Describe Ichthyol.

QUESTIONS ON ANÆSTHETICS.

Name the anæsthetic.
Define the term anæsthetic.
Name the general anæsthetics.
Name the local anæsthetics.
Define Ether—what is its strength?
Its physiological action?
What is the origin of Chloroform?
Effect externally—upon respiration, pulse, pupils?
Official preparations and strength?
Dose of Chloroform?

Origin of Cocaine—what is meant by the term alkaloid?
What is the action of Cocaine upon the heart, respiration and temperature?
In what form is it used as a local anæsthetic?
Origin and description of Antipyrine?
Its action on the temperature?
Poisoning symptoms? Dose?
What is the origin, use and dose of Menthol?

QUESTIONS ON ANTACIDS.

Name the anticids—define the term.
Name an official preparation of Ammonia and dose of it.
How is lime water prepared and its strength preserved?
What happens to it if negligently kept?
Define anthelmintic—name them.
Define tæniacide—name the drugs.
What is the dose of santonine and what is it used for?
What are the effects of prolonged use of it and of an overdose?
What is Pelletierine the active alkaloid of?
What is the dose of Oleo Resin of male fern?
What is the dose of the Oil of Spirit of Terpentine?
What is Tannin obtained from?
What is its principal action?
In what form is it most frequently applied?

QUESTIONS ON ANTISEPTICS.

Define antiseptic.
Name the antiseptic drugs.
Give the official names of corrosive sublimate.
Symptoms of poisoning and dose.
What is the source of Carbolic Acid?
Describe its appearance.
Describe its action as a poison.
What is it used for internally?
What is the dose of it?
How strong is a saturated solution of carbolic acid and how is it made?

What is the best antidote for carbolic acid burns?
Uses of Hydrogen Peroxide?
Uses of Boric Acid?
What is meant by a saturated solution of anything?
What are the several names of sulphate of iron?
What is the dose of Potassium Permanganate?

QUESTIONS ON ANTIPERIODICS OR ANTIMALARIALS.

Define the terms antiperiódic and antimalarial.
Name the alkaloids of Cinchona.
What is the specific action of Quinine? Dose?
Name the preparations of cinchona.
Name the salts of quinine.
What is the active principle and dose of Eucalyptus?

QUESTIONS ON ANTIPYRETICS.

What is the origin of Acetanilid and Phenacetine?
Describe the appearance of each, uses of them and dose.
What is Guaiacol obtained from? Dose of it?
Use and dose of Salicylic Acid?
Symptoms of poisoning?
What two substances are identical with Oil of Wintergreen?

QUESTIONS ON ANTISPASMODICS.

Define antispasmodics.
Name the antispasmodic drugs.
What is the action of Chloral? Use? Dose? How given?
What is the action and dose of the bromides?
Official names of Hoffman's anodyne? Dose?
Action and dose of Camphor-opium? Define.
Its physiological action?
Poisoning symptoms?
What treatment is best as an antidote?
What is the dose?

Name the important preparations and their doses.
What is the strength of Majendre's Solution of Morphine?
What are the two chief alkaloids of Opium and their doses?
Belladonna—what is its active principle? What is Belladonna used for?
What is its physiological action?
What are the chief preparations of it?
Their strength and dose?
Dose of Atropine?
Dose of Assafœtida?
Dose of Valerian?
Dose of Monobromated Camphor?

QUESTIONS ON ASTRINGENTS.

Define astringent.
Name the important vegetable and mineral astringents.
What form of gallic acid is mostly used?
Dose of Aromatic Sulphuric Acid? of Lead Acetate? of Silver Nitrate? of the Bismuth Salts? of Zinc Sulphate?

QUESTIONS ON CARDIAC SEDATIVES.

Define cardiac sedative.
Action—uses and dose of Aconite?
Dose of active principle?
Name the official preparation of Antimony and dose.
Names and dose of prussic acid.

QUESTIONS ON CARDIAC STIMULANTS.

Define cardiac stimulants.
Name them.
Action—use and dose of Digitalis.
Strength of tincture and infusion and dose of each.
Dose of Digitalin.
Origin of Alcohol and dose.
Origin of Caffeine and dose.
Action—dose of Nux Vomica.

Dose of Strychnia.
Dose of Tincture Strophanthus.

QUESTIONS ON CATHARTICS.

Define Cathartic—Laxative, Purgative.
Dose of Rhubarb, Senna, Cascara, Castor Oil, Ox Gall.
Give names of calomel.
Dose of Podophyllin, Colocynth, Croton Oil, Rochelle Salt, Epsom Salt, Glauber's Salt.

QUESTIONS ON COUNTER-IRRITANTS.

Define counter irritant.
Define escherotic.
Name the drugs under those two headings.

QUESTIONS ON DIAPHORETICS.

Define diaphoretic.
Dose of Pilocarpine, Dover's Powder, Spirit of Nitre.
Define and name the digestants.
Define and name the disinfectants.
Define and name the diuretics.

QUESTIONS ON ELIMINATIVES.

Define eliminative.
Dose of Colchicum.
Define emmenagogue.
Define emetic.
Dose of Apomorphine, Ipecac

QUESTIONS ON EXPECTORANTS.

Define and name expectorants.
Define and name hipnotics.
Dose of Sulfonal, Hyoscine, Cannabis Indica.

QUESTIONS ON NERVOUS SEDATIVES.

Define sedative.
Define stimulant.
Define oxytocic.
Dose of Ergot.
Define tonic and name them.
Dose of Phosphorus.
Define vaso-motor.
Dose of Nitroglycerin.

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