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THE ELEMENTS OF

MATERIA MEDICA

AND THERAPEUTICS.

THE ELEMENTS

OF

MATERIA MEDICA

AND

THERAPEUTICS,

ADAPTED TO THE

AMERICAN REFORMED AND ECLECTIC PRACTICE;

WITH NUMEROUS ILLUSTRATIONS.

BY J. KOST, M. D.,

PROFESSOR OF MATERIA MEDICA, THERAPEUTICS AND BOTANY IN THE AMERICAN MEDICAL COLLEGE, CINCINNATI; EX-PROF. MATERIA MEDICA IN B. M. COLLEGE OF NEW ENGLAND, AND B. M. COLLEGE OF OHIO; LATE PROF. OF MATERIA MEDICA IN S. B. M. COLLEGE, MACON, GA.; AUTHOR OF "PRINCIPLES AND PRACTICE OF MEDICINE," "DOMESTIC MEDICINE," ETC.

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AUTHOR'S PREFACE.

In offering this second edition of the following work, the Author deems an apology necessary to those Colleges that have continued (in expectation) to announce it as a *text-book* while out of print. Several Medical Conventions, and many of his professional friends too, have indicated their solicitude for an early reprint. The delay has been mostly occasioned by engagements upon other works deemed equally important, and which were intended to have been published before the former large edition of this work was exhausted. It had been the author's intention not to submit the work to republication, until he should have ample time for thorough revisions and extension. This has now been accomplished, and it is hoped that the work will continue to merit the liberal patronage of the profession.

Much of it has been rewritten, and nearly three hundred pages of matter, as also many new illustrations, have been added. The agents of Materia Medica have been numerically increased, and comprise among them many important new articles. Its Pharmacy has been improved and extended, and its Therapeutics also is perfected and amplified.

The work, however, is still far from what the author could wish it to be, and he cherishes the hope that the generous profession will continue their kind indulgence.

That the treatise will be considered sectarian and proscriptive, is very *possible*, since the curative intentions are all projected upon principles of absolutely safe medication. Nevertheless, the author may be permitted to say that in his revision of the work, he has still found it unnecessary to treat the views of those who differ from him in professional sentiments, with unkind feelings or discourtesy. He has pursued his labor independently, but respect-

fully, with his purpose fixed upon the maintenance of truth as indicated or corroborated by experience and observation.

For the better understanding of practical truth in medicine, the author, from the first, found it necessary to investigate all the different views in pathology and therapeutics, and to test them by the analogies afforded in an extended practice, and by a sound inductive philosophy. With him the result of all this, has been a sound conviction that no curative measures contemplating organic lesion or functional derangement, as a *basis* or *principle of cure*, can be admitted in a *perfect* system of medication.

There is indeed no record of any practice true to a theory so perfectly *physiological*, in the dusky archives of medical lore, yet this should be made at least a hypothetical standard in practice, and we should attain it as nearly as possible. Our resources of the harmless order are very abundant, and while these agencies are proven to be equally efficient in the cure of disease there is no reason why they should not be adopted.

Although the present age is one of notable progress and improvement, yet the profession should in no degree less respect the labors and accumulated knowledge of the many past ages. A full sense of this fact has given an impress upon the present, as well as upon the former character of this work. Numerous foreign, as well as native authorities, have been consulted; these have been generally credited in the work where referred to, and require no special acknowledgment here.

With these remarks the author submits the work to the press, in the hope that his labor may continue of some service to his generous co-laborers in the profession.

CINCINNATI, December, 1857.

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ABBREVIATIONS OF MEDICAL TERMS, ETC.

Sex. Syst.—Sexual System; the Linnæan, or Artificial System of Botanical Classification, founded on the Sexual Organs, or Stamens and Pistils of the Flowers.

Nat. Ord.—Natural Order; the Natural Arrangement of Plants, according to Lindley, unless otherwise expressed.

Gen. Char.—Generic Character.

Spec. Char.—Specific Character.

Ess. Char.—Essential Character.

U. S.—United States Pharmacopœia.

U. S. Dis.—United States Dispensatory.

L., or *Lond.*—London College, or Pharmacopœia.

E., or *Ed.*—Edinburgh College, or Pharmacopœia.

D., or *Dub.*—Dublin College, or Pharmacopœia.

Sp. Gr.—Specific Gravity.

Eq.—Equivalent.

Q. S., or *q. s.*—Quantum Sufficit; as much as is sufficient.

Gtt.—Gutta, vel guttæ; a drop, or drops.

SS.—Semi; a half.

Aa, or *āā.*—Ana; of each.

Cong.—Congius, vel congii; a gallon, or gallons.

O.—Octavius, vel octavii; a pint, or pints.

Min.—Minimum, vel minima; a minim, or minims.

℞.—Recipe; take of.

℥.—Uncia, vel unciæ; an ounce, or ounces.

ʒ.—Drachma, vel drachmæ; a drachm, or drachms.

℈.—Scrupulus, vel scrupuli; a scruple, or scruples.

f ℥.—Fluiduncia, vel fluidunciæ; a fluid ounce, or fluid ounces.

f ʒ.—Fluidrama, vel fluidramæ; a fluid drachm, or fluid drachms.

℔.—Libra, vel libræ; a pound, or pounds.

ABBREVIATIONS OF LANGUAGES.

Ger.—German.
Fr.—French.
Ital.—Italian.
Span.—Spanish.
Gr.—Greek.
Dut.—Dutch, Hollandish.
Port.—Portuguese.
Chin.—Chinese.
Coch. Chi.—Cochin Chinese.
Braz.—Brazilian.
Jap.—Japanese.
Per.—Persian.
Arab.—Arabian.
Bali.—Balian (Island).
Ind.—N. A. Indian.
Vul.—Common English.
Eng.—English.
Tam.—Tamool.
Duk.—Dukhanie.
Siam.—Siamese.
Hind.—Hindoostanie.
Tell.—Tellingoo.
Guz.—Guzerattie.
Cyng.—Cyngalese.
Sum.—Sumātrán.
Can.—Cánárese.
Mal.—Malayan.
Jav.—Jāvánese.
Maléal.—Máléālie (the language of the Malabar coast).
Mahr.—Mahratta.
Beng.—Bengalie.
Nep.—Nepaulese.
Pol.—Polish.
Russ.—Russian.

ABBREVIATIONS OF NAMES OF AUTHORS.

F.—Fahrenheit.
Linn.—Linnæus.
Lind.—Lindley.
De Cand.—De Candolle.
Nees V. Esen.—Nees (Fr.) Von Esenbeck.
Eberm.—Ebermair (H.), the colleague of Nees.
Hook.—Hooker.
Juss.—Jussieu.
Tourn.—Tournefort.
Lam.—Lambert.
Hum.—Humboldt.
Nut.—Nuttall.
Cuv.—Cuvier.
Raf.—Rafinesque.
Per.—Pereira.
R.—Royle.
G.—Griffith, of Philadelphia.
Willd.—Willdenow.

EXPLANATION OF CONDENSED FORMULAS.

It will be observed that throughout the work, the several formulas of the United States, London, Edinburgh and Dublin Pharmacopœias, are condensed into general ones, in all the officinal preparations that are treated of. These are, therefore, to be read strictly in reference to the parenthesis, within which is placed so much of each of the formulas as differs from the rest. By this means, a large amount of space is saved, and at the same time much convenience is secured. This plan is now mostly adopted by authors on Pharmacology and Materia Medica.

The following formula of the *Wine of Aloes*, occurring on page 161, is here given, to illustrate this matter:

VINUM ALOES, L. E. D., U. S.: *Wine of Aloes.*—Take (separately, D.) powdered Aloes, (Socotrine, E. D. or East Indian, E.), ℥ij. (℥jss. E., ℥iv. D.), (℥j. U. S.; and Canella ℥iv. L. (℥j. D. Ground Cardamom Seeds and Ginger, āā ℥jss., E.) (℥j., U. S.) Pour upon them Sherry Wine, Oij. (by measure ℔iij., mixed with Proof-spirit by measure, ℔j., D.) (Oj., U. S.). Macerate for 14 (7, E.) days, continually agitating; then strain (through linen or calico, E.).

The four formulas will now be written out below, and by glancing the eye over them all, the plan will be readily understood.

(U. S.) Take of Aloes, in powder, *an ounce*; Cardamom, bruised, Ginger, bruised, each *an ounce;* Wine *a pint.* Macerate for fourteen days, with occasional agitation, and filter through paper.

(Lond.) VINUM ALOES: *Wine of Aloes.*—Take of Aloes, in powder, *two ounces;* Canella, in powder, *four drachms;* Sherry Wine, *two pints.* Macerate for fourteen days, occasionally stirring, and filter.

(Ed.) VINUM ALOES: *Wine of Aloes.*—Take of Socotrine, or East Indian Aloes, *an ounce and a half;* Cardamom Seeds, Ground Ginger, in coarse powder, of each *a drachm and a half;* Sherry, *two pints.* Digest for seven days, and strain through linen or calico.

(Dub.) VINUM ALOES: *Wine of Aloes.*—Take of Socotrine Aloes *four ounces;* Canella, *one ounce;* powder them separately; mix and macerate for fourteen days in a menstruum, consisting of *three pounds* of Sherry Wine, and *a pound* of Proof-spirit.

TROY OR APOTHECARIES' WEIGHT.

Measure.	*Signs.*	*Equivalents.*	*Signs.*	*Equivalents in grains.*	*Signs.*
One pound,	℔j. =	12 Ounces,	ʒxij. =	5760	gr.
" Ounce,	ʒj. =	8 Drachms,	ʒviij.=	480	gr.
" Drachm,	ʒj. =	3 Scruples,	℈iij. =	60	gr.
" Scruple,	℈j. =	20 grains,	gr. xx.=	20	gr.

APOTHECARIES' OR WINE MEASURE, U. S., D.

Measure.	*Signs.*	*Equivalents.*	*Signs.*	*Equivalents.*	*Signs.*
One Gallon.	Cj. =	8 Pints,	Oviij. =	61440 Minims.	min.
" Pint,	Oj. =	16 Fluid ounces,	fʒxvj. =	7688 "	"
" Fluid oz.	fʒj. =	8 Fluid dr'hms,	fʒviij. =	480 "	"
" Fluid dr'm,	fʒj. =	60 Minims,	min. lx.=	60 "	"

This standard of measure is adopted by the U. S. Pharmacopœia, and is generally in use in this country.

IMPERIAL MEASURE ADOPTED IN THE PHARMACOPŒIAS, L. AND E.

Measure.	*Signs.*	*Equivalents.*	*Signs.*	*Equivalents.* Minims.	*Wine Measure in U. S. Pharmacopœia*
One Gallon.	Cj. =	8 Pints,	Oviij. =	76800	61440 min. = Oviij.
" Pint,	Oj. =	20 Fluid oz.,	fʒxx. =	9600	7680 min. = fʒxvj.
" Fluid oz.,	fʒj. =	8 Fluid d'ms,	fʒviij.=	480	480 min. = fʒviij.
" Fluid d'm,	fʒj. =	60 Minims,	min. lx.=	60	60 min. = lx.

The Imperial Gallon and Pint, thus evidently contain more than the Wine Measure, in the proportion of about 5 to 4; but the College, by dividing the Pint into fʒxvi., obtain nearly the same quantities for the ounce, drachm, and minim.

APROXIMATIVE MEASURE.

This has sometimes to be employed, and it is important to know the capacities of the several vessels which are in use for this purpose. This knowledge may be thus given:—

A teacup contains about a gill, = fʒiv.
A wine-glass, - - - = fʒij.
A tablespoonful, - - = fʒss.
A teaspoonful, - - - = fʒj.

In small quantities, the most common mode of dispensing fluids is by *dropping* them. Drops, however, are not of uniform amount, as their size will depend upon the consistency of the fluid, and the shape of the vessels from which they fall. The number of drops, therefore, required to measure a *fluid drachm*, at least, ought to be known before this mode is resorted to.

HYGIENIC INTRODUCTION.

BEFORE the medical man can intelligibly, and with due success go into the practice of medicine, he requires some knowledge of the conditions of health, and of the principles on which remedial agents are brought to bear upon the constitution for its restoration when diseased. A short treatise of an introductory character to this work, has therefore been deemed advisable. This is in accordance with the practice of many authors on Materia Medica and Therapeutics.

HYGIENE.

Animal life involves a state of being in which the organic elements furnished by a lower order of life (*vegetable*) are brought into requisition—first, in the *construction* of the tissues and organs of the body; and secondly, for the supply of the waste in the *maintenance of its functions.* It is in no degree *more* necessary that the tissues of the body should be *constructed in its formation*, than it is that they should be again *decomposed for the maintenance of its functions.* No force—either mechanical, chemical, or vital—takes place in the body but by a change in the relations of the elements of the tissues: constant *waste* and constant *supply* is indispensable to continued animal life; and in proportion as the voluntary motions of the body are added to the essential motions of organic life, so also must be the increase of waste and supply.

Organization, so far as it regards the physical phenomena of life, presents us nothing more *obvious*, than the specific arrangement of the elements which adapts them to the evolution of force by chemical action, in such a way as that the force may *ever be ready and specifically available.* Thus every

tissue has a FURNACE and an ENGINE; or in other words, every cell of the tissues is a *galvanic battery*. The food (*i. e.*, the various ingesta) is the *fuel* to the furnace, or the *acid* to the battery; and every motion, *voluntary* or *involuntary*, depends upon the force thus evolved. This is most strictly correct.

It is to be observed that it is the *old* materials (those constituting the tissues) that undergo the change or metamorphosis, in the economy for the evolution of force; and the *new* materials, supplied by the arterial circulation, are destined to take the place of the old in the maintenance of tissual integrity. The common sense of the people appears not to apprehend this fact—they seem to contemplate the immediate passage of the fresh elements into the *final uses*.

Our appetites, experience, and observation, have led us to the adoption of the proper food, or supply of the materials which sustain the furnaces or batteries of the body; or in other words, which compensate the metamorphosis of the tissues. But yet the rules of supply are not so perfect as to insure health; and therefore, the physician should be informed on this subject. We should ever be able to know in what degree disease may be dependent upon infractions upon correct Hygienic rules.

Beside those more important reasons for a competent knowledge of Hygiene, there are others that are not to be overlooked. The physician holds a peculiar position in community. He is the public guardian of the health of the people — he is consulted on all questions of diet, exercise, sleep, and medicine — hence needs to be informed on these subjects.

The Vegetable Kingdom, in the great order of nature, supplies the elements of animal nutrition. This is the chief ultimate resource of every animal, whether it be *direct* or *indirect*. Though some animals are Carnivorous, others Graminivorous, Fructivorous, or Herbivorous, all are nevertheless alike ultimately dependent upon vegetable organization for their main support.*

* Vegetation, however, furnishes some minerals, that are still in their simple and uncombined state, and which thus enter the body, and appear to serve a purpose in the economy.

It has been long a mooted question, as to the comparative *healthfulness*, of the different immediate sources of nourishment. Some contend, that a direct and exclusive recourse to *vegetable* diet, is most in accordance with the design of Providence and Nature,—and that it is much more conducive to health and longevity. Others contend with equal confidence, that a mixed diet of animal and vegetable food is equally or more healthful, and that a diet partly constituted of flesh, affords a more ready and constant supply of *all* the necessary elements, and some of them in a superior state of organization.

The arguments which apply to these several questions, are mainly of two classes: the *a priori*, and the *a posteriori*. The first refers to the special organization of our bodies, or the relative fitness of our organization, for the reception and disposition of these respective kinds of food. The second relates to what can be known from experience and observation in the use of the different kinds of nutriment.

The *a priori* argument contemplates first, the fitness of the prehensive organs; secondly the digestive and assimilative functions, and third, the abstract adaptations of food.

It is contended, that if man were intended as a *carnivorous* animal, he would be supplied with corresponding prehensive implements, that is, he would have claws upon his digits, and complete set of carnivorous teeth, as the panther and the cat. This position is so consummately absurd, that it scarcely needs notice at all. In the first place, no one contends that man is by nature, *exclusively* carnivorous, and that he has an organization fitted in such accordance.

Man is a creature of reason, intellect and moral power, and lives for other ends than mere animal being, and his organization must needs accord with his noble destiny. Nor do his means (implements) for taking food, adapt him less for the use of flesh, than for fruits or other vegetables, (especially *grass!*). If the close of the preceding sentence answers the "*claw*" argument, this first position may pass.

In regard to the digestion and assimilation of food, much more that is pertinent will appear, as we find that the digestive organs of animals are specifically adapted to the food which

they require. Animals that live on highly organized food as flesh, have very simple digestive organs, since but little elaboration is required. The Heron or bittern has a digestive canal, consisting of only a simple and nearly *direct tube*, running in course with the axis of the body; which is quite sufficient for the digestion of his food, and the absorption of the nutriment. But in the Ruminatia, which subsist on the coarsest vegetables, there are at least *four stomachs*, involving extraordinary facilities for maceration, trituration and digestion. The food in large quantity, is first simply bruised and reduced, so as to be taken into the first and largest stomach, the *paunch;* thence it is borne into the second, called *bonnet*, the sides of which have favosæ, or cells resembling those of the honey-comb. Here the food is moistened with peculiar secretions, and packed into pellets, which then successively ascend to the mouth, to be masticated and thoroughly ground, in what is called "*chewing the cud.*" This process continues until the food received into the paunch has been all worked over in this way. After the second mastication, the food is received directly into the third stomach, called the *leaflet*, on account of its sides having longitudinal laminæ, resembling the leaves of a book. Here again, a supply of secretion is furnished, while also the process of absorption is going on. But the main part of the digestion is accomplished in the fourth stomach, called *rennet*. The peculiar acids and pepsin, here furnished, serve as chemical agents, to dissolve the vegetable salts, and eliminate the organic elements in full. The chyle is thus formed, conjointly with the admixture of the secretions of the accessory organs.

In point of complication of the digestive apparatus, man holds his position less than midway from the simplest carnivora, to the most complicated of the herbivora (the camel). He has two stomachs, if indeed the duodenum is to be called a stomach. But he has an elongated intestinal tube, with many convolutions, serving principally to facilitate the absorption of the materials already in solution and fitted to be taken into the circulation.

For the mastication of his food he is equally fitted for either

kind. He has thirty-two teeth, and copious facilities for insalivation. Eight of his teeth, the incisors, are *cutting* teeth, fitted more especially for eating fruits; twelve others, the canine and bicuspids, are *tearers*, and fitted best for flesh-eating; and twelve others still, the molars, are *grinders*, fitted more particularly for masticating, or grinding seeds or grains.

In the stomach we observe a very complete arrangement for the solution of the organic salts, and, in a general sense, this organ may be considered the department of digestion which is particularly adapted to the process of solution. The hydrochloric acid, the peculiar gastric secretions (*pepsin*, etc.), the elevated temperature (98°—100°), concoction, fermentation, and mechanical action, must bring into solution every salt, and freely evolve the basic elements of vegetable compounds. This process does most for the fruits, or those parts of the food which abound in salts, or vegetable acids united with organic bases, and azotized principles, as gelatin, albumen, and fibrin.

Then the chyme passes down into the duodenum; and such solutions thereof as are not absorbed by the veins into the circulation, together with the fatty, oily, or carbonaceous substances, comprised chiefly in the animal and graminiferous portions of the food, here meet with their appropriate menstrua and elaborating agencies. The taurine and cholinine, furnished by the bile, and the still more powerfully alkaline agency (pancrenine?) furnished by the pancreas, emulsify the fats, oils, and resins of the meats and grains, and thus constitute the chyle.

In the small intestines another provision still obtains, in the secretions of the mucous membranes, and enteric glands (especially Brunner's), which possess the power of changing starch, or fecula into sugar and lactic acid, by which process the wonderful phenomena of digestion are completed.

The next and last point to be considered in this argument, is the abstract adaptations of the several kinds of food to the uses of the economy.

One of the methods of arriving at a knowledge of the abstract adaptation of aliments to the uses of the body, is that of a comparison of the primary and organic constituents with

those of the body. This idea rests upon the common axiom: "that which a thing does not *possess*, it can not *give*." Thus the ultimate constitution of aliments has been inquired after, and also that of the body, with a view to a comparison of the the former with the latter, thus to judge of the relative capacity of the former to afford all the elements for a perfect nutrition.

The following are the primary elements that are found in the human body:

1 Carbon.	8 Chlorine.	14 Calcium.
2 Hydrogen.	9 Iodine.	15 Magnesium.
3 Oxygen.	10 Bromine.	16 Iron.
4 Nitrogen.	11 Fluorine.	17 Manganese.
5 Phosphorus.	12 Potassium.	18 Aluminum.
6 Sulphur.	13 Sodium.	19 Copper.
7 Silicon.		

Though all these elements have been found in the human body, yet *some* of them, at least the last one, copper, has been supposed to be accidental, as also gold, silver, lead, and even arsenicum, antimony, etc., have also been detected, but are supposed to occur only accidentally, from having been thrown into the system in a medical, or other incidental way.

The elements which are supposed to be necessary in the food of man, are as follows:

1 Carbon.	6 Sulphur.	10 Calcium.
2 Hydrogen.	7 Iron.	11 Potassium.
3 Oxygen.	8 Chlorine.	12 Magnesium.
4 Nitrogen.	9 Sodium.	13 Fluorine.
5 Phosphorus.		

It would be difficult, and perhaps useless, in this connection, to attempt to give a list of all the organic elements in such a way as to form a basis for comparison, since these are the subjects of constant change and transformation under the vital processes. The more commonly recognized organic principles are Albumen, Fibrin, Gelatin, Casein, Protein, and Olein; though the latter three are indefinite. Protein is a name now usually employed in a generic sense. Albumen is found in all the nutritive fluids of the body, as the *blood*, *chyle*, and *lymph*, and is found as a constituent of various tissues. In milk its place is occupied by caseine.

The ultimate, or primary constituents of albumen, according to Scherer and Mulder, are:

	Scherer.	*Mulder.*
Carbon,	54·9	53·5
Hydrogen,	7·0	7·0
Oxygen, Sulphur, Phosphorus,	22·4	15·5 1·6 0·4
	100·0	100·0

Fibrin is of very nearly equal constitution; it is as follows:

	Scherer.	*Mulder.*
Carbon,	53·6	52·7
Hydrogen,	6·9	6·9
Nitrogen,	15·7	15·4
Oxygen, Sulphur, Phosphorus,	23·8	23·5 1·2 0·3
	100·0	100·0

Fibrin constitutes a large proportion of the soft solids of the body. The muscular and ligamentous tissues in particular, are composed almost entirely of it. It exists in all the fluids that are capable of plastic uses.

Hæmatin is usually classed with fibrin, as globulin is with albumen. But it seems that the former of these has a different ultimate constitution from that of fibrin. The following table represents it:

Carbon,	65·3
Hydrogen,	5·4
Nitrogen,	10·4
Oxygen,	11·9
Iron,	7·0
	100·0

Hæmatin and globulin constitute the red corpuscles of the blood.

Gelatin forms a large proportion of the soft tissues of the body. Under this name are comprised gluten and chondrin, though these substances are very similar. Their components are as follows:

GLUTEN.

	Mulder.	*Scherer.*
Carbon,	50·4	50·8
Hydrogen,	6·7	7·1
Nitrogen,	18·3	18·3
Oxygen, Sulphur,	24·6	23·8
	100·0	100·0

CHONDRIN.

	Mulder.	*Scherer.*
Carbon,	50·0	50.7
Hydrogen,	6·6	6·9
Nitrogen,	14·4	14·7
Oxygen, Sulphur,	29·0	27·7
	100·0	100·0

The following analysis shows the constitution of the oleaginous, or fatty substances of the animal body. They are constituted of certain peculiar acids, as the *magaritic*, *steric*, and *oleic*, united to a base called *glycerine*.

	Human Fat.
Carbon,	79·000
Hydrogen,	11·416
Oxygen,	9·584
	100·000

Blood, in addition to all these principles admits of the ready detection of the following:

Chloride of Sodium,	Magnesia,	Phosphate of Lime,
Soda,	Sulphuric Acid,	Peroxide of Iron,
Potassa,	Phosphoric Acid,	Carbonic Acid.

The remaining eight elements below, are found transient in the circulation, and permanent in the solids of the body:

Fluorine,	Silicon,	Manganese,
Aluminum,	Iodine,	Aluminum.
Bromine,	Copper,	

The following analyses of some of the principal articles of diet, will admit of a comparison that will show, on this principle, the comparative facility, with which the necessary elements, or primary constituents of the body, are supplied by the respective sources of human food.

It must be obvious, however, that such comparisons can never be any thing more than the means of a general balance, running in favor of one or the other of the two great immediate sources of food, since there are so many other circumstances that are to be taken into the account, which are by no means sufficiently fixed in character to admit of definite calculation. The chief point to be named in this respect is the use of water. This liquid carries into the system quite a variety of elementary substances that may be in a state of solution, or mechanical admixture. Respiration, also, tends to compensate, in some measure, for some deficiencies. But the air is not of a composition that will afford any considerable variety of supply.

It will be observed that, so far as regards the main organic elements, there are but few of the common aliments that do not furnish them in some proportion, though some are much

more rich in them than others. It is in the more rare constituents of the organic element, where the present question mostly applies. These will be found among the mineral, earthy, and ashy products of the analyses that are given.

COMPOSITION OF ANIMAL ALIMENTS.

COMPOSITION OF MILK.

Organic and ultimate.—Abstracted from Berzelius' Analysis.

- Milk.
  - Cream.
    - Butter.
      - Solid fat.
        - 1. Margarine.
      - Oil.
        - 2. Butyroleine.
        - 3. Butyrine.
        - 4. Caproine.
    - Butter Milk.
      - 5. Caprine.
      - 6. Caseine.
      - 7. Serain.
      - 8. Lactin.
      - 9. Osmazome.
      - 10. Phosphorus.
      - 11. Sulphur.
      - 12. Iron.
  - Skimmed Milk.
    - Curd.
    - Whey.

COMPOSITION OF EGGS.

Organic.		
White.°	Water,	80.0
	Albumen,	15.5
	Mucus,	4.5
		100.0
Yolk.†	Water,	53.78
	Albumen,	17.47
	Yellow Oil,	28.75
		100.00

° Bostock. † Prout.

Ultimate.	*White of Egg.*	*Yolk of Egg.*
Sulphuric acid,	0.29	0.21
Phosphoric acid,	0.45	3.56
Chlorine,	0.94	0.39
Carbonate of Potash and Soda,	2.92	0.50
Carbonate of Lime and Magnesia,	0.30	0.68
	4.90	5.34

COMPOSITION OF FISH.

THE SMELT.°	ROE OF FISHES.†	COD-LIVER OIL.
Fibrine.	*Of Pike, Trout, Carp and Barbel.*	Resin.
Albumen.	Albumen.	Gelatine.
Gelatine.	Osmazome.	Coloring Matter.
Osmazome.	Gelatine.	Chloride of Sodium and Calcium.
Mucus.	Oil.	Sulphate of Potash.
Yellow Phosphoric Oil.	Phosphorus.	Iodide of Copper.
Sal Ammoniac.	Sal Ammoniac.	Bromide of Potassium.
Phosphate of Soda.	Chloride of Sodium.	
Phosphate of Lime.	Chloride of Potassium.	
Phosphate of Magnesia.	Phosphate of Potash.	
Chloride of Potassium.		
° Miron.	† Miron, Vauquelin.	

COMPOSITION OF FISH—*Continued.*

THE SMELT.	ROE OF FISHES.
Carbonate of Lime.	*Of Pike, Trout, Carp and Barbel.*
Lactate of Soda.	Phosphate of Lime.
Water.	" of Magnesia.
	Sulphate of Potash.
	Carbonate of Soda.
	" of Potash.
	" of Lime.
	An Organic Salt with base of Potash.

It is remarked that the Livers of the different fishes are very much alike in their elementary constitution. What is also notable is, that the roe or eggs of the fish are very much like those of the fowl, in their constitution.

ANALYSIS OF THE OYSTER.

The Flesh.[c]	*The Liquor or Water.*
Albumen.	Osmazome.
Fibrine.	Albumen.
Gelatine.	Chloride of Sodium.
Osmazome.	" of Magnesium.
Mucus.	Sulphate of Magnesium.
Water.	" of Lime.
Phosphate of Lime.	Water.
Chloride of Sodium.	
Sulphate of Lime.	
Sulphate of Magnesia.	
Chloride of Magnesia.	

[c] Pasquier.

COMPOSITION OF BEEF.

Comprising Muscle, Tendon, Ligaments, Cartilages and Aponeuroses.

Organic.	*Inorganic or Ultimate.*
Albumen.	Carbon.
Fibrine.	Hydrogen.
Gelatine.	Oxygen.
Oleine, Margarine.	Nitrogen.
Osmazome.	Chlorine,
Stearine.	Sulphur.
Hæmatosine.	Sodium,
Globulin.	Magnesium.
Casein.	Phosphorus.
Lymph.	Calcium.
Mucus.	Potassium.
Seroline.	Ferrium (*Iron*).
Cholesterine.	Iodinum.
Extractive, etc.	Bromium, etc.

The flesh of Veal, Mutton and Grain, do not differ much in their elements, but vary in the proportions in which they contain them.

COMPOSITION OF VEGETABLE ALIMENTS.

ANALYSIS OF INDIAN CORN.

Organic Constituents.	*Primary Constituents.*
Starch.	Carbon.
Vegetable Albumen.	Hydrogen.
" Fibrine.	Oxygen.
" Glutene.	Nitrogen.
" Mucene.	Phosphate of Lime.
Oily Matter.	Carbonate of Lime.
Sugar.	Sulphate of Lime.
Gum.	
Lignine.	
Zeine.	
Acetic Acid.	
Extractive.	

COMPOSITION OF RICE.*

Starch	85.07
Parenchyma (Woody fiber)	4.80
Gluten	3.60
Thick Oil (rancid taste)	0.13
Uncrystallizable Sugar	0.29
Gum	0.71
Water	5.00
Phosphate of Lime, Acetic Acid, Phosphate of Potash, Salts of Potash, Salts of Lime, Chloride of Potash.	Traces.

COMPOSITION OF WHEATEN FLOUR.

Starch,	71·49
Gluten,	10·96
Sugar,	4·72
Gum,	3·32
Bran,	3·32
Water,	10·00
	100·00

The ultimate and the special organic principles of wheat are nearly the same as that of Indian corn; but it lacks the oil, and has more gluten and fecula.

* Braconnot.

COMPOSITION OF LEGUMINOUS SEEDS.

	Peas.°	*Garden Bean.*†	*Kidney Bean.*‡	*Lentils.*§
Starch,	32·45	34·17	35·94	32·81
Amilaceous Fiber,	21·88	15·89	11·07	18·75
Legumine Caseine,	14·56	10·86	20·81	37·32
Gum,	6·37	4.61	19·37	5·99
Albumen,	1·72	0·81	1·35	1·15
Sweet Extractive Matter,	2·11	3·54	3·41	3·12
Membrane,	2·11	10·05	7·50	3·12
Water,	14·06	15·63	(Dried)	3·12
Salts,	6·56	3·46	0·55	0·57
Loss,	0·29	0·98	0·55	0·29
	100·00	100·00	100·00	100·00

COMPOSITION OF FRUITS.‖

	Apricot.		*Green Gage.*		*Peach.*		*Cherries.*	
	Unripe.	Ripe.	Unripe.	Ripe.	Unripe.	Ripe.	Unripe.	Ripe.
Nitrogen.'s Matter,	0·76	0·17	0·45	0·28	0·41	0·93	0·21	0·57
Coloring Matter,	0·04	0·10	0·03	0·08	0·27	0·93	0·05	0·57
Lignin,	3·61	1·86	1·26	1·11	3·01	1·21	2·44	1·12
Gum,	4·10	5·12	5.53	2·06	4·22	4·85	6·01	3·23
Sugar,	traces	16·48	17·71	24·81	0·63	11·61	1·12	18·12
Malic Acid,	2·70	1·80	0·45	0·56	1·07	1·10	1·75	2·01
Lime,	a little	a little	traces	traces	0·08	0·06	0·14	0·10
Water,	89·39	74·87	74·57	71·10	90·31	80·24	88·28	74·85
	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00

COMPOSITION OF THE POTATO.

Water,		66·875
Starch,		30·469
Albumen,		0·503
Gluten,		0.055
Fat,		0.056
Gum,		0·020
Asparagin,		0·063
Extractive,		0·921
Chloride of Potassium,		0·176
Silicate of Iron, Citrate of Iron, Manganese, Alumina, Soda, Potash, Lime,	Of these, the Potash and Citric Acid are the prevailing,	0·815
Citric Acid,		0·047

° Pisum Sativum. † Vicia Faba. ‡ Phaseolus Vulgaris.
§ Ervum Lens. ‖ Berard.

COMPOSITION OF CABBAGE AND CAULIFLOWER.*

Cabbage.		*Cauliflower.*
Vegetable Albumen,	0·29	Vegetable Albumen (about 0·5 per ct.)
Gummy Extractive,	2·89	Mucilage.
Resin,	0·05	Coloring Matter (Chlorophylla).
Extractive,	2·34	Resin.
Green Fecula,	0·73	Fatty Matter.
Water, Acetic Acid, Sulphate and Nitrate of Potash, Malate and Phosphate of Lime, Phosphate of Magnesia, Iron, Manganese,	93·80	Lignin. Silica. Water (90 per cent.). Malate of Ammonia. Malate of Lime. Acetate of Potash. Phosphate of Lime. Chloride of Lime. Sulphate of Potash.
	100·00	

COMPOSITION OF CUCUMBER AND MELON.

Green Cucumber, peeled.†		*Flesh of the ripe Cantelope.*‡	
Sacharine Matter,	1·66	Crystallizable Sugar,	1.5
Coloring and Odorous Matter,	0·04	Pectic Acid,	traces
Lignin and Phosphate of Lime,	0·53	Uncrystallizable Sugar, Vegetable Albumen, Mucilage, Tree Acid, Saponifiable Fat, Nitrogenous Matter, Coloring Matter, Aromatic Matter, Starch, Woody Fiber, Salts, Water,	98·5
Albumen,	0.13		
Mucus, Phosphoric Acid, Ammoniacal Salts, Malate, Muriate, Sulphate, and Phosphate of Lime, Iron,	0·50		
Water,	97·14		
	100·00		100.00

The *Watermelon* has nearly the same constituents as the Cantelope.

The question of diet, in so far as the *a posteriori* argument goes to show the comparative adaptations of animal and vegetable food, can only be considered here in a very general way. Observations upon the history and physical conditions of the several nations that have been noted for exclusiveness in their dietetical resources are pertinent, and must have some weight in the inquiry. In this it will be observed, that the facts in their bearing, *all tend in favor of a mixed diet.* This assumption is predicated upon the position, that the claims of the vegetable diet are admitted by all, in so far as they go. If then it shall appear that nations and people who have subsisted entirely upon

* Braconnot. † John. ‡ Payen.

flesh, have been equally well conditioned, to those who are vegetarians, then the question will not require further discussion. Nor are many investigations necessary on this point.

Observations among nations in every climate, from the Arctic to the Antartic, prove the same facts. The Greenlander and the Esquimaux will subsist exclusively on the flesh and blubber of the Seal and Walrus, and will withstand the most severe hardships; the winter nights of many months, at a temperature ranging at *twenty* to *forty* degrees below zero! The Malayan in the Tropics, under the Equator, from New Guinea or the Moluccas to the Caribbean Archipelago, lives on fish and reptiles, and yet such is the thrift of his race, that nearly every Island and Coast in the broad Tropical belt, in the entire circuit of the globe, is inhabited by it.

The pastoral tribes of the north of Europe, who lived on milk and flesh, with few vegetables, were a powerful people, and became a terror to the Roman Empire, and finally laid waste the fair fields of Italy, in the conquests of their arms.

Cæsar in his Gallic Commentaries, and other Roman writers, speaking of the German nations, testify to their remarkable physical strength, and power of endurance: "fierce blue eyes, deep yellow hair, a robust frame, and a gigantic hight; inured to cold and hunger, but not to thirst and heat, warlike, honest, faithful, friendly, and unsuspicious toward friends, but toward enemies, cunning and dissembling; scorning every restraint, considering independence as the most precious of all things, is therefore ready to give up life rather than liberty. Unacquainted with the arts of civilization, ignorant of agriculture and of the use of metals and letters, the German lives in his forests and pastures, *supported by the chase, and the produce of his herds and flocks*."

The Aborigines of North America, who likewise live upon the chase, answer well also to this description, in their physical character. All history also of the primitive Oriental pastoral nations, proves the specific adaptation of animal food. Their extraordinary *longevity*, and physical *development*, in particular: "*There were Giants in the earth in those days,* * * *mighty men* which were of old, *men of renown*." Gen. chap. vi: 4.

DIGESTION.

The subject of digestion is of much interest and importance to the medical man, both as it regards the diagnosis and the treatment of disease, to say nothing of the help that attention thereto, will afford in a general hygienic way.

The different varieties of food, are of very different digestibility, and the method of preparation also, has much to do in their modification in this regard. Much information on the subject of digestion has been derived from an accident that happened with Alexis St. Martin, a Canadian, in receiving a gun-shot wound through the abdominal parietes into the stomach, and which afterward, in healing, left an opening from without, into this organ, of such a character, as admitted of the most convenient inspection of its interior, and the functions of digestion. Dr. Wm. Beaumont, was with this man for a long time, in making investigations, and conducting experiments relative to matters in physiology, but especially in observing the functions of digestion.[o]

The following table is made up from these observations, and has been of great service to the profession :

TABLE

Showing the mean time of Digestion of the different Articles of Diet, Naturally in the Stomach, and Artificially in Phials, on a Bath.

The digestion in the phials, noted in the right-hand column in the table, was conducted in Gastric Juice, in quantity of eight parts of the juice to one of the article submitted to digestion; and the temperature was kept up at 100° F., and frequent agitation was practiced.

ARTICLES OF DIET.	MEAN TIME OF CHYMIFICATION.			
	IN STOMACH.		IN PHIALS.	
	PREPARATION.	H. M.	PREPARATION.	H. M.
Rice	Boiled.	1 00		
Pigs' feet, soused	"	1 00		
Tripe, soused	"	1 00		
Eggs, whipped	Raw.	1 30	Whipped.	4 00
Trout, Salmon, fresh	Boiled.	1 30	Boiled.	3 30
Soup, barley	"	1 30		
Apples, sweet, mellow	Raw.	1 30	Masticated.	6 45

[o] These observations were published by A. Comb, Edinburgh, 1838.

ARTICLES OF DIET.	MEAN TIME OF CHYMIFICATION.			
	IN STOMACH.		IN PHIAL.	
	PREPARATION.	H. M.	PREPARATION.	H. M.
Venison, steak	Broiled.	1 35		
Brains, animal	Boiled.	1 45	Boiled.	4 30
Sago	"	1 45	"	3 15
Tapioca	"	2 00	"	3 20
Barley	"	2 00		
Milk	"	2 00	Boiled.	4 15
Liver, beef's, fresh	Broiled.	2 00	Cut fine.	6 30
Eggs, fresh	Raw.	2 00	Raw.	4 15
Codfish, cured dry	Boiled.	2 00	Boiled.	5 00
Apples, sour, mellow	Raw.	2 00	Masticated.	8 30
Cabbage, with vinegar	"	2 00	Shaved.	10 15
Milk, raw	"	2 15	Raw.	4 45
Eggs, fresh	Roasted.	2 15		
Turkey, wild	"	2 18		
Turkey, domestic	Boiled.	2 25		
Gelatine	"	2 30	Boiled.	4 45
Turkey, domestic	Roasted.	2 30		
Goose, wild	"	2 30		
Pig, sucking	"	2 30		
Lamb, fresh	Broiled.	2 30		
Hash — meat and vegetables	Warmed.	2 30		
Beans, pod	Boiled.	2 30		
Cake, sponge	Baked.	2 30	Broken.	6 16
Parsnips	Boiled.	2 30	Mashed.	6 45
Potatoes, Irish	Roasted.	2 30		
Potatoes, Irish	Baked.	2 30		
Cabbage, head	Raw.	2 30	Masticated.	12 30
Spinal Marrow, animal	Boiled.	2 40	Boiled.	5 25
Chicken, full grown	Fricaseed.	2 45		
Custard	Baked.	2 45	Baked.	6 30
Beef, with salt only	Boiled.	2 45		
Apples, sour, hard	Raw.	2 50	Entire pieces.	18 00
Oysters, fresh	"	2 55	Raw, entire.	7 30
Eggs, fresh	Soft boiled.	3 00	Soft boiled.	6 30
Bass, striped, fresh	Broiled.	3 00		
Beef, fresh, lean, rare	Roasted.	3 00		
Beef-steak	Broiled	3 00	Masticated.	8 15
Pork, recently salted	Raw!	3 00	Raw.	8 30
Pork, recently salted	Stewed.	3 00		
Mutton, fresh	Broiled.	3 00		
Mutton, fresh	Boiled.	3 00	Masticated.	6 45
Soup, bean	"	3 00		
Chicken Soup	"	3 00		
Aponeurosis	"	3 00	Boiled.	6 30
Dumpling, apple	"	3 00		
Corn-cake	Baked.	3 00		
Oysters, fresh	Roasted.	3 15		
Pork, recently salted	Broiled.	3 15		
Pork-steak	"	3 15		
Mutton, fresh	Roasted.	3 15		
Bread, corn	Baked.	3 15		
Carrot, orange	Boiled.	3 15	Mashed.	6 15
Sausage, fresh	Broiled.	3 20		
Flounder, fresh	Fried.	3 30		
Catfish, fresh	"	3 30		

ARTICLES OF DIET.	MEAN TIME OF CHYMIFICATION.			
	IN STOMACH.		IN PHIAL.	
	PREPARATION.	H. M.	PREPARATION.	H. M.
Oysters, fresh	Stewed.	3 30	Stewed.	8 25
Beef, fresh, lean, dry	Roasted.	3 30	Roasted.	7 45
Beef, with mustard, etc	Boiled.	3 30		
Butter	Melted.	3 30		
Cheeese, old, strong	Raw.	3 30	Masticated.	7 15
Soup, mutton	Boiled.	3 30		
Oyster Soup	"	3 30		
Bread, wheat, fresh	Baked.	3 30	Masticated.	4 30
Turnips, flat	Boiled.	3 30		
Potatoes, Irish	"	3 30	Mashed.	8 30
Eggs, fresh	Hard boiled.	3 30	Hard boiled.	8 00
Eggs, fresh	Fried.	3 30		
Green Corn and Beans	Boiled.	3 45		
Beets	"	3 45		
Salmon, salted	"	4 00	Boiled.	7 45
Beef	Fried.	4 00		12 30
Veal, fresh	Broiled.	4 00		
Fowls, domestic	Boiled.	4 00	Masticated.	6 30
Fowls, domestic	Roasted.	4 00		
Ducks, domestic	"	4 00		
Soup, beef, vegetables, and bread	Boiled.	4 00		
Heart, animal	Fried.	4 00	Entire piece.	13 30
Beef, old, hard, salted	Boiled.	4 15		
Pork, recently salted	Fried.	4 15		
Soup, marrow-bones	Boiled.	4 15		
Cartilage	"	4 15	Masticated.	10 00
Pork, recently salted	"	4 30	"	6 30
Veal, fresh	Fried.	4 30		
Ducks, wild	Roasted.	4 30		
Suet, mutton	Boiled.	4 30	Divided.	10 00
Pork, fat	Roasted.	5 15		
Tendon	Boiled.	5 30	Masticated.	12 45
Suet, beef, fresh	"	5 30	Entire piece.	12 00
Beefsteak	Broiled.		Cut fine.	8 00
Beefsteak	Raw.		"	8 15
Beef	Boiled.		Entire piece.	9 00
Mutton, fresh	Broiled.		Unmasticated.	8 30
Cream			Raw.	25 30
Cheese, old, strong			Entire piece.	18 00
Cheese, new, mild			Divided.	8 30
Oil, olive			Raw.	60 00
Tendon			Entire piece.	24 00
Cartilage			Divided.	12 00
Bone, beef's, solid			Entire piece.	80 00
Bone, hog's, solid			"	80 00
Parsnips	Boiled.		"	13 15
Parsnips	Raw.		"	18 00
Carrot, orange			"	12 30
Carrot, orange	Raw.		Raw piece.	17 15
Potatoes, Irish			Entire piece.	14 00
Cabbage	Boiled.	4 30	Boiled.	20 00
Peach, mellow			Cut small.	10 00
Peach, mellow			Mashed.	6 00

PHYSICAL EXERCISE.

Physical exercise in the open air, and under the direct rays of the sun, when the circumstances will admit, is an important hygienic necessity, although it has been too much regarded as a mere conventional matter, to be regulated according as the notion or pleasure of the individual might suggest.

The animal system is governed by definite or fixed vital laws, it is true, and these laws ever tend to accommodate themselves to external circumstances. Yet with all physical things there are *limits*—there are points beyond which finite causes can not extend their effects. One very remarkable peculiarity of the animal economy is, that all the conservative action of the body is dependent upon the incitement of necessities. No curative process is ever to be traced in the vital manifestations, until there has been a specific *demand* for them. This principle holds good also, in reference to every physiological function. The sedentary man becomes enervated, effeminate, and debilitated. The industrious and laboring man becomes strong, robust, and healthful. Nature responds in the measure of her abilities, to the demands or tax laid upon her. The vital principle is sensible to all *stimuli*. This is observed, not only in the general physical phenomena, but is to be traced in the most *specific* events.

When an accident happens to any one organ of the body, by which it may become disabled, other organs take upon themselves additional labors, and *supply* the office of the disabled member. When the excretions of the skin, for example, are obstructed, those of the kidneys, the intestines, and the lungs are *increased*, that by this vicarious action, the functions of the skin may be indirectly performed. When the sight of an eye, the hearing of an ear, etc. is lost, the fellow organ becomes more efficient—the sight of the other eye, and the hearing of the other ear, in these cases, always becomes *more distinct*, unless indeed the accident should reflect its power also, upon them.

On this same principle, the blacksmith's arm and the por-

ter's back, by habitual taxation of strength, become stronger and stronger, until indeed twice or thrice the normal power is thus attained. It is reported that many years since, a butcher of Edinburgh, Scotland, resolved to test this principle of the animal endowment, and he determined to carry a certain calf into the city, a distance of two miles, every day, as long as he should find himself equal to the support of the continually increasing weight of the animal; and the report is, that he continued his practice regularly, for so his strength advanced, until persons, not knowing the circumstances, and happening to meet him on his way, would be astonished beyond measure, to see a man carrying a large ox.

A fact relevant to this development of the physical energies of the body, generally overlooked, is that the enjoyments of life are, in their measure, correspondent to the amount of animal vitality and strength of constitution possessed by the individual. Thus the poor, pitiable idler—the man or woman that "*takes life easy*," takes it so, because only a *fragmentary portion thereof is possessed!*

The *exercise* is not only necessary, but it is required to be of the *proper kind*. It is the part only which is used, that derives the benefit. The shoe-maker may sit upon his bench, and employ his hands and arms in his labor, and thus acquire much strength in these members; and his hands in particular, not only will be strong and elastic, but a firm and hard skin will grow to protect the part subjected to much wear or friction.

Pedestrian, and equestrian exercises, are very popular; and indeed are useful, yet they are not always sufficient: but laborious riding, and climbing *hill-sides*, or ascending *rugged mountains*, may answer well. The Gymnasium affords the most complete manual exercise. Many varieties of industrial and frugal labors, are eminently useful.

But the most important point of all, is very often overlooked; the laborer must be out in the open air, and in the direct sunlight. Air permeates the body, and *every part of it*—this is a physiological provision. There is no tissue of the body that is not susceptible of permeation by air, to some extent; and all tissues require the *air-bath*. Not in *any degree*, is it *less*

important, that the direct sun-light should rest upon the body. Light is *indispensable* to animal life or health. An individual confined to a dark apartment, loses his vitality constantly, and will seldom live long. Very rare instances occur, in which a few years, and sometimes less than one, will not end in the death of persons confined to complete darkness.

Nor is the *reflected* light,—such as is to be had within doors, in rooms of houses, however well they may be lighted sufficient, unless the light passes directly upon the person. Reflected light is divested of its electricity, in a very large measure, when it is reflected from objects that are conductors of electricity. This chapter indicates the great secret, why so many of the inhabitants of large cities are of feeble health, why they lack bodily vigor, healthful color, activity, elasticity, tonicity, or a good vigorous appetite, which delights to be gratified.

THERAPEUTICAL INTRODUCTION.

PRIMARY PRINCIPLES OF ACTION.

Medical Agents thrown into the system, are found to involve different principles in the development of their powers. The essential processes by which their properties are apprehended by the organs or parts impressed by them, also vary considerably; thus some agents are absorbed into the circulation, and are introduced into the general system on this principle, while others are capable of developing their powers directly through the nervous system.

ABSORPTION OF MEDICAL SUBSTANCES.

It was formerly supposed that the absorption of medical agents is effected by the same organs that take up the nutriment of the food. But it is now known that this is an error, and it has been demonstrated, it is thought, that the lacteals will not take up any substances that will not admit of assimilation, and that but a very limited number of medical agents find their way into the circulation by lacteal absorption. The principal agents in medical absorption, are the veins; the Lacteals and Lymphatics, taking but a small part in it. The physical phenomena of *Endosmosis* and *Exosmosis*, doubtless, also obtain in the distribution of substances, in a state of solution.

The evidences of the absorption of medicines are; 1, their disappearance from shut cavities; 2, their detection in other parts of the body.

a. Disappearance from a Shut Cavity.—The experiments of Drs. Christison and Coindet,* show that solutions injected into the peritoneal sack of a cat, are rapidly absorbed. Four ounces

* Edinburgh Med. and Surg. Jour. xix., 335 p.

of a solution of oxalic acid were thus injected, and on killing and examining the animal in fourteen minutes, they found carcely two drachms, although none had escaped by the wound.

β. Detection in other Parts of the Body.—Camphor, Musk, Indigo, Rhubarb, Iron, Lead, Dippel's Oil, Iodine, Asafœtida, Sal Ammoniac, etc., have been found by Tiedemann, Gmelin, and others, in the blood of animals, to whom it had been administered per stomach.

In the solids also, mineral and other agents have been found, as Madder in the *bones;* Silver in the *skin;* Lead in the *liver, spinal cord and muscles,* and Mercury *in almost every part.*

The secretions are also found to contain a great variety of substances that are administered to the stomach. In the secretions of the skin were found Mercury and Iodine: the odor of Sulphur, Garlic, Musk, Onions, etc., are also detected in the breath.

Substances are likewise detected in the urine, and must hence have been absorbed. A very great variety of materials have been thus detected.

ABSORPTION BY THE VEINS.—The evidences proving the *absorption* of medicines by the veins are: 1, The detection of them in venous blood; 2, Experiments in the division or interruption of all other parts of possible access, and the proof yet, of their presence; 3, the rapidity of their action.

α. Detection of Substances in the Veins.—Rhubarb, Indigo, Madder, Cochineal, Litmus, Gamboge, Alcohol, Turpentine, etc., have been found in the veins by Tiedemann and Gmelin.

β. Division and Obstruction of other Conveyances.—Magendie and Delille* conducted an experiment upon the hind leg of a dog, in which they divided all parts, but the femoral artery and the vein. The artery was left to preserve the vitality of the limb, and as the circulation goes the contrary way in it, no objection could obtain against its integrity. Substances were then inserted into this limb, thus isolated, and were found to impress the body. Then, to prevent the possibility of the

* Elem. Comp. of Phys. p. 284. Edinburgh Edition.

action through the nerves in the coats of these vessels, the latter were also cut, and sections of quills interposed between the cut extremities, so as to keep up the circulation. Poisons (*Upas Tieute*) introduced into this severed limb, were still found to affect the body.

Segalas, Emmert, and Blake found, that when the blood-vessels are tied, poisons do not act.

γ. *Rapidity of Action.*—It is supposed that the rapidity of the effects of many agents prove to be too great to admit of the supposition, that the absorption, in such cases, is affected by the lacteals or lymphatics. Mayer found that Ferro-cyanide of Potassium could be detected in the blood in five minutes after its injection into the lungs. Herring states that when this substance was injected into one of the jugular veins, it was found in the opposite one in twenty to thirty seconds, showing the activity of venous circulation to be equal to the great activity of medical effects.

ABSORPTION BY THE LACTEALS AND LYMPHATICS.—Experiments and observation go to show, that while absorption, to a moderate extent, may go on in the lymphatics, from the primary passages or other parts, in a slow way, the *lacteals* are seldom if ever found to take up any medical substances, except perhaps a few simple alkaline salts. This is known by their being never found in these vessels or the *thoracic duct*, while yet they may be detected in the blood.

ENDOSMOSIS AND EXOSMOSIS.—If a fluid of delicate color, as water colored by litmus, is put within an animal membrane—as a piece of intestine or vein—and this is then immersed in a weak solution of sulphuric acid, it will be found that the litmus water within the vein, or intestine, will turn red from the chemical action of the acid fluid passing through the membrane (endosmose) into the former. If the relative position of these fluids is changed, it will be found that the acid water within the vein will then pass out (exosmose) into the litmus water, within which the membrane containing it is immersed. Gases have ever been known to pass and repass in this way. They permeate all tissues. Medical substances are supposed

to be diffused on the same principle in a liquid and gaseous form.

OPERATION OF MEDICINES THROUGH DIRECT NERVOUS AGENCY.—That medical and other agents operate through direct nervous agency, is evident from the following facts:

1. The rapidity of their action.

2. The effects being disproportioned to the facilities for their absorption.

3. The effects of certain agents being similar to those of others in which no substance is really communicated into the system.

4. By the rapidity of the action not being changed by diminishing or increasing the distance between the point of insertion of the agent and the brain or nervous centers.

1. *Rapidity of Action.*—Some of the most active substances—as hydrocyanic acid, oil of bitter almonds, conia, etc., according to Magendie, will operate in from two to four seconds, not only upon the brain when introduced into the mouth, or a wound in a limb, but the effects are experienced also in other, perhaps *all other* parts. When one agent can thus act, others *may;* and although medicines do not generally operate with such activity as this, they nevertheless are often so rapid in the display of their power, as not to admit of a doubt of their action by *nervous agency.* Lobelia Inflata, when in concentrated alcoholic solution, will act so instantaneously upon the nervous system, that it is often compared to an electric shock. Sometimes, in a few seconds a tingling nervous sensation, compared to the feeling caused by the vibrating magnetic machine, is experienced in the extremities, to a most disagreeable extent. The author has observed this in numerous instances.

2. *Effects disproportioned to the facility for absorption.*—Alcohol was found by Orfila, to act with less energy when injected into the cellular texture, than when taken into the stomach, although that tissue is much more favorable for absorption than the latter.

3. *Analogy of Effects caused by certain substances to those that occur by means when no substance is imparted to the body.*—Some

agents are known to effect the system, so as to cause spasms, dizziness, nausea, relaxation, etc. The prick of a needle, or a contusion, will cause spasms, and here no substance is communicated into the system. A fright, a disgusting sight, swinging, or whirling, etc., also cause nausea, dizziness, relaxation, etc., thus showing that the effects in the former cases depend upon the nerves.

4. *Rapidity of action not affected by distance of application of agent from the brain or nervous centers.* — Messrs. Morgan and Addison found, by various experiments, that the uniformity of the action of some agents, however distantly applied from the nervous centers, is such as to preclude the idea of their action by any means less instantaneous than that of the nerves.

ULTIMATE PRINCIPLES OF REMEDIAL ACTION.

Medical substances and other agents have been found to act upon the living animal body on at least three distinct principles, viz.: Mechanical, Chemical, and Vital. It is upon this distinction, which is natural and definite, that in this work the primary divisions in the classification of the Materia Medica are founded.

MECHANICAL ACTION. — Natural philosophy teaches that the fixed laws of nature may ever be expected to produce equal effects from the same causes, acting under corresponding circumstances. Hence mechanical action within the body must in principle, be expected to be the same as without it. Changes of physical state will often arise from the modification of the mechanical relations of the molecules in the organic tissues.

The elements of water, for instance, occur in such relations by a mere mechanical change, as in one case to give the form of *vapor*, and in another that of *liquid*. Dilution, and attenuation; cohesion and liquefaction; depletion and repletion, are all mechanical processes. Among the most common mechanical appliances in medicine, are those intended for the protection of abraded and lacerated parts, consisting of mucilages, lotions, oils, cerates, etc.

CHEMICAL ACTION. — Chemical action is constantly going on in the system, under vital superintendence, and sometimes in defiance of this restraint, and thus becomes *pathological.*

There is no doubt but that *medical* agents develop much of their influence on chemical principles, thus restrained, and hence obscured from our observation. It is not in this sense, however, that the caption of this article is to be understood; but rather in that which contemplates the more obvious and direct phenomena, of the agency.

The *acids* and *alkalies*, have respectively not only the peculiar power to neutralize specific chemical agencies that may be involved in the production of disease, or organic change in the tissues of the body — as the arresting of the syphilitic virus by the chemical action of the Chloride of Potassium, or the Hydriodide of Potassium; the peculiar septic acids in erysipelas by the Muriate of Iron, or the Acetate of Ammonia; the septic acids in gangrene, by the Empyreumatic Oil, Creosote, Chloride of Lime, or Nitro-Pyroxilic Oil, etc.—but in the evolution of the active alkaloid principles of organic agents, chemical action is of important service. Noxious secretions, and organic and inorganic generations—as Fungæoides, Polypi, Cancer, Exostosæ, Lithic and Phosphatic Concretions, etc.—all require either chemical or mechanical means for their removal, since they are beyond the reach of ordinary vital powers.

VITAL ACTION: (*Physio-Dynamic action.*) — By far the largest proportion of medical agents act upon the laws *peculiar* to the animal economy. The effects are *always* peculiar, and are mostly known only in a historical or an empirical way—being dependent upon the peculiar organic laws and the specific vital endowments of the living tissues, and which are comparatively little understood.

There are, however, several distinct modifications displayed in laws of vital conservative, and remedial action, and which have been the grounds of as many different Systems or Schools of Medicine. These are the following:

1. The *Allopathic.*
2. The *Homœopathic.*

3. The *Physio-Dynamic*, proper.

These doctrines, *i. e.*, the therapeutic principles that are represented by the above, are founded in nature, and are not mere conventional projections, as some other theories that are upheld, and some of which indeed are made the basis also of collegiate teaching. These are—*Hydropathy*, *Cronothermalism*, etc. The latter indeed, involve eminently useful appliances, but have no principles fixed in nature for a basis.

1. ALLOPATHY.—The term allopathy comes from the Greek *αλλος*, 'another,' and *παθος*, 'affection,' and thus at once implies the character of the theory it represents.

Much strife has existed between the different schools, which has been mostly predicated upon the relative merits of the respective theories. But it must be confessed, to the discredit of poor human nature, that a pretended zeal for the cause of truth, or for the maintenance of correct principles, has been too often made the specious pretext for courses of procedure that were really instigated from less worthy motives. Nevertheless it is also true, that the respective schools habitually inculcate much more than the abstract doctrines here to be discussed would indicate. The ways and means devised for carrying out principles, differ exceedingly, in many instances, from what is legitimate to the doctrines themselves. It is in this regard that the greatest distinctions are really maintained.

Allopathy contemplates, primarily, the obvious fact, that all organic laws involve certain conditions for their action. These may be *compatible* or *incompatible*, as to the conjoint action of foreign agents upon these laws. It is assumed that duplicate specific causes can not act conjointly upon the system, not indeed because in themselves these external activities are inconsistent with each other individually, but by acting *together* on the system they produce a reaction from it that is incompatible with their conjoint impression. The principle may be illustrated by a very simple comparison. Two men may walk together in *peace* and *harmony*, but meeting a third a disagreement springs up, which will not admit of the presence of the three: either of the two *first* can, to some extent, agree with the *third;* and either of them can *join* with

him; or the two first may still continue together in harmony. But the three can in no possible way agree.

The display of this principle in nature occurs in the phenomena involving variola, and vaccina. The small-pox may attack the system, alone, and so may the vaccine power, but the two have never been known to occur *together*. The reaction of the system against the one is incompatible with the presence of the other. When dysentery arises from one cause, it may be arrested by another which would under other circumstances produce looseness. Thus a cathartic given in dysentery, in under doses, will arrest the flow from the bowels; but when given in the absence of dysentery it causes purgation. Emetics, in under or nauseating doses, will often, and indeed generally, relieve nausea when arising from disease.

But it is on still more specific principles that the practice of allopathy is sustained in the present day. *Mercury* is supposed to have a very specific action on the system, and which is regarded to involve a law that is incompatible with almost every other foreign cause of action. It is therefore supposed that when this mercurial action can be established, it will *necessarily* subvert other diseases; and being of *self-limited* action, it will of course cease upon the exhaustion of its power, and will thus leave the system free from disease. Only two things will here be said of this modern phase of *allopathy*. First, although mercury *does* possess a specific power — one incompatible with the action of a variety of other morbid movements—still, *entirely too much is claimed for it*. Secondly, its own action is very *severe*, when fully displayed, and this is necessary in order to insure its *specific* power. It will, in numerous instances, prove much *more mischievous* than the diseases against which it is exhibited.

Homœopathy.—This name, which represents the popular German practice, is compounded from '*ομοιος*, 'like,' and *παθος*, 'affection.' Hahnemann, its founder, discovered that cinchona, and several other agents of marked specific power in the cure of certain diseases, were capable of producing the same effects, or rather corresponding symptoms on the system in health. This led him to suspect a *principle* of action, that

might lie at the foundation of all cure. He carried his investigations to an incredible extent—testing the properties of nearly every article of the Materia Medica; and he convinced himself and many others of the old profession, that his speculation was founded on truth. This is the cardinal principle of the Homœopathic theory. Another principle of this theory is, that medical agents are not cumulative in their action, according to the common understanding of this term, but that each particle of an agent operates on its own basis, and hence that a single *particle* is entirely equal to any indication. Furthermore, it is contended that these particles may become *antagonistic* in their action, when administered consecutively; and thus they will neutralize each other. *Infinitesimal* doses, *specifically applied*, on the doctrines of *similia similibus curantur*, is the sum of Homœopathy.

Physio-Dynamic Action.—This compound term is derived from φυσις, 'nature,' and δυναμις, 'power,' meaning thus *natural power*. It is applied so as to indicate the vital power, and in connection with medicine implies such remedies as act in accordance, or by the conjoint help of the vital force.

That the vital principle which for more than a score of centuries has been recognized as the "*Healing Power of Nature*," is absolutely conservative, there would seem to be scarcely the least ground for a doubt, but yet its sanative tendencies are practically disregarded by a great portion of the profession; the very names of Allopathy and Homœopathy ignore it.

The schools of medicine in America, that have founded their indications of cure upon this principle, have been called the *Physiological* and *Eclectic Schools*. Their therapeutic doctrines are well represented by the term at the head of this article, in so far as they relate to the vital principle, for their chief indications of cure, contemplate the exaltation of vital resistance, and the subversion of disease, on this safe and rational principle. But still it does not otherwise express the direct relations of the *medicine* (as a cause of cure) to the *disease* which is the subject of its action. In this regard, the term

Antipathic from *αντι*, 'against' or 'opposite,' and *παθος*, 'affection,' i. e. *against the disease*, is very proper. But the Greek "*anti*" is of a still stronger sense than the English, it means *direct opposition*. Now, since the vital laws of cure are directly *antipathic*, all the remedies that operate, as curative agencies, and in harmony with the vital conservative forces, must in like manner be *antipathic*.

The medicine which cures without the necessary superinduction of a *new disease*, is certainly the *better*, and is nearer what the proper conceptions of science would suggest as the true remedy.

THE ELEMENTS

OF

MATERIA MEDICA

AND

THERAPEUTICS.

MATERIA MEDICA (*Medical Materials*), are terms used to designate the material substances employed in the treatment of disease, and contribute happily to the formation of a title for a treatise upon them.

When the entire profession entertained the same medical views, and all the doctrines taught in the science were comprised in a single system, then this definition of *Materia Medica* was sufficient, but now something more special is required. In endeavoring to avoid the errors of the old system, made so palpable in the present age of improvement, it is not strange that many, or even *opposite* theories should be adopted by different portions of the profession: thence the Homœopathic, Hydropathic, Antipathic, and the new Physiological or Eclectic systems have gained their origin and have each a peculiar materia medica. But it is unnecessary for the purpose of this treatise, to investigate, to any considerable extent, the remedies of any other system than the last named. This being considered the only true one, corresponding, as its name imports, in every part, to the laws of nature. In this all substances intrinsically poisonous, whether *mineral, vegetable or animal* are rejected. Organic agents are chiefly esteemed, because their

action is most congenial to the animal economy, owing to the peculiar modification of the affinities and the specific arrangement of the elements of organized substances.

THERAPEUTICS (from *θεραπευω, to take care of* the sick), in its most extended sense, would comprise the application of all means of cure, *somatical*, or *psychical;* but the refinements of learning have restricted its latitude considerably, and when the term is associated with *materia medica* it is considered to contemplate only the application or *modus operandi* of *medicines* proper.

Thus *materia medica* furnishes the *implements*, while *therapeutics* teaches their *use* in the practical operations of the profession.

A proper classification of the materia medica offers numerous facilities to the physician, but more especially to the young practitioner or student of medicine, and hence much labor has been bestowed upon this point. Numerous plans have been proposed and adopted by the schools, and authors on materia medica, and still no classification has yet been made that has not met with many objections. When the idea of classification is presented, the mind is at once struck with the propriety of an arrangement contemplating the therapeutic properties of the different articles. Most authors however have adopted other plans, and have classified them according to their natural history or physical properties, comprising their botanical, zoological, and chemical characters, while others have simply adopted an alphabetical arrangement. All these classifications have their advantages and disadvantages. The first would seem to correspond more with the study of the natural sciences: the latter or alphabetical arrangement is most convenient for the apothecary or practical pharmaceutist. But the student of medicine, and the practicing physician are most interested in this subject, and have the best right to expect an accommodation in the premises; with them a physiological arrangement is of paramount importance. The author has therefore adopted this with the conviction that he could on no other plan do so much for this important department of medical science.

DIVISION I.

PHYSIO-DYNAMIC REMEDIES.

This division of the materia medica is designed to embrace those remedies commonly called *physiological*, and which, in producing their effects on the system, do not depend strictly on chemical or mechanical laws, or any other abstract physical powers. *Physiological action*, when spoken of in reference to remedies, is now, with doubtful propriety, understood in a more special sense, meaning the action of remedies on the system while in health alone.

The term physio-dynamic (from φυσις, "nature," and δυναμις, "force"), literally means *natural force*, or *natural vital force;* hence physio dynamic remedies are such as are dependent for their action upon the natural vital force of the system, and not upon chemical or mechanical laws. This division, therefore, embraces by far the larger portion of our remedies.

The articles embraced in this grand division are very naturally divided into two sub-divisions, viz: *Evacuents* and *non-evacuents.*

SUB-DIVISION FIRST.

EVACUENTS.

The remedial action of *evacuents* involves the removal of various offensive agents, or abnormal accumulations in the system, and also the common humors, for purposes of depletion or relaxation and revulsion. They are among the most important agents we possess.

Among the evacuents are found the *Emetics*, *Cathartics*, *Diaphoretics*, *Diuretics*, *Expectorants*, *Emmenagogues*, *Anthelmintics*, *Sialagogues*, and *Errhines.* The two latter classes might, however,

be dispensed with, as the objects to be accomplished by them may be very conveniently effected by some of the remedies of other classes, simply by means of their topical application. The more prominent or pungent stimulants, as *capsicum* and *zingiber*, as well as lobelia, will act promptly, both as errhines and sialagogues.

Class I.—EMETICS.

Emetics (from $\epsilon\mu\epsilon\omega$, I vomit) are substances used for the purpose of provoking vomiting, or evacuating the stomach upward. They are now defined to be such agents only as are capable of producing this effect, independently of any unpleasant taste or smell, or any particular quantity taken.

Physiology.—We perceive in the animal, as well as in the vegetable, that there are many organs and tissues which possess very peculiar endowments, which in the higher order of animals, involve the singular means by which the intellectual faculties hold correspondence with external objects, and which evince, in all living bodies, a conservative power, that, under ordinary circumstances, maintains the normal standard of health. The manifestations of this power vary with the different tissues and organs of the body. In some instances, very obvious mechanical and chemical phenomena are developed; others involve various obscure vital actions. These different processes comprehend all the different natural indications of the restorative processes. Subservient to these purposes, we find the nerves of the various important organs to be endowed with peculiar sensibilities. Thus, when an irritating substance happens to get into the eye, the sensation produced gives rise to a flow of tears; and in this manner, the foreign substance is washed away. When a hard substance is thrust into the flesh, the part will take on inflammation—pus is secreted, and the intruding substance is thus disengaged and removed. The same law obtains in regard to the stomach and other cavated organs. Irritating ingesta, or the presence of any substance or cause that may excite the peculiar sensation of which this organ is susceptible, may give rise to emesis.

It may, however, be objected, that there are *many* substances which, on finding their way into the stomach, will produce unpleasant sensations that arise from an irritation, and yet, they do not excite emesis. But this position assumes that there can be no quality of impression; whereas we find that other organs are susceptible of an almost infinite variety of impressions, from the most pleasurable to the most painful.

If it be feared that there is not a sufficient distinction maintained here between *irritation* and mere *sensation*, it may be remarked, that in reality these *two principles* should be regarded with discrimination only for *convenience* sake, as they are, emphatically, only different modifications of the same physiological endowment. The practice of recognizing irritation as essentially a pathological phenomenon, is very erroneous.—We can not conceive of a single reparatory process within the domains of the *vis medicatrix natura*, that does not embrace a state of irritation as a condition necessary to the reparation. Inflammation can not exist without it; nor yet is it an unnecessary *consequence* here; but, on the other hand, an indispensable attribute; and it may be added, that no wound or physical injury is ever healed without the phenomena involved in inflammation, however they may be developed.

The obvious fact is, therefore, here assumed, that the stomach, like other organs, is susceptible of certain specific impressions, that are dependent on the peculiar endowments of some of the nerves distributed upon it. Whenever, therefore, any substance or cause capable of inducing these impressions, is brought to act upon it, the legitimate effects, *nausea* and *vomiting*, must necessarily ensue.

This endowment of the nerves of the stomach is not in any respect more singular than those which characterize the gustatory, auditory, optic, and olfactory nerves, as well as the nerves of touch.

It is in vain to inquire after the *essence* of this peculiar property of the nerves. Like that of *electricity*, *magnetism*, and all the *physical elements*, it may ever remain among the unfathomable mysteries of nature, which are now, perhaps, known alone to Deity, but may serve as future objects of investiga-

tion and pleasing contemplation, to the inhabitants of more exalted spheres. We must now be satisfied with a knowledge of their existence, an acquaintance with their effects, and the various purposes of their institution.

Emesis must, hence, be regarded, not only as a physiological function, but as involving one of the most important general indications of cure.

It is evident, however, that this, like any other healthy function of the system, may, under certain circumstances, assume all the characteristics of a pathological action, instead of a physiological. But the mere *susceptibility* of a function to become deranged, is no argument that it is essentially a pathological one.

Modus Operandi.—Different views have been entertained as to what part of the act of vomiting is dependent exclusively upon the stomach. Chirac, Magendie, and others, have alleged that they have ascertained, by numerous experiments, that the stomach is quiescent in the act of vomiting, and that being suddenly compressed between the diaphragm and abdominal muscles, its contents are thus ejected.

Magendie supposed, moreover, that the brain was the chief organ concerned in the process, and that the whole matter depended upon the direct agency of this organ over the abdominal muscles.

Haygarth, on the other hand, formerly supposed, that vomiting was effected, solely, by the contractions of the fibers of the stomach.

Physiologists, however, are now pretty generally satisfied, that all the organs above named are concerned in the act of vomiting. These all being supplied with the same nerves (*par vagum*, etc.), may act in concert with the same facility that either of them may act alone.

Emesis is thus dependent upon a specific irritation of the gastric nerves, either direct, as in the case of certain ingesta, or it is transmitted by a reflex action from the sensorium commune, as in cases of vomiting from remote irritations, such as the irritation of the fauces mechanically produced, when the impression may be transmitted through the

naso-palatine branch of the fifth pair; or the irritation produced by the passage of calculi through the ureters or biliary ducts, in which cases, the impression may be conveyed by the connections of the pneumogastric nerve. In the same way the vomiting attending utero-gestation, or irritations in the intestines, may be transmitted through the spinal nerves, and thus reach the sensorium. It is supposed, that in cases dependent on cephalic irritation, the communication is made to the diaphragm and abdominal muscles, partly through the vagus nerve, and partly through the splanchnic and sympathetic nerves, while the spinal cord and spinal nerves are simultaneously employed in conducting the impression so as to produce the mechanical actions of the process. The vomiting produced by sea-sickness, or other motions of the body, as well as that arising from disgusting smells, or sights, or even the thought of some offensive object, is evidence in favor of these views.

Application.—During the last two centuries, emetics did not occupy a very prominent place in the materia medica. They were regarded rather as having merely an incidental application, as in cases of noxious accumulations in the stomach. It is not a little strange that their many well marked, remote influences, and constitutional effects, should have eluded the observations of the profession for so long a time. But it seems that Hippocrates, and many other ancient physicians, held emetics in high esteem. This renowned father of physic, recommended them to be used even in time of health, with a view to prevent disease.

Emetics evidently exert a very extensive influence over all the secretions and excretions of the body. They also tend, manifestly, to equalize the circulation, chiefly in virtue of the nausea attending their operation. The nervous system is also sanatively influenced by the operation of emetics. Again, we find that advantage is often derived from their mere mechanical effects: visceral obstructions are thus frequently removed, especially those of the liver and lungs.

The influence of emetics on neighboring viscera is well known. The appearance of bile among the ejecta is no un-

common circumstance; this bile, however, may, in some instances, have been thrown into the stomach by a retroversive action of the duodenum from other causes. But it is evident that emetics when pushed, will extend their mechanical influence even much lower than the stomach. It is improper, therefore, to push an emetic with the view of ridding the stomach of bile, seeing that its source is beyond this organ, and that the bile will not cease coming until the vomiting is discontinued.

From the extensive influence that this class of remedies exerts on the animal economy, it may be readily conceived that their remedial application is diversified and important. Indeed, in a great number of cases, emetics are indispensable, while, in many more, than is generally supposed, they are found among the most prominent means of cure.

Whenever a powerful constitutional impression is intended to be made, emetics are certainly the most available: hence, they are so commonly prescribed by Medical Reformers in violent attacks of disease, and in obstinate chronic affections.—When all other remedies fail to effect the object, emetics are resorted to with confidence. They are usually accompanied with a vapor bath or two, and thus constitute the popular "*Course of Medicine*," which, without doubt, admits of successful application, more generally, than any other simple conjunctive process of medication now known to the profession.

It is a matter of the greatest consequence, that the physician should know the relative importance of his remedies: and here it is, that some practitioners are so much more successful than others who use the same medicines. If, for instance, emetics should be regarded as admitting of incidental application only, and should, therefore, never be used except in cases of improper ingesta, etc., then it can not be presumed that the same success will follow, that attends the proper and thorough use of these potent agents.

In fevers and visceral inflammations, emetics seem to evince their different therapeutic effects in the most striking manner. By their use, the stomach is not only cleansed from the morbific matters, so commonly collected in this organ, in febrile

diseases, but the nausea common to their operation, diminishes arterial excitement in a remarkable manner, while the free perspiration which usually ensues, not only relieves the sanguiferous system from irritating and combustible matter, but moderates the temperature of the system by the phenomenon of evaporation.

In intermittents, vomits, with many judicious practitioners, are a very common remedy. They often put a stop to the disease without the employment of any other medicine, especially when exhibited at the commencement of a paroxysm. Independently of their constitutional impression, which, alone, is of no small advantage in breaking up the chain of morbid associations, they certainly make the stomach much more susceptible to the impression of other remedies, and thus, of course, give them a vast deal better chance of displaying their remedial influences.

Professor Eberle speaks very favorably of emetics in typhus fever; and to their utility in this affection, the author is very ready to offer his own evidence. They seem to do the work up with a promptness characteristic only of emetics. Their power to break up in this disease, the tendency of the fluids to putrefaction, is much dependent on their activity in promoting all the several excretions of the body.

"In typhus pneumonia," says the same writer, "I have derived much advantage from emetics. They appeared to be particularly serviceable where much distress and pain in the thorax, with signs of internal congestion, were present. In such cases they promoted expectoration, and tended to re-establish the equilibrium of the circulation. They appeared, moreover, to render the system more susceptible of the operation of stimulants."

Professor Potter, who has fully realized the superiority of emetics, as a means of equalizing the circulation, over the old plan of bleeding, etc., remarks: "In typhoid and typhus pneumonia, that occasioned such lamentable mortality of late years, throughout the United States, emetics, judiciously employed, were more beneficial than any other remedy. It was, indeed, a novel spectacle to those who were accustomed to

unsheath the lancet in almost every thoracic affection, to behold a pneumonic fever, perhaps a hœmoptoe, removed by the incantation of a single emetic."

Eberle speaks favorably of emetics in the exanthemata, especially in the early stage of scarlatina, both in its simple and malignant forms. He indorses the sentiments of Armstrong, who states that, when aided by the warm bath, they tend to "free the system from the pressure of the plethora of the internal blood-vessels; so frequently observed in the commencement of this disease, and by thus equalizing the whole circulation, to render the future case most commonly mild and manageable." *

In erysipelas, especially the bilious type (Desault Renauldin), in which there is a yellow fur on the tongue, nausea, and a bitter taste in the mouth, emetics are of great advantage.

In the first stages of measles and small-pox, attended with strong internal congestions, the operation of an emetic often proves decidedly beneficial. (Eberle.) "They are particularly useful in cases where, from great internal venous congestions, the appearance of the rash is retarded. In cases of this kind, that is, where the temperature of the skin is moderate, the pulse weak, and the animal functions depressed, about the period when the eruption of the exanthema may be expected, the operation of an emetic will often speedily develop the arterial excitement, and bring the measly rash." (Ib. Therap. p. 32).

In the new practice, this class of remedies has been much more extensively tested in the exanthemata; and their reputation, especially that of lobelia, has been fully established. In rubeola and scarlatina, they are best accompanied with the vapor bath, when they will be almost certain to bring out the eruption.

In no cases do we find emetics more useful than in pectoral affections. In asthma, especially, they seem to be peculiarly calculated to afford the most prompt relief. The lobelia emetic is, however, much the best in this variety of disease.

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* Armstrong, on scarlet fever, page 35.

The constriction in the chest, with the attendant dispnœa, will yield to no other known article of medicine so promptly. In those cases, the medicine should be given in nauseating doses first, and afterward in quantities sufficient to provoke emesis, when relief will generally be experienced.

Anginose affections are alike under the control of emetics; Cynanche trachæalis, and C. laryngea, which have carried off so many children, find their cure in the proper use of our emetics. Prof. Eberle, who has not even had much experience with our best articles of this class, remarks as follows: "In the treatment of croup, emetics are of unquestionable advantage. They are, indeed, altogether indispensable in managing this formidable malady, and will often procure effectual relief without any other remedy. In slight attacks, vomits, assisted by the warm pediluvium, and the application of rubefacients to the throat, often suffice to put a speedy termination to the disease."

Vomits are also of great avail in spasmodic complaints. Spasms are incompatible with the nausea and relaxation caused by emetics. Hence, the most distressing convulsions are at at once relieved by their administration.

Emetics promote absorption in a remarkable manner. The principle on which this effect takes place, is explained elsewhere.* This class of remedies is, hence, quite available in dropsies. The author, from his own experience, feels confident in adding his testimony in favor of emetics, in these complaints, having cured some of the most difficult cases, with their occasional use, often after other prominent remedies had failed to afford relief.

For some time after an emetic is given, the stomach usually remains undisturbed. But, in ten to fifteen or twenty minutes, an uneasy sensation, with nausea supervenes, which continues increasing until vomiting takes place. Then, an interval of ease is commonly experienced, for a longer or a shorter time, generally for ten or fifteen minutes, when the nausea again sets in, and the vomiting ensues. On taking an ordinary emetic,

* See article on Cathartics.

there are usually about three turns at vomiting. While the nausea only is present, the countenance is pale, the system relaxed, the pulse feeble, quick, and irregular, and there is a sensation of coldness; but during the act of vomiting, the face becomes flushed, the pulse is quickened, but still irregular, and the patient feels warm and often perspires freely. During the intervals at vomiting, and after it is over, the patient feels languid and inclined to sleep; but a reaction soon comes on, when he will feel revived, his pulse is full, his mind free, and his spirits refreshed; but what is the most remarkable, if the emetic has been a proper or harmless one, the patient will generally feel a pressing sensation of hunger, very soon after he has done vomiting, and will relish a hearty meal. It is best to give him some porridge or soup, in suitable quantities.

There is much difference among individuals, with regard to the facility with which they are made to vomit. This difference also obtains with the same individual, at different times. Certain morbid conditions also affect the susceptibility of persons to the impression of emetics. In most nervous affections, as mania, melancholiæ, hypochondriasis, and in cases of narcotic poisoning, it is difficult to excite emesis. On the other hand, in cases of fever, the patient is, usually, easily vomited.

Persons are more easily vomited, as they become accustomed to the use of emetics. In this respect, this class of medical agents differs much from every other kind, as we find that the susceptibility of persons to the impression of medicines, commonly diminishes, as their application is continued.

As the susceptibility of persons to the impression of these agents differs so much, it is difficult to regulate the quantity of the dose. It is best, therefore, to divide emetics into under doses, to from two to three portions, giving one of these every ten or fifteen minutes, until the desired effect is produced.

To promote the operation of an emetic, it is common to take freely of any suitable liquids, as tepid water, medical teas, etc. Astringent and stimulant infusions, are rather the most prompt to excite vomiting. Sometimes vomiting is retarded by an acid condition of the stomach, when an alkali will be found

serviceable. Half a drachm of soda or sub. carb. of potash, dissolved in half a pint of warm water, will be found to obviate the acidity, and to excite emesis.

When there is a high fever or much congestion present, emetics should never be given in full doses at the onset, but should be either premised by some sudorifics or relaxants, or the emetic should first be given in very small but frequently repeated doses, so as to prepare the system for the operation. If this precaution is not observed the mechanical force attending the operation may produce unpleasant effects.

Order I.—SPECIFIC EMETICS.

Every observing practitioner has discovered a marked variety in the operation of the different articles of the class of remedies called *emetics*. Some produce their emetic effect specifically; that is, they occasion emesis without being necessarily taken into the stomach. They depend, in producing this operation, upon their absorption into the circulation, and then acting through the nervous system, first upon the brain, and then, by a reflex action, upon the stomach and its associate organs, producing emesis. It is known, that lobelia and ipecacuanha will operate as an emetic, when injected into the bowels, or veins; and the oleo-resinous extract of the former, or even the watery infusion, or the alcoholic tincture of either of these articles, when freely applied to the epigastrium, or the surface generally, will excite vomiting.

There are other medical substances that will excite emesis when taken into the stomach, but will have no such effect when taken into the system in any other way. These have been denominated *topical* emetics and constitute a separate order.

Specific emetics possess a very extensive influence over the general system, and it is this order that is always employed when remote effects are designed to be produced. Their operation is attended with much nausea and sickness, as well as relaxation of the general system. Hence, their adaptation to the treatment of febrile and inflammatory affections. But

since what is said of the application of *emetics* in the foregoing article is chiefly applicable to this order, it is unnecessary to enlarge upon the subject here.

LOBELIA INFLATA.—The Seeds, Leaves and Capsules.

SYNONYMES.—Lobelia, *L.*, *E.*, *U. S.*; Lobelia Enflee, *Fr.*; Emetic Herb, Indian Tobacco, Bladder-podded Lobelia, Eye-bright, etc., *Vul.*

HISTORY.—The genus *Lobelia* was dedicated to Lobel, an early botanist; it contains many species,—according to Rafinesque, fifteen are found in the United States. Excepting the lobelia inflata, none of the species, however, have, as yet, gained much character, other than as ornamental plants.—Schoepf was the first writer that noticed the officinal lobelia, but he had only a vague idea of its virtues, as he considered it an astringent. This notion is, perhaps, chiefly owing to the fact that it was very early used by the natives in ophthalmia. It is said that the Indians, also, used the plant in their preparations for their great ceremonies and councils.

It is certain, however, that not only the honor of its introduction into the materia medica, but its present popularity, very justly belongs to the memory of Dr. Thomson, who brought the plant into notice through the severest persecutions, and even *prosecutions* both *civil* and *criminal*.* This remarkable man seems to have discovered its virtues by accident, as early as 1790, and to have commenced using it extensively in practice in 1805.

In reference to the history of lobelia, Dr. W. P. C. Barton, in his Medical Botany, makes the following remarks: "The first notice I can find in print, of the medical virtues of Indian tobacco, is simply a brief remark by Schoepf, that the 'root is astringent, and used in ophthalmia.' He seems to have had

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* For an account of his prosecution, for the alleged murder of Ezra Lovett, jr., the reader is referred to Thomson's Narrative, and Barton's Medical Botany, second edition, vol. i, p. 188, where a full report of the trial will be found.

little knowledge on the subject, and from the manner in which the plant is mentioned by him, it may reasonably be suspected that a vague rumor only of its medical properties had reached him. The next accounts we hear of it, as a medicine, are by the Rev. Dr. Cutler [who gained his knowledge of it from Dr. Thomson] and the late Professor Barton. The latter does not speak from experience, but remarks, that it has been found useful in leucorrhœa; and that it will probably be found diuretic. He is altogether silent respecting its emetic power, though he seems to have suspected that this was the species of lobelia, called in New England emetic weed [the name by which Dr. Thomson called it]. Since the accounts of these gentlemen were published, the lobelia has gained admittance into our dispensatories, and Dr. Thatcher has given a long and satisfactory [?] history of its virtues."

The medical histories of this plant, especially so far as they relate to the physiological effects, given by writers of the old school, are, in the main, very erroneous. It was, from the first, classed among the deadly acro-narcotic poisons. This was, perhaps, principally owing to a prejudice the profession held against those concerned in the innovation upon the old practice.

LOBELIA INFLATA.

BOTANY.—*Sex. Syst.* Pentandria Monogynia—*Nat. Ord.* Lobeliaceæ.

Gen. Char. *Calyx*, five-lobed. *Corolla* five-parted, cleft on the upper side, nearly to the base. *Anthers* united. *Stigma* bi-lobed, barbed at the point. *Ovary* inferior, or semi-superior, and (in all the species much alike) somewhat free.

Spec. Char. *Root* fibrous, white. *Stem* erect, six to thirty

inches high, somewhat angular, branched, pubescent or hairy, purplish below, green above. *Leaves* scattered, sessile, lance-ovate, acute, serrate, pubescent. *Flowers* numerous, disposed in terminal leafy racemes, supported on short axillary foot-stalks. *Calyx* tubular or campanulate, five-cleft, with linear pointed segments. *Corolla* of a delicate blue color, has a labiate or irregularly lobed border; upper two lobes smaller and more pointed, lower three equally divided. The upper side of the tube of the corolla is cleft nearly to the base, exposing the stamens. *Stamens* closely surrounding the pistil. *Anthers* united and enclosing the stigma. *Capsule* two-celled, striated, inflated, crowned with the persistent calyx. *Seeds* numerous, very small, of a brown color, and of an oblong or ovate shape.

The Lobelia Inflata is a biennial plant, growing in neglected fields, or road-sides, throughout the U. S. Its flowering time is from July to September. The time for collecting it is about the first of September, when the leaves begin to fade or turn yellow, as much of the seed is then matured, and will make its collection more profitable, than when collected for the seed or herb alone.

Description and Preservation.—The herb prepared by the Shakers, is put up in oblong packages, closely pressed; it is generally of a good quality, being clean, and clear from the stalks and larger branches; and by them it is also collected in good season.

In this country, lobelia is collected in large quantities, by farmers, and other persons, who make a business of collecting medical plants. They usually cut it during the first of November, and placing it upon sheets, dry it, and after threshing it on a tight floor, they shake out the seed, which is further cleaned from the dust and the leaves, by sifting in a current of air. This seed, when quite clean, is sold to the manufacturing houses, or physicians, at from fifty cents to a dollar per pound. In some sections several barrels of seed are collected by a single individual, in a good season. After the seed is obtained, the herb is further threshed, with a view of separting the pods and leaves, which are preserved together, under the appellation of *lobelia herb*. When this is purchased, that

should be selected which is the most fresh, and green in its color. When the herb is more than one year of age, its virtues may be more or less impaired. The herb, in its crude state, is sold by its collectors, for from twelve to twenty-five cents per pound. The entire plant is medicinal in any stage of its growth.

The seed of lobelia when pulverized, has a dark brown appearance, and an oily consistence. Its taste is exceedingly acrid and nauseous; the smell is not unpleasant. That of the herb is slightly irritating, but not offensive. The latter, when chewed, will, like the seed, produce a peculiarly acrid and lasting impression upon the mouth and fauces.

ANALYSIS.—Lobelia contains 1, a *volatile oil;* 2, a *fixed oil;* 3, *lobelina;* 4, an *acid;* 5, *gum;* 6, *resin;* 7, *chlorophylle;* 8, *lignin;* 9, *salts of lime* and *potassa;* 10, *oxide of iron.*

1. VOLATILE OIL.—This is contained in but very small quantities, and is not easily collected. When distilled with water, however, the plant will yield traces of such an oil, possessing its peculiar odor, but not its acrid taste or medical properties.

2. FIXED OIL.—This may be obtained by bruising the seed between heated rollers, and pressing while hot, in a strong linen cloth, between proper iron plates. This oil is of a consistence nearly like that of linseed oil, and possesses the drying qualities common to the fixed oils. Its specific gravity is 940. It possesses all the medical properties and constitutes about twenty per cent. of the seed.

Another method of obtaining it is by taking advantage of its solubility in ether and alcohol. The best product is obtained by the use of the ether, but as this article is much more expensive, the alcohol is commonly employed in its stead. In either case the process is the same; the pulverized seed is digested in the ether or alcohol to saturation, when the solution is to be decanted, filtered, and evaporated at a low temperature. A thick brown oil is thus produced, containing also much of the resin, extractive, and coloring matter of the seed, but is sufficiently pure for medical use.

3. LOBELINA.—This substance may be obtained in the following way: Take of lobelia seed, lb. j; alcohol, O viij; acetic acid, O j, bruise the seed in a mortar, and add the liquors, digest in the sun heat, for five or seven days, and strain. Evaporate this tincture, to two pints, and filter; then evaporate to an extract, using the water bath when the liquor thickens, so as to prevent burning it. The extract is then to be triturated with magnesia and water, and after repeated agitation for sev-

eral hours, is strained through calico, and then filtered. This liquor which holds the lobelina in solution, is then shaken repeatedly with fresh portions of sulphuric ether, until the water, settling below, is deprived of its acrimony. The etherial solution must now be drawn off, with a syphon, or carefully decanted, and then left to evaporate spontaneously. This process furnishes an impure article of lobelina, having a reddish-brown color, and a consistence like that of honey. It may be obtained more pure, by treating this article with a sufficient quantity of water and acetic acid, mixed in the same proportion as the alcohol and acetic acid, first used, and boiling this with animal charcoal, saturating with magnesia, filtering, agitating repeatedly, with fresh portions of ether, till the aqueous portion is deprived of acrimony, then decanting carefully, or drawing off with a syphon as before, and allowing the ether to evaporate again, spontaneously.

Lobelina, thus prepared, is a yellowish liquid, lighter than water, rather of an aromatic odor, and of an extremely acrid and durable taste. It is very soluble, in ether or alcohol, but less so in water. Ether will remove it, from its aqueous solution, and upon evaporation, the lobelina may be again produced. It has, decidedly, an alkaline reaction, and will form soluble and crystallizable salts with the mineral acids, and a soluble, but not crystallizable salt, with acetic, and perhaps, citric acid. With tannic acid, it forms an insoluble compound, which is constantly precipitated from its solution. A boiling heat will entirely decompose it, unless combined with an acid.

Lobelina possesses the active medical properties of the plant, in a highly concentrated form, and if sufficiently diluted with water, may be used as an emetic. From three to ten drops will generally operate. With good vinegar, or citric acid and honey, the lobelina will form an oxymel of lobelina that is very available in bronchitis and cynanche trachealis.

4. Resin.—On evaporating gently, the tincture of lobelia, prepared with proof-spirits, a resinous principle may be collected from the surface of the liquid: this has an exceedingly acrid taste, and contains most of the active properties of the plant. By conducting the process of evaporation far enough, an *oleo-resinous* extract may be prepared, which is exceedingly valuable, as a therapeutic agent. This, however, will be treated of in another place.

5. Acid.—An acid, supposed to be peculiar, and called *lobelic acid*, by Pereira, may be obtained by washing the precipitate resulting from the addition of sulphate of copper to a concentrated decoction of lobelia until it ceases to effect litmus, and then suspending it in water, and precipitating the copper by a current of hydrosulphuric acid. Now, by filtration and

evaporation, the acid is obtained, in an impure state. By treating this acid with ether, and then evaporating, it may be procured in a yellowish semi-crystalline mass.

This acid reddens litmus, and, on the addition of sesquichloride of iron, becomes of a dark olive-brown, and, in a short time, a precipitate will be formed (Lobeliate of Iron? *Pereira*). A solution of isinglass produces no obvious change in the decoction, showing the absence of tannic acid. Sulphate of copper produces a green precipitate (Lobeliate of Copper, *Pereira*). Acetate of lead occasions a precipitate (Lobeliate? of Plumbium).

Physiological Effects.—When first taken, lobelia produces a very acrid and peculiar impression upon the mouth and fauces, which is quite durable. If the dose be sufficient, this will be followed, in from one to fifteen minutes, with nausea and vomiting, and general relaxation of the system. It was contended by the early followers of Dr. Thompson (who had the honor of introducing the lobelia into medical use), that on persons in perfect health, lobelia will not produce either nausea or vomiting; but this was certainly a mistaken notion. Lobelia also promotes the secretions and excretions, especially those of the lungs, parotids, skin, and mucous membranes, generally. Under certain circumstances, it produces a laxative effect upon the bowels; but it can not be said to be cathartic. One of of its most prominent physiological effects is that of a stimulant, which is very diffusible. It also produces quite an impression upon the nervous system, which is sometimes characterized by a very singular pricking sensation. Its effects upon the nervous system differ in different individuals: on some, it produces a species of intoxication and delirium; but it has never been observed to be followed with any permanently bad effects. Its effects upon the nervous system somewhat resemble those of tobacco, especially in the relaxation produced: there is, however, not a corresponding dilatation of the pupils, nor any disposition to coma. It must be remembered, too, that much of the mental excitement that the lobelia produces, is occasioned purely by its stimulating power. The disposition to sleep that sometimes attends its effects, is, moreover, often the result of the extreme relaxation and fatigue produced by its nauseating and emetic virtues; and there is,

usually, a correspondence between the extent of the nausea and distress it occasions, with the inclination to sleep that follows.

It has been asserted that lobelia is an acro-narcotic poison. This originated with Dr. Thatcher, who, in his Dispensatory, states: "The melancholy consequences resulting from the use of lobelia inflata, as lately administered by the adventurous hand of a noted empyric (Thompson), have justly excited considerable interest, and furnished alarming examples of its deleterious properties and fatal effects. The dose in which he is said usually to prescribe it, and frequently with impunity, is a common teaspoonful of the powdered seeds or leaves, and often repeated. If the medicine does not puke or evacuate powerfully, it frequently destroys the patient; and, sometimes, in five or six hours." Wood, in the United States Dispensatory, states, that it produces "extreme prostration, great anxiety and distress, and, ultimately, death, preceded by convulsions." These statements have been copied from one book into another, until, at the present time, almost every work on therapeutics, medical botany, or even the medical journals, have either quoted the same language, or indorsed the same sentiments, without making the least effort to ascertain their correctness. These statements are not a little amusing to the experienced medical reformer, who has used the medicine thousands of times, without any bad results whatever, and hundreds of times, without any emetic or evacuating effect at all, except, perhaps, a copious diaphoresis. Cases are recorded, in which several pints of the strong tincture have been given in the course of a single day, and that, with decided benefit. Lobelia has now become a common nauseant in the treatment of continued fever, and thus, sixty to eighty grains are often taken, without occasioning emesis, once in forty-eight hours.

It is nevertheless, true, that lobelia sometimes occasions a great deal of distress and excitement in the system, for a short time. But, this is not owing to any poisonous effect of the medicine, but, rather to the idiosyncrasy or peculiar nervous susceptibility of the patient, as well as various obstructions in the circulation of the blood and nervous fluid. This is evident,

from the fact that, sometimes, most of the force of the medicine is directed to a single organ or apparatus. Thus, it sometimes happens, that its specific effect does not take place at all; and, that a remarkable excitement of the brain, uterus, intestines, or even the genital organs, will follow. Sometimes the most intolerable priapism is produced, which may last for fifteen or twenty minutes, when the patient may either vomit or gradually get over its effects.

The singular effect that lobelia sometimes produces on the mind, is dependent upon two causes; 1st, a congestion to the brain, depending upon local obstruction in the sanguiferous circulation; and, 2d, upon a determination of nervous stimuli to the cerebrum. When it arises from nervous excitement, it may be relieved by the use of diluted vinegar, or citric acid, taken freely. On the other hand, the cold dousch to the head is most available, when it arises from sanguineous congestion.

Distress is, also, sometimes occasioned in other parts of the body, by the taking of lobelia. This, also, arises from obstructions in those parts; and any means calculated to detract the circulation from those parts, will give relief. Thus, proper traction, or manipulation, will sometimes afford great relief.

The wonderful relaxing power of lobelia is, also, occasionally so displayed, as to alarm persons not acquainted with the operation of the medicine. This effect of the lobelia is referable to its influence upon the nervous system, and is, consequently much dependent upon the idiosyncrasy of the subject. The phenomenon consists in a modification of the tonic power of the system, and may be obviated by the use of active stimulants, and astringents conjoined.

Those effects here referred to, are all transient, and never permanently mischievous.

Therapeutic Properties.—Lobelia is decidedly the most certain and efficient emetic known, and is at the same time safe in it use. Unlike most emetics from the mineral kingdom, it produces its specific effect without corroding the stomach, or producing morbid irritation and inflammation of the mucous membrane of this organ, which are so common to the use of antimony, zinc, and the sulphate of copper.

Lobelia may, emphatically, be said to "operate in unison with the laws of life."

In addition to its emetic properties, lobelia possesses many others, which will be noticed under their respective heads.—But there are some that seem to be simultaneous, and very closely allied with its specific emetic effect, that may merit attention here, although the same may be noticed elsewhere.—It may be proper to remark, *first*, that in cases of high febrile excitement and violent congestions, common emetics are justly considered objectionable. Lobelia, however, which is one of the most nauseating emetics we possess, is even eminently adapted to those cases. The nausea it occasions obviates the congestion and fever, by equalizing the circulation and provoking diaphoresis. Hence, the medicine is usually given in under doses, until these effects are produced, when more is given to excite emesis. This course is remarkably successful, and is, generally, pursued in the synochal grade of fever, and in violent inflammatory affections. No one need apprehend any mischief in the application of lobelia in this way, as the system will always be found relaxed, and the arterial excitement modified, before the violent mechanical movements take place. Therefore, as an emetic in fevers, lobelia should always be preferred.

This singular combination of medical properties, not only eminently adapts this article to the treatment of febrile and inflammatory affections, but we find that in many other varieties of disease, it is equally available. In spasmodic disease, no remedy is more effectual. Spasmodic movement is incompatible with nervous relaxation. Hence, the lobelia emetic is usually invoked in all cases of violent spasms, or cramps.—Epilepsy, hysteria, and other convulsions, and even apoplexy, are all relieved with remarkable promptness, by the exhibition of lobelia in proper doses to excite emesis, after sufficient nausea is provoked.

Hæmorrhages, of every kind, are, also, stopped by instituting emesis with lobelia. This doctrine may seem like heterodoxy to some of our old-school friends, but it is in good keeping with many facts that have been forced upon them by their

own observation, and which they have been compelled to admit, although inexplicable to them, and absolutely in opposition to some of their most cherished and prominent principles. For instance: Ipecacuanha is, by them, acknowledged one of the best remedies, even in *active hæmorrhages*. Professor Chapman, of Philadelphia, says, on this head: "Ipecacuanha is an exceedingly important article in hæmorrhage. Many physicians, of respectability, bear testimony to its good effects in hæmoptysis, though it is in uterine hæmorrhage that it displays its best powers. In these cases, I really think it is quite equal to the saccharum saturni, and, sometimes, superior to that useful article."*

In dyspepsia, lobelia emetics are, also, quite available, and should never be neglected, especially when other, and more mild articles, do not give satisfaction.

As an emetic, lobelia admits of a more general application than any other article of this class. But it is unnecessary here to enlarge on this subject; and the reader is referred to the general application of emetics, for a notice of the indications they are capable of fulfilling.

Lobelia, when administered as an emetic, is generally given in divided doses. A portion, that may be considered sufficient to produce the effect desired, is prepared for taking, and then divided into, say three parts, and given at intervals of from ten to fifteen minutes, until emesis takes place. In the mean time, the operation is promoted by the free use of astringent, stimulating, or alkaline drinks, according to the circumstances. The latter are, generally, necessary, where there is much free acid in the stomach.

Pharmaceutic Prep.—It is proper to remark here, that the virtues of lobelia are impaired by heat, unless united with an acid. In all its preparations, therefore, this fact should be remembered. The plant, itself, contains an acid, but it is not sufficient to prevent the decomposition of the lobelina at the temperature of 212°, F. Acetic, citric, or some other free vegetable acid, will answer to be combined with the lobelia, for

* Chapman's Therapeutics, vol. i, p. 181.

the purpose here expressed. Care should also be taken, not to expose lobelia, even to a moderate heat, in combination with a salifiable base, as potash, soda, etc., as the specific virtues of the medicine are most easily eliminated when thus combined. This circumstance readily explains the important facts, so often observed in the exhibition of lobelia as an emetic, that the acids tend to restrain its effects on the nervous system, while the alkalies promote its emetic power.

INFUSUM LOBELIÆ: *Infusion of Lobelia.*—℞. Lobelia (the entire plant, if fresh), pods and leaves, in coarse powder, ℥j.—Warm water, O j. Infuse for an hour, and strain.

Action: use.—This is the mildest preparation of lobelia that can be made, and is, therefore, preferred as an emetic for children and delicate females. This is, also, the most eligible form of preparation, when the medicine is used by enema. *Dose*, f℥j—f℥iij., repeated, if necessary.

PULVIS LOBELIÆ: *Lobelia Powder.*—The seed, or herb, is simply pulverized and exhibited in substance. The powder, prepared from the seed, is termed *brown lobelia*: and that made from the herb, or pods and leaves, is called *green lobelia*. The pulverized lobelia should be kept in close vessels, excluded from the light, and should never be compounded with any other substance, except when it is immediately used. Some articles, as above discovered, will impair it, and others may, perhaps, be contra-indicated in some cases in which the medicine may be used. The dose of the powdered seed, for an emetic, is from gr. x to gr. xxx; that of the herb is about twice the quantity; but much more is often given; still, however, it is not certain that more than this would be ever required, if properly administered. The usual way of taking it, is in warm water, or in some astringent, or stimulating infusion.

TINCTURA LOBELIÆ: *Tincture of Lobelia.*—℞. Lobelia seed, bruised, ℥iv, or of the herb, in coarse powder, ℥vj. Dilute alcohol O ij. Digest for seven days, and strain.

Dose.—As an emetic for a child, f℥j—f℥j; that, for an adult, f℥j—f℥iij.

TINCTURA LOBELIÆ ACIDUM: *Acid Tincture of Lobelia.*—℞. Lobelia, green, herb, bruised, any quantity. Good vinegar, q. s. to cover the herb. Digest in a glass jar for ten days, and strain. This preparation is sometimes called *vinegar of lobelia.*

Action: use.—An excellent emetic in asthmatic affections, whooping-cough, and pectoral diseases generally. *Dose*, same as that of the alcoholic tincture.

OLEUM LOBELIÆ: *Oil of Lobelia.*—℞. Lobelia seed, pulverized, ℥xvi; alcohol O iij; acetic acid ℥j; mix, and digest in the heat of the sun, or other warm place, in a glass jar for six days, decant and filter through muslin. Place the tincture in a retort and gently distil until three-fourths of the spirit or liquid has passed over; take the remainder from the retort and evaporate in a shallow glass vessel, in a warm and airy place, where it may be free from dust. Where there is no object in saving the alcohol, the saturated tincture of the seed of lobelia, with acetic acid, may be evaporated over a sand bath. The evaporation is to be conducted until the liquid acquires the consistence of honey. An oleo-resinous product is thus obtained, commonly called *oil of lobelia*, which is possessed of the medical properties of the seed. To succeed well in this process, the seed must be thoroughly ripened, or it will yield but little oil. When fully ripe, or of a dark brown color, it will yield four ounces of the oil to the pound of seed.

℞. Lobelia seed, pulverized ℥x; sulphuric ether ℥xxx. Digest in a close glass vessel, in a warm place for six days, pour off, and press out the etherial tincture; put it into a flat glass or Liverpool-ware vessel and evaporate spontaneously in a place free from dust.

This method produces a much better product than that above, but is somewhat more expensive.

Action: use.—This is the most convenient form in which lobelia can be exhibited, for any medical use. The dose, as an emetic is v to x drops.

OXYMEL LOBELIÆ: *Oxymel of Lobelia.*—℞. Vinegar of lobelia Oij; clarified honey, lb. iij. Mix them, and evaporate by means of a water bath, to the proper consistence.

Application.—Oxymel of lobelia is an excellent preparation in anginose affections generally, as well as pectoral diseases.—It is much preferable to the spiritous tincture in inflammatory attacks, such as cynanche trachæalis, humoral asthma, bronchitis, and the sequelæ of scarlatina and rubeola. The *dose* is gr. x to ʒj, or more.

SYRUPUS LOBELIÆ: *Syrup of Lobelia.*—℞. Lobelia herb, in coarse powder, ℥viij; Havana, or moist sugar, lb. vj; water, a little below the boiling point, Oiij. Macerate the lobelia in

the water in the sun, or other warm place, for twelve hours, strain and press the dregs. Add the sugar to the liquid, and dissolve it. This may be improved in flavor by adding one ounce of the oil of anise.

Application.—This is the best preparation of lobelia for spasmodic pectoral diseases among children, as pertussis, chronic dyspnœa, etc. It, also, constitutes an excellent medicine for adults, in all affections in which expectorants are required.—As an emetic for infants and small children, the dose is from half a tea-spoonful to two tea-spoonfuls, in warm water, or tea.

IPECACUANHA.—The Root.

Synonymes.—Cephælis Ipecacuanha, *L.*, *E.*, *D.*; Ipecacuanha, *U. S.*: Ipecacuanha, *Fr.*, Breckwursel, Ipecacuanha, *Ger.*; Ipecacuanha, *Ital.*, *Span.*; Ipecac, *Vul.*

History.—Ipecacuanha is first mentioned by Michael Tristram (*Purchas, Pilgrimes, Vol.* IV, *fol.* 1311), who calls it *Ighpecaya* or *Pigaya*. In 1684 it was described and figured by Piso.—(*Hist. Nat. Brazil*, 101). In 1686 it was celebrated in Paris as a remedy for dysentery. It appears that Jean-Adrian Helvetius (then a young man), attended with Afforty, a member of the faculty, a merchant, named Grenier or Garnier, who, when he recovered from his illness, gave to his physician, as a testimony of his gratitude, some of this root as a valuable remedy for dysentery. Afforty attached very little importance to it, but gave it to his pupil, Helvetius, who tried it, and thought he had found in it a specific against dysentery. Numerous placards were placed about the streets of Paris, announcing to the public, the virtues of the new medicine, which Helvetius sold, without discovering its nature. Luckily for him, some of the gentlemen of the court, and even the dauphin, the son of the king (Louis XIV), were at this time afflicted with the dysentery. Being informed, by his minister, Colbert, of the secret possessed by Helvetius, the king deputed his physician, Aquin, and his confessor, Le P. de Chaise, to arrange with Helvetius, for the publication of the remedy. One thousand louis d'or was the price which was paid, after some trials had been made with it at the Hôtel Dieu, and which

were crowned with the most brilliant success. Garnier now put in his claim for a part of the reward; saying, that he, properly speaking, was the discoverer of the medicine; but, the claim was not allowed. Subsequently, Helvetius obtained the first medical honors of France. He wrote a treatise describing the use of Ipecacuanha in diarrhœa and dysentery.—(K. Springel, Hist. de la Med., tom. v., p. 468.)

Great confusion existed, for a long time, respecting the plant yielding the Ipecacuanha. The name of the medicine, which was derived from the aborigines of Brazil, seems to have been applied to various emetic roots of South American origin. It is now evident, however, that most of the drug brought to this market, is produced by the cephaëlis ipecacuanha.

Botany. *Sex. Syst.*—Pentandria Monogynia.—*Nat. Ord.* Rubiaceæ, Cinchonaceæ. *Lind.*

Gen. Char. Tube of the *calyx* obovate; limb very short, five-toothed. *Corolla* somewhat funnel shaped; its lobes five, small, rather obtuse. *Anthers* inclosed. *Stigma* bifid, usually exserted. *Berry* obovate-oblong, crowned with the remains of the calyx, two-celled, two-seeded. *De Cand.*

Spec. Char. *Stem* ascending, at length erect, somewhat pubescent at the apex. *Leaves* oblong-ovate, rough above, finely pubescent beneath. *Stipules* cleft into setaceous segments. *Heads* terminal, erect, at length pendulous. *Bracts* four, somewhat cordate.—*De Cand.*

Cephaelis Ipecacuanha.

Root perennial, annulated, simple, or dividing into a few diverging branches, flexuous, from four to six inches long; when fresh, plain brown externally. *Stem* somewhat shrubby, two or three feet long, emitting runners. *Leaves* rarely more than four or six, placed at the end of the stem and branches; *Petioles* pubescent, which are connected to each by the erect stipules. *Stipules* membranous at their base. *Peduncles*, solitary, erect when in flower, reflexed when in fruit. *Head* semiglobose, eight or ten flowered. *Involucre*, one-

leafed, spreading, deeply four to six-parted, segments obovate. *Bracts* acute pubescent; a single one to each flower. *Calyx* minute. *Corolla* white. *Stamens* five. *Ovary* obovate; *style* filiform, white; *segments* linear, spreading. *Berry* soft, fleshy, violet-black; *seeds* (nuculus), pale, plane-convex; *albumen* horny. (Condensed by Pereira from Martius, *Spec. Mat. Med. Brazil*, p. 5; 1824). Grows in Brazil, in shady or moist situations, from 8° to 20° South latitude, in the province of Rio Janeiro, Espirito Santo, Bahia, and Pernambuco.

Description.—There are several varieties of ipecacuanha found in the market, which, perhaps, are best noticed separately, but, all the varieties found in the drug-stores of this country agree in most particulars, both as regards their description and medical properties. The principal varieties are: 1, the *Brown;* 2, the *Red*, and 3, the *Grey*. Dr. Pereira thinks that the age of the root, the nature of the soil, and the mode of drying are, perhaps, the cause of the difference in the root, and that the same species produces the whole.

α. Brown Ipecacuanha.—This is the best kind, and the greater part of the ipecacuanha brought to this country, consists of this variety. It is a round, annulated root, about the thickness of a crow's quill. Its epidermis is more or less deeply brown, sometimes even blackish; its fracture is grey, or brownish, and its powder grey. The cortical portion has a horny appearance. It has an aromatic taste, and a very peculiar nauseous odor, which, in some persons, excites violent sneezing, and in others dispnœa resembling an attack of asthma.

β. Red Ipecacuanha.—This variety differs from the preceding, by the lighter and reddish color of its epidermis, by its less powerful odor, and its want of aromatic taste. Sometimes it has, when broken, the same horny and semi-transparent quality of the brown ipecacuanha; but, more frequently, it is opaque, dull, and farinaceous; in which case it is generally less active.

γ. Gray Ipecacuanha.—The color of this variety is greyish-white. It occurs in pieces of larger diameter than those of either the red or brown varieties, and has also fewer, more regular, and less prominent rings. The size of the root is also somewhat larger.

Analysis.—The following table exhibits the results of the

analyses of Pelletier and Bucholtz, whose results have generally been considered the most important.

PELLETIER'S ANALYSIS.			BUCHOLTZ'S ANALYSIS.	
Bark of Brown Ip.		*Bark of Red do.*	Emetic extractive [emetina].	4.13
			Soft resin,	2.43
			Wax,	0.75
Emetina,	16	14	Gum,	25.17
Odorous fatty matter,	2	2	Starch,	9.00
Wax,	6		Woody fibre,	10.80
Gum,	10	16	Bitter extractive,	10.12
Starch,	42	18	Sugar,	2.00
Ligneous matter,	20	48	Extractive, gum, and starch, extracted by potash,	34.80
Loss,	4	2	Loss,	0.80
Ipecacuanha, cort,	100	100	Ipecacuanha,	100.00

Of the above constituents of ipecacuanha, none are of much value, in a medical point of view, excepting the emetina, which contains the active properties of the ipecac. This, however, has not, as yet, been admitted into our materia medica; as it has been regarded too violent in its effects. It has not, however, yet been proven that it possesses intrinsically poisonous properties: the mischief being always traceable to the circumstances of its use, and not to the essence of the medicine. It contains no properties that are more violent than those of lobelina. These alkaloids, i. e. lobelina and emetina, contain the active properties of several ounces of the seed or root of the articles from which they are prepared, in as many scruples of the former.

Now, it is known, that the volume that the emetic substances possess, has much to do in modifying their operation. Hence, unless the alkaloids are suspended, in an equal bulk, by their solution in some liquid, as water, or some infusion, they may not be expected to operate with the same mildness. Moreover, those alkaloids are generally given in over doses, and then, when the smallness of the bulk prevents the medicine from operating, these excessive doses are retained, and prove mischievous; whereas, if the bulk had been large, they would not have been retained. Hence, it is, that excessive doses, of bulky

substances, are not so likely to do mischief, as those of a small compass.

Emetina may be prepared in the following way: Digest powdered ipecacuanha, with ether, at 60° to dissolve the fatty matter, whence it derives its disagreeable odor, and which possesses no emetic virtue. When the powder yields nothing more to ether, it is treated with alcohol, and the latter, when filtered, is evaporated in a water bath, and the residue, dissolved in water. It thus loses some of its wax, and a little of the fatty matter which eluded the ether. The gallic acid of its extractive, is now to be removed by triturating the watery solution, with magnesia. After subsiding, the water, containing the emetina, in solution, is to be filtered, and then evaporated. This produces, what is called *impure emetina*, which is in transparent scales, of a brownish-red color, almost inodorous, of a bitterish, acrid taste, deliquescent, very soluble in water and alcohol, insoluble in ether, and is precipitated from its solutions by gallic acid, and the acetates of lead.

Pure emetina may be prepared by substituting calcined magnesia for the carbonate of this article, used in the process above described, in such quantity that the acid existing in the liquid, may be neutralized, and that which is associated with the emetina, be separated from it. The salt being decomposed, and the organic alkali being insoluble, is precipitated with the excess of the magnesia. This precipitate is now to be washed with cold water, and digested in alcohol, which dissolves the emetina; then, on evaporation of the alcohol, the residue is to be re-dissolved in a dilute acid, boiled with animal charcoal, and then, after filtration, the emetina must be precipitated by a salifiable base.

Thus obtained, emetina has a white, and frequently a somewhat yellowish appearance. It does not deliquesce in the air, like the former. Its taste is feebly bitter, and somewhat nauseous. Its incompatibles are gallic acid, or the vegetables containing it. These arrest its effects.

"Magendie recommends the administration of the colored emetina—as the pure is much too dear—in every case where it is desirable to excite vomiting, and especially where ipe-

cacuanha is indicated. It has not, however, been much used, except by Magendie himself. Lerminiér, who prescribed it, says that one or two grains of colored emetina are equal, in strength, to from ten to twenty of ipecacuanha; but that he observed no difference in their operation, and Dr. Domeiér appears to have arrived at the same results. The obvious advantages it possesses, are, the convenient form under which it may be administered, and the circumstance, that several spurious sorts of ipecacuanha are frequently passed off in commerce, and occasion, in consequence, a considerable disappointment in the mind of the practitioner. The employment of the active principle, of course, precludes these inconveniences."—*Dunglison.*

Physiological Effects.—The dust of ipecacuanha, applied to the delicate parts of the skin, or to the eyes, produces great irritation, and when inhaled into the lungs, it causes irritation of the respiratory passages, and in some, great dispnœa.

On the mucous membranes, its effects are different. "How singular it is," says M. Hall, "that ipecacuanha taken into the bronchia should excite asthma, and taken into the stomach should induce another effect," i. e., vomiting and expectoration, and consequent relief to asthmatic habits. In the full dose, ipecacuanha acts as a pretty certain emetic, but is very mild and harmless as such. Dr. Pereira (*Ther., Vol. II ,p.* 452) says, "its operation as an emetic is exceedingly safe, since inflammation is not produced by it, even when an overdose has been swallowed."

Therapeutic Properties.—Ipecacuanha ranks next to lobelia as an emetic; it is, perhaps, equally mild and much less nauseating; and is, hence, much better adapted to delicate females, children, and even nervous males, on whom that article would be likely to induce unnecessary nervous excitement. It is, however, much less thorough in its effects, than the lobelia, and should, hence, not be so much depended on in violent cases of disease.

Without going into details, it must suffice to remark, that ipecacuanha is generally applicable in all cases in which

emetics are indicated, but especially in diseases affecting the mucous membranes, such as dysentery; indeed, it has been considered a specific for this affection, by very many respectable gentlemen of the profession. Its power in dysentery, as noticed in its history, was the incident that first gained for it, popular favor.

Ipecacuanha is also, an excellent remedy in narcotic poisoning, if taken before the poison escapes from the stomach.

United with lobelia, it forms an excellent compound to be used as a common emetic. It modifies the constitutional effect of that article, which is sometimes a desideratum, when it is desired only to evacuate the stomach.

Ipecacuanha, like lobelia, is also useful in pectoral and bronchial affections. In those cases, it may be used in doses large enough to excite emesis, or just sufficient to produce nausea.

The usual dose of ipecacuanha, in powder, as an emetic, is grs. xv., but much less will sometimes do.

INCOMPATIBLES.—Gallic and Tannic acids, or any of the barks, or other vegetable substances that contain tannic acid, will modify its effects on the constitution, although by their use, the mechanical phenomena of vomiting, are generally promoted. These acids form a partially insoluble compound, (*tannate or gallate of emetina*) with the active principles of the medicine.

PHARMACEUTIC PREPARATIONS.—Besides the powdered root, there are only two preparations of much importance; these are the *Vinum Ipecacuanhæ*, and *Syrupus Ipecacuanhæ*.

VINUM IPECACUANHÆ: *Wine of Ipecacuanha.*—℞. Ipecacuanha, bruised, ℥ ij.; Wine, O ij. Macerate for fourteen days and strain. *Dose*, as an emetic, for a child, from f℥j, to f℥j, according to the age.

SYRUPUS IPECACUANHÆ, E.; *Syrup of Ipecacuanha.*—℞. *Ipecacuanha*, in coarse powder, ℥iv.; *Rectified Spirit*, Oj.; *Proof Spirit* and *Aq. dist.* aa f℥xiv.; *Syrup*, Ovij. Digest the *Ipecacuanha* in *Rect. Sp.* f℥xv., at a gentle heat for twenty-four hours; strain, squeeze the residue, and filter. Repeat this process with the residue and proof spirit, and again with the water. Unite the fluids and distil off the spirit, till the residuum amount to f℥xij. Add to the residuum *Rect. Sp.* f℥v.,

and then the Syrup. "Dr. Christison says this process is unnecessarily complex, and that a syrup made from the alcoholic extract, as directed in the Parisian codex, is probably as good." *Dose*, as an emetic for infants, f℥ss.—f℥j. As an expectorant, f℥j—f℥ij.

EUPHORBIA IPECACUANHA.—The Root.

Synonyms.—Euphorbia Protulacoides; Brechenmachende Wolfsmilch, *Ger.;* American Ipecacuanha, Ipecacuanha Spurge, Wild Ipecac, *Vul.*

History.—The Euphorbia Ipecacuanha, is spoken of as being emetic, by Schœpf, Puihn, Dr. B. S. Barton, and others; but it seems not to have attracted much notice until Dr. W. P. C. Barton announced it as an emetic, "equal in importance, if not, on some accounts, superior to the common ipecacuanha of the shops." It has since found a place in the secondary list of the U. S. Pharmacopœia, and in treatises on materia medica, and medical botany generally.

Botany.—*Sex. Syst.* Dodecandria Trigynia, *Linn.* Monœcia, Monadelphia. *Michoux.*—*Nat. Ord.* Euphorbaceæ.

Gen. Char. *Involucrum* caliciform, eight to ten-toothed, exterior alternate dentures glanduloid, or petioloid. *Stamens* indefinite, twelve or more, rarely less; *filaments* articulated. *Receptacle* squamose. *Female flower* solitary, stipitate, naked. *Capsule* three-grained. *Nuttall.*

Spec. Char. This is a very singular species, being extremely amorphous. The shape and color of its leaves, and, indeed, its entire aspect changes so that some varieties might readily be taken for distinct species. The *root* is perennial, of a yellowish color, irregular, and very large, penetrating, sometimes, to the depth of even six or seven feet into the sand, and its thickest part measuring from three-fourths of an inch to an inch and a half in diameter. The stems are numerous, dichotomous, and of a reddish yellow, or pale green color. The *stipules* are cordate and small. The *leaves* are opposite, sessile, and, generally, oval, but varying from this even to a linear shape; they are always entire on their margins, but sometimes, when obovate, are emarginated, or notched at the apex. While the plant is in bloom, in May, the leaves are small; but when mature, they are, often, three inches in

length, and one or more in breadth. The flowers are small, and situated on solitary, one-flowered, axillary peduncles. The seeds, three in number, are enclosed in a triangular-like capsule. The plant is found in the Middle States, growing in sandy soil.

ANALYSIS.—Among the constituents of the dried root of this plant, we find *mucilage*, *sugar*, *starch*, *caoutchouc*, *resin*, an *essential oil*, *tannin*, and a *peculiar principle*, similar to emetina, which is soluble in alcohol, but is insoluble in water. The plant yields its virtues to alcohol, sparingly to water, but, perhaps, as freely to dilute as to pure alcohol.

PHYSIOLOGICAL EFFECTS.—Taken in doses of from ten to fifteen grains, the root will occasion emesis, and in a few hours, catharsis, attended with diaphoresis. In excessive doses, it is said to act violently, producing excessive vomiting, with alarming prostration and hypercatharsis.

THERAPEUTIC PROPERTIES.—The author has not had much experience with this article, and can not, therefore, judge from his own observation, what its therapeutic merits are. Dr. W. P. C. Barton, however, speaks in the highest terms of its medical virtues. In his Medical Botany, he introduces his account of them in the following language: "It is not without great satisfaction that I now present the medical profession with a figure and history of an indigenous plant, which, promises to yield a medicine equal in importance, if not on some accounts superior, to the common ipecacuanha of the shops. That the Euphorbia Ipecacuanha is possessed of virtues entitling it to supersede the use of the imported ipecacuanha, my own extensive experience with it, corroborated by the numerous trials of the medicine by Prof. Hewson, my brother, Dr. John Rhea Barton, of the Pennsylvania Hospital, and others, all embolden me to declare. * * * I last year determined to give a fair and extensive trial to the medical virtues of this species of spurge. A portion of the root was finely pulverized, and administered with caution to various patients. I at first commenced with small doses of three, four, and five grains. In this quantity the powder nauseated, and produced a determination to the skin, as small doses of

ipecacuanha do. On increasing the number of grains to ten, vomiting was produced, with occasionally an operation on the bowels. Fifteen grains I found sufficient to produce full vomiting in most cases." But, he adds, that in one instance, the powder given to the extent of twenty-five grains, he had reason to be alarmed at the violent cathartic effect which ensued, and continued for fourteen hours, attended by distressing sickness at the stomach.

This author further states, that he used the article in various combinations, in the place of the imported ipecacuanha, and confidently asserts, that in all the instances, it has been equal, if not superior, to that article. "It has, indeed, some advantages which the imported article does not possess. It is not unpleasant, either in taste or smell." He closes his remarks as follows: "Upon the whole, the attention of physicians may be confidently called to our native ipecacuanha, as possessed of virtues equal, and in some respects superior, to the imported ipecacuanha. Its occasional cathartic effect is no more than what follows the use of the foreign medicine, on some occasions. This view of the subject derives peculiar importance, from the well known fact, that the ipecacuanha of the shops, at least in this country, is rarely good; perhaps, seldom genuine."

Pharmaceutic Preparations.—There are no preparations of this article, that have, as yet, become officinal. The extract, prepared by evaporating the tincture, made by digesting sixteen ounces of the coarsely powdered root, in a gallon of alcohol, contains all the active properties of the medicine. Of this, five grains is a proper dose, as an emetic; and, three, as a diaphoretic and nauseant expectorant.

This extract, no doubt, will prove serviceable, as a remedy in intermittents, especially those obstinate varieties common in northern Indiana, and some portions of Illinois.

EUPHORBIA COROLLATA.—The Root.

Synonyms.—Blum Wolfsmilch, *Ger.;* Tithymale Fleuri, *Fr.;* Blooming Spurge, Milkweed, etc., *Vul.*

History.—The *euphorbia corollata* has received attention by

some of the members of the profession, particularly by Barton, Bigelow, and Zollickoffer. It has generally been regarded as an equivalent, or, at least, a substitute for the imported ipecacuanha, as well as for jalapa. It has not, however, gained much reputation, except with individuals; the profession, generally, not having given it much investigation. It has gained admission into our Dispensatories, and works on medical botany generally.

Botany.—*Sex. Syst.* Dodecandria Trigynia., *Linn.;* Monœcia Monadelphia, *Michoux.—Nat. Ord.* Euphorbaceæ.

Gen. Char. Same as Euphorbia Ipecacuanha.

Spec. Char. *Root* perennial, irregular, of a yellowish color, branched, from a half inch to an inch in diameter, and sometimes several feet in length. *Stems* several, erect, round, generally simple, from two to five feet in hight. *Leaves* sessile, alternate or irregular, flat or revolute at the margin, smooth in some varieties, and hairy in others; they are entire, oblong-cuneate, obtuse. *Flowers* umbeliferous, with a five-leafed involucrum, and five trifid and dichotomous rays, at each fork of which are two large bractes; *calyx* large, rotate, white, with five segments, resembling a corolla, and hence the name of this species.

The entire plant abounds in a milky juice, and yields it freely when wounded. It is found in various parts of the United States, particularly on the Atlantic coasts, and other sandy places and barrens; seldom growing in fertile, shady or moist places. Its flowering time is in July and August.

Analysis.—Among the most important organic constituents of this plant are, *a peculiar principle* (*euphorbin*)—by some called *emeta—mucilage*, *sugar*, *starch*, *caoutchouc*, *resin*, an *essential oil*, *gum* and *tannin*.

Physiological Effects.—In large portions, the root of the euphorbia corollata is capable of producing unpleasant, if not mischievous effects; as excessive vomiting, and hypocatharsis generally result from over doses. The milky juice is acrid, producing vesication, when applied to the skin. It has been used successfully to remove warts, and to cure herpes.

Therapeutic Properties.—The root of the euphorbia cor-

ollata is a pretty active emetic, and is likewise cathartic and antiscorbutic. But, as its action on the system is so harsh, it has generally been regarded as unsafe, and has consequently not been introduced into general practice, among our botanic practitioners. It is still more violent in its operations than the E. ipecacuanha; and while we have enough safe and efficient articles, it is hardly necessary to extend the list of this order of emetics. Nevertheless, it has been argued that the article now under consideration, is specifically adapted to the successful treatment of different varieties of disease, as jaundice, hepatitis, etc. The dose of the powder is from gr. x. to gr. xx.

PHARMACEUTIC PREPARATIONS.—Like the foregoing article, this has not yet furnished many pharmaceutic preparations. A wine is sometimes prepared from the bark of the root in the same way in which the officinal *vinum ipecacuanha* is made.

An extract is also prepared by evaporating a solution, made by digesting the root, coarsely powdered, in equal parts of alcohol and water. The dose of this is from gr. iij. to gr. v.

GILLENIA.—The Root.

SYNONYMS.—Gillenia Occidentale, *Fr.*; Gillenwurzel, *Ger.*; Spirea Trifoliata; Indian Physic, Meadow-sweet, etc., *Eng.*

BOTANY.—*Sex. Syst.*—Icosandria Pentagynia. *Nat. Ord.*—Rosaceæ.

Gen. Char. *Calyx* campanulate, five-cleft. *Corolla* five-petaled. *Petals* lanceolate. *Styles* five. *Stigmas* capitate. *Carpels* five, two-seeded.

Spec. Char. G. STIPULACEA.—*Root* perennial, dark brown, amorphous, with large and long fleshy fibers. *Stems* several, from two to three feet high, slender, smooth, brittle, red or brownish, branched at the top. *Leaves* lower ones pinnatifid, upper trifoliate or ternate, deeply serrate or toothed. *Stipules* linear, entire, foleaceous, jagged. *Flowers* terminal and loosely corymbose. Grows only in the Western States, on hilly grounds, and rarely in limestone land.

There is one more species—the G. TRIFOLIATA—growing on the Alleghany Mountains, and in that meridian, but not west

of those mountains. This species is possessed of the same properties as the G. Stipulacea, but is inferior to it in power.

MEDICAL PROPERTIES AND USE.—This article is pronounced by some, one of the most certain, and yet mild emetics that we possess. It is also cathartic. But as we have many cathartics that will not so readily prove nauseant in over doses, this article is more properly placed among the emetics. Raffinesque, who was a very accurate observer, has much to say in favor of this article as an emetic. It is employed in the treatment of fevers and in dyspepsia. *Dose*, as an emetic, gr. x. to gr. xxx., of the powdered root. But the medicine is most commonly given in form of decoction. Water and alcohol extract its virtues.

EUPATORIUM PERFOLIATUM.

The description and history of this valuable medical agent will be found under the head of nauseating diaphoretics. This species of the eupatorium, being prominently diaphoretic, emetic and laxative, is entitled to a notice in each of these classes. In the former edition of this work its position among the emetics was in the topical order, but it is now thought proper to place it here; for although it is inferior to either of the foregoing articles of this order, in point of power and promptitude of action, yet it is persistent, and when used in full doses, is also pretty certain in its effects as a specific emetic. It is most applicable in autumnal fevers, and bilious diseases. The form of its employment is that of extract, or decoction. The dose of the extract is five to ten grains, given in emulsion, or two to three fluid ounces of the decoction. The active principle—eupatorin—is not sufficiently certain in its emetic power to be relied on.

Eupatorium is much more certain and effectual when combined with lobelia. Five grains of the latter article, added to a dose of the decoction of this, will insure a happy effect.

TARTARIZED ANTIMONY.

(Tartar Emetic) is the most common emetic now employed in the old profession. This article is very certain

and prompt in its effects, producing free and copious vomiting, attended with much nausea. A convenience in its use, very much appreciated, is the smallness of the dose required, this being only from one to three grains. Antimonial wine, made by dissolving ℈j. of the tartar emetic in f℥x. of sherry wine, is the form in which this article is commonly employed in delicate cases, as among children, and females.

But Antimony sometimes is quite severe, and even dangerous in its effects. The mischiefs resulting from its use are not even confined to over doses, but small quantities, as portions much less than one grain have proved fatal. Still, however, antimony is more employed in the regular old school practice than any other emetic. In the Reformed and Eclectic practice it is not used.

Order II.---TOPICAL EMETICS.

The larger proportion of emetics prove *such* only when taken into the stomach, and do not, therefore, possess a specific emetic power. They seem to be, in their essence, obnoxious to the stomach, and provoke an irritation sufficient to give rise to emesis. This is the principle on which most of the articles used by the allopaths operate; and it is questionable whether this order should at all be admitted into our materia medica. It is nevertheless true, that none of the articles here admitted, can reasonably be said to be poisonous, unless, indeed, it be the *sinapis*, which, when mixed with water, as stated elsewhere, will produce a substance that will, if sufficiently concentrated, or taken in large enough doses, act mischievously. But this is a product of the substance rather than an educt.

Topical emetics cause but comparatively little nausea or sickness, and produce but slight effects in the general system, other than that occasioned through their operation on the stomach. They have their application, in cases in which an evacuation of the contents of the stomach alone is necessary, as in cases of excessive ingestion, or the taking of poisonous substances, or such as are difficult of digestion. In these cases, topical emetics seem better adapted than the specific, as

they are much more prompt in their operation, and produce much less nausea and sickness.

This order, however, is comparatively very little used among practitioners of the new school; those articles of the first order, being generally preferred, as they are supposed to act more in accordance with the physiological laws.

SINAPIS.—The Seeds.

SYNONYMS.—Ναπυ *Gr.;* Senfsamen, *Ger.;* Moutarde, *Fr.;* Senapa, *Ital.;* Mostaza, *Span.;* Mustard, *Vul.*

HISTORY.—Mustard was known at a very early period of history. Hippocrates used it under the name of *ναπυ*, and the Romans, under *sinipi.*—Although a native of Europe, it is cultivated in almost every country.

SINAPIS ALBA.

BOTANY.—*Sex. Syst.* Tetradynamia Siliquosa.—*Nat. Ord.* Brasicaceæ, or Cruciferæ.

Gen. Char. *Calyx* spreading. *Corolla* with straight claws.—*Glands* between the shorter stamens and pistil, and between the longer stamens and calyx.

Spec. Char. There are three species of the mustard genus that yield the mustard of commerce, the *S. nigra*, *S. alba*, and *S. arvensis.* The *silique* of the first is glabrous, four-angled, pressed to the stem; *leaves* at the top lance-linear

entire, smooth; the *seed* is blackish, and smaller than that of the alba.

The *S. Alba*, or white mustard, has bristly *siliques*, which are shorter than their two-edged beaks. The *leaves* are pinnatifid; upper ones sub-lyrate, all irregularly toothed; *seeds* largest of all the species, of a yellowish white, but sometimes they become a little dark.

The *S. arvensis*, like the first, has glabrous *siliques*, which are many-winged, tortose, beaks sword-like; *valves* three-nerved. The *stem* and *leaves* are more or less hairy.

DESCRIPTION. *α.* SINAPIS ALBA: *White Mustard.*—This consists of globular seeds, which are about half a line in diameter, of a yellowish white color, and an acrid fragrant taste, resembling that of the horse radish.

β. SINAPIS NIGRUM: *Black Mustard.*—This is a smaller seed than that just spoken of. Its exterior is of a reddish brown or black color, and sometimes beautifully veined. The black mustard is not so acrid to the taste as the white.

γ. The S. ARVENSIS, usually called *Wild Mustard*, produces a seed that is sometimes substituted for the black variety, but it is not very common in this country. It is, perhaps, somewhat inferior to the latter.

The ground mustard is prepared from either kinds of mustard, but most commonly from the black, or from a mixture of this and the white. It consists of the powder of the seeds ground between rollers, and divested of their fixed oil by pressure, and of their hulls by sifting. It is stated that flour is often added to improve its color; and then, to compensate for the loss of strength, ginger or capsicum is added. Ground mustard, when mixed with water, is much more acrid than the seed; which circumstance arises from a chemical change produced by the action of the latter upon some of the constituents of the mustard, as shown elsewhere.

ANALYSIS.—Although both the white and black mustard have been minutely examined by several chemists, they still require further investigation. The black contains a *fixed oil*, *gummy matter*, *sugar*, *a coloring matter*, a *peculiar green matter*, a *fatty*, *pearly matter*; *myronic acid*, in combination with *potash*, or *Myronate of Potash* (the *Sulpho-Sinapisin* of Henry and Garot), *Myrosyne*, *Sinapisin*, and some salts. "The fixed oil of Mustard constitutes 28 per cent. It is mild in taste, with little odor, of a yellow color, Sp. Gr. 0·917, thicker than olive oil, does not readily become rancid, makes an excellent soap, is

sometimes used instead of rape oil, and has been employed as a purgative. (*Bussy.*) The *Sinapisin* of Simon is in white, brilliant, micaceous, and volatile crystals, soluble in alcohol, ether, and oils, insoluble in acids and alkalies. *Myrosyne* is a substance analogous to vegetable albumen, or the emulsin of bitter almonds. *Myronic acid*, composed of Carbon, Hydrogen, Oxygen, Nitrogen, and Sulphur, is bitter, without odor, uncrystallizable, and may be separated in an impure state by alcohol, when the fixed oil has already been removed by expression or by ether."—*R.*

"It is curious that we do not find, among the above products, the acrid principle for which Mustard is so remarkable. In fact, it is not contained in the seeds; the acrimony is due to what is called *Volatile Oil of Mustard*, which is the result of the action of some of the constituents of the seed, that is, of the Myrosyne and Sinapisin, on one another, when water is added under 200° F. Bussy is of opinion that the Myronic acid, on the contact of Myrosyne and water, yields the volatile oil of Mustard. When flour of Mustard is exposed to dry heat, or acted upon by alcohol, no acridity is observed; but if water be added first, the pure volatile oil is obtained, which may be separated by distillation. The mineral acids check the formation of this volatile oil, so does the Carbonate of Potash, and also the vegetable acids when they are of the Sp. Gr. of at least 1022."—*R.*

"White Mustard seeds yield about 36 per cent. of *fixed oil*, and when macerated in water, a thick, mucilaginous, almost insipid liquor, while Black Mustard seeds give little mucilage, but a pungent taste to the water. According to the analysis of John, these seeds contain: 1, An *acrid volatile oil.* 2, A *yellow fixed oil.* 3, *Brown resin.* 4, A very little *extractive.* 5, A little *gum.* 6, *Lignin.* 7, *Albumen.* 8, *Phosphoric acid*, and *salts.* Henry and Garot ascertained the presence of Sulphosinapisin,—a name which Berzelius has contracted into Sinapin. This is white and light, without odor, at first bitter in taste, but then like mustard; soluble in water, alcohol, and ether, and crystallizable. It consists of C 57·92, H 7·79, N 4·9, O 19·68, and of Sulphur 9·65. 'Acted on by acids, oxides, and

salts, readily yields Sulphocyanic acid, (*P*) which strikes a red color with the persalts, as, for instance, the Sesquichlor. Iron, and produces a white precipitate in a solution of Sulphate of Copper containing Iron. White Mustard does not furnish volatile oil; but, in certain circumstances similar to those with Black Mustard seed, a fixed acrid principle is produced, which, like the volatile oil of Black Mustard, did not previously exist."—*R.*

"The *fixed acrid principle* is an unctuous liquid of a reddish color, without odor, but having a biting acrid taste, analogous to that of Horse-radish root. It contains Sulphur. M. Faure states that this same principle is formed in small quantity when Black Mustard is treated with water. *Euricin*, which does not redden the salts of Iron, and contains no Sulphur, is another principle found by Simon."—*R.*

Physiological Effects.—In small doses, mustard is an acrid stimulant, holding an intermediate rank between horse-radish and pepper. In large doses, it proves actively emetic. Its topical action is that of a powerfully acrid agent, producing vessication. But this effect is only produced when combined with water. In moderate doses, it promotes the appetite, and assists digestion.

Therapeutic Properties and Use.—In doses of from ʒj. to ʒij., mustard powder acts very promptly as an emetic, and has, generally, been used for this purpose, when a topical emetic is indicated. It has been regarded of eminent service in dyspepsia, and in cases of narcotic poisoning, when other emetics are less available. It is also recommended by Dr. Pereira, in cases of malignant cholera, and some forms of paralysis.

The volatile oil prepared from the mustard, by the addition of water, although used by the German physicians, in colic and other violent diseases, is much too harsh and violent to be employed. Three drops have occasioned the most distressing symptoms and death.

Pharmaceutic Preparations.—Mustard has not yet furnished many pharmaceutic preparations. The most impor-

tant we have, is the *cataplasma sinapis;* and *mustard whey* is also sometimes used.

SANGUINARIA CANADENSIS.

The powdered root of this article, which is described under another head, in doses of from gr. xv. to gr. xxx., constitutes an active topical emetic, and is much used by some practitioners, but it is rather too severe to be used alone. Combined with lobelia or ipecacuanha, however, it will answer very well.

UVARIA TRILOBA.

This is the American Custard-apple, or Papaw; a small tree growing most commonly in rich bottoms, where the soil is deep, as on the larger rivers of the Western States. The fruit is luscious and very palatable to some.

The tree belongs to *Sex. Syst.* Polyandria Polygenia; *Nat. Ord.* Anonaceæ.

The oblong or kidney-shaped seeds, found in the fruit to the number of three to six or eight, are possessed of very active emetic properties. The dose required is very small, being only a few grains of the kernel. It may be given in substance or in the form of the alcoholic tincture.

The author will ever remember his first discovery of the emetic properties of papaw seed. Happening when very young, in company with other lads, to go in quest of this fruit, and finding only some remaining seeds, they were tasted, and perhaps eaten in small quantity. The result was protracted nausea and copious vomiting, which, for the time, excited no small alarm.

As a medicine, this article has not been much tested, but there is little doubt but that it will prove to be valuable, since with all the activity no poisonous or virulent properties are observed in its operation.

SODII CHLORIDUM.

Synonyms.—Muriate of Sodæ Sodæ Murias, *E. D.*—Chlorure de sodium, Hydrochlorate de soude, Sel narin, *Fr.;* Chlornatrium, Kochsalz, *Ger.;* Salt, *Dan., Swed.;* Chloruro di sodio, Sal commune, *Ital.;* Sal, *Span.;* Salt, *Vul.*

History.—Salt is abundantly diffused in nature, and being

so much used in the preparation and preservation of food, must have been known from the earliest ages. It is found in many animal solids and fluids, and in the juice of some vegetables. It exists in the earth, in the solid form, as rock salt, or in solution, in some springs, and every where in sea water.

This very common article needs no description here.

Properties.—Chloride of sodium, is a white crystaline substance, without odor, but of a peculiar taste, called *saline*. Its crystals usually form in cubes, but by hasty evaporation, they often assume a hollow, quadrangular pyramidical shape. When pure, salt undergoes no change in the air, but when contaminated with magnesia, as is often the case, it is deliquescent. It is soluble in a little less than three times its weight of cold or boiling water. Pure spirit dissolves it but sparingly, but when diluted with water, it dissolves it freely. When heated, salt decrepitates; at a red heat, it fuses, and sublimes without decomposition. Sulphuric and nitric acids decompose it, and give rise to fumes of muriatic acid. Its sp. grav. is 2·17, and its formula Na 40– | –Cl 60 = 100.

Physiological Effects.—The almost universal animal appetency for salt, would seem to indicate its adaptation to the purposes of the animal economy. Certain it is, that in the blood, and most of the glandular secretions, the saline property necessarily predominates.

Chloride of Soda, is, then, an example of the applicability, or occasional use of inorganic substances, to the animal economy, and should be noted by those who argue that inorganic substances are unnecessary to the animal body. Water and air might be named in the same connection for illustration.

Still, however, we know that the elements of nutrition in animals are mostly obtained from the organic world. The safest position that can be taken in the assumption of any proscriptive policy, in the selection of remedial agents, is to reject such agents only as are, by careful observation, proven to be possessed, intrinsically, of poisonous properties — let the sources whence we obtain our materials be what they may.

When taken in small portions, salt is a gentle stimulant, and promoter of digestion. It is a powerful antiseptic, as is

shown by the preservation of flesh in the hottest weather, when pickled in water saturated with it.

THERAPEUTIC PROPERTIES AND USE.—In small doses, salt is stimulant, tonic, and anthelmintic, and in larger ones, say ʒiv. to ʒj., it is cathartic, and when from ʒjss. to ʒij., dissolved in warm water, is given, it proves emetic.

By some, chloride of soda is regarded as the best topical emetic that we possess, operating with great promptness, although very mildly. As an emetic, it is said to be particularly adapted to cases of narcotic poisoning, but in this application the experience of the author does not enable him to decide on its merits.

PHARMACEUTIC PREPARATIONS.—Various useful preparations are made, into which this article enters as an important ingredient. Among the most important of these that are medical are, *Aqua Chlorinii*, *Enemata Salina*, and the *Solutio Salina Compositus*.

VERBENA HASTATA.

Verbena Hastata (described under the head of Bit. Tonics), when taken freely in strong decoction, is a good emetic, and has been highly esteemed, particularly by some of the early Thomsonians, in intermittents and remittents. The decoction is usually taken at short intervals, in portions of fʒj.—fʒij., until the patient shall have vomited some two or three times. The root is mostly used, but the tops or herb is also medicinal.

APOCYNUM.

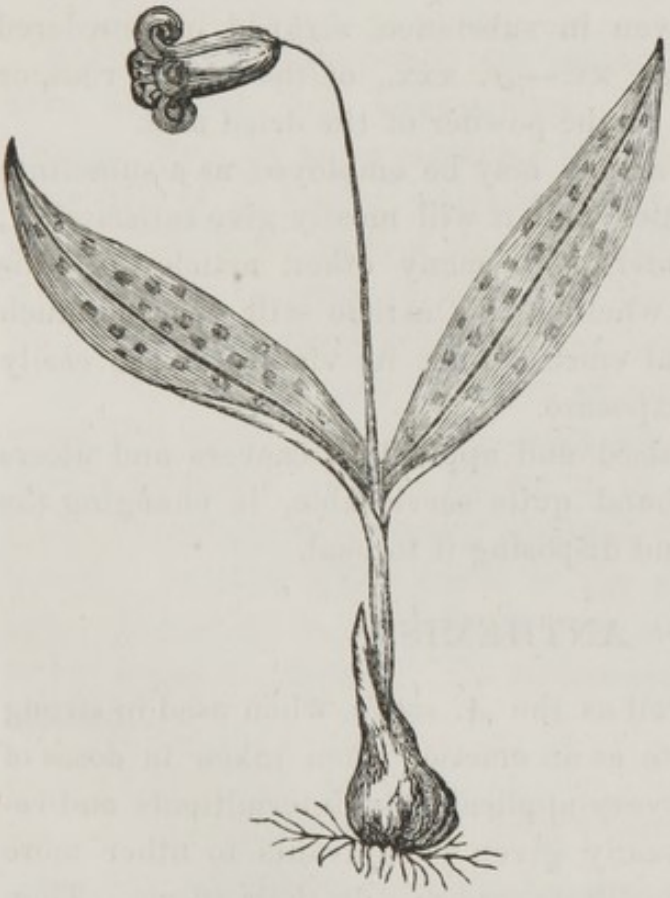
The *A. androsæmifolium*, and the *A. canabinum*, which are described elsewhere, are active emetics, and may be used in doses of gr. v.—gr. x., of the extract, or Oss. of the strong decoction. As an emetic, both these species of *apocynum* are very applicable in low fevers, when it is designed only to evacuate the stomach from putrid accumulation, and when the specific or relaxing emetics are less applicable. In intermittents, they have been used with complete success, having been

known to break up the disease entirely by one simple operation. The bark of the root is the officinal portion.

ERYTHRONIUM.—The Root and Stalk.

SYNONYMS.—Erythronium, *Lat.;* Dent-de-Chien Jaune, *Fr.;* Gelb Hunden Zohn, *Ger.;* Yellow Snake-leaf, *Eng.;* Adder-leaf; Dog-tooth Violet, etc., *Vul.*

BOTANY.—*Sex. Syst.* Hexandria Monogynia. *Nat. Ord.* Liliaceæ.



ERYTHRONUM AMERICANUM.

Gen. Char. *Calyx* none. *Corolla* inferior, six-petaled, the three inner petals with a callous prominence on each edge near the base.—*Bigelow.*

Spec. Char. ERYTHRONIUM AMERICANUM. *Root* a cormus or bulb, brownish externally, white within, solid. *Stem* a single naked flower stem, rising about six inches high, and surmounted with a single nodding, yellow flower. *Leaves* one or two arising near the ground, smooth, entire, lanceolate, mucronate, mottled with round purple or brown spots. *Flower* solitary, nodding, yellow, with petals reflected.

HISTORY.—A beautiful genus of plants, having several species, some of which are indigenous to Europe and Asia—several grow here in the United States, found in rich soil, on river courses and low lands generally, throughout the Middle and Western States. It found a place in the secondary list of the U. S. Pharmacopœia, and was described by Michaux, Pursh,

Smith, Nuttall, Elliot, Bigelow, Barton, Zollickoffer, Raffinesque, and others.

Analysis.—The author is not aware that a thorough analysis has yet been made of this plant, but Raffinesque says, that the whole plant, but particularly the root, contains fecula, mucilage, a resin, and a volatile acrid principle. The active properties are much impaired by age, or by boiling.

Medical Prop. and Use.—As an emetic, the erythronium may be employed, either in the fresh or the recently dried state. It must be given in substance, scraped or powdered finely. The dose is gr. xx.—gr. xxx., of the recent root, or about one-third more of the powder of the dried root.

As an emetic, this article may be employed as a substitute for other topical emetics, and it will mostly give satisfaction; yet it is certainly inferior to many other articles of this class. It is doubtful whether this article will ever be much employed as a general emetic, since its virtues are so easily impaired by age or exposure.

The fresh root, bruised and applied to cancers and ulcers generally, will be found quite serviceable, in changing the habit of the lesion, and disposing it to heal.

ANTHEMIS.

The *A. nobilis*, as well as the *A. cotula*, when used in strong decoction, will operate as an emetic, when taken in doses of Oss. They are both very applicable in intermittents and remittents, but are usually given as adjuvants to other more powerful articles, to facilitate and modify their effects. They tend to make the specific emetics more topical in their action.

GILLENIA TRIFOLIATA.

This is an indigenous, herbaceous plant, commonly known under the name of *Indian Physic*. It has a perennial *root*, with many long, slender fibers. *Stem* two or three feet high, one to six in number from the same root. *Leaves* subsessile, trifoliate, linear, lanceolate, serrate. *Flowers* white or pinkish, terminal. It belongs to *Sex, Syst.* Icosandria Pentandria.—*Nat. Ord.*

Roseaceæ. Grows on hilly places throughout the Middle States. Flowers in June and July. The root is emetic, cathartic and diaphoretic. It is a powerful agent, and in over doses produces severe emesis and hyper-catharsis. As an emetic, the dose is gr. xx. When combined with ipecacuanha, it will give good satisfaction. It is particularly useful in bilious affections, dyspepsia, dropsy and amenorrhea.

ROBINIA PSEUDO-ACACIA.

Description.—The locust tree belongs to Diadelphia Decandria, and *Nat. Ord.* Leguminosæ. It is cultivated in this country, both as an ornamental tree, and on account of the durability of its timber, which is mostly used for fencing purposes. The inner bark of the root and trunk is medicinal. It is considered, by some, to be one of the mildest emetics that we possess. Professor Eberle states that "an infusion, made of an ounce of the bark to a pint of water, may be taken in doses of a small wineglassful every ten minutes, until vomiting is produced. I have known it to be employed with as much advantage as is usually obtained from ipecacuanha. It is said to be particularly useful in the early stages of dysentery, when given in under doses, so as merely to excite nausea, or but slight vomiting."* Its virtues are yielded to water and alcohol.

MYRICA CERIFERA.

Bayberry (described in the order stim. astringents), in large doses, will excite vomiting with so much certainty as to entitle it to a place in this order. It should, however, rather be regarded as an adjunct, to be given either in combination with, or subsequently to, the exhibition of the more powerful emetics, as lobelia. In the form of the common diaphoretic powder or that of the astringent tonic compound, this article is most generally exhibited during the operation of other emetics. Its active astringent and stimulating power is well calculated to

* Therapeutics, p. 78.

sustain the functions of the stomach. The dose of the powdered bayberry, as an emetic, is from ʒij. to ʒiv., taken in warm water. Myricin, the active resinoid principle of the bayberry bark, is a reliable topical emetic agency. The dose is ten to fifteen grains or more. It may be given alone in warm water, or it may be combined with lobelia.

SULPHATE OF ZINC.—(White Vitriol.)

SULPHATE OF COPPER.—(Blue Vitriol.)

These two articles have formerly been much employed, and are still some in use as topical emetics in the regular old practice. But their less certain effect than those of antimony or ipecacuanha, has, in a large measure, tended to bring them into disuse. They are very harsh agents, and capable of doing much mischief, and it is very proper therefore that they should go out of use.

They are not employed as emetics by Reformers.

Class II.—CATHARTICS.

DEFINITION.—Cathartics, *Catharticus;* from *καθαιρω, to purge,* constitutes a class of agents which, in their action on the system, have a specific tendency to evacuate the contents of the intestines, downward; or which, when given in proper doses, will excite purging.

As the direction of the intestinal canal, from the stomach downward, is not, in every part, of a course that will favor the exit of its contents by the laws of gravitation, it is evident that a power separate from this must ever be exerted, when these move forward in their course. The manifestation of this force is called the *peristaltic motion,* from *περιζελλω, "to contract"*; which, in the mean, produces about one alvine evacuation per day. These agents, therefore, that have the power to increase the activity of this motion of the intestines, are called laxatives or cathartics.

ANTIQUITY.—Cathartics have been in use from the remotest periods of antiquity.* Thout, the Egyptian Hermes, or Mer-

* Strabo.

cury (*always regarded as the founder of medicine*), seems to have practiced their use. Purges, vomits, and clysters were used by the Egyptians, for three days successively in every month; and the Assyrians, Hebrews, Greeks, Romans, Persians, Chinese, Hindoos, and Arabians, all ranked purges among their prominent medicaments.

The antiquity and general popularity of a medicine, is, however, not always an evidence of its importance or general utility. Mercury, antimony, and arsenic, have now been popular remedies, for rising of two hundred years, and yet it is evident, that they have done infinitely more mischief than good.

Abuse.—There is, perhaps, no class of medical agents that has been the cause of more mischief than that of cathartics. This is chiefly owing to the *popularity*, which insures purgatives their indiscriminate and general use. Whenever a prescription is made for any case, not fully understood, it is almost certain that some cathartic or other will be given; and when the diagnosis is *clear*, and general evacuents are required, these agents are sure to be invoked. They are conveniently prescribed, and, commonly, easily taken; and, as their pernicious effects are not very apparent at first, and thus overlooked, they have become a fashionable medicine.

Cathartics are very indiscriminately used for habitual costiveness. When the bowels are confined, they are moved by a physic, and then suffered to remain, until they again become constipated, when they are moved as before. This practice is pursued until the tone of the bowels is so impaired, as scarcely to admit of cure. But, what is most *unfortunate*, these very cases, thus produced, are but too frequently attempted to be relieved by the use of still more *powerful purges*, until the patient dies, a victim to quackery. Unlike emetics, these agents produce their effects at the expense of the irritability of the organs on which they operate; hence, the frequent repetition of them, must, of necessity, prove mischievous. Torpor of the intestines is dependent upon a want of their irritability. Therefore, any agent tending to diminish this principle, or its

manifestations, must, in a corresponding degree, serve to promote constipation of the bowels.

Purgative medicines influence the general functions of the system very extensively. Almost any of the vital processes may be influenced, to some extent, by inducing an irritation in the gastro-enteric mucous membrane. Thus the vis conservatrix may often be diverted from very remote parts to the intestines. In numerous instances, therefore, we find that the use of purgative medicines, detract the determination of the available vital forces from the fulfillment of important indications of cure—perhaps, they may be diverted from the defense of parts much exposed to morbific influences, and they, in consequence, may suffer *irretrievable injury.*

Some very intelligent practitioners are often misled by the appearance of the *discharges* produced by their cathartics. Should these assume an unhealthy appearance, or become offensive, they take it as an indubitable evidence of the utility of the medicine, and thus continue it on, until some incidental change occurs, or, perhaps, until the patient betrays unmistakable evidences of approaching mischiefs. It is certain that the irritation produced by the long-continued use of even the most *mild cathartic* may occasion green and offensive stools, having all the appearance of being the consequence of a diseased condition of the intestines; and this is, indeed, the case, for the prolonged irritation set up by the continued physic, induces disease of the mucous coat of the bowels, perhaps of the *ileum* or *jejunum*, which is attended with inflammation. When mercury is taken in this way, the inflammation generally implicates the stomach, liver, and other adjacent organs, and this article is thus a fruitful source of incurable dyspepsia.

Modus Operandi.—Cathartics seem to involve different principles in their operation. Some articles appear to augment the peristaltic motion by a specific stimulant effect upon the muscular fibers of the intestines, thus, by occasioning their contraction, they move their contents, without materially changing the latter in consistence. Rhubarb is a good example of this kind. Others, it would seem, excite the motion of

the intestines by a mere mechanical agency over the nerves; and it would not be difficult to find many illustrations of this fact, in the history of various species of animals, especially that of the herbiverous quadrupeds. Prof. Paris (*Pharmacologia*), remarks on this subject, that he is disposed to consider the harsh and coarse texture which certain grasses assume in moist situations, a "as wise provision in nature to furnish an increased stimulus to the intestines of the animals who feed upon them, at a time when their diminished nutritive qualities must render such a result desirable." A more familiar example of the operation of a mechanical laxative is furnished in the use of *brown bread*, which produces its loosening effects merely by the friction its rough particles, or the scales of the bran occasion upon the inner coats of the intestines, as it is known that the flour without the bran will not have this effect.

Other articles, again, occasion catharsis by stimulating the exhalent vessels, terminating in the inner coat of the intestines, and by exciting the mouths of the excretory ducts of the mucous glands, by which an increased flow of serous fluids takes place from the former, and a more copious discharge of mucus from the latter; the effect of which will be an increased activity of the peristaltic motion, attended with more thin, or watery evacuations. The cathartics operating in this way are denominated *Hydragogues.*

Finally, we discover still another order of purgatives, which produce their effect upon the intestines by first stimulating some of the neighboring viscera, as the *liver* and *pancreas*, so as to excite a more copious flow of their secretions into the former; the consequence of which is an increased action of the peristaltic motion. Those thus operating upon the liver are called *Cholagogues* (from $\chi o\lambda\eta$, "bile," and $\alpha\gamma\omega$, "I expel.").

Physiology.—It has been contended that catharsis is not a *physiological* function, but is rather a *pathological* action. But it is not a little *strange* that the same individuals recognize every other evacuent process of the system, through any of the natural emunctories, as being fully in accordance with the physiological laws. Nay, more, almost *every degree of activity* of the other emunctories is admitted as being natural. Thus,

the action of the kidneys may be promoted to the production of even *twice* or *thrice* the usual quantity of urine. Diaphoresis may likewise be *pushed to almost any extent;* and all this is considered not only in accordance with the physiological laws, but that it may contribute to the accomplishment of very important ends in the recuperative economy, or in many therapeutic intentions.

But, in reference to the *peristaltic* motion, according to the notions of some *ultra* medical philosophers, the order of nature is reversed. This function, they think, can not with safety be *promoted.* When obstructed, it must either *remain* so, or the difficulty must be obviated in some other more *indirect* way. Dr. Blackburn remarks, that Dr. Withering's fear of purging was so great that he suffered one of his patients to remain costive *eight days,** A number of instances of the same kind have occurred under the author's own observation.

Various cases might here be related, in which enemas, warm baths, anti-spasmodics, emetics, and other different means had failed to afford relief, when one or two little pills of beef's gall (*a cathartic*), afterward accomplished the object in twenty or thirty minutes after they were taken. It is not to be understood, however, that the indiscriminate use of cathartics, in constipation, is here advocated. It has already been stated that this is an exceedingly mischievous practice.

Application.—Besides their immediate operation in removing the contents of the bowels, purgatives possess many very important remote influences. Almost every movement of the entire economy is influenced or modified, by their action, to some extent.

The importance of cathartics in all cases of morbific accumulations in the intestinal canal, can not well be overlooked. Again, no one can help observing the remarkable sympathy existing between the organs of the first passages, and almost every other part of the body, especially that between these and the brain, as well as the nervous system generally.

The symptomatic head-ache, in constipation of the bowels,

* Good's Study of Medicine, VI. Amer. Ed. vol I. p. 600.

and the convulsive movement of the entire system, which attends intestinal irritations, are examples of the extent of this influence.

Now this difficulty, though generally within the control of other appropriate means, such as enemas and anti-spasmodics, is sometimes completely *beyond* their influence, as is the fact in some cases of bilious colic, ileus, enteritis, etc., in which a simple cathartic, as *olea ricini, or fel bovis*, has often afforded complete relief in a very short time.

We have a striking example of the *utility* of cathartics, in the proper treatment of typhus fever. Here, in this disease, it is evident that the characteristic debility, and the depression of the vital functions, are very much dependent on the irritation kept up by the morbific contents of the bowels. The brain is affected by direct sympathy, and the *consequence is delirium, coma, subsultus tendinum*, and *universal prostration of the nervous system.*

As soon as the irritating cause is removed from the intestines, these symptoms are obviated. To effect this object, cathartics of the proper kind, alone can be depended upon, for when the normal sensibility of the intestines is so much overcome, stimulants, relaxants, and counter-irritations, are of little avail; and, even *enemas* are inefficient, in many cases; as their influence will often not extend to the small intestines. Besides all this, it must reasonably be expected that there will be more or less *absorption* of the morbific contents of the intestines into the general circulation, and which will thus occasion still more mischief. Their early evacuation, therefore, becomes indispensable.

In febrile disease generally, and more especially, in the synochal grade, proper cathartics are of incalculable advantage. The pathology of fever comprises the increased or supernatural *combustion* or *chemical metamorphosis* of the elements of the blood, as well as those of the tissues. *Hence*, the evacuation of the carbonaceous or combustible materials, will, to a corresponding extent, *restrain* the combustion, or *obviate the cause of the fever.*

Depletion, in the *common acceptation of the term*, is not here

advocated, as this practice must ever be *deprecated as mischievous*. There is much difference between the promotion of a natural physiological function (as is that of the normal motion of the intestines), and blood-letting. The object of the *latter* is to diminish the living energies;* that of the *former*, to obviate the pathological *consequences* of such diminution.

Abnormal congestions, when attending fever, are also obviated by the operation of purgatives. The head may thus be relieved with remarkable promptness, from congestion and general hyperæmia.

In inflammation, no matter what tissue may be implicated, the same facts obtain, which have been noticed in the application of cathartics in fever. It is hence, unnecessary to advert particularly to their use, in inflammatory diseases.

Chronic affections present a large field for the display of this class of remedies.

Among the diversified phenomena of the animal economy, no one is more remarkable, than the peculiar relation existing between the vascular system and the function of absorption. It is a curious fact, that the general absorption goes on, always in an indirect ratio with the fullness of the vessels; e. g.; when the veins are *replete*, absorption is always *slow*, or entirely *suspended*; and, on the other hand, when *depleted*, this function is always increased, in a ratio corresponding with the emptiness of these vessels. This fact gathers *importance* when viewed in relation to the remediate or therapeutic action of purgatives.

When, therefore, in any part of our curative or remedial intentions, it becomes an object to excite the absorbents, we will find all those agents that draw upon the circulation, as cathartics, diaphoretics, etc., of *great* avail. *But does not this doctrine encourage blood-letting?* the reader may ask:—*By no means.* An idea of evacuation, in this part of special therapeutics, does not specifically contemplate the *ways and means* by which

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* The idea of general depletion originated in the mistaken notion that the vital principle may be abnormally exalted, and thus become the proximate cause of disease.

the end is to be accomplished, any more than in any other. For illustration, we may suppose the idea of the removal of gravel or calculi, from the bladder. Does this idea necessarily involve the painful operation of lithotomy? and may not these substances, sometimes be removed by various other and more natural means, as by *dissolving* them, or *crushing* them with the lithontriptor, if necessary, and then removing them *via* the urethra, or natural outlet? Thus the means employed to effect given objects, may differ very much.

But, when we speak of the use of cathartics and diaphoretics, in evacuating from the *blood-vessels*, we do not contemplate the absolute removal of the *blood*, but only some of its superabundant constituents, that is, its serous portion. This is often an important desideratum, as in the treatment of dropsy, etc. The principle of the operation of these agents must not, therefore, be confounded with that on which phlebotomy is instituted.

We often have occasion to promote absorption in the treatment of various *scrofulous* and *tuberculous* affections, as well as in the different cases of *deposition*, besides dropsy; and here cathartics are of incomparable service. Many practitioners have been led, by observation, into the practice of their use, without at all apprehending the principle of their action. Having thus noticed the general character of cathartics, and the principles that should govern their use, it may be more convenient to notice their many different applications, in treating of the several *orders* of this class of remedies.

Order I.---ESCULENT LAXATIVES.

Laxatives constitute several important orders of cathartics, which, although generally arranged indiscriminately together, evince some difference in their therapeutic power, and still more in the convenience with which they are taken.

The medical influence of the *esculent* laxatives is chiefly confined to the alimentary canal, while on the other hand, the laxative bitters sometimes effect some important remote objects.

Laxatives are applicable in many cases in which the more active cathartics are objectionable. In chronic disease, when there is a tendency to constipation of the bowels, and in which the frequent repetition of active cathartics would only serve to aggravate the difficulty, laxatives are generally available. Convalescence, too, is often accompanied with torpor of the bowels; and here the esculent laxatives are *particularly* applicable, as they produce little disturbance in the general system, and may, moreover, be used for almost any length of time without becoming offensive to the taste or the stomach.

The esculent laxatives are eminently calculated for the use of children and females, whose tastes are so delicate as not to admit of the taking of medicines so unpleasant as the bitter laxatives.

MANNA.

SYNONYMS.—SUCCUS CONCRETUS, *L.;* CONCRETE JUICE OF ORNUS EUROPÆA, *U. S.;* Manne, *Fr.;* Manna, *Ger., Ital.;* Mana, *Span.;* Manna, *Vul.*

HISTORY.—"Actuarius is believed to be the earliest writer who mentions our manna. (Friend,—*Hist. of Physic*, i., 271.) The nature of the substance called manna (*Manhu*, Heb., *what is it?* Eng.), in our translation of the Old Testament (*Exod.* ch. xvi., v. 14,) is quite unknown. (Carpenter, *Script. Nat. Hist.*, p. 514, 1829; *Pictorial Bible.*) Under the names *Honey-dew*, *ærial honey*, and *honey oil* (δροσο μελι, and αιρο μελι, Galen; ελαιο μελι, Dioscor.; elæomeli, Pliny), the ancients have been supposed to include our manna; for it is difficult to believe they were unacquainted with it, since Theophrastus (*Hist. Plant.* lib. iii., cap. xi.) speaks of two kinds of ash (*Μελια, Fraxinus*), one of which, (ταπεινοτερα, humilior), is supposed to be *Ornus europoa* (Sprengel, *Hist. Rei. Herb.* i., p. 76.)"*

BOTANY.—*Sex. Syst.* Diandria Monogynia.—*Nat. Ord.* Oleaceæ.

Gen. Char. *Calyx* very small, four-cleft. *Corolla* divided to the base into linear segments. *Pericarp*, a winged key, not dehiscing.—*Lind.*

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* Pereira.—*Therapeutics*, vol. ii., p. 371.

Spec. Char. A small *tree*. *Leaves* opposite, large, pinnated, in three or four pairs; *leaflets* ovate oblong, pointed, large, irregularly toothed. *Panicles* large and many flowered. *Flowers* small and polygamous. *Corolla* yellowish or greenish white. *Fruit* flat, wedge-shaped, smooth, winged.—*Pereira.*

Description.—Manna is obtained chiefly by making incisions into the bark of the tree and sticking leaves below them, in the middle of summer and in early autumn. The juice flows out as a clear liquid, and soon concretes on the stem and the leaves, as well as on straws stuck into them, forming stalactitical, or *Flake Manna*. Some falls on leaves, or into vessels placed for receiving it. Several kinds are known in commerce. *Manna in tears* is a pure kind, in bright and roundish white grains; but *Flake Manna* is chiefly valued, and mostly met with in this country. It is in light and porous pieces, five or six inches in length, mostly stalactitical in character, often hollowed on one side, of a pale yellowish-white color, easily broken. The odor is faintish, the taste mawkishly sweet, followed by acridity. Its color changes to a yellowish red when long kept. Inferior kinds are in smaller pieces, irregular in form, soft and sticky, of a yellowish red or brownish color, of an unpleasant sweetness, and often intermixed with impurities. These are called *Manna in sorts*, *Fat Manna*, *Tolfa Manna*, etc. Another set of Mannas are produced in Syria, Persia, and Arabia (*v.* Manna, *Penny Cycl.*); but these are never met with in European commerce. Manna melts with heat, and burns with a bluish flame. When pure, it is soluble in three parts of cold and in its own weight of boiling water. It is also dissolved by alcohol. Manna consists of about 60 per cent. of a peculiar principle called *Mannite*, but which varies in different varieties of Manna, Sugar, of which some is crystallizable (*Thenard*) and some uncrystallizable, a little Gum, with some yellow nauseous Extractive, which is supposed by some to be the purgative principle. *Mannite* is in acicular four-sided crystals, sweet, without smell, soluble in water, less so in alcohol, incapable of undergoing fermentation.—*R.*

Physiological Effects.—Manna is nutritive in small quan-

tities, but when the dose is increased, it proves laxative. Sometimes it occasions flatulency and colicky pains in adults, but, with children, it is usually agreeable.

THERAPEUTIC PROPERTIES AND USE.—This is a mild laxative, well suited to children, no matter how young. Dr. Burns (*Principles of Midwifery*) recommends it for recently-born infants, when the meconium does not readily come away. The dose for an adult is ℥j to ℥ij; for children, from ʒj to ʒiij. It may be taken in substance, or dissolved in warm milk or water.

CASSLÆ PULPA.—The Pulp of the Cassia Fistula.

DESCRIPTION AND PREPARATION.—This is the fleshy portion of the pods of the *cassia fistula*, a native of Upper Egypt and India. To prepare it, the pods are bruised, and then are left to stand in boiling water until the pulp is softened. The mass is now strained, first through a coarse sieve, and then a fine one, to separate the pulp with the water; this is then to be evaporated, by means of a water-bath, to the proper consistence. The pulp has a slight and rather sickly odor, but a sweet and mucilaginous taste. It is apt to become sour by exposure.

ANALYSIS.—Cassia pulp, as appears from the analysis of M. Henry, contains *sugar*, *gum*, a substance *analogous to tannin*, a *coloring matter* soluble in ether, *traces of a principle resembling gluten*, and a small quantity of *water*.

THERAPEUTIC PROPERTIES AND USES.—The cassia pulp is, perhaps the most laxative of all the esculents of the kind, but is somewhat objectionable on account of the flatulence and griping, as well as *nausea* it sometimes produces. It is recommended as a laxative in habitual costiveness, but is not much used by reformers, except in confections, as the C. of senna, which is much esteemed by many practitioners. The dose of cassia pulp is ʒj—ʒij.

TAMARINDI PULPA.—Pulp of Tamarinds.

DESCRIPTION AND PREPARATION.—The pulp of tamarinds consists of the fleshy portion of the pod of the *Tamarindus In-*

dica, a native tree of the East and West Indies, of Egypt and Arabia. The fruit is brought to us, preserved in sugar, constituting a dark-colored, adhesive mass of syrup, mixed with the pulp, membrane, strings, and seeds of the pod. That should be selected whose seeds are hard, clean, and not swollen, and the strings of which are tough and entire, and which has no musty smell. The pulp is prepared by digesting the preserved tamarinds with a little water, in an unglazed crock, over a sand bath or hot ashes, until it is rendered soft and of a uniform consistence, when the pulp is pressed out through a hair sieve.

Analysis.—According to the analysis of Vauquelin, the pulp of tamarinds, independently of the sugar with which they are preserved, contains, in one hundred parts, 9·40 parts of *citric* acid, 1·55 *tartaric acid*, 0·45 of *malic acid*, 3·25 of *bitartrate* of *potassa*, 4·70 of *gum*, 6·25 of *jelly*, 34·35 of *parencymatous matter*, and 27·55 of *water*.

Therapeutic Properties and Use.—The pulp of tamarinds is a very agreeable and delicious laxative; very useful in fevers, and during slow convalescence, when the appetite is poor and the bowels costive. It serves as an excellent adjunct to other and less pleasant cathartics. The dose is from ʒj to ℥j.

PRUNI PULPA.—Pulp of Prunes.

Description and Preparation.—This is prepared from plums or prunes, of which the best varieties are to be selected. The French prunes are the dried fruit of the St. Catharine and the green-gage varieties. In Germany, a variety, called *Quetsche*, is dried for market. The "*dits a medicine*," or Black Plums, are prepared from the small black Damascus Plums; they are more acid and laxative than the others.

When the pulp is prepared from the fresh fruit, it is only necessary to bruise it and press the pulp through a fine sieve, when it is to be carefully dried to a proper consistence. The dried plums are to be exposed to a hot vapor, until softened, when the stones are taken out, and the remainder bruised and

pressed, as before. This pulp may be either preserved with clarified sugar, or syrup. Thus prepared, the pulp contains a large quantity of *sugar*, some *gum*, *malic acid*, *azotized matter*, *pectin*, and *ligneous fiber*.

THERAPEUTIC PROPERTIES AND USE.—Pulp of prunes is a very agreeable laxative, to be used by convalescent fever-patients, when the appetite does not readily return, and the bowels incline to constipation. It also forms an important constituent of various laxative confections, as the confection of senna, etc. The dose is not regulated; the patient being allowed to eat as much as is agreeable to the stomach.

AMYGDALÆ PERSICÆ PULPA.—Pulp of Peaches.

The peach, which is such a palatable fruit to the healthy, is also of equal value to the sick. The pulp is laxative and nutritive; and though not always relished by those in ill health, is seldom offensive.

To prepare the pulp from the fresh fruit, the peaches are to be divested of their skins and stones, and then simmered in a proper vessel, over a slow fire, hot ashes, or sand-bath, until of a proper consistence. To preserve the pulp, an equal weight of clarified sugar is generally added.

Usually, the peaches, which are dried in great abundance, as an article of diet, are simply stewed in water, and the juice, thus prepared, is drank by sick persons, as well for its nutritive properties, as its medical virtues.

The juice and pulps of various other domestic fruits, as *apples*, *pears*, *strawberries*, etc., are, also, very useful in a domestico-medical application.

MEL.—Honey.

This article (*elsewhere described*) is occasionally used as a laxative esculent; but it is apt to occasion flatulency. Nevertheless, it sometimes happens that patients take an abiding notion for honey, and it generally agrees with *such*, like many many other articles that are thus especially craved for. An ounce or two will generally prove laxative.

SACCHARUM.—Sugar.

Sugar is described in the class *demulcents*, but its laxative qualities, it is thought, entitle it to a place here. It is generally palatable, especially to children; yet it is not applicable in febrile and inflammatory diseases, but is, perhaps, most useful in habits of constipation, unattended with much other derangement. It has occasionally proved very serviceable in *dyspepsia*—having restored persons that had resorted, in vain, to many more active medical prescriptions. With *dyspeptics*, however, sugar will favor the generation of acids, and it, hence, has been considered objectionable in weak stomachs. From ʒj to ʒij, will generally prove laxative. When used as a laxative, sugar is best taken in the form of candy. But the most extensive use of this article, as an aperient, is in the form of syrups, with other articles.

Order II.—BITTER LAXATIVES: LAXATIVE BITTERS.

Some articles in the cathartic class have their purgative power very intimately associated with a bitter principle; and it seems that, by virtue of this combination, they become possessed of rather a peculiar therapeutic power. We have a striking example of this in the bile of animals, which constitutes the natural and peculiar excitant of the peristaltic motion. Many vegetables also possess a very similar combination of their virtues, and are marked by a corresponding physiological effect.

In the classification of medical agents, respect has always been paid to the *degrees*, as well as to the *qualities* of their impression upon the economy. Hence, purgatives have been divided into *laxatives*, *cathartics*, *hydragogues*, etc. But in some articles of this class, the specific quality of their impression has been too much overlooked. Bitter laxatives are certainly entitled to a separate consideration. It would be better, however, if the name of this order were as much expressive of the peculiar therapeutic quality of its agents, as it is of their more obvious properties, i. e. their taste.

Laxative bitters, as this order are commonly called, may be used a long time without occasioning debility from their cathartic power. This arises from the intimate relation existing between their *tonic* and cathartic virtues. In this respect, as already hinted, they are very analogous to animal bile.

This order of cathartics is particularly applicable in all cases where a habit of constipation is attended by general debility, feeble digestion, and a sluggish circulation; also when cathartics are required, during *convalescence*, or in the treatment of *nervous diseases*, *dyspepsia*, *inflammation of the liver*, and other important viscera, laxative bitters, tempered with more active agents, according to circumstances, will be found very available. They are of eminent service when used in the form of enemas.

MENISPERMUM CANADENSE.—The Root.

Synonyms.—Yellow Parilla, Sarsaparilla, Moonseed, Vine Maple, *Vul.*

History.—This very important medical plant is unknown to the old school medical profession generally; it has never been made officinal, nor received any attention by them whatever. Indeed, it would seem from the total silence of botanists, in reference to its medical virtues, that these have been entirely unknown. The late Dr. Howard spoke of it in his "*Botanic Medicine*," and states that Dr. Gunn, of Kentucky, in speaking of the indigenous sarsaparilla, probably had reference to this article. The medicine has of late, however, been much used by our reformed and eclectic practitioners, and has established a reputation commanded by few new remedies.

Botany.—*Sex. Syst.* Diœcia Polyandria.—*Nat. Ord.* Menispermaceæ.

Gen. Char. Menispermum Staminate Flowers—*Calyx* six-sepalled, somewhat two-bracted caducous; *petals* six to nine, glandular, minute, retuse; *stamens* sixteen to twenty-four; *anthers* four-lobed, two-celled, adnate to the filaments. Pistillate Flowers—*Calyx* and *corol* like the staminate; *germs* and *styles* three to six; *drupes* or *berries* mostly solitary, one-seeded; *nut* woolly, lunate, compressed.—*Eaton.*

Spec. Char. M. Canadense. *Root* perennial, horizontal, very long, woody, of a beautiful yellow color externally. *Stem*

climbing, twenty to thirty feet long, of a greenish-yellow color, when young. *Leaves* sub-cordate, peltate, five-angled, four to five inches in diameter, with the petiole near the base, and white lines radiating from this, on the upper surface, on to each angle; they are entire, smooth, glaucous, green above, paler below. *Flowers* in axillary clusters, small, yellow. "*Drupes* about four lines in diameter, black, resembling grapes" (*A. Wood*), *Seeds* crescent.

MENISPERMUM CANADENSE.

ANALYSIS.—The author regrets his want of time to analyze the root of this plant. But it is evident that its medical virtues reside mostly in an extractive, and perhaps to some extent in a resinous principle.—Water and alcohol are its proper menstruums.

PHYSIOLOGICAL EFFECTS.—When taken into the mouth the root gives out an extremely bitter but not unpleasant taste, which is quite durable. In small doses no obvious effects are produced on the general system. But in larger doses, a slight increase of the volume of the pulse may be perceived, as well as an increase of the appetite, and the action of the bowels. In excessive doses vomiting and purging will follow. But no other unpleasant effects have been observed.

THERAPEUTIC PROPERTIES AND USE.—Menispermum canadense is laxative, tonic, and alterative. As a laxative bitter there is, perhaps, none other known of equal value. It is applicable in all cases in which other articles of the kind are indicated, and has never been known to be disagreeble to the stomach, when taken in proper doses. It has been regarded a specific for syphilis, and is properly much esteemed as a remedy in scrofulous affections, and diseases of the skin generally. In the mercurial diseases it has also proved serviceable. Dyspepsia and general debility, attended with nervous prostration, yield happily to its remedial powers. In chronic inflammation of the

viscera, it admits of beneficial application. Some also have esteemed it much, as an anthelmintic. The dose is gr. iij.—gr. v. of the extract, or about a wineglassful of the infusion. As it is difficult to be pulverized, it is usually taken in the form of an infusion, tincture, or sirup. The active properties (*Minisperimin*) may be obtained by evaporating carefully the alcoholic tincture to the consistence of honey. The dose is gr. iij.

TRIOSTEUM PERFOLIATUM.—The Bark of the Root.

Synonyms.—Breitblattrige Dreistein, *Ger.;* Fever-root, Gentian, Horse gentian, etc., *Vul.*

History.—This article is spoken of, by some of the medical profession, as a *valuable medicine.* It has found a place in the secondary list of the U. S. Pharmacopœia, and Dr. W. P. C. Barton, in his medical Botany, has given a very accurate drawing and description of the plant, as well as an account of its medical virtues. Other authors, as Rafinesque, Griffith, Dunglison, etc., have also noticed it. The late Dr. Howard* has also described it and spoken of it as a tonic, stimulant, and cathartic; useful in intermittents, etc.

Among the country physicians generally, this article has usually been known by the name of *gentian* or *genson*, but although it resembles the gentian somewhat in its medical properties it has no botanical affinities with it.

Botany.—*Sex. Syst.* Pentandria Monogynia.—*Nat. Ord.* Caprifoliaceæ.

Gen. Char. *Calyx* five-cleft, persistent; segments linear, about three-fourths of an inch in length. *Corolla* tubular, five-lobed, sub-equal; base gibbous, nectiferious. *Stigmas* rather five-lobed, capitate. Fruit or berry drupaceous, somewhat dry, three-celled, three-seeded.

Spec. Char. *Root* perennial, horizontal, branched, about eighteen inches long, diverging, caudaceous at the base, of a dirty yellow brown color without, whitish within, thick fleshy bark, woody center. *Stems*, many from the same root, from two to four feet high, from a quarter to a half an inch in

* Botanic Med. 3rd Ed. Vol. ii., p 296.

diameter, round, simple, somewhat hairy, slightly grooved. *Leaves* large, opposite, in some varieties connate, especially the lower ones; in others, amplexicaule, or simply clasping, never petelate, narrow at the base, oblong, lanceolate, elliptical, entire, somewhat rough, prominently veined, smooth margins, somewhat woolly to the touch. *Flowers* axillary, sessile, and arranged in triplets around the stem; the *corolla* is reddish-purple above, striated with lake, blended with white below, and covered with a dense pubescence. Its form is tubular, widest at the top, where it is divided into five lobes; at the bottom it is terminated abruptly, in a gibbous articulation with the germ. *Berries* oblong, smooth, about three-fourth of an inch in length, and half an inch in diameter, of an orange-red or purple color when ripe; crowned by the persistent calyx; they are situated close in the axils of the leaves, generally one, but sometimes, more, to each axil. Dr. Barton states, that he has seen as many as nine at a whorl. These berries have three very hard or bony seeds, whence the generic name *triosteum*. The plant is found in most parts of the United States, growing in rich soil and rocky places. The Triosteum Angustifolium is an equivalent for this species.

Therapeutic Properties and Use.—The bark of the root of this plant is an invaluable laxative bitter, but when fresh or when taken in large doses, will occasion nausea and vomiting. It is eminently adapted to the treatment of autumnal fevers, and has been used specifically as a *fever powder* by some Western practitioners and the aborigines. Some practitioners have also held it in high estimation as a remedy in dyspepsia. It is said to have given complete satisfaction, even in some desperate cases.

Pharmaceutic Preparations.—The only preparations yet made of this plant, are the *extract* and the *tincture*. It forms an ingredient, however, in several valuable compounds.

TINCTURÆ TRIOSTEUM; *Tincture of Triosteum*. ℞. Rad. Triosteum, in coarse powder, ℥xvj. Alcohol. Oiv. Digest in the sun seven days, and filter.

Use—A laxative tonic, valuable in hysteria, hypocondriasis, and tedious convalescence after fever. *Dose*, f℥ij—f℥iv.

EXTRACTUM TRIOSTEUM: ℞. Root of Triosteum, a suitable

quantity; water sufficient to cover the whole in a convenient vessel; simmer over a slow fire for six hours; then strain, and evaporate to the proper consistence. The alcoholic extract, however, is much preferable to this.

Use.—Applicable to all the general purposes for which the root is used. The dose is gr. iv—gr. vi.

APOCYNUM ANDROSÆMIFOLIUM.—The Bark of the Root.

Synonyms.—Apocin gobe-mouche, *Fr*; Bitter Root; Dog's Bane; Wandering Milk-Weed, *Vul.*

History.—Both the A. *androsæmifolium*, and the A. *canabinum*, are noticed for their emetic properties, in most of the popular treatises on Materia Medica. They have gained admission into the secondary list of the U. S. Pharmacopœia, but never have received the attention they merit, especially the plant here under consideration. Our Botanic Eclectic physicians, however, have used the A. androsæmifolium, pretty extensively, as a laxative bitter, and tonic, in intermittents.

APOCYNUM ANDROSÆMIFOLIUM

Botany. — *Sex. Syst.* Pentadria Digynia. — *Nat. Ord.* Apocynaceæ.

Gen. Char. Apocynum. *Calyx* very small, five-cleft, persistent. *Corolla* campanulate, half five-cleft, lobes revolute, furnished at the base with five dentoid glands, alternating with the stamens. *Anthers* connivent, saggitate, cohering to the stigma by the middle. *Style* obsolete, *Stigma* thick and acute, *Follicles* long and linear. *Seed* commose. *Nuttall*

Spec. Char. A. ANDROSÆMIFOLIUM. *Root* perennial, creeping, very long, dark brown externally, whitish within, with a thick fleshy bark. *Stems* several, upright, branched, smooth, of a beautiful brown, or reddish brown color. *Leaves* opposite, petiolate, ovate, acute, entire, smooth on both sides, two or three inches long. *Flowers* white, tinged with lake, disposed in terminal, or axillary, loose cymes. *Corolla* campanulate, with a spreading border. *Fruit* a pair of long, linear, tapering acute follicles, containing the seed, and silky seed-down; they are about four inches long, and from two to four lines thick, in the middle.

The entire plant when wounded, emits a milky juice. It grows in meadows, and other rich grounds, in open places, in most parts of the United States. Flowers in June and July.

ANALYSIS.—Dr. Bigelow says, that the root, according to his experiments, contains a *volatile oil*, *bitter extractive*, *a red coloring matter*, soluble in water, and not soluble in alcohol, and *caoutchouc*. It also contains a *soft resin*.

The medical virtues reside in the *resin* and *bitter extractive matter*, and are imparted readily to alcohol.

PHYSIOLOGICAL EFFECTS.—The bark of the root is extremely bitter to the taste, as much so as quinia. In small portions no very visible effect is produced, except its use is long continued, when it promotes the appetite, assists digestion, and relaxes the bowels. In very large quantities, it occasions nausea, vomiting, and purging.

THERAPEUTIC PROPERTIES.—Apocynum is an excellent bitter laxative, and detergent; very valuable in the treatment of many varieties of chronic disease, especially liver affections, lues venerea, and scrofulous disease.

It has been highly prized as a remedy in intermittents, and it is certainly equal with any of the common tonics in these cases.

The author has long been in the habit of combining this article with *menispermum*, in the proportion of two parts of the latter, and one of the former, as a prescription for some varieties of dyspepsia, and is prepared to report favorably of the remedy. The same preparation is also valuable, as a laxative tonic, in amenorrhœa, and will prepare the way for

the successful administration of the emmenagogues. The medicine may be given in the form of sirup or decoction, with sugar. Age impairs the virtues of the medicine.

PHARMACEUTIC PREPARATIONS.—W. F. INFUSUM APOCYNI ANDRO. *Infusion of Apocynum, Andro.* ℞ Apocynum ℥j. Boiling water, O j. Digest for an hour and strain. *Dose*, a wineglassful, three times a day, as a laxative tonic.

EXTRACTUM APOCYNI ALCOHOLICUM: This is made by evaporating the alcoholic tincture of Apocynum to the proper consistence.

Uses. Applicable in all cases in which the apocynum is useful. *Dose*, gr. v.

APOCYNIN: This is made by washing thoroughly the alcoholic extract. It is a dark, thick fluid—contains nearly all the med. prop. of the root. *Dose*, gr. iii.

EXTRACTUM APOCYNI ANDROS.: *Extract of Apocynum Andros.* ℞ Root of Apocynum lb. iij. Aq. Cong. iij. Acetous acid or vinegar, O j. Boil together, over a slow fire, for three hours and strain. Evaporate slowly, in a water bath, to the proper consistence. *Dose*, gr. v.—gr. x.

This extract is one of the best forms in which to exhibit the Apocynum, for, as it can be formed into pills, or can be easily enveloped in some pulpy substance, it can be much more conveniently taken than any other preparation of the medicine. Great care must, however, be taken, not to burn the medicine. To avoid injury from this accident, the process of making it should always be conducted by means of the water bath.

AMYGDALUS PERSICA.—The Bark, Leaves, Blossoms, and Kernels.

SYNONYMS.—Περσικον μηλον, *Gr.;* Pfirsichbaum, *Ger.;* Pecher, *Fr.;* Persico, *Ital.;* Alberchigo, *Span.;* Peach tree, *Vul.*

HISTORY.—The peach tree was know at a very early age. Dioscorides and Pliny both speak of it. It is a native of Persia, but is now cultivated in every civilized country, where the climate is not too cold.

BOTANY.—*Sex. Syst.* Icosandria Monogynia.—*Nat Ord.* Amygdalia.

Gen. Char. AMYGDALIS. *Calyx* five-cleft, inferior. *Petals* five. *Drupes* with a nut perforated with pores.—*Will'd.*

Spec. Char. A. PERSICA. A domesticated tree, too well known to need description.

PHYSIOLOGICAL EFFECTS.—It is stated that the blossoms, bark, and leaves of the peach tree, have been known to be poisonous. It has been contended, that they contain *Hydrocyanic Acid*, but the reports of the poisonous effects that they are said to have produced, do not at all correspond with the symptoms of poisoning from prussic acid. The pernicious effects of all these parts of the peach tree, are said to be violent vomiting, purging, giddiness, convulsions, and stupor. The author, not having used much of any part of the peach tree, or its production, except the pulp or fleshy part of the fruit, is not prepared to judge properly as to their physiological effects. The kernels, however, have been considerably used by many that make it a point to reject poisons from their practice. Nevertheless, if it should be established that the peach tree is really poisonous, there is no reason why we should not totally expunge it from our Materia Medica.

THERAPEUTIC PROPERTIES AND USE.—All the medical parts of the peach tree, and its productions, except the pulp, are laxative bitters, and have been used, very profitably, it is said, in dysenteries, nephritis, ischuria, hæmaturia, and for the removal or prevention of worms. But for these purposes, the non-ligneous portions of the twigs, and the leaves are much the best.

ADMINISTRATION.—The dose of *peach blossoms* is the infusion of half an ounce of the fresh, or a dram of the dried flowers macerated in water. That of the infusion of *peach leaves*, prepared by digesting ℥ss. of the dried leaves in Oj. of boiling water, is f℥ss. three times a day for a child. The bark of the root and the kernels, are taken in the form of tincture or sirup.

PHARMACEUTIC PREPARATIONS.—The bark, leaves, and kernels, alone, have entered into preparations that have inherited the name of this article.

TINCTURÆ PERSICÆ CORT. VEL FOLIA: *Tincture of Peach tree Bark or Leaves.* ℞ Bark or leaves of the peach tree, in coarse powder, ℥iv. Alcohol, O jss. Digest in the sun for seven days and filter. Dose, f ʒ—f ʒiij.

SYRUPUS PERSICÆ SEMINA COMPOSITA: *Compound Sirup of Peach Kernels.*—℞. Peach kernels, finely bruised, ℥viij. Rhubarb, in coarse powder, ℥vj. Scutellaria, ℥iv. White sugar, ℔. iij. Compound tincture of myrrh, ℥iv. Water, O iv. Boil the rhubarb and scutellaria in the water, down to three pints; strain, and add the sugar, peach kernels, and tincture of myrrh, and simmer until the sugar is dissolved.

USE.—This is an excellent article in dysentery, and summer complaints of children. Dose, from f ℥j.—f ℥iij., to a child three years old.

EUONYMUS ATROPURPUREUS.

This article (described in the first order of *Tonics*) is an excellent laxative bitter, and is very highly esteemed by some of the Western practitioners. A friend of the author, Dr. J. Overholt, of Wooster, O., has long been in the practice of using this article, as a laxative bitter, in convalescence from fever, especially when of an intermittent or remittent type; and he regards it as decidedly the best article of this order he has ever used. There are many others that bear testimony to the same purport. The dose is gr. x.—gr. xx., of the powder, and gr. v. of the extract.

BERBERIS VULGARIS.

Barbery (described under the head of tonics) is a laxative bitter, eminently adapted to the treatment of dysentery, cholera infantum, cholera morbus, diarrhea, and dyspepsia. The dose is gr. j.—gr. x. of the extract, and gr. x. —gr. xx. of the powder. The best way to exhibit it in those affections, is in the form of a sirup. This may be prepared by making a strong decoction, and adding an equal weight to the latter, of white sugar, on every pound of which two ounces of the essence of winter-green is to be previously dropped. The dose of this sirup is a small wineglassful.

ASCLEPIAS TUBEROSA.

This species of asclepias (described under the head of diaphoretics) is a very pleasant and mild laxative bitter, very serviceable as a collateral means in the treatment of visceral

inflammation. In pneumonia, it is quite available, and its utility in pleuritis is such as has entailed on the plant one of its vulgar names, *pleurisy-root*. The dose is ℈j. of the powder or gr. v. of the extract.

CONVOLVULUS PANDURATUS.

This article (described in the class Expectorants), although not very prominently bitter, is still thought to merit a place here. Its cathartic power is well marked, and its adaptation, as a laxative in chronic visceral inflammation, is rather peculiar, especially when the disease implicates the lungs, liver, or kidneys. It is best taken in extract. The dose of this is from gr. v.—gr. x.

FRASERI CAROLINENSIS.

The American columbo (described among the tonics) is a laxative bitter of some value, but is most laxative when quite fresh. When the medicine has been kept two or three years, its laxative properties become nearly extinct. The medicine has, however, generally, been favorably regarded as a laxative tonic. The dose is gr. xx. to ʒj. of the powdered root, or gr. v.—gr. x. of the extract.

SYRUPUS TONICA LAXATIVÆ: *Laxative Tonic Sirup*—

℞	Asclepias Tub.,	ʒxvj.
	Menispermum Canaden.,	ʒxvj.
	Triosteum Perfol.,	ʒviij.
	Apocynum Andros.,	ʒvj.
	Saccharum purif.,	℔viij.
	Aqua font.,	Cong. ijss.

Boil the first four articles in the water for three hours, and strain. Boil down to five pints, strain while hot, and add the sugar.

Use.—This is an excellent laxative tonic, applicable in most cases in which any of the foregoing articles are indicated. It is very agreeable to the stomach, and not unpleasant to the taste. *Dose*, from fʒij. to fʒj.

Order III.---COMMON CATHARTICS.

The terms "*common cathartic*," are here designed to be understood as meaning that order of cathartics which possess no very specific action upon any of the neighboring organs, and whose primary action is principally confined to the intestines. Indirectly, however, they produce many very important effects in almost every part of the system. The evacuations produced by them, consist mostly of the simple contents of the bowels.

When cathartics are spoken of in an unqualified sense, the articles of this order are generally referred to. When any other kind are intended, they are designated by names indicating their qualities, as *laxatives*, *hydragogues*, etc.

The articles of this order, are generally *mild* or *easy* in their operation, although some of them are very *prompt* or *quick* in their effects. As to their application, it is not necessary to say much here, since what was said under the general head of cathartics applies largely here. The indications to be fulfilled by them are easily understood. They may be stated as follows: 1st, To evacuate the contents of the intestines. 2d, To obviate remote sympathies, as headache, etc. 3d, To restrain or obviate the causes of febrile and inflammatory action. 4th, To change the terminations.

RHEUM.—The Root.

SYNONYMS.—Ρηον, *Gr.;* Rabarbaro, *Ital.;* Ruibarbo, *Span.;* Hai-houng, *Chinese;* Schara-modo, *Thibet;* Rhubarbe, *Fr.;* Rhabarber, *Ger.;* Rhubarb, *Eng.*

HISTORY.—It is supposed that Dioscorides, in speaking of "ρα," ("Rha,") and "ρηον," ("Rheon,") has reference to our Rhubarb. Dr. Pereira, however, thinks that the description given by him,* as well as that of Pliny,† does not answer to

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* *Rha*, Dioscorides says, by some called *Rheon*, grows in those countries which are beyond the Bosphorus, and from which it is brought. It is a root which is black externally, like to great centaury but smaller, and redder, odorless, loose or spongy, and somewhat smooth externally.

† "*Rhacoma*," says Pliny, "comes from the countries beyond Pontus, resembles the black costus, is odorless, and has a hot, astringent taste."

our drug. But P. Alpinus was of opinion, that the "ρα" of Dioscorides was the root of *Rheum Rhaponticum*, which he (Alpinus) obtained from Thracia, in A. D. 1608, and cultivated at Pavia. It is pretty evident, however, that the late Greek writers were acquainted with our rhubarb. Alexander, of Tralles speaks of it as a remedy in weakness of the liver, and dysentery. According to Adams' translation, Paulus, in noticing the practice of the ancients, says, "Alvine discharges they promoted, by giving turpentine to the extent of an olive, when going to rest; or, when they wished to *purge* more effectually, by adding a little *Rheon*."

The Arabs were acquainted with several kinds, as the *Indian* (Khorassanee), and the *Chinese* (Rewund sini). The Persians, it is said, give *reon* as the Greek synonym, of their *rawund* (Rhubarb), and of which, the plant producing it, they say is named *ribas*.

Botany.—*Sex. Syst.* Eneandria Trigynia.—*Nat. Ord.* Polygonaceæ.

Gen. Char. Rheum. *Calyx* petaloid, six-parted, withering. *Stamens* about nine, inserted into the base of the calyx. *Styles* three, reflexed. *Stigmas* peltate, entire. *Achenium* three-cornered, winged, with the withered calyx at the base. *Embryo* in the center of the albumen.—*Lindley.*

Spec. Char. It is not a little singular, that long as rhubarb has been in use, and great as has been the attention given it by naturalists, the precise species yielding the different sorts of the drug, are not yet satisfactorily ascertained. This is to be accounted for by the remoteness of the region whence it is derived, and the jealous care with which the monopoly of its trade is guarded. "All that science has accomplished," says Dr. Griffith, "is rather to have ascertained by what species it is *not* afforded, than to point out those that *do*" [afford it]. The species inhabit the extensive plains of Tartary, the steppes of Siberia, and the great mountains lying between these and the northern parts of India.

The species agree in being perennial, wild, thrifty, herbaceous plants, with perennial and branching *root-stocks*, which

are thick and succulent. The *stems* of most of them attain the hight of four to ten feet. The *leaves* are large, more or less cordate, wavy at the margin, shething at the base, either all *radical*, or where *cauline*, *alternate*. The inflorescence is paniculate, or spica-to-racemose.

The following synoptical arrangement, drawn up from the accounts of Drs. Lindley, Royle, Pereira, Guibert and others, embraces most that is known of the species, that are supposed to yield the commercial rhubarb. They are divided into two classes, viz: *those with compound racemes*, and *those having close* or *spike-like-racemes*.

I. Species with Compound Racemes.

RHEUM PALMATUM

1. RHEUM PALMATUM, *Linn.*—"*Leaves* roundish cordate, half palmate; the lobes pinnatifid, acuminate, deep, dull green, not wavy, but uneven and very much wrinkled on the upper side, hardly scabrous at the edge, minutely downy on the under side, sinus completely closed; the lobes of the leaf standing forward beyond it. *Petioles* pale green, marked with short purple lines, terete, quite obscurely channeled at the upper end. *Flowering stems* taller than those of any other species."—*Lindley*.

This species grows spontaneously in the Mongolian empire, on the confines of China, and is extensively cultivated near Banbary, in Oxfordshire, for the supply of *English Rhubarb* to the London Market. In 1750, Kauw Boerhaave, physician to the Emperor of Russia, obtained the seeds of two species from a Tartarian merchant, and on growing them they proved to be the *R. Palmatum*, and the *R. Undulatum*, but as cultivated by the Russian government, it never produced as good rhubarb as is produced from this species in England and France.

2. RHEUM COMPACTUM, *Linn.*—"*Leaves* heart-shaped, obtuse, wavy, deep green, of a thick texture, scabrous at the margin, quite smooth on both sides,

glossy and even on the upper side; sinus nearly closed by the parenchyma. *Petioles* green, hardly tinged with red, except at base, semi-cylindrical, a little compressed at the sides, with the upper side broad, flat, elevate bordered by edges, and of equal breadth at each end."—*Lindley.*

RHEUM COMPACTUM.

This is a native of Chinese Tartary, but is cultivated in France, and affords part of the *French Rhubarb.* Guibourt says, this is a pretty good imitation of the Chinese, but when cleared of the yellow powder, its different color and closely radiated marbling distinguish it; it does not crepitate under the teeth, nor stain the saliva of as deep a yellow. It is said, this is one of the species principally grown on account of its stalks.

3. Rheum Undulatum, *Linn.*—"*Leaves* oval, obtuse, extremely wavy, deep green, with veins purple at the base, often shorter than the petiole, distinctly and copiously down yon each side, looking as if frosted when young, scabrous at the edge: sinus open, wedge-shaped, with the lower lobes of the leaves turned upward. *Petiole* downy, blooded, semi-cylindrical, with elevated edges to the upper side, which is narrower at the upper than the lower end."—*Lindley.*

The R. Undulatum grows in Asiatic Russia, and probably in Chinese Tartary. It was formerly cultivated in Siberia, as the real officinal plant; but as the genuine rhubarb could not be procured from it, its cultivation has been given up.—*Guibourt.*

As already stated, K. Boerhaave obtained the seed from Tartary, and its cultivation was then tried by the Russian government, but without satisfactory results. It is now raised in France, and constitutes a part of the *French Rhubarb.*

4. Rheum Emodi, *Wallich.*—"*Leaves* cordate, acute, dull green, but little wavy, flattish, very much wrinkled, distinctly rough, with coarse, short hairs on each side; sinus of the base distinctly open, not wedge-shaped, but diverging at an obtuse angle, with the lobes nearly turned upward. *Petioles* very rough, rounded, angular, furrowed; with the upper side depressed, bordered by an elevated edge, and very much narrower at the upper than the lower end."—*Lindley.*

RHEUM MEODI.

The *emodi* grows on the Himalayas. It is supposed to be the best species known to the profession, and was at first considered, especially by Mr. Don, as the species affording the Russian and Turkey rhubarbs. But Dr. Pereira received some specimens of the Himalayan

rhubarb from Dr. Wallich himself, who obtained them from the inhabitants of the Himalayas, who had strung the pieces around the necks of their mules. These specimens, says Dr. Pereira, had scarcely any resemblance to the officinal rhubarb.

5. Rheum Raponticum, *Linn.*—"*Leaves* roundish, ovate, cordate, obtuse, pale green, but little wavy, very concave, even, very slightly downy on the under side, especially near the edge itself; scabrous at the margin, sinus quite open, large, and cuneate. *Petioles* depressed, channeled on the upper side, with the edges regularly rounded off, pale green, striated, scarcely scabrous."—*G.*

The raponticum grows in Thrace; on the borders of the Euxine Sea; north of the Caspian, Siberia, etc. It is cultivated in England and the U. S. for the leaf-stalks, which are used for tarts and puddings; also cultivated in France, and yields a part of the *French Rhubarb.* This species, it is supposed, yielded the rhabarbarum of the ancients.

6. Rheum Leucorrhizum, *Pallas.*—"*Radical leaves* about three, short-stalked, coriaceous, transversely elliptical, scarcely hollowed out at the base; with three thick branched nerves, projecting very much beneath, smooth on both sides, denticulate at the edge, with here and there a few scattered, roughish warts, no cauline leaves, or scarcely ever one. *Petioles* about an inch long, compressed, solid, with a narrow channel on the upper side."—*G.*

This species is found in the deserts of the Kirghis, and south of Siberia, and Altai Mountains. It is said to yield the *White* or *Imperial Rhubarb.*

7. Rheum Crassinervium, *Fischer.*—"*Leaves* heart-shaped, acuminate, wavy, very bullate, deep-green, quite smooth on both sides, rather glossy on the upper; scabrous at the edge; the ribs of a slight red color, and the central ones very thick at the base; sinus open, cuneate, with the lobes inflected. *Petioles* dull-red, rounded, rather angular, with the upper side narrow and flattened, the edges raised, narrower at point than at base."—*Lindley.*

The nativity of this species is unknown. It was sent from St. Petersburg under this name, and is now said to be growing at the Apothecaries' Garden, at Chelsea, near London. Dr. Lindley says that roots of it, of only three years of age, were as thick as the wrist, and, when examined at Apothecaries' Hall, were found to possess the color and peculiar odor of the best *Turkey Rhubarb.*

8. Rheum Capsicum, *Fischer.*—"*Leaves* ovate, acuminate, cordate, and inflexed at base, very wavy, of a deep green, thick texture, glossy and somewhat even on the upper side, scabrous at the edge, a little downy on the under surface; sinus somewhat open, rolling inward; *Petioles* pale green, with scarcely a tinge of red, minutely downy, semi-cylindrical, with elevated edges to the flat upper side, which is of equal breadth at both ends."—*Lindley.*

Found on the shores of the Caspian, and on the Altai Mountains. Nothing is known of its roots.

9. Rheum Webbianum, *Royle.*—*Radical Leaves* large, long-stalked, cordate, acute; cauline ones obtuse, rather downy above, veiny beneath, and margin hairy; *Petioles* hairy.

This grows on the Choor and Himalaya mountains. The root is said to possess the same properties as R. Emodia.—*Griffith.*

10. Rheum Ribes, *Linn.*—This is a species given by Dr. Royle, as being the *Ribas* and *Rivash* of the Affghans and Persians, celebrated among them, and much esteemed on account of the agreeable acid of its leaf-stalks. "The root is said to be *rawund.*" "It is the *Rivas* of Serapion, who mentions it as making a good sherbert."—*Royle.*. It is reported as growing on the mountains of Syria.

11. Rheum Hybridum, *Murray.*—"This," says Royle, "is a doubtful species, but is remarkable for the great size of its roots, as cultivated both on the Continent and in England."

II. Species with Close or Spike-like Racemes.

12. Rheum Spiciforme, *Royle.*—"*Leaves* thick, *leathery,* cordate, blunt, red, and reticulated beneath, and covered with stellate down on each side. *Petioles* and peduncles smooth. *Racemes* arising from the root, spicate."—*G.*

The R. Spiciforme is an inhabitant of the northern face of the Himalayas and of Thibet. Royle says that rhubarb, sent Mr. Moorcroft, from near Ludak, was of excellent quality; and it is suggested, by Dr. Lindley, that it is not improbable that it may have been furnished by this species.

13. Rheum Moorcroftianum, *Royle.*—"*Petioles* deeply furrowed, with stipules as long as the petioles, and much more membranous. The imperfect rudiments of leaves (scales) at the base are even longer than the stipules, and are very thin and much torn. *Leaves* clothed with a short, scabrous pubescence."—*G.*

It is found at the Niti Pass, in the Himalayas, and in Thibet. This is considered to afford good Rhubarb.

Description.—There are a number of different sorts of Rhubarb in market, affording some variety in their physical properties, and still more in their virtues or medical activity. They are best described separately.

a. Russian Rhubarb.—This article, which, in Russia is called *Chinese Rhubarb,* in this country is also sometimes called *Turkey Rhubarb,* owing to the fact that it was formerly brought by way of Natolia, or some other Turkish ports. This is imported from Tartary into the frontier town of Kiachta, and thence sent to Moscow and St. Petersburgh, whence it is carried to the rest of Europe. This drug, by the express stipulations of a contract, undergoes a peculiar preparation before it is shipped; and then is again subjected to a rigid inspection at Kiachta, by an official apothecary, from the Russian government.

The pieces of Russian Rhubarb vary in shape, being irregularly roundish and angular, the bark having been shaved off with a knife. Many pieces have holes in them, made by the

inspector. They have a clean and fresh appearance, and lively yellow color. Internally, the texture is rather dense; the fracture is uneven, irregularly marbled with white and red veins, having a strong and peculiar, slightly aromatic, odor; a bitter, rather astringent, taste; feels gritty, when chewed, tinges the saliva, yellow; and produces a powder of a bright yellow color. The grittiness on chewing, is owing to the existence of raphides, or crystals of oxalate of lime, which are situated within the cells.

β. Chinese, or East India Rhubarb.—This may be said to consist of two or three varieties, as: "1st, One which is called by Dr. Pereira, the *Dutch Trimmed* or *Batavian Rhubarb;* and, according to the shape, called *Flats* or *Rounds*, in the trade, is closely allied to, and is derived, with very little doubt, from the same sources as the Russian Rhubarb; some of which passes through Canton into Europe, or first into one of the Indian ports, and thence re-exported to Europe. It resembles the above in appearance, as the cortical portion appears to have been sliced off, and not scraped. The holes with which the pieces are perforated are smaller than those of the Russian, and often contain within them pieces of the string by which they have been strung together. 2d, Another variety, which is more particularly called *Chinese Rhubarb*, also *half-trimmed*, is distinguished from that called Russian, as being irregular in shape, never angular, but the edges rounded, as if the bark, instead of being sliced, had been scraped off; the roots are besides of less uniform good quality than the Russian. Externally, of a dull yellow; many of the pieces heavier from being more compact, the reticulation less regular, and of a yellowish-brown. 3d, A third variety has lately been described by Dr. Pereira, under the name of *Canton Stick Rhubarb*. This is in *cylindrical* pieces, about two inches long, and from half to three-quarters of an inch in diameter. These are probably produced in the mountains which bound China, as those of the province of Sechuen, and perhaps of Cansu."

γ. Himalaya Rhubarb—This is supposed to be the product of different species, and is of different qualities. That yielded, as is thought by the R. Moorcroftianum, is of a bright and lively color, and is, as supposed by some, equal to the best Rhubarb. The variety afforded by the R. Webbianum was experimented with by Dr. Royle at the hospitals of Saharunpore, and found of good quality. Some of it was also submitted by the Medical Board of Mr. Twining, for experiment in the hospital at Calcutta. "After trial in forty-three cases," he reported, that in doses of ℈ j. or ʒss. it has a good purgative effect—nearly equal to the best Turkey Rhubarb; in small doses, was tonic, astringent, and highly useful in diarrhea." This kind of Rhubarb is not generally divested of its bark, which is of a brownish color. The texture is radiated and

somewhat spongy. The color is of a brownish yellow, and the powder produced by the root, of a dull, yellowish brown, with but little aroma.

δ. Siberian Rhubarb.—"Small quantities of this kind have been imported [into England] by Mr. Faber, and have been proved to be those called by Grassman and others *Siberian Rhapontic Root.* This occurs in long, thin, almost cylindrical, or spindle-shaped pieces, decorticated and perforated by a hole. Color, externally, pale yellow; internally, brownish yellow or reddish white. Odor and taste of good Rhubarb, but weaker; does not feel gritty. Dr. Pereira compares it with English *Stick Rhubarb.* It has since been proved, that the Rhubarb cultivated at Banbury is yielded by the same species, that is *Rheum Rhaponticum.*"—Royle.

ε. English Rhubarb.—This is said to be cultivated at Banbury, in Oxfordshire, to the extent of twenty tons annually, and is supposed to be the produce of *Rheum Rhaponticum.* "It is the kind frequently sold by men dressed up as Turks, as Turkey Rhubarb. The pieces vary in shape, some being ovoid, others cylindrical (*English Stick Rhubarb*), smoothed externally, and rubbed with a yellow powder; light, rather spongy, with a reddish hue. It is rather mucilaginous in taste, and a little astringent. Its odor feeble, but unpleasant. It is supposed that much of this is employed for adulterating the Asiatic Rhubarb, when in a powdered state."

ζ. French Rhubarb.—The French Rhubarb is produced chiefly from the R. Rhaponticum, R. Undulatum, and R. Compactum. That produced by the R. Palmatum, it is said, most closely resembles the Asiatic, but by cultivation in Europe seems invariably liable to degenerate. Some of its products are almost worthless. That produced by the R. Rhaponticum, which is cultivated in the gardens in the environs of Paris, is in pieces of various sizes, which are ligneous in their appearance, of a reddish-gray color on the outside, marbled internally with red and white arranged in the form of crowded rays, proceeding from the center to the circumference. It has a mucilaginous and astringent taste, and rather a disagreeable odor, and when chewed does not crackle under the teeth. Considerable quantities of French Rhubarb are imported into the United States, under the name of *Krimea Rhubarb*, and it is supposed that it is often employed in the adulteration of the better kinds, as the Russian and Chinese. This is to be inferred from the quantity imported, and the fact that but little, comparatively, is used under its proper name.

Choice of Rhubarb.—In the selection of Rhubarb, the Russian is preferable, not so much on account of the superiority of the *kind*, as the *care* with which it is prepared, and

the close *inspection* it undergoes. Next to this, in value, is the Chinese Rhubarb.

When the drug is selected without reference to the commercial variety, those pieces should be preferred which are moderately heavy and compact, of a fresh or lively color, brittle, and which, when fractured, present a lively, fresh appearance, marbled with reddish and yellowish veins blended with white, and whose odor is aromatic and agreeable, possessing a bitter and moderately astringent, but not mucilaginous taste, and which feel gritty under the teeth, and stain the saliva yellow when chewed. The powder should be of a bright or lively yellow, or but slightly tinged with a reddish-brown color. When too light, Rhubarb may be suspected as being worm-eaten or rotten; and when too heavy, it may be of an inferior sort, or contaminated by foreign substances; the coloring may also be artificial.

ANALYSIS.—Many analyses have been made of Rhubarb, with variable results. The most recent is that of Brande, who found in one hundred parts of Chinese Rhubarb, 2 of *rhabarbaric acid*, 7·5 of the *same acid impure*, 2·5 of *gallic acid*, 9·0 of *tannin*, 3·5 of *coloring extractive*, 11·0 of *uncrystallizable sugar with tannin*, 4·0 of *starch*, 14·4 of *gummy extractive*, 4·0 of *pectic acid*, 1·1 of *mallate* and *gallate of lime*, 11·0 of *oxalate of lime*, 1·5 of *sulphate potassa* and *chloride* of *potassium*, 1·0 of *silica*, 0·5 of *phosphate of lime* and *oxide of iron*, 25·0 of *lignin*, and 2·0 of *water*.

It seems that Rhubarb, as regards its therapeutic and chemical properties is a compound of resin, extractive matter, and various acids, as the crysophanic. Dr. Royle makes the following remarks on these substances:

"The Chrysophanic acid of parmelia parietina is identical with the pure yellow crystalline obtained from Rhubarb, which has been described, in its impure state, as *yellow principle of Rhubarb*, *rhein* or *rhababarainas*, by Geiger; the *rhabarbaric acid*, by Brande.

"Resins are among the chief constituents of Rhubarb, although their presence is denied by Dulk; they are, by the intermedium of other substances, as the so-called extractive matter, etc., partially soluble in water.

"The three chief resins, are aphoretine, phæoretine, and erythreortine; the two former appear isomeric; but all three are chiefly characterized by their different degrees of solubility.

"The taste, odor, the relation to chemical re-agents, and the therapeutic action of Rhubarb, appear to be modified essentially by the joint co-operation of the *resins*, the *coloring matter*, and the *extractive matter;* and probably, also, in a less degree by the tannin, gallic acid, sugar, pectine, and the copious salts of lime which it contains."—(Ann. der Chemie und Pharmacie, May, 1844, Phar. Jour., iv., 322.)

The medical virtues of Rhubarb are taken up by water, cold or hot, and by alcohol. Gelatine produces a precipitate in its infusion (*tannate of gelatine.*)

Physiological Effects.—In small doses, as three to five grains, it acts on the system as an astringent tonic. When the dose is increased to that of a scruple or a drachm, it purges slowly and mildly. It imparts its color to the urine and sweat, and, if long continued, also to the tissues, as the mesentery intestines, and even the bones. It is also perceptible in the milk of nurses. When potash is given in connection with the Rhubarb, the stain produced by it will be red.

Rhubarb is perfectly innocent in its action on the system, having never been known to produce any inconvenience when properly administered.

Therapeutic Properties and Use.—Rhubarb may justly be considered at the head of our cathartic class of medicines. It is perfectly mild and safe in its use, and yet certain in its operation. The gallic acid that it possesses renders it somewhat astringent, and, when not taken in doses large enough to exhibit its cathartic power, it will usually act as an astringent tonic. This property eminently adapts the medicine to the treatment of diarrhea and dysentery. The cathartic power is generally developed first, so that the bowels are always cleansed of their irritating contents, before the astringent produces its effects. It will seldom fail to relieve tenesmus, and soon to remove all the urgent symptoms of dysentery, whatever its type may be. Its properties are improved for some varieties of dysentery, as when the acids prevail, by the addition of the

bi carbonate of potash. But, when the potash is not indicated, it should not be given with the Rhubarb, when the latter is used in dysentery; for, by it, its astringent property is impaired, as this is dependent on the tannic acid that the medicine contains. In choleras and typhoid fever, as well as in typhus, the medicine may also be expected to be beneficial.

The purgative properties of Rhubarb seem to expend their force chiefly on the muscular coats of the bowels, as the discharges it produces are chiefly fecal, and not watery.

The medicine, sometimes, is roasted, when intended as a remedy in dysentery. By this process, its purgative properties, which are dependent, in part, on a volatile principle, are driven off, while its astringent power remains unimpaired. But this is an unnecessary process, seeing that the astringent power may be so easily improved by the addition of other articles, while all the cathartic virtues may be made available.

The dose of Rhubarb as a cathartic, is gr. xx.—gr. xxx.; as a remedy, in dysentery, the dose is gr. v. to gr. x., taken once an hour, until a good effect is produced.

PHARMACEUTIC PREPARATION.—Rhubarb has been the subject of many pharmaceutic preparations. This has been partly owing to the great therapeutic value of the medicine, and partly to the object of rendering its administration more pleasant—the drug being very unpleasant to the taste.

PULVIS RHEI COMPOSITUS: *Compound Powder of Rhubarb, or Neutralizing Mixture.*—℞ Turkey Rhubarb; Bicarbonate of Potassa; Mentha Piperita, equal parts; White Sugar, equal to the whole. Pulverize and mix.

Uses.—One of the best preparations in cholera complaints that we possess. *Dose.*—Gr. xx. to gr. xxx., with f℥j of good brandy. Take once in 10 or 20 minutes, until relief is obtained.

PILULÆ RHEI, E., U. S.: *Rhubarb Pills.*—Beat into a proper mass, finely powdered Rhubarb, 9 parts. Acet. Potash, 1 part. Conserve of Red Rose, 5 parts. Divided into 5 gr. pills.

℞ Rhubarb powd., ℥vj. Soap, ℥ij. Make a mass with water, and divided into 120 pills. (U. S.)

Action—Uses.—Aperient in doses of gr. x.—gr. xv.

PILULÆ RHEI COMPOSITÆ, L. E., U. S.: *Comp. Rhubarb Pills.*

Mix powdered Rhubarb, ℥j., (12 parts, E.) Powdered Aloes, ʒvj., (9 parts E.) Powdered Myrrh, ℥ss., (6 parts, E.) Then rub into a proper mass with Soap, ʒj., (Castile, 6 parts, E.) Oil of Caraway, fʒss. L. (Oil of Peppermint, 1 part, E.) Syrup, q. s. L. (Conserve of Red Roses, 5 parts, E.), till thoroughly mixed. (Divided into 5 gr. pills: or, if preferred, omit the Oil of Peppermint, E.)

℞ Rhubarb powd., ℥j. Aloes powd., ʒvj. Myrrh powd., ℥ss. Oil of Peppermint, fʒss. Syrup of Orange Peel, q. s. Beat the whole together to form a mass. To be divided into 240 pills. (U. S.)

Action—Uses.—Cathartic in doses of gr. x.—ʒj. Well suited to a sluggish state of the bowels.

EXTRACTUM RHEI, L. E. D.: *Extract of Rhubarb.* (L. D.) Macerate for four days (with a gentle heat, L.),—Powdered Rhubarb, ℥xv., (℔j. D.), in Proof Spirit, Oj., (℔j. D.), and Aq. dest., Ovij. (℔ij. D.) Strain. Set by, for the dregs to subside. Pour off the liquor, and evaporate to the proper consistence.

℞ Rhubarb ℔j, cut into small pieces. Macerate in Aq. Oiij., for 24 hours; filter through cloth, express moderately, macerate the residuum with Aq. Oij. for at least 12 hours, filter through the same cloth, and express strongly. Filter again, if necessary, and evaporate to the due consistence in the vapor-bath. The extract may be obtained, of fine quality, by evaporation, in vacuo, with a gentle heat.

Action—Uses.—Cathartic in doses of gr. x.—ʒss. A good preparation may be obtained with cold water and percolation, when spirit is unnecessary, and still better if evaporated in vacuo, as recommended in the E. P.

INFUSUM RHEI, L. E. D. U. S.: *Infusion of Rhubarb.*—Infuse, in a lightly covered vessel, for 2 (12, E.) hours in boiling Aq. dest., Oj., (f℥xviij., E.; by measure, ℔ss. D.) Rhubarb in coarse powder, ʒiij., (℥j., E., ʒj., D.) Add Spirit of Cinnamon, f℥ij., E. Strain (through linen or calico, E).

℞ Rhubarb, ʒj. Boiling Water, Oss. Digest for two hours in a covered vessel and strain.

Action—Uses.—Aperient and Stomachic in doses of f℥jss., repeated. The boiling water is ineligible, as a precipitate takes place on cooling: this is intended to be prevented by the addition of the Spirit. A good preparation may be made with cold water and percolation.

VINUM RHEI, E.: *Rhubarb Wine.*—Digest for 7 days coarsely powdered Rhubarb, ℥v., (℥ij., U.S.) Coarsely powdered Canella,

℥ij., (℥j., U. S.), in Proof Spirit, f℥v., (f℥ij., U. S.), and Sherry, Oj., and f℥xv. Strain; express strongly the residue. Filter.

Action—Uses.—Stomachic in doses of f℥ij. Purgative f℥ss.—℥j.

TINCTURA RHEI, E., U. S.: *Tincture of Rhubarb.*—Mix powdered Rhubarb, ℥iijss., (℥iij., U. S.), and bruised Cardamoms, ℥ss. Proceed by percolation with Proof Spirit, Oij., as in Tinct. Cinchona. Or prepare by digestion.

Action—Uses.—Stomachic in doses of f℥j. Purgative, f℥ss. A good preparation, especially if prepared by percolation, as Proof Spirit is an excellent solvent.

TINCTURA RHEI COMPOSITA, L. D.: *Comp. Tinct. of Rhubarb.*—Macerate for 14 (7, D.) days Cut Rhubarb. ℥ijss. (℥ij. D) Bruised Liquorice, ℥vj., Cut Ginger (℥ss., D.) and Saffron, ℥āā, ℥iij., (Bruised Cardamoms, ℥ss., D.), in Proof Spirit, Oij., (by measure, ℔ij, D.) Strain.

Action—Uses.—Cordial, Stomachic in doses of f℥j. Purgative, f℥ss.—f℥j.

TINCTURA RHEI ET ALOES, E., U. S.: *Tincture of Rhubarb and Aloes.*—Mix powdered Rhubarb, ℥jss. Socotrine or East Indian Aloes powdered, ℥vj. Bruised Cardamoms, ℥v.; and Proof Spirit, Oij. Proceed as for Tinct. Cinchona.

℞ Rhubarb bruised, ℥x., Aloes powdered, ℥vj. Cardamoms bruised, ℥ss. Diluted Alcohol, Oij. Macerate for 14 days; compress and filter through paper. U. S.

Action—Uses.—Warm Cathartic in doses of f℥ss.—f℥j.

TINCTURA RHEI ET GENTIANÆ, E., U. S: *Tincture of Rhubarb and Gentian.*—Mix Powdered Rhubarb, ℥ij. Powdered or finely Cut Gentian, ℥ss., Proof Spirit, Oij. Proceed as for Tinct. Cinchona.

Action—Uses.—Stomachic in doses of f℥j., and Aperient in f℥ss.—f℥j.

TINCTURA RHEI ET SENNÆ, U. S: *Tincture of Rhubarb and Senna.*—℞ Rhubarb, bruised ℥j. Senna, ℥ij. Coriander bruised, Fennel Seed bruised, āā, ℥j. Red Sounders rasped, ℥ij. Saffron, Liquorice, āā, ℥ss. Raisins, deprived of seeds, ℔ss. Diluted Alcohol, Oiij. Macerate for 14 days; compress and filter through paper.

SYRUPUS RHEI, U. S.: *Syrup of Rhubarb.*—℞ Rhubarb bruised, ℥ij. Boiling water, Oj. Sugar ℔ij. Macerate the Rhubarb in

the water for 24 hours and strain; then add the Sugar, and proceed in the manner directed for Syrup.

This is a mild astringent and laxative, and may be used in bowel affections. *Dose*, from f℥j. to f℥j.

SYRUPUS RHEI AROMATICUS, U. S.: *Aromatic Syrup of Rhubarb. Spiced Syrup of Rhubarb.*—Take of Rhubarb bruised ℥ijss. Cloves bruised, Cinnamon bruised, āā, ℥ss. Nutmeg bruised, ℥ij. Diluted Alcohol, Oij. Syrup, Ovj. Macerate the Rhubarb and Aromatics in the diluted Alcohol for 14 days, and strain; then by means of a water-bath, evaporate the liquor to a pint, and while it is still hot, mix it with the Syrup previously heated. It may also be made by displacement.

OLEUM RICINI.

SYNONYMS.—RICINI OLEUM. Ricinus communis, *Oleum e seminibus; expressum, Lond.;* RICINUS COMMUNIS Oleum e seminibus, *Dub.;* Huile de ricin, *Fr.;* Ricinusol, *Ger.;* Olio di ricino, *Ital.;* Aceyte de ricino, *Span.;* Castor Oil, *Vul.*

HISTORY.—The Castor Oil was known in the most ancient times. The plant (Palma Cristi) producing it, is the *gourd* spoken of in Jonah iv., 6, 7, 9, 10. (See *Kihayon*, in Bibl. Cycl. ii., p. 203.) In the Greek, the plant is also called κικι or κροτων (Dioscorides). The Latin name *Ricinus*, comes from the Greek name of an insect, the *tick*, which the seeds resemble. Both Hippocrates and Herodotus, speak of this plant. The Oil is now almost universally known, and used as a medicine. A native of India; when cultivated in this country, it is an annual. The Oil is manufactured extensively in the East and West Indies, as well as in the United States.

BOTANY.—*Sex. Syst.*—Monœcia Monadelphia.—*Nat. Ord.*—Euphorbiaceæ.

Gen. Char. RICINUS. *Flowers* monœcious. *Calyx* three to five-parted valvate. *Petals* none. *Filaments* numerous, unequally poladelphus; cells of the *anther* distinct, below the apex of the filament. *Style* short; *Stigmas* deeply bipartite, oblong, colored, feathery; *Ovary* globose, three-celled, with an ovule in each cell. *Fruit* generally prickly, capsular, tricoccous. *Trees, shrubs*, or *herbaceous plants* sometimes becoming arborescent. *Leaves* alternate, palmate, peltate, with glands at the apex of the petiole. *Flowers* in terminal panicles, the lower male, the upper female.

all articulated with their peduncles, and sometimes augmented by bi-glandular bracts.—(*Lindley.*)

Spec. Char. R. COMMUNIS. *Root*perennial or annual, long, thick, and fibrous. *Stems* round, thick, jointed, hollow, glaucous, of a purplish-red color upward. *Leaves* large, peltate, deeply divided into seven lanceolate, serrated segments, on long, tapering, purplish petioles, with glands at the apex of the petiole. *Flowers* monœcious, in terminal panicles, the lower male, the upper female, all articulated with their peduncles, and sometimes supported by bi-glandular bracts. *Calyx* 3—5 cleft, valvate. *Petals* wanting. *Male. Stamens* numerous, with the filaments branched and united below, with distinct globose cells of the anthers. *Female. Style* 1. *Stigmas* 3, bipartite, plumose, colored red. *Capsule* tricoccous, covered with spines, three-celled; one-seeded. *Seeds* pendulous, elongated, ovate, convex externally, somewhat flattened on the inside, of a pale grey color, but marbled with darker colors. The *seed* is covered by a thin, coriaceous, smooth seed-coat, composed of two layers, at its upper end is observed the fleshy swelling which has been termed *Strophiole*, with a delicate white membrane investing the nucleus, which is large, oleaginous, and consists of albumen, containing in the middle a large leafy embryo.—*Royle.*

PREPARATION.—"Two varieties of Castor Oil seed are known, one large, the other small. The latter is thought to yield more oil, and of a superior quality. Geiger found in 100 parts of these seeds, exclusive of moisture, 23·82 parts of seed-covering, and 69·09 of kernel. These 69·09 parts contained 46·19 parts of fixed Oil, 2·40 of Gum, 20·00 of Starch and Lignin, and 0·50 of Albumen. The kernel, when fresh, is of a white color, and sweetish almond-like taste, followed by some acrimony. The Oil may be extracted from the seeds by decoction in water, or expression, with or without the aid of heat, and for experiment by the agency of Alcohol. Sometimes the Oil is boiled with water to dissolve out the Mucilage and to coagulate the Albumen. Dr. Christison sums up the results of various papers by stating that by simple expression a mild oil of excellent quality may be extracted alike from the small and large varieties of the seed; that when so prepared,

it is apt to become sometimes rancid (Wright), but may be prevented from doing so, if heated to about 200°, so that its Albumen is coagulated and detached; that the embyro is scarcely more active than the Albumen of the nucleus, and that the husk and perispermal membrane are inert (Boudron and Henry); that if the seeds be boiled in the Eastern way, without first roasting them, or driving off the residual water from the Oil by heat, an Oil of fine quality is obtained, which keeps well (Guibourt), but is probably not quite so active: that the active part of the Oil is probably volatilizable during decoction with water (Guibourt), so that long ebullition may materially impair its energy; and that if the seeds be roasted before being expressed, or the Oil be exposed to a considerable heat, as in the American process, peculiar acids are engendered (called the Ricinic, the Elaïodic and Margaritic), which greatly increase the acridity" (Bussy and Lecanu).*

Description.—Castor Oil is a thick, viscid fluid, colorless when fresh, pale straw-colored when old, of a faint but unpleasant smell, oily, and sometimes acrid taste. Although heavier than most fixed oils, it is lighter than water. Its specific gravity is 0·969 at 55° F. If exposed to a cold of 32°, it deposits a few grains of Margarin. Exposed to the air, it becomes rancid, and dries up. It is soluble in all proportions in both Alcohol and Ether. "By the action of Hyponitrous acid, a solid fatty matter is produced, which has been called *Plamine*." The alkalies saponify it, but produce acids apparently identical with those generated during its distillation. Differing in many respects from other fixed oils, some chemists are inclined to consider it as consisting "of a single and peculiar oleaginous principle," others as composed of three fatty acids, the *Ricinic*, *Elaiodic*, and *Magaritic*, which are combined respectively with Glycerine.

Its purity may be tested by its being entirely dissolved by its own volume of Alcohol or Ether. In this respect it agrees with palm oil, but disagrees with all other fixed oils.

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* *Royle*, Ther. Amer. Ed. p. 538, 539.

ANALYSIS.—The castor-beans were analysed by Geiger, and produced the following results:

Seed coats.	Tasteless resin and extractive,	1·91	23·82
	Brown gum,	1·91	
	Ligneous fiber,	20·00	
Nucleus of the Seeds.	Fatty oil,	46·19	69·09
	Gum,	2·40	
	Caseum (albumen),	0·50	
	Ligneous fiber with starch,	20·00	
Loss			7·09
Castor seeds,			100·00

The oil has produced, as products of saponification. 1. Ricinic acid.* 2. Elïodic acid† (*Ricinio oleic acid*). 3. Margaritic acid‡ (*Ricinio-stearic acid*). By distillation a volatile oil is produced, which is analagous to *acroeline*. When the oil is acted on by hyponitrous acid, *palmine* is produced, and by the action of nitric acid on it, it produces, according to Mr. Tilly, Œnantheylic acid, Seberic acid, and Sipinic acids. The formula of the first is $C^{14} H^{13} O^{13} \times Aq$.

PHYSIOLOGICAL EFFECTS.—The castor seeds (*semina racina communis*) when taken, have a nauseous and somewhat acrid taste, and with most persons occasion protracted nausea, and even vomiting. But the oil, as usually prepared from them, is not very apt to produce much nausea, except what arises from its taste, which is disagreeable to almost every one. In doses of from a teaspoonful to a tablespoonful, it generally produces a laxative effect, and from one to three tablespoonfuls will operate as a purge in from one to six hours.

The purgative power of castor oil is, it would seem, of a specific nature, as we find that its tendency to move the bowels is evinced in whatever way it may be administered, as when injected into the veins or bowels, or when simply applied to the epigastrium, or to raw surfaces.

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* The crystallized Hydrate of this acid consists of C 73·56, H 9·86, and O 16·58, or $C^{35} H^{31} O^{5}$.

† The composition of this is unknown.

‡ The crystallized hydrate of this consists of C 70·5, H 10·90, and O 18·59. Its formula is C 35 H 31 O 6.

THERAPEUTIC PROPERTIES.—Castor oil is regarded as being one of the mildest purgatives that we possess, and although of great activity, seldom occasions any uneasiness in the bowels. Dr. Cullen (Mat. Med.) says, "It has this particular advantage, that it operates sooner after its exhibition than any other purgative I know of, as it commonly operates in two or three hours. It seldom gives any griping, and its operation is generally moderate—to one, two, or three stools only." Its immediate effects are chiefly confined to the intestinal canal, and the discharges produced are never very thin. Nor is the medicine ever apt to occasion much debility.

The application of castor oil is in all cases, in which the milder cathartics prove beneficial. Dr. Pereira has specified eight special applications of the medicine, viz:

1. *In inflammatory affections of the alimentary canal*, as enteritis, peritonitis, and dysentery.

2. *In obstructions and spasmodic affections of the bowels*, as intussusception, ileus, and colic, especially lead colic, "this oil is the most effectual evacuent we can employ."

3. *As a cathartic after surgical operations about the pelvis or abdomen* (e. g., lithotomy, and the operation for strangulated hernia), and after parturition.

4. *In affections of the urino-genital organs, of a spasmodic or inflammatory character*, as inflammation of the kidneys, or bladder, calculous affections, gonorrhea, strictures, etc.

5. *In diseases of the rectum*, particularly piles, prolapsus, stricture, etc., in which no better cathartic can be used.

6. *As an anthelmintic.*

7. *As a common purgative for children.*

8. *In habitual constipation.*—Dr. Cullen thought that instead of persons becoming habituated to the action of this article, so as to require an increase of the dose progressively, as is the case with most others, they will find that, in fact, a gradual diminution may be practiced with equally good effect until the dose is reduced from half an ounce to two drachms.

ADMINISTRATION.—The dose of oil for children is from a teaspoonful to a tablespoonful; that for adults from a tablespoonful to an ounce. It is best taken floating on coffee, or spirit,

especially gin, or it may be given with aromatics, or be made up in an emulsion with the yolk of egg and mucilage.

ALOE.—The inspissated juice of various species of Aloe.

SYNONYMS.—Πικρος, *Greek;* Elwa, *Hindoo;* Sibbur, *Arab;* Bol-seah, *Persian;* Aloe, *Ger., Ital.;* Aloe, *Span.;* Suc d' Aloes, *Fr.;* Aloes, *Eng.;* Pica, *Vul.*

HISTORY.—Aloes were known to Dioscorides, to Galen, to Celsus, and to Pliny, but Hippocrates and Theophrastus do not speak of them. They must have been in use for a long time, both in India and Arabia.

BOTANY.—*Sex. Syst.*—Hexandria Monogynia. *Nat. Ord.* Liliaceæ.

Gen. Char. ALOE.—*Perianth* tubular, six-cleft, fleshy, nectariferous at the base, the sepals of the same form as the petals, and closely embricating them. *Stamens* hypogynous, as long as the perianth, or even longer. *Capsule* membranous, scarious, three-cornered, three-celled, three-valved, with a loculicidal dehiscence. *Seeds* numerous, in two rows, roundish or angular.—*Lindley.*

Spec. Char. There are a number of species yielding the different aloes of commerce, some of which merit a separate notice.

1. ALOE SOCOTRINA, Lam, De Cand.—*Stem* woody, straight, one and a half feet or more in hight, naked below, where it is strongly marked with the scars of leaves. *Leaves* amplexicaul, ascending, ensiform, green, curved inward at the point, convex below, rather concave above, marked with numerous small white marginal serratures, the parenchyma abounding in a bright brownish yellow juice. *Raceme* cylindrical, unbranched. *Flowers* scarlet at the base, pale in the middle, green at the point. *Stamens* unequal, three of them longer than the flowers.—*Lindley.*

The *aloe socotrina* is a native of the island of Socotra, near the straits of Babelmandel, and yields the socotrine aloes, and, according to some, also the real hepatica.

2. ALOE VULGARIS. *Lam. Stem* woody, simple, cylindrical, short. *Leaves* fleshy, amplexicaul, first spreading, then ascending, lanceolate, glaucous green, flat above, convex below, armed with hard, distant, reddish spines, perpendicular to the margin; a little mottled with darker color; the perenchyma slightly colored brown, and very distinct from the tough, leathery cuticle. *Scape* axillary, glaucous, reddish, branched. *Spike* cylindrical-ovate. *Flowers* at first

erect, then spreading, after pendulous, yellow, not longer than the stamens.—*Lindley.*

This species is a native of the East Indies and Barbary, and is cultivated in the West Indies, Italy, Sicily, and Malta. It yields Barbadoes aloes. It is said that the two sub-species *A. Abyssinica* and *A. Barbadensis* are now divided from the A. Vulgaris.

3. ALOE SPICATA, *Thun.* *Stem* three to four feet high, as thick a s a man's arm. *Leaves* thick, fleshy, broad at the base, gradually narrowing to the point, channeled, full two feet long, distantly toothed, with a few white spots, their parenchyma almost colorless. *Spike* a foot long, very compact, with the flowers campanulate and horizontal. The three petals broader, ovate, obtuse, white, with a triple green line, the sepals narrower, less concave. *Stamens* much longer than the perianth. The flowers are filled with a purplish honey. *Lindley.* A native of the interior of the Cape of Good Hope, and contributes to yield *Cape Aloes.*

4. ALOE RUBESCENS, *Dec.* *Stem* suffruticose. *Leaves* amplexicaul, spreading. thorny at the margin. *Peduncle* compressed, branched. *Branches* subbractate (*Pl. grass* t. 15). A native of Arabia—*R.*

5. A. BARBADENSIS, *Mill.* *Stem* somewhat shrubby, offshoots from the root. *Leaves* sword-shaped, sinuato-serrate. *Corol* yellow. Var, of *vulgaris*, Nees von E. 50. South of Europe, perhaps in the Peninsula or India. (Rheede, ii. t. 3). Introduced into the West Indies.—*R.*

6. A. ABYSSINICA, *Lam.* Subcaulescent, *Leaves* long and lanceolate, rather, erect, hard, of a deep green color, rather concave above; *margin* sinuato-dentate, reddish; *flowers* of a greenish yellow. Var. of *A. vulgarie* Linn.—Abyssinia.—*R.*

7. ALOE INDICA, *Royle.* A low plant, with spikes of red flowers, which grows in dry barren places in N. W. Indies. This, if known to Roxburg, was probably included by him in *A perfoliata.* Col. Sykes has a species from the Deccan also with red flowers.—*R.*

DESCRIPTION.—There are different commercial varieties of this drug, whose physical and medical properties are considerably different, and merit separate descriptions.

a. SOCOTRINE Aloes. (*Aloe Socotrina.*)—The true socotrine aloes may be distinguished from all others, by its being of a redder color, and much more agreeable odor. It has a "garnet-red" hue, is in thin and translucent pieces, and when quite dry, is of a "golden-red" or copper color, but by exposure it changes to a brownish red. Its fracture is conchoidal, usually smooth and shining, but occasionally a little rough. The odor fragrant, especially when the drug is fresh and heated, or when the breath is blown upon it. It is almost completely soluble in spirits, and easily reduced into a golden-yellow powder.

As this is considered rather the best variety of aloes, many

inferior sorts are called by the name it bears, to promote their sale. The annual export of aloes from Socotra is only about two tons; and when it is considered that the whole world must be supplied with this, it is not reasonable to suppose that every article going by this name is genuine. Hence it has been said, that "much aloes going by this name has never seen the island of Socotra."

β. Hepatic Aloes. (*Aloe Hepatica.*)—The genuine hepatic aloes is supposed to be a variety of the socotrine. It is imported from Bombay, and has hence been called *Bombay* or *East India Aloes.* It comes in skins, contained in casks, holding two to three hundred pounds each. Its odor is pleasant, resembling the socotrine, but may be distinguished by its opacity and *liver* color. This, at first, was justly considered a superior variety of aloes, and only inferior to the genuine socotrine; but, like that of the latter, its name was soon applied to other and inferior sorts from motives of speculation. When the name *Hepatic Aloes* was first applied to the aloetic productions of the West Indies, the better sorts of the latter were only considered entitled to the appellation. But, at present *Hepatic Aloes* seems to be a common name for all the West Indian varieties of the drug.

γ Cape Aloes. (*Aloe Capensis.*)—This variety of aloes is imported from the Cape of Good Hope, on the southern extremity of Africa. It is brought here in chests and skins; that brought in the latter is best. Cape aloes has a shining, resinous appearance, is of a deep, brown color, with a greenish tint, and has a glossy or resinous fracture. The edges of the fracture, or thin pieces, viewed by a light transmitted through it, have a ruby or yellowish-red color. Its odor is still more strong and disagreeable than that of the West India aloes, but it is not nauseous. The powder is greenish yellow.

Cape Aloes is collected by the Hottentots and Dutch boors, in great quantities, so that it has become extremely low in price, and being generally of a moderately good quality is more used than any other kind. The greatest objection to it is its unpleasant odor.

δ Barbadoes Aloes. (*Aloe Barbadensis.*)—This, which is now generally called *hepatic aloes*, is the product of the West Indies. Its color is not uniform; sometimes it is dark brown or almost black, or of a reddish-brown, or liver color, and again of some intermediate shade. It is never clear or transparent like the socotrine, but is of a dull fracture, and almost perfectly opaque, even at the thin edges of the fractures, or thin layers. Its odor is nauseous and disagreeable. The powder is of a dull, olive-yellow color.

Besides those varieties already named, there are some others of less importance, as the Cabaline or *Horse Aloes*, which is

said to be a product of Spain; MOCHA ALOES, produced on the Island of Muscat—said to be a tolerably good kind; INDIAN ALOES (not the *A. Indica* of the Ed. P.), of this Dr. Pereira states he has received four varieties from Professor Royle, viz: 1, Those from Northern India—dull, black, brittle, of little odor. 2, *Guzerot Aloes*—dark, gummy, and difficult to fracture. 3, *Salem Aloes*—blackish masses, large air cavities within, of an agreeable odor. 4, *Trichinopoli Aloes*—resembles Cape Aloes in its brittleness, odor, and color, but is more opaque.

ANALYSIS.—Aloes has been analysed by Trommsdorf, Vogel, and Bouillon-Lagrange, Braconnot, Winkler, and others, with variable results depending upon the kinds of the drug used, and the care with which the analysis was conducted. But the principle constituents were found to be a *resin*, a *saponaceous principle* (called *aloisin*), *albumen*, or an *insoluble albuminous principle*, and *aloetic acid*. Aloes were formerly considered to be a gum-resin, but Braconnot has shown that the portion considered to be gum is an extractive of a peculiar character (*aloisin*). The proportion of this principle varies from fifty to eighty per cent. in the different sorts of aloes.

"*Aloisin* is soluble in water and in weak spirit, and may be obtained from the former solution in thin, translucent layers, which are of a reddish-brown color, but of a fine yellow when powdered, very bitter, and extremely active as a cathartic. Besides this, there is an *oxygenated extractive matter*, of which the quantity is increased when aloes are boiled. The quantity of this varies from six to forty-two per cent., and in some kinds there is *vegetable albumen*, as might be expected where the juices of leaves are pressed out and then boiled. The presence of an acid in a solution of aloes is indicated by litmus-paper. Trommsdorff considered this to be the Gallic, but Dr. Pereira has named it *aloetic acid*."

PHYSIOLOGICAL EFFECTS.—Aloes proves cathartic to most animals of the higher order. On man, from one to five grains will usually produce this effect. It also proves tonic, but this effect is most apparent when taken in small doses. In its operation as a purge, it is rather slow, and is moreover chiefly

confined to the lower portions of the intestines. This has been attributed to its being difficult of solution, and that because it is not dissolved when passing through the upper portions of the intestines, its specific effect is not there developed. But this is a mistake, as the tincture of aloes is also slow, or, at least, not by any means *proportionally* more quick.

Aloes is considered a very safe medicine, and is very extensively used in pills, as its dose is small, and its virtues rather permanent. What is remarkable with this article, is that an increase of its dose is not followed by a proportionate increase of its powers or activity; twenty grains will produce but little more effect than five.

THERAPEUTIC PROPERTIES AND USE.—All varieties of aloes are cathartic, but are slow in their operation. They seem to direct their action to the muscular coat of the intestines, rather than to the exhalent vessels, and, as already stated, to the lower portions of the canal more than the upper.

Aloes is also tonic and emmenagogue; the latter property has secured it a place in another class. Its tonic power is a happy accompaniment with the cathartic, and gains it many applications that simple cathartics do not possess.

The particular cases in which the use of aloes is, and has been advised, are the following:

1. *In loss of appetite, and dyspepsia*, especially when accompanied with costiveness. Here the medicine will prove very serviceable when exhibited in small doses.

2. *In habitual constipation of the bowels*, arising from a deficiency of bile, or a sluggish condition of the large intestines. Aloes, given in doses sufficiently large to occasion purging, will generally be very beneficial.

3. *Hypocondriasis and nervous inactivity*, occasioned by study or sedentary habits, are well calculated to prove the valuable medical virtues of aloes.

4. *In cerebral affections*, especially when of an inflammatory character, and there is much congestion and tendency to apoplexy, a thorough purge of aloes will often be of more benefit than any other remedy.

5. *In worm complaints* an occasional cathartic of aloes will

often serve as a complete prophylactic against worms. Used in strong decoction by enema, aloes will remove the *ascaris vermicularis*, or thread-worm.

6. *To promote the secretion of bile.*—It is thought that aloes has a specific power to excite the functions of the liver, in the secretion of bile.

7. *To excite the menstrual discharge.*—If thorough purging is instituted with aloes, the menstrual flux is often brought on after the most active emmenagogues have failed. The consideration of its specific emmenagogue powers belongs to another class.

The dose of aloes is gr. v.; but less will often operate.

PHARMACEUTIC PREPARATIONS.—**DECOCTUM ALOES (E.), COMP., L. D.:** *Compound Decoction of Aloes.*—Boil Extract of Licorice ʒvij. (ʒss. E. D.), Carb. Potash, ʒj. (℈ij., E. D.), bruised. (Socotrine, E. or Hepatic, E. D.) Aloes, powdered Myrrh and Saffron, āā, ʒss. (ʒj., E. D.), in Aq. dist., Ojss. (fʒxvj., E., by measure ℔j., D.), till only Oj. (ʒxij., E. D.) remains. Filter and add Comp. Tincture of Cardamoms, fʒvij. (fʒiv., E. D.)

Action—Use.—Cathartic; emmenagogue in doses of fʒss.—fʒij. The boiling must not be carried to any considerable extent, as some of the aloes becomes insoluble.

ALOISIN: *Extractive of Aloes.*—℞ Pulverized Aloes, ʒxij.; boiling water, Oij.; place the water into a proper vessel and throw the aloes by intervals into it and stirring it until cold, then let it rest for two days, so as to allow the apotheme, albumen, or fecula to settle; pour off the liquid and evaporate to one-fourth the quantity; add a very weak solution of acetate of lead to precipitate the gallic acid and what albumen may still remain; pour off the fluid again carefully, and evaporate to the proper consistence by means of a water bath.

The product is the extractive principle of aloes sufficiently pure for medical use. Dose, gr. v.

Use.—Same as aloes.

VINUM ALOES, L. E. D., U. S.: *Wine of Aloes.*—Take (separately, D.) powdered Aloes (Socotrine, E. D. or E. Indian, E.), ʒij. (ʒjss., E., ʒiv. D.), (ʒj., U. S.); and Canella, ʒiv. L. (ʒj., D. Ground Cardamon Seeds and Ginger, āā., ʒjss., E.). (ʒj., U. S.) Pour upon them Sherry Wine, Oij. (by measure, ℔iij., mixed with proof Spirit, by measure ℔j. D.), (Oj., U. S.) Macerate for 14 (7, E.) days, continually agitating; then strain (through linen or calico, E.)

Action— Use.—Warm cathartic in doses of f℥ss.—f℥j.

TINCTURA ALOES, L. E. D., U. S.: *Tincture of Aloes.*—Macerate for 14 (7, E.) days bruised (Socotrine, E. D. or Indian, E.,), Aloes, ℥j. (℥ss., D.) Extract of Licorice, ℥iij. (℥jss., dissolved in boiling Aq., ℥viij., D.), in Aq. dist., Ojss., L. (Oj. and f℥viij., E.), and Rectified (Proof, D.) Spirit, Oss. (f℥xij., E., by measure, ℥viij., D.) (Agitate occasionally, E.) Strain. (Not conveniently prepared by percolation, E.)

Action— Use.—Cathartic adjunct to purgative or emmenagogue draughts, in doses of f℥ss.—f℥ij. The weak spirit is an excellent solvent of the active properties.

TINCTURA ALOES (COMPOSITA, L. D.), ET MYRRHÆ, E. U. S.; *Tincture of Aloes and Myrrh.*—Macerate for 14 (7, E.) days bruised (Socotrine, E. D. or Indian, E.) Aloes, ℥iv., (℥iij., D., U. S.), Saffron, L. E., ℥ij. (℥j., U. S.), in Tincture of Myrrh, Oij., (by measure, ℔ij.) Strain. (Not well prepared by percolation, E.)

Action— Use.—Emmenagogue. Stimulant Cathartic and adjunct to draughts and mixture in doses f℥ss.—f℥ij.

PILULÆ ALOES (E.) COMPOSITÆ, L. D.: *Compound Aloes Pills.*—Beat into a pill mass, Bruised Aloes (Socotrine and Castile Soap, equal parts, E., Hepatic, D.), ℥j., L. D. Extract Gentian, ℥ss., L. D. Oil of Caraway min., xl., L. D. Syrup, q. s., L. D. (Conserve of Red Roses, q. s., D.)

Action— Use.—Cathartic and tonic, in doses of gr. x.—℈ss. The Gentian and the soap are both thought to promote the action of the Aloes.

PILULÆ ALOES (CUM MYRRHA, L. D.) ET MYRRHÆ, E. U. S.: *Aloes and Myrrh Pills.*—Rub separately into powder, Aloes (Socotrine or E. I. 4 parts, E., Hepatic, D.), ℥ij., and Myrrh, ℥j. (2 parts, E.), then rub them together, till incorporated, with Saffron, ℥j. (1 part, E.) Syrup, q. s., L. D. (Conserve of Red Roses, E.)

Action— Use.—Cathartic and emmenagogue in doses of gr. x.—℈j., every night.

PILULÆ ALOES ET ASAFŒTIDA, E. U. S.: *Aloes and Asafœtida Pills.*—Beat into a proper pill mass, Socotrine, or E. Indian Aloes, Asafœtida, and Castile Soap. āā., equal parts, with Conserve of Roses, q. s.

EXTRACTUM ALOES, PURIF., L. EXTR. ALOES HEPETICÆ, D.: *Extract of Aloes.*—Macerate with a gentle heat for three days, Bruised Aloes, ℥xv. Hepatic 8 parts, D. in boiling Aq. Oj. (8 parts, D.) Strain and set aside for the dregs to subside. Pour off the clear liquor, and evaporate to a proper consistence.

Action — Use.—Cathartic, in doses of gr. v.—xv. Useful preparation, when freed from all impurities.

PULVIS ALOES CUM CANELLA, D. (ET CANELLÆ, U. S.): *Aloes and Canella Powder.*—Rub separately into powder, Hepatic Aloes, ℔j. White Canella, ʒiij; and mix.

Action — Use.—Cathartic and stomachic, in doses of gr. x.—ʒj.

PELVIS ALOES COMPOSITUS, L. D.: *Compound Aloes Powder.*—Rub separately into powder Aloes (Hepatic D.), ʒjss. Resin Guaiacum, ʒj.; and add Comp. Cinnamon (Aromatic, D.) Powder ʒss.: mix.

Action — Use.—Warm cathartic and diaphoretic in doses of gr. x.—ʒj.

JUGLANS CINNEREA.—The Extract.

Synonyms.—Juglans Cathartica; Weiser Walnus, *Ger.;* White Walnut, Butter-Nut, Oil Nut, etc., *Vul.*

History.—During the Revolutionary War, Dr. Rush, became acquainted with the valuable cathartic power of the bark of the white walnut. The soldiers had gained a knowledge of its empirical use, as a remedy for dysentery, which proved so violent, that the physicians could not successfully control it, until this remedy was discovered. The attention of Rush was thus directed to the article, and on finding it so valuable, he prescribed it extensively. The *extract* has since become officinal in the United States Pharmacopœia.

Botany.—*Sex. Syst.*—Monœcia Polyandria. *Nat. Ord.*—Juglandaceæ.

Gen. Char. Juglans. Male—*Amentum* imbricated. *Calyx* a scale. *Corolla* six-parted. *Filaments* four to eighteen. Female—*Calyx* four cleft, superior. *Corolla* four cleft. *Styles* two. *Drupe* coriaceous with a furrowed nut.—*Wild.*

Spec. Char. J. Cinnerea. An indigenous forest *tree*, smaller than the black walnut, but known, in favorable situations to attain considerable size—fifty feet in hight—with a *trunk* three or four feet in diameter. When standing in open situations, the tree usually branches out within from eight to fifteen feet from the ground. The *branches* are nearly horizontal; these,

as well as the trunk, are covered, when young, with a smooth, gray or ash-colored *bark*, whence its specific name *cinnerea;* but when old, it cracks and becomes rough, and of a darker color. The *leaves* are long, and consist of from six to eight pairs of oblong, lanceolate, leaflets: they are aromatic, like all those of the juglans genera. The male *flowers* are in large aments, four or five inches long, hanging down from the extremity of the shoots of the preceeding year's growth. The fertile flowers are on the ends of the twigs of the same year's production. The fruit, which consists of an oblong nut, from an inch to an inch and a half in diameter, and from two to four inches in length, is generally in pairs on the same peduncle. The color of the *drupe* is the same as that of the leaves when immature, but of a blackish-brown when ripe. Its *shuck* or fleshy portion is juicy, but hard, and extremely acrid to the taste,—produces vesication when applied to the skin.* The *nut* is deeply furrowed, and has a severable longitudinal seam. The kernel is lobular, like that of all the juglans, very oily and edible. The tree grows in most parts of the United States.

Analysis.—The inner portion of the bark of the root, which is the medicinal part, contains an *essential* and a *fixed oil; resin*, *sugar*, an *extractive*, yielding a *peculiar principle* (*juglandine*), upon which the active properties of the medicine are dependent, *tannic acid*, *potassa*, and *lime*. The bark will yield its virtues to water and alcohol.

Physiological Effects.—In small doses, the decoction of the bark is slightly stimulant, and aperient; in larger ones it proves cathartic; in excessive doses, vomiting. In moderate doses it is harmless.

Therapeutic Properties and Use.—The bark of this tree affords one of the mildest and most certain catharties that we possess. It operates without griping, nausea, or any other unpleasant effects. Like rhubarb, it is somewhat astringent, and is hence, very applicable in dysentery and diarrhea. It

* The shuck of the butter-nut has been used as a vesicant by those who practice the use of those agents.

is also available in fevers, dyspepsia, habitual costiveness, liver complaints, and visceral inflammations generally. Its operation seems to be quite physiological, and not apt to occasion debility. The medicine is also considered a valuable anthelmintic, when given in cathartic doses.

PHARMACEUTIC PREPARATIONS.—The white walnut has not yet furnished us many pharmaceutic preparations. The following, however, are quite valuable.

VINUM JUGLANDIS: *Wine of White Walnut.* — ℞ Port Wine, Oiij., White Walnut, inner bark of the root, in coarse powder, ℥iv. Digest in the sun for ten days, or by a moderate heat for five or six hours, and strain.

Action—Uses.—A valuable stimulating, and tonic cathartic, useful in dysentery, diarrhea, intermittents, hypochondriasis, delirium tremens, etc. *Dose*, a small wineglassful, repeated.

EXTRACTUM JUGLANDIS: *Extract of White Walnut.*—Take of the inner bark of White Walnut (that of the root is much the best) a suitable quantity. Water q. s. Put in an iron kettle, and boil for four hours; strain and boil to the consistence of syrup; clarify with the white of an egg, and evaporate by means of a water bath to the proper consistence.

Action—Use.—This contains all the virtues of the bark, and may be taken in doses of gr. x. to gr. xx.

EXTRACTUM JUGLANDIS PRECIPITATUM: *Precipitated extract of White Walnut* (JUGLANDIN). ℞ Saturated Alcoholic tincture of White Walnut Bark one part; water two parts; boil away or distil off the alcohol; set aside the residuum in a proper vessel, so that precipitation may take place. In two days this will be mostly completed when the supernatant liquor is to be thrown off, and the precipitated extract or impure *juglandin* taken up and dried in an airy place. This is a black, scaly mass, capable of powdering, in cold weather, but rather adhesive in hot. It possesses the peculiar flavor and taste of the bark, and contains its active medical properties.

Action—Use.—Same as the common extract, but requiring smaller quantity. Dose, gr. iij.—gr. v.

FEL BOVINUM *seu* TAURI.

SYNONYMS—FEL TAURI INSPISSATUM; Ox Galle, *Ger.;* Bile de Bœuf, *Fr.;* Beef's Gall, Ox-Gall, *Vul.*

DESCRIPTION.—Fresh Beef's Gall, is a viscid fluid, of a greenish-yellow color, a peculiar nauseous odor, and a very bitter,

sickening taste. As prepared for medical purposes, it is dried by spontaneous evaporation, when it is of a more or less solid and hard consistence, brown color, and possesses its natural and peculiar odor.

The gall may also be refined in the following manner: Take of Fresh ox-gall, Oij, alum, ℥j, chloride of soda, ℥j. Boil one pint of gall, and skim; add the alum and keep it on the fire for some time; boil the other part of the gall, as before, and add the salt in the same way as the alum; keep both these solutions bottled separately, for three months; then decant off the clear liquid; mix them in equal proportions; a thick, yellow coagulum is immediately formed, leaving the refined gall clear and colorless.

Analysis.—The Ox-gall, analyzed by Berzelius, was found to contain 1, *bilin;* 2, *cholepyrrhin;* 3, *mucus;* 4, *extractive matters;* 5, *a peculiar fatty matter* (*cholestrin*); 6, *oleate*, *magarate*, and *sterate* of *soda;* 7, *chloride of sodium*, *sulphate*, *phosphate*, and *lactate* of *soda*, and *phosphate* of *lime*.

It will be discovered that the composition, as well as its common effects, prove bile to be a powerful chemical agent,—alkaline in principle,—well calculated for the digestion of oleaginous substances.

Physiological Effects.—Ox-gall produces effects on the human system, very analogous to those ofhuman bile; it promotes digestion, proves tonic, and prominently laxative. The bile appears to be the chief agent that maintains the peristaltic motion.

Therapeutic Properties and Use.—Bile is justly considered the most natural cathartic that can be used, and the repugnance with which it is taken, can be the only objection to its employment.

When the normal peristaltic motion is feeble, and the bowels incline to costiveness, no article is better adapted than this; and when duodenal digestion is imperfect, from a want of the natural biliary secretion, the Ox-gall will serve as a substitute.

Beef's gall is also an excellent remedy in flatulent and even lead colic. It has often given relief, when many other more

fashionable remedies had failed. As a remedy in intermittents, it has been much esteemed by some country practitioners; and perhaps there is no better common cathartic for dyspeptic habits. The dose is a few grains of the dried gall, or from ten to fifteen drops of the fluid bile. The most convenient form of using it is in pills. These may be coated with sugar, flour, or any other substance desired, and thus the disagreeable taste of the gall may be obviated.

CHOLAGOGUES—ANTI-BILIOUS CATHARTICS.

The term *Cholagogue*, from the Greek word χολη, "bile," and αγω, "I expel," is employed to designate that order of cathartics which are known to have a decided action upon the biliary apparatus, and which carry away the bile.

The theory which projects the doctrine, that all the structures of the body are within the reach of medical action, and that every function may thus be modified, interposes no objection to the admission of this order of purgatives. And, happily for its systematic initiation, no *a priori argument* is necessary; for observation settles the matter at once—all know the cholagogue power of certain agents from what experience has taught. Indeed, our solicitude in future must, for some time at least, be shifted upon *other* grounds. It will require all the power of the profession to arrest the quackery and speculation now enlisted alone under the streaming banners, posted every where, for the sale of "Anti-bilious Pills." What a war against bile!—what a battle-ground the poor livers of the people do present!

Even on the part of the profession, a more perfect discrimination, as to the demands for the use of this order of purgatives, would, without doubt, have circumscribed more the employment of the *mercurials*, which have for so long been considered the only reliable agents to reach the liver, in their action.

But a new element has now been introduced, whose molding power upon popular sentiment, will move as the omnipotent force of truth—this new element comprises the great organic resources of our materia medica, which are now being

developed. The mercurials must now as certainly give place, as did the old *stage-coach* to the modern *locomotive*.

Modus Operandi.—The knowledge of the fact, that any irritation or impression, made upon the mouths or the ducts of glands, reaches the glands themselves, as if directly impressed, will readily suggest the *modus operandi* of the cholagogues, so far as their impression upon the liver is concerned. But the more extended action of these agents, that upon the *other* glandular structures, and which is not strictly cholagogue, is much less readily apprehended.

To understand this matter correctly, it must be remembered that all medical agents are dependent, for their special action, upon certain susceptibilities that are inherent to the organs upon which such action is displayed. Sulphuric and carbonic acids, in gaseous form, are exceedingly irritant to the nerves of the air-passages; but upon those of the alimentary canal, these acids, in the same, or *in any other state*, diluted, produce no disagreeable symptoms whatever; but on the other hand, they give rise to very pleasurable sensations. Sugar is agreeable to the gustatory nerves,—it tastes pleasantly—but when put in contact with the denuded sentient extremities of any of the other nerves, it will produce *irritation* and *pain*.

It is this peculiar endowment of the nerves of the several organic tissues that has to be invoked by all therapeutists, in their attempts to explain the specific action of any of the dynamic medicines.

When, therefore, we refer, in a philosophical sense, to the action of cholagogues, we mean *an action displayed especially upon the liver*, as upon a *gland*: and when we speak of the *general impression* of this order of cathartics, we mean *that impression which extends also to the general glandular structures*. Cholagogues, thus, are special stimulants to the liver, or to its ducts (for it is all the same whether the impression reaches only the duodenal mouth of the duct, or whether they act directly upon the glandular structure), and their action thus implies a stimulation of the parts so as to promote the *secretion* and consequent *excretion* of the bile, and hence the term cholagogue. The *quality* of the impression required upon the mouth of the

ductus communis choledocus,—at its entrance into the duodenum—is, however, not necessarily very specific, as appears from the effects of common irritants. The acrid humors in some forms of dysentery, and diarrhea, in bringing off bile (sometimes in considerable *quantity*), prove this pretty clearly. Emetics also bring up fresh bile, in most instances, if they are pushed somewhat.

It is evident from this that the simple cholagogue effect of cathartics, is more readily developed than that which relates to the elimination of secretions from other glands. The latter seem to require either that the medicine shall enter the circulation, and by this means reach the parts upon which their effects are to be displayed, or they must produce a constitutional impression, as it is sometimes called, upon the nervous system, through which the glandular structures may be reached. But however the agents may *produce* their effects, there can be no question as to the *facts:* that is, *cholagogues do reach the general glandular structures also*, and produce corresponding evacuative results.

There is still one more principle of action, upon which the phenomena in question may be explained, and this concerns the *reciprocal affinities* of the vascular and secretory systems. It is well known that the activity of glandular secretion is much dependent upon the condition of the vessels of the circulation, as to their *repletion*, or *depletion*. When the vessels are well supplied, the action of the glands is free and full, but, on the other hand, when the circulation is not well supplied—when there is a state of depletion—then the functions of the glands are correspondingly modified, *i. e.* there is *less* secretion.*

This law of reciprocal action is necessarily often referred to in therapeutics, since it lies at the foundation of a philosophical exposition of much that relates to the effects of evacuents.

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* This glandular action is exactly the reverse of that of the veins, under similar circumstances. They are *more* active, when the vessels are exanguous, as is remarked where the author describes the effects of hydragogues, and their utility in dropsy.

It is evident, however, that while the general impression of the *cholagogues*, upon the glandular system, may be on the same principles upon which the *hydragogues* produce this effect, still the former have only a subordinate power in this way: for we know that the latter will suppress *perspiration* much more readily than the former.

The instincts of empiricism, if the expression can be permitted, seem to have apprehended this fact; for we sometimes observe prescriptions, where diaphoretics and what are called anti-bilious remedies, are given conjointly, while hydragogues, and diaphoretics, are by them generally treated as incompatible.

APPLICATION.—Cholagogues have their range of application chiefly in those forms of disease which are dependent upon a disturbed state of the hepatic functions, or in congestion of the portal system.

In the tropical regions, and in high thermal districts, generally, the liver is much more subject to congestion, and derangement of circulation, than any other organ of the human body. This may be explained by the fact that it receives more blood, by far, than any other structure. While it shares, at least equally, with all other parts in the supply of *arterial* blood, it receives moreover a very large amount of *venous* blood through the venæ portarum.

Under all circumstances, therefore, that favor congestion, the liver must suffer quite the most. In addition to this fact, it must also be remembered that the venous blood, thrown into this viscus, is far less vitalized than the arterial, and that here the functional integrity is, therefore, sustained with much more difficulty, than in other organs. If the Hippocratean and Galenic doctrine of the "*concoction of the humors*," were now admissible, then it would not be *difficult* to apprehend the mischiefs attendant on hepatic venous congestion.

Remittent fever, of the bilious type, yellow fever, icterus, cholera, etc., clearly indicate the use of this order of cathartics; and the more *South*, and the further *West* we go, on this continent, the more apparent will be our observation of this truth. Hence it happens, that in South-western districts, the profession find the views of men who obtained their education

and experience in the North, and East, to be *untenable* in a practical sense; and, on the other hand, the treatises on medicine, written by individuals that have had experience in the fever districts of our Western rivers, and in our Southern climate, are much more esteemed by the profession, in those places, than those produced by others.

PODOPHYLLUM—The Rhizoma.

SYNONYMS.—ANAPODOPHYLLUM CANADENSE, *Catasb.;* ACONITIFOLIA humilis, flore albo unico campanulato fructu cynosbati, *Mentz.;* Πους φυλλον, *Gr.;* Schildblattriger Entenfuss, *Ger.;* Entenfuss, Fluss blatt, *Dutch;* Podophylle de Peltate, *Fr.;* Mayapfel *Vul. Ger.:* May Apple, Mandrake, Wild Lemon, etc., *Vul.*

HISTORY.—This is a native of North America, and is peculiar to this country. The Aborigines, it seems, had the first knowledge of it. They were all very fond of the fruit. The Cherokees made a syrup of it, which they regarded as a common purgative, useful in fevers pleurisies, etc. They also regarded it anthelmintic, as by its active purging power it carried off the worms. The juice of the fresh root they considered a cure for deafness; they dropped a few minims into the ear. The Osage tribe considered the root a cure for poisons; they state that it drives the poisons off through the bowels.

The root of this plant has been in empirical use from the early settling of this country by the colonists, who gained their knowledge of it from the Indians. It is about fifty years since the attention of the regular profession was first directed to its virtues. The plant has become officinal in the U. S. Pharmacopœia, and has gained a notice in all regular treatises on Materia Medica. In Europe it has, as yet, gained but little attention. But as the profession have confined their attention to its empirical use, rather than to its consideration in a pharmaceuto-physiological point of view, the medicine has never gained a higher character than that of a drastic hydragogue, rather suspicious in its effects. Of late some of our persevering and inquisitive reformers have investigated its therapeutic properties, and their inquiries have been so amply rewarded by their discoveries, that the plant is certain to gain

the character of a highly important article of our Materia Medica.

BOTANY.—*Sex. Syst.*—Polyandria Monogynia.—*Nat. Ord.* Ranunculi, *Juss.*; Rhæadeæ, *Linn.*; Podophylleæ, *Lind.*

Gen. Char. PODOPHYLLUM. *Calyx* (perianth), inferior, three-parted, colored, elliptical, convex-concave sepals, soon falling. *Corolla* nine-petaled. *Stamens*, filaments numerous, short; anthers oblong, pointed, large, erect. *Pistil*, germen superior, roundish-oblong; *style* none; *stigma* obtuse, furrowed, persistent; *Pericarp*, berry globose, crowned with the dark, persistent stigma, yellow, or orange-colored when ripe, one-celled, many-seeded.

Spec. Char. The podophyllum genus has been thought to consist of one species only; yet three have been discovered by Rafinesque, viz: 1, *P. Peltatum*; 2, *P. Montanum*, 3, *P. Callicarpum*. Of late several other species have been discovered in Northern India. The medical properties of all the species are very nearly alike.

α. P. PELTATUM. *Root*, Rhizoma, perennial, horizontal, creeping, jointed, white, several feet in length, with many fibers issuing from the joints.—*Stem* annual, upright, simple, smooth, cylindric about a foot or more in hight,

P. PELTATUM.

and divided, in the bearing plants, into two equal branches or petioles bearing a single leaf each. *Leaves* large, round, peltate, lobed or divided into segments; *segments* cuneate, prominently toothed at the outer margin. *Flowers* white; petals seven to nine, concave, obovate. *Fruit*, berry ovate, somewhat

flattened, yellow when ripe, juicy, edible; palatable to most persons when perfectly ripe, but nauseous when immature. This species affords many varieties, as the *Pumilum*, *Elatior*, *Grandiflorum*, *Odoratum*, *Heterophyllum*, *Oligodon*, *Tryphyllum*, *Extraxillare*, *etc.* Grows throughout the United States n rich soils.

P. MONTANUM.

β. P. MONTANUM. *Root* of the same description as the foregoing. *Stem* annual, slender, furrowed. *Leaves* large, palmate, not peltate; *segments* long, central ones subdivided by shorter segments, prominently serrate from midway out. *Flower* axillary to the petioles, like those of the other species; *petals* narrow, seven to nine in number. Grows on mountains.

γ. P. CALLICARPUM. *Stem* short, *Leaves* peltate, much resembling those of the first-named species. *Fruit* small, oval, somewhat flattened, of a beautiful white color, crowned with the dark-colored, persistent stigma. The beauty of the berry has occasioned Rafinesque to confer on this species the name Callicarpum, from καλλος (*beauty*), and καρπος (*fruit*).

ANALYSIS.—The dried root of podophyllum contains, 1, a trace of an *essential oil*; 2, *extractive*; 3, *gum*; 4, *starch*; 5, *resin*; 6, *gallic acid*; 7, a *peculiar principle* (*podophylline*).

The virtues of the root are very readily taken up by alcohol, less so by ether, very sparingly by cold water, and little more so by boiling water.

PHYSIOLOGICAL EFFECTS.—The entire plant, in its recent state, is poisonous, producing excessive vomiting, hypercatharsis, tormina, stupor, and bloating of the body. The fruit, when ripe, is esculent and nutritious; when taken freely it proves laxative. The rizome, when recently dried and taken in large doses, will operate as a drastic purgative and emetic. When it is well dried, or kept a year or two, or when baked, the poisonous property, which is volatile, becomes dissipated, and the medicine is comparatively mild in its operation as a cathartic.

THERAPEUTIC PROPERTIES AND USE.—The medicine, properly prepared, is one of the most valuable cathartics that we possess. It has long been a desideratum, with the general medical profession, to find a cathartic that will affect the glandular organs and their functions as mercury does, and which will, at the same time, be safe in its use. This object, which has become of paramount importance, on account of the incalculable mischief that mercury has occasioned, is now gained in the discovery of the full therapeutic power of this medicine alone. The alcoholic extract and the podophyllin have a very decided action upon the liver, giving rise, under some circumstances, to copious bilious discharges, and will answer every reasonable expectation as a cholagogue, and as an excitant to, the biliary apparatus, and as a general alterative.

In large doses podophyllum is actively hydragogue. In more moderate portions, several times repeated, it is almost certain to extend its action to the liver and secretory system generally. Thus the theater of its action is very extensive, and therefore, when this is considered in connection with the greatness of its power, very important consequences may justly be expected from the display of its full energies.

Among the cases in which podophyllum is most useful are the following:

1. *In the ordinary Autumnal or Bilious Remittent, and Intermittent Fevers.* It cleanses the primæ viæ directly, and the general vascular system indirectly. It has a stimulating influence over the liver, and maintains also, a tonic power, and thus, the primary indications of intermittents and remittents are fulfilled. No article, now known, can supply its place in these cases.

2. *In Jaundice and Chronic or Acute Hepatitis.* In these cases it has a very specific application, and its modus operandi here, is readily understood.

3. *Enlargements of the Spleen.* Here *its alterative* and *depurative* powers, are eminently proven.

4. *Glandular Enlargements generally.* In these cases its remedial powers are chiefly the hydragogue, which excite the absorbents as explained elsewhere. Nevertheless, it seems also, to have a specific tendency to excite healthy glandular action.

5. *Dropsies.* Its application and great utility in dropsy, is considered in the next ensuing order.

6. *Inflammatory Affections generally, and especially those of the Viscera.*

7. *As an Anthelmintic.* Its power to expel worms is chiefly dependent upon its *cathartic* effect. It is said to remove tænia.

In Phrenitis. A brisk operation of podophyllum will greatly relieve phrenitis, and especially the attendant delirium.

9. *In Constipation of the Bowels.* This article, after its operation, leaves the bowels in a loose condition, and obviates costiveness.

10. *In Scrofula.* No other single article, perhaps, is more valuable in this disease.

PHARMACEUTIC PREPARATIONS.—As this article, in its simple or unprepared state, is unfit for therapeutic application, its pharmaceutic preparations are of paramount importance. Still, however, its preparations are not necessarily many in number.

PULVIS PODOPHYLLI PREPARATÆ: *Prepared Podophyllum Powder.* Pulverize the scraped root of podophyllum, that has been kept in a dry place for a year or fifteen months, or which has been moderately baked in an oven; add to every pound of this powder one ounce of pulverized Anise or Fennel seed, and three drachms of Capsicum. Mix well, and keep in a clean glass jar.

Action—Use. This is the only way the Podophyllum should be taken in substance; that is, it should not be taken fresh, nor yet alone. The dose is from gr. xx. to gr. xxx. Is best taken in divided portions. Good cathartic powder in bilious autumnal fevers.

TINCTURA PODOPHYLLI COMPOSITÆ: *Compound Tincture of Podophyllum.* ℞ Well dried, or baked Podophyllum, in coarse powder, ℥xvj.; Cinnamon, in coarse powder, ℥jss.; Anise, or Fennel seed bruised, ℥ij; Alcohol, Ovj. Digest the dry articles in the alcohol for seven days, and filter. *Dose*, f ℥j.—f ℥j.

EXTRACTUM PODOPHYLLI: *Extract of Podophyllum.* ℞ Well dried Podophyllum, in coarse powder, ℔iij: Alcohol Cong. jiss. Digest for seven days and strain. Distil the Alcohol to Oij; place in a water bath, and evaporate to the proper consistence.

Action—Use.—This extract contains all the virtues of Podo-

phyllum. Useful in all cases in which any of the other preparations are applicable. Dose, gr. ij.—gr. iv.

The extract of Podophyllum thus prepared, is one of the best preparations made of this article. But when it is made, as is generally the case, by the use of water as the menstruum, it is of little value, as the active purgative properties are yielded but very sparingly, even to boiling water. The virtues of Podophyllum reside in a resin and a peculiar extractive, and although they are given out even to cold water with facility, while combined with the juices of the fresh root, yet when the latter are dissipated in the process of drying, water will no more serve as a proper solvent. This circumstance should not be overlooked, seeing that it is of such great practical importance. The watery extract requires a dose fully as large as that of the powder, and has, hence, no advantages over the latter, in its application as a remedy.

SYRUPUS PODOPHYLLI COMPOSITUS: *Compound Syrup of Podophyllum.* ℞ Podophyllum, in coarse powder, ℥xvj.; Alcohol, Oiij.; Ess. Anise, Ess. Peppermint, each f℥ij.; White Sugar ℔iij. Digest the Podophyllum in the alcohol until the virtues are extracted, and strain; add the sugar and other ingredients.

Action—Use.—This is a very agreeable cathartic, and is a good form in which to exhibit Podophyllum in cases where there is an aversion to its taste, or where the medicine should prove unacceptable or irritating to the stomach. The dose is from a teaspoonful to a tablespoonful.

EXTRACTUM PODOPHYLLI PRECIPITATUM. (PODOPHYLLIN.)

Obtain a saturated tincture of the powdered root of podophyllum, by the process of percolation, or otherwise; strain through muslin, and put it into a copper still, placed in a water bath; distil until four-fifths of the alcohol has passed over; remove the residuum from the still into a proper vessel, and pour upon it four times its measure of cold water; stir it a few minutes, and then let it rest so as to precipitate the resinous principle. When this is completed, pour off the water, and wash again with a new water; set aside as before for

precipitation, and when this is again completed, pour off the water carefully as before, and dry the precipitate in a cool, airy place. When dry, it is to be triturated in a mortar and put up for use.* This process furnishes the best quality of the brown *Podophyllin*, commonly in use. But a much fairer product may be made by submitting this article to a very simple additional process. And it may here be remarked that this same process should be adopted in discoloring all the resinoid and extractive preparations: Triturate in a mortar one part podophyllin with two parts of purified animal charcoal, until well incorporated; place the mixture into a glass percolator, and pass a sufficient quantity of strong alcohol (95 per cent.)

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*It appears, from certain positions taken in the Eclectic Dispensatory, that much credit is due in particular quarters for the discovery and introduction of this article, and most other isolated and concentrated agents of our materia medica; and it is there implied that the profession have a right to know how far the men of such achievements are advanced before certain other parties. One of these parties, who is particularly alluded to in the Dispensatory at page 1001, it would appear, is quite reprehensible for not having treated of these agents *under their present names*, in certain works which were written *more than half a score of years in advance*. It would seem, too, after such deficiencies, that he ought to blush for his temerity in pointing out, in one of these works, and defining the active principles of the medical plants, and of clearly indicating the means of their isolation and concentration. It is presumed that the high position of the author, and his assistant, of that Dispensatory, justifies the obtrusion of a challenge upon the profession, as to the merits and discoveries of any other persons, and especially the *time* or *period* of discovery, since it is evident that the certain failure of all attempts of other persons to make a showing must inevitably inure to the high credit of the present happy party. Nor should the splendor of these achievements be affected in the slightest degree, if it would turn out that others have done somewhat, in this way, or if even some considerable *priority* of date were made apparent, since *all general rules have their exceptions*. What, if it does appear that Βαλσαμον, Σμυρνα, Πανακς Σαγαπηνον, Αμμωνιακον, and many other resins and resinoids were noticed by Pythagoras, Hippocrates, Theophrastus and Dioscorides? These dates are entirely *too ancient* and can not be admitted. If the resinoid principle of podophyllum (*podophyllin*) was made, and notice of its importance given, by Wm. Zollickoffer, M. D., of Middleburg, Frederick county, Md., in the Am. Med. Recorder, vol. v., page 273, A. D. 1822: or if in page 277 of the same work there is, by the same authority, an account of the Oleo-resinoid principle of the Apocynum Androsæmifolium: or even though Prof. Dana, of

through it, to dissolve all the podophyllin; evaporate either by distillation or the water bath, and precipitate again as stated for the first process.

This process affords a very superior and beautiful article of podophyllin, whiter than the fairest powdered root of podophyllum. Podophyllin, obtained by this process, comprises the resinous and a small portion of the extractive principles of the root of the plant. The resin is the most persistent and certain cathartic principle, and, being insoluble in water, the product of the process is proportionately improved, as is the thoroughness of the washing in pure cold water. For this purpose, either distilled or rain water is always preferable, as other waters are liable to contain much lime or other alkaline earths, and are thus unsuitable as a precipitant for resin.

Podophyllin possesses the common chemical characteristics of resin. It is soluble in the alkaline solutions, and in alcohol, and to some extent in ether. With alkaline solutions it forms

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New York University, in 1824, did prepare *Sanguinarin*, as reported in the 12th vol. of the Am. Med. Recorder, 1827, page 426: or again, if Dr. Cox, of the American Dispensatory, in the very first edition, published June 1, A. D. 1806, should have mentioned, on page 332, precisely the process of precipitating the resinoid principles from the concentrated alcoholic solutions of medical plants, as now practiced: if Dr. Barton, in his Medical Botany, 1817, Dr. Murry, in his Mat. Med., and the Am. Med. Recorder, both published nearly half a century ago, should give many of the resinoids and the processes for obtaining them: and finally, if the Prof. of Mat. Med. in the Worcester Med. Institution, Mass., did, in the spring of 1847, even exhibit, before his class, many concentrated medicines prepared by himself, and suggested the propriety and practicability of preparing all our organic agents in a highly concentrated or extracted form:—*even if all this is true, and more also*, should not these modern men, who have made such important discoveries,—now that they have also found their impersonation in a large book, dedicated as a scientific work, to the profession,—should they not have the *glory?* If the labors of other men are entirely ignored, what is that to these, since their own transcendent achievements require *exclusive* notice! If other men have not taken pains to inform the world of their discoveries, they ought not to have credit for them: and if they have published *results* merely, and have been too modest to *define* their labors, who can assume the right to enjoin a successor from appropriating both the labor and the credit thereof to himself?

acrid soaps. Acids do not dissolve it, but they affect whatever amount of coloring matter may be present. They change it red, brown or black.

Physiological Effects.—In small quantities, as a fourth of a grain, podophyllin is slowly aperient and diuretic. If the dose is increased to half a grain, it proves a mild cathartic, operating in six or eight hours, producing, perhaps, three motions, at considerable intervals, of a moderately thin serostercoraceous character. If the dose is increased to one full grain, it will operate in from four to six hours, with a decided hydragogue effect, and it will sometimes continue its purgative influence at longer intervals for several days.

But in all these doses, the operation is unattended with much pain or griping. The cathartic influence is insinuating and gentle, so that, but for the movement of the bowels, nothing else would indicate that a purgative had been taken. The bowels, moreover, are left in a soluble state, and are not inclined to become constipated, as is usually the case when other kinds of purgative medicine is administered.

In two-grain doses it will nauseate the stomach, perhaps cause emesis, and will occasion pain in the stomach and bowels, attended with griping, not unlike the common symptoms of dysentery. In three or four grain doses, it proves actively emetic and hypo-cathartic. Its operation in this quantity is attended with much pain, nausea, and griping. The bowels become tender to the touch or pressure; sometimes tympanitic, and inflammation of the mucous membrane of the mouth, throat, stomach and bowels, is liable to ensue. A larger quantity is not safely administered, even to a robust or stout man, and much *smaller* portions have given rise to alarming symptoms in more delicate constitutions, especially in children.

From five to ten grains are sometimes sufficient to destroy life. The author, when he first prepared it in 1844, took six grains, for the purpose of testing its physiological effects,—he then having no idea of its extraordinary power, came near paying with his life the penalty of his temerity. Violent vomiting set in, in a few minutes, which was attended with

intolerable pain, nausea, cramp, purging, and prostration. Means were promptly applied for relief. These consisted of olive and castor oil, lobelia and mucilaginous drinks, and in the course of five hours some relief had been obtained, and in three days the relief was complete with the exception of soreness and tenderness of the bowels, and debility.

Effects on Lower Animals.—The author has experimented considerably with this article upon other animals, mostly upon quadrupeds, as cats and dogs. In January, 1848, a very interesting experiment was made by him, in which three grains of podophyllin were given to a fine Newfoundland pup, two months old. Vomiting set in immediately, and in 20 minutes evidence of intense suffering was apparent. The dog cried constantly with agony: he would roll on to his side, and back again upon his belly, draw himself up, and would scream with pain. Convulsions set in, in two hours, and these continued, first at short intervals, but afterward at longer, until about four hours after the podophyllin was taken, when he began to show signs of dissolution. His cry, which during the whole time simulated more that of a human in distress than could be imagined, was now low and pitiful, and died away in a soft moan, when, soon afterward, death relieved the poor sufferer.

The case was submitted to a *post-mortem* examination, of course. On opening the skin on the belly, the parietes presented a dark purple color, indicating the high inflammatory action and venous congestion that had taken place. When the parts had been opened, and the intestines were taken out, they presented the most extraordinary appearance ever beheld by any of the persons present, as they all declared it. The peritoneal surface of the intestines presented a dark purple hue, and was marked by a most complete injection of the veins with black blood. The intestines and stomach contained a considerable quantity of dark, clotty, but soft and pulpy blood. The mucous membrane was entirely destroyed throughout the length of the alimentary tract. The muscular coat overlaced with vessels and nerves, was exposed when the soft,

pulpy mass was scraped off. The brain and spinal marrow, in this case, were not examined.

Three grains of podophyllin were given to a young cat (perhaps nine weeks old). The symptoms throughout were almost precisely the same as in the case of the dog, even in the matter of the crying, screaming, and subsequent moaning.

Examination after death proved the same condition, so far as regards the signs of intense inflammation, and disorganization of the internal coats of the intestines. In addition, however, the brain and spinal marrow were in this case also examined. These were found injected with dark blood, and beset with specks, of a redder hue, of blood upon the membranes. A little water was found within the pia-mater. In nearly all the other cases of the experiments, the symptoms and *post-mortem* appearances were very much the same.

These facts, together with subsequent observations, where this article had been given to young children, and was followed with similar symptoms, even the same vehement cries, alternated with fitful moaning, brought irresistible convictions upon the observer's mind, that much mischief is unconsciously done by practitioners unacquainted with this powerful agent.

Several intelligent physicians have reported cases of deaths that occurred after the administration of large doses of the medicine, and under such circumstances, and with such symptoms, as fixed the conviction that the deaths were caused by the injudicious use of this article.

Persons, therefore, can not be too prudent when they deal with such potent agents among delicate children. The poor creatures can not describe the character of their suffering, and if the external or general signs of the bad effects of the article are not soon detected, they may die in spite of all the help that may be offered. Thus the most intense anguish, if not, in some cases, death may follow a prescription, without the least suspicion on the part of the physician; and, indeed, sometimes, from the very increase of the urgent symptoms, he may be induced unconsciously to add to the dreadful cause of the distress, by repetitions of the doses, under the hope of hastening a reaction, or of promoting ultimate relief.

ENDERMIC ACTION.—Upon the skin, Podophyllin possesses a great power of action. The conditions of its immediate action are a state of solution of the podophyllin, or its contact to parts where the skin is delicate. But any part of the skin, except, perhaps, that of the palms, or soles, will become highly irritated and inflamed by continued contact for a longer or shorter time.

Thus, manufacturers of the article are even liable to erysipelas of the face, hands, and other parts subjected to its contact. Persons attending the mills, in grinding the root of podophyllum, are also liable to erysipelas from the dust which settles upon them.

The parts more particularly subject to be affected in persons who work with it are those about the nose, mouth, and eyes, where, in addition to the common exposure, the parts are also more apt to be touched with the hands.

From the peculiar diathesis produced in the skin by the action of podophyllin, many of the common exanthemata are subdued on homœopathic principles.

TOXICOLOGY.—The question will now naturally arise, whether podophyllin is not absolutely poisonous, since it is capable of producing such violent symptoms under certain circumstances.

The solution of one question alone can settle this point, and that is, whether the power to produce the irritating and inflammatory effects, is inherent in the article as an essential property, or whether it is dependent on other circumstances. A correct understanding of such matters involves the necessity of close discrimination.

It is well known that various classes of agents, which are not possessed of any intrinsic property inimical to the animal economy, and which are indeed of great utility under some circumstances, will, nevertheless, under others produce harmful, and even the most violent effects. Such are the simple acids and alkalies. Potash, for instance, in a state of attenuation or dilution, is quite harmless: so are the acids; but when concentrated, they, in virtue of the concentration simply, will produce irritation, inflammation, and sloughing. But

we can not call them poisonous simply because they are acids or alkalies. The definition of a poison must always involve the question of *essential quality* or *intrinsic property*. Mercury, Antimony, and Arsenic, present us a law of action entirely different from the above; these are *essentially* poisonous, and will present corresponding effects, no matter how *large* or how *small* the quantity taken may be.

Until podophyllin is proven to be of this kind, it can not be called a poison.

THERAPEUTIC PROPERTIES AND MODUS OPERANDI — Few articles of materia medica admit at once of uses so important, and of applications so extensive, as Podophyllin. All that is said in this regard, under the orderal head of cholagogues and of hydragogues, will apply here. Certainly we know of no article more convenient in application, and which is equal to it in certainty and extent of action. Under a full dose the entire system becomes the theater of its operations. The nervous system, *per se*, is, indeed, not remarkably impressed; but here we have an evidence that the article produces its specific influence in remote parts, through the circulation. It enters the circulation by venous absorption, and thus reaches the structures upon which it displays its power in the general system.

Its most defined and obvious action through nervous agency, is indicated by the peculiar sympathy existing between certain organs or apparatuses, as between the mucous follicles of the intestines and the sweat glands of the skin, as also between the former and the lymphatics, and the venous radicles of all parts. Thus, when the mucous membrane is impressed by the action of podophyllin, the direct response is an influx of serum, through the agency of the follicles, or the intestinal exhalents, Anatomy teaches the direct vascular continuity from the ducts of the remotest glandular structures to the intestinal surface. This anatomical structure is consonant with the nervous endowments of the parts, so that a specific impression upon the intestinal mucous surface will govern the functions of these remote organs.

Such is the peculiar sympathy of these structures; and hence, such also is the power of podophyllin, in stimulating

the enteric mucous membrane, that it will bring the secretions of the general glandular system into the grand enteric passage.

The cholagogue power of podophyllin is, to some extent, *also* dependent upon sympathetic action. As was explained, under the head of cholagogues, certain impressions made upon the mouths of excretory ducts are quite equivalent to a direct impression upon their glands. Thus, when certain cathartic agents stimulate the mouth of the biliary duct in the duodenum, the response to such stimulation, will be the influx of bile from the duct. Podophyllin has this power in a remarkable degree.

All this sympathetic action, as connected with the vascular structures of organs, is consonant with, and admits of the free and direct action also, of podophyllin, on what is commonly called constitutional principles, *i. e.*, through the circulation. As to the fact of the absorption of podophyllin into the circulation, there can be no doubt, since its effects on remote structures are so very analogous to its topical impressions. And that this absorption is effected by the veins is also evident, for we now know that the lacteals do not take up foreign substances, or such as do not admit of immediate assimilation; and the action of podophyllin is too prompt and considerable upon the general system to be accounted for on the supposition of its being dependent upon the lymphatic absorption going on in the mucous membrane of the intestinal tract.

APPLICATION.—This article is placed in the order of cholagogues, because it possesses the power of stimulating the liver and removing bile in an eminent degree, and *not* that it is less efficient than other articles, as a hydragogue or common cathartic; for it lacks efficiency in *none* of these uses.

As a common purgative or loosening medicine, podophyllin is equal, and perhaps superior to any other article now known; for the quantity necessary to be taken to move the bowels is so very small, and its operation very certain and mild, when thus taken; and what is, perhaps, the best thing in its favor, it leaves the bowels in a loose or open state, which is the case in the effects of scarcely another article in the materia medica.

The philosophy of this is: it stimulates the liver, and thus keeps the bile (which is the natural agency to sustain the peristaltic motion) running freely into the intestines. As a cholagogue, the podophyllin will hold undisputed sway wherever it is properly known. Its applications are very general in bilious diseases, fevers, visceral inflammations, indigestion, etc.

It is prescribed by many practitioners in pill form, and when thus employed, it may be advantageously combined as follows;

℞	Podophyllin,	ʒj.
	Pul. Aloes,	ʒij.
	Fl. Ext. Senna,	q. s.

Make up into pill mass with the extract, in sufficient quantity to give the proper consistence, and form into pills of ordinary size, and roll them in the dust of licorice. *Dose*, one pill will commonly operate in four to six hours. The operation is thorough, but without pain, griping or debility. The aloes in this combination is not in the least objectionable in any case.

When the podophyllin is given in the form of powder, it may be prescribed alone, in one-half to one grain doses; or this quantity may be combined with two parts of sugar of milk, or of the same of pulverized licorice root. Many prefer combining the podophyllin with cream of tartar; others again think that it does best in conjunction with leptandrin.

The object of combining other articles with podophyllin is not always for the improvement of its cholagogue powers, since these will hardly admit of improvement. But as this article is rather slower in its action than some other cathartic agents, it may sometimes be quickened in its operation by proper combinations. The formula given above answers to this purpose, for the senna, which is one of our quickest cathartics, serves us exactly in this point. It is remarkable that since this preparation of podophyllum has been in general use, our practitioners succeed better in the management of the autumnal fevers than they formerly did, and it is confidently asserted that this circumstance is less dependent upon any modification of the fevers, than upon the *improvement in the treatment*. When large doses of medicine were required, patients were much less certain to take a sufficient quantity, to effect the desired end.

In the American or Reformed and Eclectic practice, podophyllin holds about the same position which calomel does in the old practice, and there is little question, but that it is equally efficient with that article in controlling the action of the liver and general glandular system. Many physicians who had been in the practice of using calomel for *years*, have now abandoned it for this, and declare it superior to that article for all the purposes for which they formerly employed the other.

SANGUINARIA.—The Rhizoma.

S. Canadensis.

Synonyms.—Sanguinaria Canadensis, *Linn.;* Sanguinaria du Canada, *Fr.;* Canadisches Blutkraut, *Ger.;* Puccoon, *Ind.;* Bloodroot, Red Puccoon, *Vul.*

History. — This plant has long been known by the natives. They used the root to stain their faces, and to dye their garments and skins. The plant was early in empirical use as a medicine, and for the last forty years it has been the subject of many medical essays, and has been spoken of in the highest terms by most of our authors on materia medica. It is made officinal in the U. S. Pharmacopœia.

Botany.—*Sex. Syst.* Polyandria Monogynia. *Nat. Ord.* Papaveraceæ.

Gen. Char. Sanguinaria. *Calyx* two-leaved, deciduous. *Corolla* with from seven to fifteen petals. *Stamens* many. *Pistil* oblong; *stigma* sessile, bi-lobed. *Capsule*

superior, oblong, attenuated at apex, one-celled, two valved. *Seeds* globular.

Spec. Char. S. CANADENSIS. *Root*, rhizoma perennial, horizontal, oblong, contorted, tubercular, beset with fibers, brownish- red without, deep red or orange-colored within, emitting, when broken, an acrid, red juice; its size is about that of the little finger, or larger, in rich soil. *Leaves* radical, with long channeled petioles; they are convoluted, as they ascend out of the ground early in April or even in March, embrace the scape and expanding flower. In shape they are sub-reniform, cordate, lobed, glaucous, and prominently veined below, green above, and when full grown, about five inches in diameter. *Flower* white, in some varieties tinged with pink, appearing early in the spring, sometimes before the leaves are unfolded. *Fruit* an oblong, attenuated pod, with round, brownish seeds.

This is the only species of the genus, but it has several varieties. Rafinesque has mentioned six, viz: 1, *Parviflorum;* 2, *Cespitosa;* 3, *Reniformis;* 4, *Repens;* 5, *Multipetala;* 6, *Stenopetala.*

ANALYSIS.—Analysis proves the root to contain an *extractive* (*Cinchonin, Rafinesque*) *resin*, a *gum resin*, *gallic acid*, *fecula*, and a *peculiar principle*, containing much of its virtues, and which has been called *Sanguinarin.* Alcohol extracts its virtues readily, and boiling water to some extent, but cold water very sparingly.

PHYSIOLOGICAL EFFECTS.—The seeds and tops are acro-narcotic, and the entire plant poisonous in its green state, when taken into the stomach. Its root is escharotic, and has a very acrid taste when fresh, but less so when dried. When thoroughly dried, or when one or two years kept, it is not capable of producing any violent effects when taken in moderate doses. In doses of ten to twenty grains it excites vomiting. Five grains will nauseate, and lessen the pulse while the nausea continues. In one grain doses it acts as a tonic.

THERAPEUTIC PROPERTIES AND USE.—Sanguinaria is considered one of the most valuable of our indigenous plants. It has a remarkable effect upon the secretions, and with podophyllin will operate powerfully upon the liver. It is placed in this order, not so much on account of its cathartic power,

as for its influence over the secretory organs. It is not much used alone, but in connection with some other cathartic remedies, it is capable of effecting important ends in many cases that are otherwise difficult to be managed.

Sanguinaria is regarded cathartic, emetic, expectorant, diaphoretic, tonic, stimulant, deobstruent, anthelmintic, escharotic, etc. It has many applications, but is most valuable in autumnal fevers, scrofula, and pectoral diseases. In extolling its virtues, Professor Rafinesque says, "from thirty to eighty drops of the tincture in wine, twice a day, is a good prophylactic for intermittents, marshy fevers, and inward fevers. It is very bitter, increases the appetite, and tone of the stomach. But it is beneficial in many other diseases, as of the liver and lungs, typhoid pneumonia, hooping-cough, torpor of the liver, hydrothorax, croup, amenorrhœa, asthma, peripneumonia, trachitis, incipient consumption, ulcerous sore throat, cynanche trachealis, dysentery, inflammatory rheumatism, and, externally, in ulcers, polypus of the nose, fleshy excrescences, and fungous tumors." Dr. Tully says, "it unites all the beneficial effects of squills, seneca root, digitalis, guaiacum, and ammoniacum, without their bad effects." The dose of the powdered root, as a cathartic, is gr. v. to gr. x., repeated, but it is apt to nauseate, and is not often given alone as a cathartic.

Pharmaceutic Preparations.—Although Sanguinaria enters, as an ingredient, into many preparations, few bear its name.

TINCTURA SANGUINARIÆ: *Tincture of Sanguinaria.* ℞ Coarsely powdered Sanguinaria, ʒiv; Alcohol diluted, Oij. Macerate fourteen days and filter.

Action—Use.—An aperient, cathartic, emetic, and expectorant, mostly used as an emetic and expectorant in croup, pneumonia, etc. *Dose*, fʒss.—fʒij.

EXTRACTUM SANGUINARIÆ: *Extract of Sanguinaria.* This is prepared in the same way as the Extract of Podophyllum, which see.

Action—Use.—As this contains all the virtues of the root, it is applicable in all cases in which *that* is indicated. The dose is from gr. j. to gr. iij.

PULVIS SANGUINARIÆ: *Powdered Root of Sanguinaria.* Where the powdered root is to be prepared it should first be carefully picked over so as to exclude foreign substances which are often found in it, and rotten portions should be removed. A good way of effecting the latter object is by bruising the roots with a flail or passing it through a crusher, and then sifting it so that the fine and worthless portions may pass off. A farmer's fan or wind-mill will answer instead of the sieve.

Pulverizing should be done by machinery, since the dust of Sanguinaria is exceedingly irritant and disagreeable to respiration. The chasing machine is the proper means for powdering the Sanguinaria and most other articles of the kind.

Dose.—As an emetic, gr. xxx. Is a cathartic gr. x.—gr. xx. Should be given in combination with other articles of a milder nature.

EXTRACTUM SANGUINARIÆ PRECIPITATUM; (SANGUINARIN). This is prepared in precisely the same manner as the precipitated extract of podophyllum (*Podophyllin*). It is a brownish-red powder, somewhat resembling the powdered root.

Action—Use.—Same as the root in substance, possessing all the active medical properties.

Sanguinarin is much esteemed by some Eclectic practitioners in chronic disease of the liver. In this case it is employed conjointly with the apocynin, or the extract of triosteum. It is given in laxative doses for a week at a time, and is then replaced by tonics, as the minispermum or hydrastis, in wine, or in the simple state, when wine disagrees. As soon as the tonic effect is fully instituted, the sanguinarin is again given as before, and thus these remedies are alternately employed until the normal action of the liver is restored.

In jaundice, the sanguinarin conjoined with podophyllin, is of eminent service.

There are several physicians in the West who rely upon sanguinarin for the cure of intermittents and remittents. They give it first in emetic doses, and order their patients to drink warm water freely during the operation. On the following day, the use of the sanguinarin is commenced in one or two grain doses, to be repeated three times a day until free catharsis is produced. By this time the paroxysms cease, and in the subsequent treatment three or four grains of hydrastin is

given with one grain of sanguinarin morning and evening. There is no doubt but that sanguinarin will, in a majority of instances, break up intermittents and remittents, but there is no question but that with the help of quinine, the cure would not only be more certain, but the treatment would be easier upon the patient.

A cathartic of equal portions of sanguinarin and podophyllin, followed for two days with tonic of quinine will do the work effectually.

The dose of sanguinarin, as a cholagogue and general cathartic is gr. j.—gr. ij.; it should only be given combined with milder articles.

LEPTANDRA.—The Root.

SYNONYMS.—VERONICA VIRGINICA, *Linn.;* Black-root, Brinton's root, Culver's Physic, etc., *Vul.;* Quitel, *Del. Ind.;* Him, *Osage & Missou. Ind.*

HISTORY.—Although this plant has long been in empirical use, and high estimation, as with those physicians whose names it bears, yet it has never acquired popular favor. It had, however, gained an admission into the U. S. Pharmacopœia, but was omitted at a later revision. It is an indigenous perennial, growing in rich soil, along fences, and in open woods, in most parts of the United States.

L. VIRGINICA.

BOTANY.—*Sex. Syst.*—Diandria Monogynia. *Nat. Ord.* Scrophularineæ.

Gen. Char. LEPTANDRA. *Calyx* four-parted. *Corolla* subrotate, deeply four-cleft, lower segments mostly narrow. *Capsules* compressed, two-celled, few-seeded.

Spec. Char. There are several species of this genus, that possess nearly analogous properties, and are used indiscriminately, by some practitioners. But some of the species, perhaps, are too violent to be admitted into our materia medica. The *L. Virginica* is the species generally used.

The LEPTANDRA VIRGINICA is a beautiful plant, and like the other species, indigenous. *Root* perennial, horizontal, woody, of the thickness of the finger, from six to twelve inches long, with many long, slender, dark fibers issuing horizontally in every direction. *Stems* one to six, upright, from two to five feet high, from one-fourth to half an inch thick, simple or branched at the top, from one to five spikes, bearing the fructification. *Leaves* whorled, from four to six in a whorl, long, lanceolate, acuminate, serrate. *Flowers* numerous, nearly sessile, in long, terminal, cylindrical spikes; they are small and white, tubular, pubescent inside. The varieties of this species are, the *quadrifolia*, *multicaulus*, *polystachya macrostadrya*, *angustifolia*, *etc.*

The other species are: 1, L. PURPUREA, which has only three leaves to a whorl, and which are broader. The flowers, which are purple, are larger, and disposed in a single, terminal, loose tapering spike. 2, L. VILLOSA. (Raf.) This has its leaves in whorls also, but they are hairy and brownish beneath, lower whorls with five leaves, upper ones with three or four. The spikes are cylindrical, and pubescent, and the flowers white.

ANALYSIS.—The root contains an *essential oil*, *bitter extractive*, *tannin*, *gum*, *soft resin*, and *woody fiber*. Its virtues reside in the resin and extractive, and are imparted freely to boiling water and alcohol. Age impairs its virtues.

PHYSIOLOGICAL EFFECTS.—In the recent state, the root is acrid and violent in its effects. In doses of three or four ounces of the strong decoction, it will give rise to severe nausea, vomiting and purging, it is said, of blood. But in the cured state, it is quite mild, and makes a good and safe medicine.

THERAPEUTIC PROPERTIES AND USE.—The Leptandra has been in creditable use among Reformed and Eclectic physicians for many years. "The Blackroot," says Dr. Howard,* "is very highly celebrated by those best acquainted with its virtues and effects, as an efficient purge, operating with mildness and certainty, without producing that depression of the living powers so common to other purgative medicines. In typhus and bilious fevers, it removes the black, tarry, morbid matter, from the intestines, which seems so necessary to be carried off

* Botanic Medicine, vol. II., p. 262.

by some means or other, and it does it in a manner most natural, without weakening the tone of the bowels, or leaving behind it the poisonous sting so often remaining after the use of calomel, that almost cathartic in fevers."

The dose of the powdered root is from gr. xx. to ʒj; that of the decoction of an ounce of the root to a pint of water, fʒj—fʒij, repeated.

PHARMACEUTIC PREPARATIONS—EXTRACTUM LEPTANDRI; *Extract of Leptandria.*—℞ Cleaned and crushed root of Leptandria, any quantity desired; place into an iron kettle; pour over it water in sufficient quantity to cover it; boil for two hours; pour off the liquid, and while hot, press through a loose woollen cloth filter; replace into the kettle when cleaned, and boil down to the proper consistence, taking special care not to burn it. This extract is of a dark or black color, possessing the bitter and peculiar taste of the root, together with its active medical properties.

Action—Use.—A good common and anti-bilious cathartic. The dose is gr. v., or two common-sized pills.

EXTRACTUM LEPTANDRI PRECIPITATUM (LEPTANDRIN).—℞. Crushed root of Leptandria lbx., Alcohol Cong. iij., Water Cong. iij.; place the root into an iron kettle, and pour the alcohol and water over it, and simmer over a slow fire, at a temperature of about 150° F., for three hours; pour off the liquid, and strain through a coarse cloth while hot; place the liquid into a still; still over three gallons slowly, and remove the residuum into a proper vessel, that precipitation may take place. In three days the precipitation will be mostly completed, when the precipitate, or *leptandrin*, as it is now called, is to be removed upon a dry cloth suspended in a cool, airy place for drying.

The product thus made is a black mass, which, in cool weather, may be powdered, but is liable to become concrete again in the summer season, or when kept in a warm place. The dose of this preparation is gr. j.—gr. iij.

The leptandrin found in the powdered state in the drug-houses is usually precipitated from the concentrated alcoholic tincture in the same way as directed for making Podophyllin, and the precipitate is then subjected to a drying heat for days together, until it is found that the product is sufficiently friable to be readily pulverized. This, however, is quite an inferior article, when thus prepared, as the continued high heat

impairs the virtues. The dose of this required, as a cathartic, is from three to ten grains, according to the extent of the heat to which it had been exposed. Keith & Co., of New York, prepare an alkaloid, called *Leptandrine*, which is very highly esteemed by Prof. R. S. Newton of this city, and by others. One of the best forms in which the active principle of the leptandria can be had in the concentrated state, is that of the alcoholic extract.

EXTRACTUM LEPTANDRIA ALCOHOLICUM: *Alcoholic Extract of Leptandria.*—Obtain a saturated alcoholic tincture from powdered root of Leptandria; place it into a still, over a water bath, and distil over of the alcohol, until, by testing, it is found that the remainder begins to thicken, or until it acquires the appearance of syrup; remove it from the still, and continue the evaporation, by means of a sand or water bath, until the extract acquires a consistence suitable for making pills. This is the best simple form in which to use the leptandria, as it is the most active. The dose is one or two pills. It may be diluted at pleasure with alcohol, and given in fluid form, of which 15 to 20 drops will operate as a cathartic.

PILULÆ LEPTANDRIA COMPOSITUM: *Compound Pills of Leptandria.* (COMPOUND ANTI-BILIOUS PILLS).

℞	Alcoholic Ext. Leptandria,	℥iv.
	Podophyllin,	℥j.
	Aloes Pul.,	℥ij.
	Sanguinarin,	℥ss.

Mix well and form into pills of usual size. Should the mass be too dry, add a little alcohol.

Dose. One or two. This is perhaps the best common, and anti-bilious pill for general use, that is to be found. The pills operate without pain or uneasiness of any kind, and occasion no debility. The aloes in this form is not objectionable. Constipation very seldom follows the use of these pills.

APOCYNUM ANDROSÆMIFOLIUM.

This article also merits a place in this order, as it is known to be a good anti-bilious cathartic. As such it is an excellent remedy in marsh and autumnal fevers. The dose is from gr. xx. to ℥j. The extract and the apocynin however, afford the most eligible forms in which to take it.

CHELIDONIUM MAJUS.

Celandeine.—This is a perennial herbaceous plant, growing about old habitations in this country, but is supposed to be a native of Europe. It belongs to, *Sex. Syst.*—Polyandria Monogynia, *Nat. Ord.*—Papaveraceæ. It is a very beautiful plant growing from one to two feet in hight, with pinnate leaves, and peduncled umbels of beautiful yellow or purple flowers.

It is here introduced on account of the high praises that have been bestowed upon it as an anti-bilious cathartic, and as a remedy for jaundice, scrofula, syphilis, scrofulous sore eyes and chronic inflammation of the liver; which latter, it is said, can be cured by its use with great facility. It appears that the article has been long employed for these same purposes by the German physicians, and has been investigated by Chevallier and Lassaigne, and also by Dr. Probst of Heidelberg, and has been pronounced to possess very great and valuable powers. The properties depend upon an acrid resin found in the yellow juice (*Chelidonin*) exuded from the entire plant, when wounded. This juice will remove worts and corns, when applied to them a few times.

There is no question as to the power and activity ascribed to this article, and the only thing to be feared about it is, that it is unsafe in its internal use. It belongs to a natural family of plants that are mostly acro-narcotic poisons. It, however, merits investigation, and it is to be hoped that ere long our profession may be favored with a further history of its character and use. The dose is gr. iij.—gr. v. of the inspissated extract or gr. xx. of the powdered root or herb.

MERCURY.

Having noticed, or said something of most of the Old School Medicines rejected by Reformers, in the places where they would occur in a therapeutic arrangement of this character, it may not be improper to express a few thoughts here in reference to mercury. Yet the character of this work will by no means admit a full discussion of the subject. In late treatises, the most of the salts of mercury have been arranged, by some of the oldest therapeutists, under the heads of the

Sialagogues and alteratives. Yet Calomel and Blue mass, have ever been regarded by Allopathic writers as among the most reliable or efficient stimulants to the liver, and general secretory system; and it is supposed to be entitled to the very first rank among the cholagogues.

It is by no means marvelous, therefore, that an article so potent—one having such an extensive range of chemical affinity, and consequent power over the minutest structures, and which has been in use over six centuries, should be reluctantly parted with by the patrons of a system which has been constructed upon it as a foundation.

Nevertheless there have been, in every age of its history, men, such too as were at the very head of the profession, who deplored its power for mischief, while they had in prospect no reliable substitute. These have well counted the cost, for they have fully known the general solvent power of mercury, its special stimulant action to the glandular system, its alterant influence upon the assimilative functions, and above all, they were cognizant of the distinctive and *peculiar* action which it sets up in the system, to the subversion of every other diathesis. With all these facts fully in view, the article has been abandoned by *many* of the most learned and experienced men, while *all* have seriously lamented its liability to do mischief.

This, as above intimated, has been the expressed sentiment of the profession while there was no prospect of a substitute,—no alternative upon which to fall. Is it therefore other than creditable to the intelligence and good sense of our age, to think that *now, since experience and science have brought such ample resources* to our hands, in this department of materia medica,—since the most reliable and yet harmless substitutes have been discovered, that now the mercurials should be gradually laid aside by the old profession?

Order V.---HYDRAGOGUES.

Hydragogue (*Hydragoga;* from $\upsilon\delta\omega\rho$, "water," and $\alpha\gamma\omega$, "I expel") is a term applied to such articles of the cathartic class as possess the power to expel serous effusions.

One of the most remarkable circumstances, common to the animal economy, is the very peculiar relation existing between the circulatory and secretory systems. To understand this correctly, it is proper to premise first, by noticing the instinctive disposition of the blood-vessels to maintain the normal quantity of the serous portion of the blood. Whenever this is lacking, absorption is accelerated from every accessible source to supply it. This doctrine appears to be established by the experiments of M. Majendie.* The inordinate loss of the aqueous portions of the circulating humors by any one emunctory, is counterbalanced either by a greater absorption from the cellular system, or from some of the internal cavities, in which it may be accumulated, or it is compensated by the diminished action of one or more of the other serous emunctories. Thus we discover, that in dropsical effusions, there is always a *diminished* action of the cutaneous exhalents, and of the kidneys, and that whenever the latter are excited so as to carry off a larger proportion of serum, the dropsical collection will not only cease to progress, but will diminish, as the kidneys and cutaneous emunctories make their draw upon the circulation; for the latter in turn must be supplied by some other source, and thus the absorbents are called into action and the dropsical fluid is re-absorbed into the circulation, and thence removed faster or slower, as the diuretics or diaphoretics may be pushed.

It is on this same principle, that hydragogue cathartics reduce dropsical swellings. These agents stimulate the internal exhalents, and thus drain from the common circulation a vast amount of serous fluid, which can only be again supplied by the agency of the absorbents.

Objections have been urged against the use of cathartics in dropsies, on the ground that they produce debility. These are valid to some extent, for when purgation is rapidly sustained, it will, without doubt, carry away more or less chyle, before it enters the circulation. But so far as the serous discharge is concerned, the objection would apply with equal force against the use of diaphoretics, as well as diuretics, or any other means

* Jour. of Experimental Physiology, 1821.

capable of removing serum. For further explanation of the *modus operandi* of hydragogues, see remarks in what is said of the medical action of Podophyllin, page 183 *et sec.*

SENNA—The Leaves and Legumes.

Synonyms.—Cassia Senna, *Linn., Dub.;* Sennesblatter, *Ger.;* Senna, *Ital.; Portugal.;* Sen, *Span.;* Senna, *Eng.*

History.—The history of senna dates with that of the Arabians, among whom its virtues were early discovered. It is said that it was employed by Mahomet. (*Reiske.*) Mesue, Serapion, and Avicenna mention it. The Arabians, however, only used the fruit. At the present time senna is used by almost every class of physicians, and constitutes one of the most popular articles of the old Materia Medica. It is a native of India, Arabia, and Africa.

Botany.—*Sex. Syst.*—Decandria Monogynia—*Nat. Ord.*—Leguminosæ.

Gen. Char. Cassia. *Sepals* five, scarcely united at the base, more or less unequal. *Petals* five, unequal. *Stamens* ten, free, unequal, the three lower ones longer, the four middle ones short and straight, the three upper ones with abortive anthers. *Anthers* dehiscing at the apex. *Ovary* stalked, frequently arched. *Legume* various.—*Pereira.*

Spec. Char. There are many different species that contribute in furnishing the sennas of commerce, and there seems to be still some uncertainty about the identity of several. The following excellent descriptions are given by Professor Royle,* who had abundant opportunities of knowing what he was writing about.

"1. C. Forskalii (C. lanceolata, *Forsk.* and *Lindley*, Fl. Med. p. 259). Leaflets in four or five pairs, never more; oblong, and either acute or obtuse, not at all ovate or lanceolate, and perfectly free from downiness even when young; the petioles have *constantly* a small, round, brown gland a little above the base. The pods are erect, oblong, tapering to the base, obtuse, turgid, mucronate, rather falcate, especially when young, at which time they are sparingly covered with coarse, scattered hairs. (Lindl. *l. c.*) Collected by Dr. S. Fischer in Palm-grounds, in the valley of Fatme, flowering at the end of February. Forskal describes this as being distinguished 'glandula supra basin petioli.,

* Materia Med. etc., Amer. Ed. p. 350.

It was found by him at Surdud and about Mor. It is called *Suna* by the Arabs, and probably yields some of the Arabian Senna of commerce.

"2. CASSIA LANCEOLATA.—This is a bushy annual, of about two to three feet in hight, extremely leafy, and of a most luxuriant inflorescence in a cultivated state. The stems are erect, round, smooth, a little flexuose toward the apex. The leaves alternate, abruptly pinnate. The leaflets five to eight pairs, with short petioles, ovato-acute in the lower and lanceolate-acute in the upper parts of the plants, 'slightly mucronulate, smooth above, rather downy beneath (especially in young leaves), with the veins turning inward and forming a flexuose, intramarginal line; petioles without glands; stipules softly spinescent, semi-hastate, spreading, minute.' Racemes axillary, and terminal, erect, rather longer than the leaves. Ovary linear, downy, falcate, with a smooth, recurved style. Legumes pendulous, membranous, flat, only slightly protuberant over the seeds, olblong, sometimes elliptical, nearly straight, with the upper margin a little curved, tapering abruptly toward the base, and rounded at the apex, of a brown color, containing from five to eight white, rugose seeds.

These are figured by Gærtner, ii. t. 146. It is probably the *Cassia Medica* of Forsk. p. cxi., and agrees with his specimen of 'Senna Meccæ Lohajæ inveniebatur foliis 5—7 jugis, lineari-lanceolatis,' p. 85, of which Forskal states large quantities are yearly exported from the district of Abu-arisch to Jidda. This species includes:

"α. *Tinnevelly Senna*, cultivated by Mr. Hughes in the south of India; also that cultivated by the author [*Royle*], at Saharunpore, *C. lanceolata*, Royle, Him. Bot. t. 37, and by Dr. Wight near Madras. v. fig. 60, B. and spec. in Brit. Mus. t is the *Cassia officinals* of Gært. and Roxburgh, Fl. Ind. ii. p. 346, which name ought to have been retained, or the above *C. medica*, Forsk. instead of *C. elongata* being coined, especially as this was formed from the leaves of a cultivated Indian Senna found in commercial samples. It is cultivated by Dr. Gibson, near Poona.

"Dr. Burns writes that he has found the lanceolate Senna wild near Kaira in Guzerat. His cultivated specimens, if picked, would form good Senna.

"β. *C. lanceolata* of most authors, *C. acutifolia*, Hayne, ix. t. 41. Nees and Ebrem. t. 345, St. and Church. Pl. 30, as C. Senna. These best represent the form of Alexandria Senna (v. 60, A., a small leaf,) and specimens in Brit. Mus. from Sennaar. (*Kotschy.*) It is found in the valleys of the desert to the south and east of Syene or Assouan, and collected for the trade to Cairo, forming three-fifths of Alexandrian Senna.

"γ. *C. acutifolia*, called of Delile, Esenbeck and Eberm. t. 346. (fig. 60. c.) The leaflets are narrower and more tapering toward the apex than the foregoing, as might be expected in a poorer soil and drier climate. Some of the Indian specimens in Dr. Rottler's Herbarium closely resemble this variety; also African specimens from Tajowra to the south of the Straits of Bab-el-Mandel.

"The author is unable to distinguish these by any permanent characters, nor dried Senna-leaves, cultivated at Saharunpore from good specimens of *Bombay Senna* (that is, ordinary Indian Senna) imported here from India; nor those from *Senna Mukki* sent him by Dr. Malcolmson from Aden, and which he states are 'the produce of Africa, but in appearance exactly resemble the Arabian Senna. In the market both are sold as one kind, and bring the same price.'

3. C. OVATA of Merat, Dict. de Mat. Med. b. 613. *C. æthiopica*, Guibourt. Is probably a distinct species, as it is said to have a gland at the base of the petiole and another between each pair of leaflets. The leaflets are in three to five pairs, exactly oval acute, slightly pubescent below; the follicles are thin, pale, yellow-colored, one-third smaller than those of *C. obovata*. It is said to be found both in Nubia and Fezzan, and to furnish exclusively the Senna of Tripoli, Sene de Tripoli. It is extremely like a variety of *C. lanceolata*. The figure of C. Senna in Stevenson and Churchill, Med. Bot. t. 30, quoted by Dr. Pereira as representing this plant, is referred to by Dr. Lindley as a good representation of C. acutifolia of Delile. But Merat and De Lens say of it: 'Nous ne le connaissons que par les feuilles et les fruits qu'on en voit dans la commerce.' M. Guibort calls it *C. æthiopica;* but instead of referring to *C. lanceolata* of Colladon. Pl. xv. f. e. as representing this species, he says that it is exactly represented by the Sene de Nubie of Nectoux, pl. 2.

"4 C. OBOVATA, *Colladon.* Hayne, ix. 42. Nees and Eberm. 347. Diffuse herbaceous plant. Leaves equally pinnate, glandless. Leaflets four—six pair (somewhat villous, Roxb.), obovata, obtuse, but slightly mucronate, unequal at the base, the terminal pair more cuneate and larger. Stipules triangular, narrow, and tapering, rather stiff and spreading. Flowers yellow, in racemes. Bracts ovate, cordate; acuminate, concave, singled flowered. Legumes broad, membranous, smooth, lunate in shape, rounded at each end, with an elevated crest over each side on both valves, so as to form an interrupted ridge along the middle of each valve. Seeds six to eight, wedge-shaped, rugose as in C. lanceolata—A native of Africa, from Senegal (*Fl. de Senegambia*) to the Nile; found in Fezzan by Dr. Oudney (*R. Brown*), in Egypt from Cairo to Assouan, Nubia; found in the Adel county near Sultalli (*Mission to Abyssinia*); Desert of Suez; Syria; dry parts of India, as Kaira (*Burns*); Guzerat, Dekkan (*Col. Sykes*), near Delhi, and Valley of Rungush, near Peshawar (*Falconer*); high, dry, uncultivated lands of Mysore (*Roxburgh. Wight*). It has been cultivated in Italy (*Sene d'Italie*), and forms three-tenths of Alexandrian Senna.

"This species is very distinct, in its obtuse, obovate leaves and crested legumes, from the preceding acute-leaved species. *C. obtusa* Roxb. was probably described from young legumes, as the author, like Dr. Lindley, has compared good specimens from Mysore with others from Africa. The *obtusata* of Hayne does not seem to differ sufficiently from his *C. obovata.* It is possible, however, that there are two very similar species in Africa. Mr. H. Grant, late of the

India House, has favored the author with a specimen in flower, collected by him in February, at Philæ which has upon it *both* obovate leaflets and some which are ovate and acute. Lieut. Wellsted's collection contains a specimen from the coast of Arabia, of which the leaflets are obtuse, elliptic, and hairy."

DESCRIPTION.—Senna has a peculiar, agreeable odor, somewhat resembling that of tea, and a nauseous, bitter taste. It has a pale green color, and consists of the leaflets of many different species. These afford several commercial varieties of the drug.

a. ALEXANDRIA SENNA: *Senna Alexandriana.* This variety receives its name from the Egyptian port whence it is shipped. It consists of the leaflets of several varieties, and even different species of Senna. 1, Those of the C. ACUTIFOLIA, which is a variety of Royle's *C. Lanceolata*, but is figured more linear in the American edition of his Mat. Med.: it is a product of Nubia, Sennaar, and Abyssinia. Its leaflets are acute and short, although the example given by Royle is rather long. 2. Those of the C. OBOVATA, known by their rounded, obtuse summits, which are sometimes surmounted with a little projection. We find, also, the leaves of the CYNANCHUM OLEÆFOLIUM, or *Argel*, which are distinguished by their length, lighter color, absence of visible lateral nerves on the upper side, their thickness and firmness, and the regularity of their base. Sometimes, too, the leaflets of the TEPHOSIA APOLLINEA, sometimes called *Silver-leaved Alexandria Senna*, are to be found with this commercial variety of the drug.—These may be known by their silky or silvery aspect, their obovate oblong, somewhat cuneiform, emarginate, equal-sided appearance, and their lateral veins, being parallel, regular, and oblique to the midrib. The flowers and fruit of the Cynanchum are also often present; the former are of a white color and in small corymbs, the latter in shape are ovoid, follicular, rather larger than an orange seed.

C. ACUTIFOLIA.

C. OBOVATA.

C. OLEÆFOLIUM.

T. APOLLINEA.

Alexandria Senna is an excellent variety when the genuine lance-shaped leaflets are carefully selected. But as brought to us, mixed with those cynanchum and tephrosia leaves, which latter must be considered adulterations, it is hardly fit for use.

β. TINNEVELLY SENNA: *Finest East India Senna.* This is cultivated by Mr. G. Hughs, at Tinnevelly, in the southern part of India. It is a very fine, unmixed kind, which is becoming much esteemed. It consists of large, thin, unbroken leaflets of a fine green color. This is supposed to be produced by the *C. elongata* or *C. lanceolata.*

T. SENNA.

γ. INDIA SENNA: *Mecca or Mocha Senna; Bombay Senna.* This is the produce of Arabia, and has gained its different names from some of the ports and countries through which it is carried to Europe. It is brought to us chiefly from Bombay and Calcutta. It consists of the leaflets of the *Cassia elongata*, with some of the leaf stalks and pods intermixed. The India Senna is distinguished from all other kinds, except the Tinnevelly, by the length of its leaflets, which is from an inch to an inch and a half, or more, and comparatively narrow. Its purgative powers are considered less active than most other kinds.

δ. TRIPOLI SENNA: *Senna Tripolitana.* This is brought from Fezzan to Tripoli, and is hence called by this name. This has much the appearance of the Alexandria Senna, except that it is much broken up, and has hence more uniformity of appearance. It was formerly supposed to be a variety of the *C. acutifolia*, but is now considered the product of a distinct species, and is named *C. Æthiopica.* The Tripoli Senna is less esteemed than the Alexandrian.

"*Tunis Senna*," says Dr. Pereira, "agrees with that of Tripoli."

ε. ALEPPO SENNA. This is an article that was formerly imported from Aleppo. It is produced by the *C. Obovata*, and has formerly been carried into India and Turkey, and thence to Europe; but being of inferior quality is not much used now.

ζ. SENEGAL SENNA. This, says Pereira, is a "blunt-leaved Senna, having a rougher and more glaucous appearance than the leaflets of the C. Obovata." The author has never seen any of it.

η. SMYRNA SENNA. This is another kind mentioned by Dr. Pereira, who says it resembles the Tripoli Senna, but some of its leaflets are similar to the acute-leaved Alexandrian.

θ. AMERICAN SENNA: *Cassia Marylandica.* This is an indigenous plant growing in rich soils, in bottom-lands or low grounds. It is a very ornamental plant, about three feet in hight, with beautiful pinnate leaves, and is surmounted with clusters of very rich-looking yellow flowers, that are succeeded, like those of all the Sennas, with oblong, flattened legumes. It is found plentifully in the Middle States, along rivers, especially along the banks of the Ohio. The leaflets of this plant differ some-

what from most of those of the other species, being obtuse at both ends. They resemble the leaflets of the *Tephrosia*, and those of the *C. Obtusa*, more than any others. The Cassia Marylandica, or American Senna, is a pretty certain cathartic, and is well esteemed by some of our practitioners, but the author has never thought much of it. It has rather an unpleasant and sickly odor, and a nauseous taste. It is also more apt to gripe in its operation than the best imported Sennas.

ADULTERATIONS.—Senna is subject to adulteration in the countries where collected, as well as in Europe. The adulteration of the Alexandrian Senna, in Africa, by means of the Tephrosia and Synanchum or Argel, has already been spoken of. This fraud is chiefly practiced at Boulac. This Senna is also said to be adulterated most shamefully with the leaves of the *Coriaria myrtifolia*, and the leaflets of the *Colutea arborescens* or Bladder Senna, which is said to be poisonous and astringent. The leaflets of the latter are elliptical, regular and obtuse. Their regularity at the base serves well to distinguish them from the *C. obovata*. The European adulterations, happily, are not extensive, and, it is hoped, will soon cease to affect us, as our government has, of late, taken some important steps to prevent the importation of adulterated drugs.

C. MYRTIFOLIA.

ANALYSIS.—There have been three important analyses made of Senna, viz: one in 1797, by Bouillon La Grange; another by Braconnot; and a third by Lassaigne and Fenuelle, in 1821. The following table exhibits the results of the two last.

SENNA LEAVES.		SENNA LEAVES.
BRACONNOT.		LASSAIGNE AND FENUELLE.
Bitter Matter of Senna,	53·7	Cathartin,
Reddish-Brown Gum,	31·9	Chlorophylle,
Matter, similar to Animal Mucus, perceptible by Acids,	6·2	Volatile Oil,
Acetate of Lime,	8·7	Fixed Oil,
Malate (or some other Vegetable Salt), of Lime,	3·7	Albumen,
Acetate of Potash, Chloride of Sodium,	*Traces.*	Mucus,
		Malic Acid,
		Malate and Tartrate of Lime,
		Acetate of Potash,
		Mineral Salts,
Watery Extract of Alexandrian Senna,	104·2	Alexandrian Senna.

CASSIA MARYLANDICA.—(American Senna).

A print of the flowering top of the American Senna, representing the plant and a pod of about one-third the natural size.

Fenuelle found the pods to contain the same principles, with the exception of the Chlorophylle; instead of which he discovered a peculiar coloring matter.

Water, cold or hot, readily extracts the virtues of Senna. They also yield to alcohol. But long boiling injures its properties as a medicine.

THERAPEUTIC PROPERTIES AND USE.—Senna has been much employed, even from the earliest ages of medical history. Its reputation as a hydragogue has always been good. It operates with promptitude and certainty, and perhaps the only objection which can be urged against it is that it is somewhat drastic and is apt to gripe the bowels, unless it is combined with aromatics or stimulants. The most decided application, for Senna is in dropsical diseases, especially in forms of dropsy involving effusions into the larger visceral cavities. It also admits of very useful application in the removal of intestinal worms. With spigelia it forms a very popular combination, "*pink and Senna*," prescribed for children against worms. It is much employed in combination with other articles, as a general cathartic or opening medicine, and has thus been used in habitual costiveness and dyspepsia. But it is not so good for this purpose as some other articles.

Being very quick in its operation, it is compounded with many other articles less active, to improve their activity. For this purpose it is combined with podophyllin. The dose is ʒss. —ʒij. for a full hydragogue effect.

PHARMACEUTIC PREPARATIONS.—Senna affords many preparations—the following are among the most important.

INFUSUM SENNÆ COMPOSITUM: *Compound Infusion of Senna.* ℞ Senna, ℥ij., Coriander, bruised, ʒj., Water, Oj. Macerate for an hour in a covered vessel, and strain. *Dose*, f℥jss.—f℥iij.

INFUSUM SENNÆ (CUM TAMARINDUS, D.) COMPOSITUM, E: *Compound Infusion of Senna.*—Infuse for 4 hours (occasionally stirring, E.), in a covered vessel not glazed with lead, Senna, ʒj., Tamarinds, ℥j., Bruised Coriander Seed, ʒj., Muscovado or Brown Sugar, ℥ss., (℥j., D.), Boiling Aq., f℥viij. Strain through linen or calico. The same may be made with 2 (or 3, E.), times the quantity of Senna.

This is a very good way to prepare the infusion of Senna, as the sugar and tamarinds much improve its taste. The dose as an effective purgative is f℥jss.—f℥iij.

TINCTURA SENNÆ COMPOSITA, L. E. D: *Compound Tincture of Senna.*—Macerate for 14., (7, E.), days, Senna, ℥iijss., (℥iv., E., ℔j., D.), Bruised Caraways, ℥iijss., (℥v., E., ℥jss., D.), bruised Cardamoms, ʒj., (ʒv., E., ℥ss., D.), Raisins, (stoned), ℥v., (℥iv., Coriander, bruised, ℥j., powdered Jalap, ʒvj., Sugar, ℥ijss., E.), in Proof Spirit, Oij., (by measure, Cj., D.) Strain. (Express the residuum and filter. Or prepare by percolation, as directed for Comp. Tinct. of Cardamom. If Alexandrian Senna be used, free it of Cynanchum by picking, E.)

"A warm and stimulant purgative. That of the E. P. is made more effective by the Jalap, and by the corrective effects of the Sugar. Usually prescribed as an adjunct to the Infusion, in doses of fʒj., sometimes alone in doses of f℥ss."

TINCTURA SENNÆ ET JALAPÆ, U. S.: *Tincture of Senna and Jalap.*—℞ Senna, ℥iij., Jalap, in powder, ℥j., Coriander, bruised, Caraway, bruised, āā., ℥ss., Cardamom, bruised, ʒij., Sugar, ℥iv., Diluted Alcohol, Oiij. Macerate for 14 days and filter, or

Macerate for 48 hours, and then transfer to a displacement apparatus, and displace with Diluted Alcohol until Oiij., are obtained.

SYRUPUS SENNÆ, L. E., U. S.: *Syrup of Senna.*—Macerate in boiling Aq., Oj., (Oj., and f℥iv., E.), with heat for 1 hour (12, E.), Senna, ℥ijss. (℥iv., E.), Bruised Fennel, ʒj., L. Filter. (Infuse Senna into the water; express strongly, so as to obtain at least Oj., and f℥ij., of Liquid, E.) Add (while hot, E.) Sugar, ℥xv., and Manna, ℥iij., L. Boil down to a proper consistence; add to the infusion of Senna, Treacle concentrated in the vapor-bath, as much as possible, ℥xviij., E. Stir carefully, and when the mixture is complete, remove it from the vapor-bath. Carefully pick Alexandrian Senna, E.

℞ Senna, ℥ij., Fennel seed, bruised, ℥j., Boiling water, Oj., Sugar, ℥xv. Proceed as L., U. S. *Dose*, f℥ss.—f℥j.

Dr. Christison says that the syrup obtained by the Edinburg process is far superior to that prepared according to the London formula, as the infusion in that is added after the treacle has been concentrated.

EXTRACTUM SENNÆ FLUIDUM: *Fluid extract of Senna.* ℞ *Tinnevelly Senna*, ℔xv. avoirdupois, and exhaust it with boiling

water by displacement: (about four times its weight of water is sufficient.) Concentrate the infusion in vacuo to ℔x.; dissolve in it *Treacle* ℔vj. previously concentrated over the vapor-bath till a little of it becomes nearly dry on cooling; add of *Rectified Spirit* (Sp. Gr. ·835) f℥xxiv.; and, if necessary, add *water* to make *fifteen* (16 oz.) *pints*. Every f℥. will correspond to Senna ℥j. avoirdupois.

This is Dr. Christison's preparation so highly recommended by him. It tastes very pleasantly, and generally operates without nausea or griping. The dose is f℥ij., for an adult.

CONFECTIO (ELECTUARIUM E. D.,) SENNÆ, L. (U. S.) *Confection of Senna.*

Rub together Senna ℥viij. and Coriander ℥iv. Pass through a sieve ℥x. of the powder; boil the residue with Aq. Oiij. (Oiij. and ¼ E.), Figs ℔j. and Licorice ℥ij. down to one-half. Express, strain, evaporate in water bath till f℥xiv. remain. In this dissolve Sugar, ℔ijss., and make a syrup; rub in gradually Pulp of Prunes (Cassia, Tamarinds, L.,) āā ℔ss.; then throw in the sifted powder, and mix (triturate to a uniform pulp, E.)

Boil Pulp of French Plums ℔j. and Pulp of Tamarinds ℥ij. in Treacle, by measure Oss., to the thickness of honey; add very finely powdered Senna ℥iv., and when cold, Essential Oil of Caraway ʒij. Mix well. D.

Action—Use.—A mild but useful purgative in doses of ʒj. —ʒiv.

POTASSÆ BITARTRAS.

Synonyms.—Tartari Crystalli, *Dub.;* Fœx Vini, *Roman;* Cremor Tartari, *Lat.;* Doppelt weinsaures Kali, Weinsteinrahm, *Ger.;* Cremor de tartaro, *Span.;* Cremore di tartaro, *Ital.;* Tartrate acide, de potasse, Creme de tartre, *Fr.;* Super tartrate of potash, *Eng.;* Cream of Tartar, *Vul.*

Description and Preparation.—Cream of Tartar is deposited from wines during their fermentation. The philosophy of its formation is this:—the salt is a native constituent of the juice of grapes, especially of those that are very tart; it seems to be in intimate combination with the sugar, the juice undergoes the vinous fermentative change, and alcohol takes the place of the latter, the capacity of the liquid for holding this salt in solution is destroyed, and hence it is deposited in crystals in the bottom and sides of the casks or vessels, containing the wine. In this state the salt is called *crude tartar* or *argol.* That deposited from red wines is of a reddish color, and is

called *red tartar*, and that from *white*, being of a dirty white color, is denominated *white tartar*. Both kinds consist of potassa, united with an excess of tartaric acid, forming a bitartrate with this base, but which is impure from the existence of coloring matter, lime, and the lees of the wine, and hence, requires purification.

The purification of tartar is conducted on a large scale at Montpelier, in France. Here they take advantage of the greater solubility of the bitartrate of potassa in hot than in cold water. "The tartar previously pulverized, is boiled with water in copper boilers. The solution, when saturated, is transferred to earthen pans, where it deposits, on cooling, a crystalline layer, nearly free from color. This is re-dissolved in boiling water, and the solution having been mixed with four or five per cent. of pipe-clay, is evaporated to a pellicle. The clay precipitates with the coloring matter, and the clear solution, as it cools, deposits white crystals in crusts, which upon being exposed to the air, on linen, for several days, acquire an increased degree of whiteness." The powder of these crystals constitutes the *Cream of Tartar* of pharmacy.

Cream of Tartar is in white powder, which has a pleasant acid and gritty taste, and dissolves slowly in the mouth. It is insoluble in alcohol, soluble in sixty parts of water at 60°, and eighteen parts at 212°. Its formula is K O, 2 C^4 H^2 O^5 or two eq. of tartaric acid—132, one of potassa=47·15, and one of water=9, making it 188·15. The water can not be expelled without decomposing the salt, and is hence, supposed to act the part of a base. As usually found in the drug stores, it contains from two to six per cent. of tartrate of lime, and sometimes more or less sand.

Therapeutic Properties and Use.—Cream of tartar is a good hydragogue cathartic, and is considered quite mild in its action. It is also diuretic, and is hence well adapted to the treatment of dropsy. The beverage called *imperial*, is a drink made by dissolving half an ounce of the salt in three pints of boiling water, and adding to the solution four ounces of white sugar, and half an ounce of fresh lemon peel. *Cream of Tartar whey*, is made by adding about two drachms of the tartar to a

pint of milk. The dose of bitartrate of potassa is from ʒss., to ʒj., as a hydragogue cathartic.

MAGNESIA SULPHAS.

Synonyms.—Schwefelsaure Magnesia, *Ger.;* Sulphato di Magnesia, *Ital.;* Sulfato de Magnesia, *Span.;* Salts, Epsom Salts, *Vul.*

Description and Preparation.—Sulphate of Magnesia is a constituent of sea water, and of many saline springs. It occurs, also, as a native product in some soils or earths, and appears in the form of efflorescence, on rocks and grounds which contain it. Sometimes, also, it is found in the crystalline form. The bittern of sea-water, after the crystallization of common salt, contains Sulphate of Magnesia, and Chloride of Magnesium, and by simple evaporation the former may be separated by crystallization. Sulphuric acid is sometimes added to convert the chloride into a further quantity of the sulphate.

The formula of Sulphate of Magnesia is $Mg\,O, S\,O^3 + 7\,Aq.$ = 123. As commonly prepared it is in "acicular crystals, but it may be crystallized in quadrangular or hexangular prisms, acuminated by two to six planes, the primary form being a right prism with a rhombic base. The salt is white or colorless, transparent, and sparkling, of a saline, nauseously bitter taste. Unalterable or slightly efflorescent, according to the dryness of the air. Sometimes, but only when impure, deliquescent. Insoluble in Alcohol, soluble in its own weight of water at 60°, and in less than three-fourths at 212°. Exposed to heat, the crystals melt in their water of crystallization, of which six Eq. are dissipated; the salt is then fused into an enamel without decomposition. If moistened when in the anhydrous state, water is re-absorbed with increase of temperature."

Therapeutic Properties and Use.—Salts, as this article is commonly called, is regarded a very mild and safe, but yet efficient hydragogue cathartic and diuretic, and is hence very highly esteemed in dropsical complaints. The dose of Sulphate of Magnesia is about an ounce; but it is considered best given in divided doses, repeated. The most agreeable form in

which it is taken, is a solution of it in carbonic acid water, with lemon syrup. But it is commonly taken simply in a watery solution.

POTASSÆ TARTRAS.—Soluble Tartar.

This is a deliquescent salt of tartar, possessing nearly the same medical properties as the bitartrate, or *cream of tartar;* but is less pleasant to the taste, and consequently little used in medical practice. The dose is ʒj.—ℨj.

POTASSÆ BISULPHAS.

Synonyms.—Potassæ Supersulphas; Sal Enixum; Bisulfate de Potasse, *Fr.;* Doppelt Schwefelsaures Kali, *Ger.*

Description.—Bisulphate of Potash (KO, 2 SO_3+2 HO), is obtained in the manufacture of nitric acid, as a residual salt. It is colorless, and without odor; but possesses a decidedly acid bitter taste. It crystallizes into flat, right rhombic prisms. It is unalterable in dry air; very soluble in water; insoluble in alcohol; and melts when heated, gives off one proportion of acid, and is reduced thus to the simple sulphate.

Action—Use.—A safe hydragogue cathartic; though not now much employed. With an equal quantity of carb. of soda, it forms an effervescing draft, useful in constipated habits and habitual headache. The two salts are to be dissolved separately in water, and then drank when thrown together. The dose of the Bisulphate of Potash is ʒj.—ℨj.

PULVIS SALINUS COMPOSITUS, E. D: *Compound Saline Powder.*—℞ Sulphate Potash, ℨiij.; Sulph. Magnesia and pure Muriate of Soda, āā ℨiv. Dry the Salt separately with a gentle heat; pulverize and triturate them well together. Preserve the compound in well-stopped vessels.

Action—Uses.—This is a useful combination of several salts, in which some degree of stimulus is combined with the cathartic properties. It may be beneficially taken in costive habits.

Dose, ʒij.—ʒiij., dissolved in water.—R.

POTASSÆ SULPHAS CUM SULPHURE, E.: *Sal Polychrestum Glaseri. Glaser's Sal Polychrest.*—℞ Nitrate of Potash and Sulphur, equal parts; mix; throw the mixture in small portions, into a

red-hot crucible; when the deflagration is over, and the salt cools, reduce it to powder, and preserve it in well-stopped bottles.

Action — Use.—This Salt acts as a safe and mild purgative, and may be given with an equal weight or more of Bitartrate of Potash. It was formerly much used in Dyspepsia and chronic cutaneous diseases. Dr. Duncan says, that in use it agrees with the Sulphureous Waters. R Dose, ʒss.—ʒj.

POTASSÆ SULPHAS.—Vitriolated Tartar.

Sulphate of Potash (KO, SO_3), is found in the organic and inorganic state, in four different forms: —1st., in the mineral solid form, about volcanoes and in alum, and polyhalite; 2nd., in some mineral waters; 3rd., in many plants; 4th., in some animal secretions. When pure, it occurs in hard crystals of variable shape; but the primary form is a right rhombic, or rhombic octohedron. The crystals are unalterable in the air; insoluble in alcohol; soluble in sixteen parts of cold, and four parts of boiling water. The taste is somewhat nauseous and bitter.

Action — Use.—A mild hydragogue cathartic; but not much in use. Dose, gr. x.—ʒss.

LIQUOR POTASSÆ EFFERVESCENS, L. POTASSÆ AQUA EFFERVESCENS, E.: *Effervescing Solution of Potash.—Prep.* Dissolve Bicarb. Potash, ʒj. in Aq. dest. Oj. Pass through the solution Carb. Acid Gas under pressure (more than sufficient for saturation; preserve the solution in well-stopped vessels, L.). This may be extemporaneously imitated by pouring a bottle of soda-water (*i. e.*, Carbonic Acid water) into a tumbler containing gr. xx. of Bicarb. of Potash.—R.

This is a solution of Bicarbonate of Potash containing Carbonic Acid Gas in excess.

LEMON AND KALI.—A mixture of powdered White Sugar, dried and powdered Citric Acid, and powdered Bicarbonate of Potash—employed for making extemporaneous effervescing draughts. Acid and Alkali is to be kept separate until used.

PULVERES EFFERVESCENTES.—The Ed. Pharm. orders—of Tartaric Acid, ʒj.; Bicarb. Potash, ʒj. and gr. 160. Reduce both to fine powder, and divide into sixteen parts. Preserve the Acid and Alkaline powders in separate papers of different colors.

Action — Use.—A common beverage, possessing laxative hydragogue properties. When taken it is mixed with various kinds of syrup, or with sugar, to improve the taste.

It must be remembered, however, that the habitual use of Carbonic Acid drinks, as now practiced at the "*soda founts*" in our cities and towns, is not such a wholesome practice as is generally represented. It inclines to cholera, and cholera morbus.

IRIS.—The Rhizoma, Leaves, and Flowers.

Synonyms.—Iris, *Fr., Lat.;* Violen, *Ger.;* Ireos, *Ital.;* Lirio, *Span.;* Orris, *Eng.;* Flag, *Vul.*

History.—This beautiful genus is valuable for its medical character, as well as the beauty of its flowers, and in some species, its agreeable odor. Many of the species have been used in Europe and America; but one only has been made officinal, the I. Florentina; but the I. Versicolor has also found a place in the secondary list of the U. S. P. They are natives of Europe and America.

Botany.—*Sex. Syst.*—Triandria Monogynia. *Nat. Ord.*—Iridaceæ.

Gen. Char. Iris.—*Corolla* six-parted; the alternate segments reflected. *Stigmas* petal-shaped.—*Willd.*

Spec. Char. All the species agree in having fleshy, perennial, horizontal *Rhizomes*, beset with fibers. *Leaves* radical, long, sword-shaped. *Stem* upright, from one to three feet high, sometimes branching. *Flowers* very beautiful; *colors* varied, but very rich. Grows in wet places; cultivated in gardens.

There are many species of Iris—the *I. Florentina, Germanica, Fœtidissima*, and *Pseudo-acorus, etc.*, are natives of Europe; and the *I. Versicolor, Prismatica, Lacustris, Missouriensis, etc.*, are natives of this country.

Analysis.—The rhizome of the I. Florentina, and most probably that of all the species, contains *volatile oil, acrid resin, astringent extractive, gum, starch or fecula, ligneous matter*, and perhaps *oxalate of lime.*

PHYSIOLOGICAL EFFECTS.—Iris, in its recent state, is capable of producing violent effects upon the system, giving rise to severe nausea, vomitings, and drastic purging, with other unpleasant effects. In its dried state it is much more mild.

THERAPEUTIC PROPERTIES AND USE.—The rhizome is a hydragogue cathartic and diuretic, and has also a powerful effect on the liver and glandular system generally. The powder of the root of I. Florentina, or *orris* of the drug stores, makes a valuable tooth-powder, being astringent, anti-scorbutic, acrid, and of a rich odor. The *I. Versicolor* is the variety chiefly used as a cathartic in this country. It is very powerful, and requires to be taken in small doses. It is regarded by very many in the reformed profession, to be perhaps the best single article that can be used in syphilis. Rafinesque says that a decoction of three-fourths *Iris*, and one-fourth *eryngium yucefolium*, has cured dropsy, without disturbing the bowels. Its chief application is in hydrothorax, syphilis, scrofula, etc. The flowers and leaves possess the same cathartic property with the root or rhizome, only they are milder in their effects. The dose of the powdered rhizome is from gr. v. to gr. x., repeated.

PHARMACEUTIC PREPARATIONS.—**EXTRACTUM IRIDIS ALCOHOLICUM**: *Alcoholic Extract of Iris.*—Evaporate the saturated alcoholic tincture of Iris Versicolor, either by distillation, or by means of the common water bath, to the consistence of syrup; place it in shallow dishes in the sun, and let it thicken to the consistence of soft wax or pitch.

Action—Use.—This extract is employed for making cathartic pills. Useful in Dropsy, Syphilis, Scrofula, Cancer, etc. It can be readily diluted with alcohol if desired, and given, dropped from a vial. Dose, gr. iij., gr. iv.

IRISIN.—This is prepared, by washing thoroughly the Alcoholic Extract of Iris with cold water; by which means the extractive matter, some of its coloring matter, and a small quantity of gum (which is taken up in the spirit by the water it may contain), is removed, and the oleo-resinous principle, which is the active part of the plant, is left. This is called *Irisin*, under the supposition that it is a peculiar principle of the plant nearly pure. It is a soft resin.

Action—Use.—Same as the Alcoholic Extract. Dose, gr. j.—gr. ij.

IRISINE.—Messrs. Keith & Co., of New York, prepare an alkaloid from the *Iris*, which they call *Irisine*, and which is represented to possess the active medical properties of the plant.

The author has had no experience with this article; but is informed by Dr. R. S. Newton, of this city, that it has proved in his hands, a useful and reliable article—quite equal to the Alcoholic Extract, and being in crystalline or powdered state, is much more convenient than that article. The dose is gr. j., gr. ij. Useful as a hydragogue; an alterative in syphilis, scrofula, cancer, and hydrarthrus.

JALAPA.—The Root.

SYNONYMS.—Jalap, *Fr.;* Jalappen-Wurzel, *Ger.;* Sciarppa, *Ital.;* Jalapa, *Span.;* Jalap, *Vul.*

HISTORY.—Jalap is a native of Mexico, and has derived its name from the city of Xalapa, in the State of Vera Cruz, in the neighborhood of which it grows, on mountains, sometimes at the hight of six thousand feet above the level of the ocean. The drug is brought from the port of Vera Cruz in bags, containing from one to two hundred pounds.

BOTANY.—*Sex. Syst.*—Pentandria Monogynia.—*Nat. Ord.*—Convolvulaceæ.

Gen. Char. IPOMŒA. *Sepals* five. *Corolla* campanulate. *Stamens* included. *Style* one. *Stigma* two-lobed; the lobes capitate. *Ovary* two-celled; cells two-seeded. *Capsule* two-celled.—*Lindley.*

Spec. Char. I. JALAPA. Some confusion has existed in reference to the true species yielding the officinal *Jalapa.*

The following description of the Jalap plant is taken from Royle's Therapeutics, and is most probably correct.

"The true Jalap plant, has a tuberous, fleshy root-stalk with numerous pear-shaped tubers, externally brownish-colored, internally white, with numerous long fibers. The stem, climbing to a great extent, is of a brownish color, round and smooth, without downiness. Leaves on long foot-

stalks, cordate, with a tendency to become hastate in the lower leaves, deeply sinuated at the base and acuminate at the apex entire, very smooth. Peduncles axillary, two-flowered, commonly only one blown at a time. Calyx without bracts; sepals five, obtuse, mucronate, with two of them external. Corolla of a crimson or a light-red color, with a long, rather clavate tube, four times longer than the calyx: limb undulated, with five plaits; lobes obtuse, submarginate. Stamens five; filaments smooth, unequal, longer than the tube of the coral, with white, linear, exserted anthers. Stigma capitate, deeply furrowed. Capsule two-celled; cells two-seeded."

IPOMŒA JALAPA.

ANALYSIS.—Guibourt analyzed the root of Jalap, but without the design of trying to procure all the salts and peculiar principles. He found it to contain "*Resin* 17·65 per cent., a liquid *Sugar* obtained, by alcohol, containing some of the deliquescent salts, 19·00; *Brown, Saccharine extract*, obtained by water 9·05; *Gum* 10·12; *Starch* 18·78; *Woody matter* 21·60; loss 3·80=100. This, as M. G. remarks, differs from the analyses hitherto given, but in the presence of sugar, which he supposes to be of the nature of cane sugar, approximates Jalap to batatas and other Jalap (as rose Jalap) roots of the same family, which contain it. The cathartic properties depend on the resin: hence, rectified spirit is the best solvent. Water takes up the gum and starch, with little of the active principle. Though Jalap is apt to be attacked by insects, its virtues are not in consequence impaired, for they leave untouched the resinous part. This resin is of a grayish color, opaque, brittle, acrid in taste, soluble in alcohol, a little so in ether, readily so in nitric or acetic acid, and in solution of potash. It is now

often adulterated with guaiacum, which may be detected by the blue color produced by nitrous gas, while ether dissolves it, but does not dissolve pure resin of Jalap. Dr, Kayser has named this rhodoretine, from its producing a red color with strong sulphuric acid. He considers it composed of C^{42} H^{35} O^{20}."

The resin of Jalap, may be said to be of two kinds; one, amounting to seven parts out of ten, is very hard and insoluble in ether; the other is soft and is soluble in that menstruum.

THERAPEUTIC PROP. AND USE.—Jalap is an active, and pretty certain purgative of the hydragogue order, and has long been in use by the old profession. But it is in no respect superior to the Podophyllum except in quickness of action, and being much more expensive, will ere long give place to that article, to a very large extent. It is more drastic than the podophyllum, but it produces its cathartic effects in half the time required by the latter. It is in view of this that it is now combined with podophyllum for hydragogue purposes. The combination is usually in about equal proportions, and a small quantity of Cardamoms, or fennel seeds pulverized is commonly added to improve it, to render it less griping.

PHARMACEUTIC PREPARATIONS.—**PULVIS JALAPÆ COMPOSITUS, L. E. D.** (U. S.): *Comp. Jalap Powder.* Rub separately into very fine powder Jalap, ℥iij. (℥j. E. [U. S.] ℔ss. D.) Bitartrate of Potash, ℥vj. (℥ij., E. [U. S.] ℔j., D.) Ginger, ʒij. Mix.

Action — Use.— Hydragogue cathartic; useful in dropsies. Dose, from ℈j. to ʒj. It will reduce the swelling of dropsy in an incredible short time.

TINCTURA JALAPÆ, L. E. D. (U. S.): *Tincture of Jalap.*— Macerate for fourteen days powdered root of Jalap, ℥x. (℥vij. E., ℥viij. D. [U. S.]) in Proof Spirit Oij. Strain. (Prepare by digestion or percolation, *v.* Tinct. Cinchonæ, E.)—Contains the Resin of Jalap, with some of the principles soluble in water.

Action—Use.— Cathartic adjunct to purgative draughts, in doses of fʒj.—fʒij.

EXTRACTUM (SIVE RESINA, E.) JALAPÆ, L. D.: *Extract or Resin* (E.) *of Jalap.*— L. D. Macerate powdered Jalap root, ℔ijss. (℔j. D.), in Rectified Spirit, Cj. (by measure, ℔iv. D.), for four days. Pour off the Tincture. Boil the residue in Aq. dist. Cij., (Cj., D.) to Css. (℔ij. D.) Strain the liquors, evaporate

the decoction, and distil the tincture till thick; then mix the Extract and the resin, and evaporate to the proper consistence over a water-bath. The Extract must be kept soft for pills, and hard for powder, L.

RESINA JALAPÆ: *Jalapin.*—℞ Finely powd. Jalap, any quantity; moisten with Rectified Spirit; in twelve hours put it into the percolator and exhaust with Rectified Spirit; distil off the greater part of the Spirit, and concentrate the rest to a due consistence over the vapor-bath. "As the active properties of Jalap depend upon its resinous, and not upon its saccharine, gummy, or amylaceous principles, this preparation is preferable to those of the L. and D. P., where the extracts of water and of spirit are mixed together, and the produce necessarily weaker than the Resin."

Action—Use.—Cathartic in doses of gr. v.—℈j. Usually prescribed in combination. The Resin of the E. P. in doses of gr. iij.—gr. xij.

PODOPHYLLUM.

This article, which was described and treated of in the order of Cholagogues, also merits a place here, as it is a very certain hydragogue cathartic, if used in doses about one-third larger than recommended for other complaints, generally.

ELATERIUM.

The elaterium of commerce is the deposition that takes place when the juice emitted by the Momordica Elaterium, or *Squirting Cucumber*, is left standing in a vessel for some hours.

The plant belongs to *Sex. Syst.*—Monœcia Monodelphia, and *Nat. Ord.*—Cucurbita. It has a large fleshy root, from which proceed several round, rough, trailing stems without tendrils. The vine very much resembles that of the common cucumber.

To obtain the elaterium, the ripe fruit—which is a prickly body about the thickness of a man's thumb and an inch in length, shaped much like the common cucumber—is to be sliced and pressed carefully in a very fine wire sieve, so as to force through the juice, which contains the active principle. This juice will deposit the elaterium in a few hours, when it is to be dried in the shade.

The best elaterium is that brought from Germany. Clutterbuck's is generally the most esteemed.

Physiological Effects.—Though possessed of very great power, elaterium is now conceded to be free from any specifically poisonous properties. When given in small doses long continued, it occasions no effects different from those which attend the use of other milder and innocent agents.

Viborg, as related by Dr. K. Wibmer, in his work on Medicines and Poisons, gave a pound of the fruit to a horse, without any effect. Two and a half pounds of the entire plant—roots, stalk and leaves—were also given without any effect. Still, however, it is not advisable to be rash in its employment, since it is known to have so powerful an effect on man. When an over-dose is given, its action seems simply to be irritant, and the irritation is evinced upon the mucous membrane of the bowels. When applied to the membranes of the eye or to denuded surfaces, it also proves irritant.

From all that has yet been learned of its effects, when given in over-doses, they appear to be extremely like podophyllin. This article, also, is mild enough when given in proper doses; yet in excessive quantities it will, like elaterium, occasion much irritation and even inflammation of the mucous surfaces; or when applied externally and kept in solution it will occasion erysipelas.

Therapeutic Properties and Use.—Elaterium is the most effective hydragogue that we possess. It has availed in hydrocephalus, hydrothorax, hydropericardium, anasarca and other forms of dropsy, after many other means have failed.

But the uncertainty of the strength of the commercial elaterium should, when this is employed, ever be a caution against recklessness, since by an over-dose of this article much mischief might be done. Under doses of, say, one-eighth of a grain, should be given once in two hours, combined with leptandrin, or jalap.

It would be scarcely advisable, however, to use an article of such power, in general practice. It should be reserved for special occasions—as in those hopeless cases of dropsy, that

trouble the practitioner occasionally.* The dose of the best German elaterium is one-fourth of a grain. But the common article has been given in much larger doses. Often, no effects at all follow its exhibition in large doses, which must be referred to the worthlessness of much of the elaterium in market. In such cases, the practitioner must not commence the use of a new article of the medicine in similarly large doses.

GAMBOGIA.

Gamboge is a gum or gum-resinous exudation from an

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* The author well remembers a case which occurred in his practice near twenty years since, when he entertained strong prejudices against this medicine. The case was one of anasarca and ascites. Thorough and protracted treatment had been given by several respectable physicians; during all of which time the patient was getting worse, for the swelling continued to progress, while his weight was increasing at the rate of five pounds per week. When the author was called to the case, the prospects were indeed almost hopeless; but the solicitude of the friends of the unfortunate sick man was not to be resisted, and a most thorough treatment was at once adopted.

Diaphoretics had no effect. Diuretics seemed at first to promise something, but in a few days they evidently lost their power. Thorough emetics and vapor-baths had been instituted, with a view to a change of the determination of the fluids; but this, with thorough friction and internal stimulants, effected nothing. The most powerful hydragogues then in common use, conjoined with stimulants and tonics, were then invoked. By this means about two gallons of water were removed daily for about seven days, when the patient began to evince signs of debility, which contra-indicated the continued use of the hydragogues. They were therefore superseded by the use of tonics and astringents. In the mean time, the weight of the patient, which had been diminished about ten pounds, was again increasing.

At this stage of affairs an itinerant practitioner came along, and hearing of the case, applied at once for the charge thereof. Under circumstances so discouraging, it is not common that the physician in attendance offers much objection to a change of responsibility. A change was made, and the new doctor applied his "*Specific.*" The consequences which followed were astonishing to every one except the "New Doctor," who seemed to expect the effects with complete assurance. Four gallons of water were removed every twenty-four hours, for four days, by means of a hydragogue cathartic; and the author's prejudices against elaterium were giving way fast, as he witnessed a rapid convalescence of the patient after the use of the "Specific," which proved to depend for its activity entirely upon elaterium.

uncertain tree growing in India. It occurs in our markets in dry, hard and friable, bright-yellow masses. Sometimes the gum occurs in cyllindric form, when it is called *Siam gamboge*, and this is usually free from dirt, and of superior quality. *Lump*, or *cake gamboge*, occurs in lumps of several pounds weight, and is not so nice as the former kind, being sometimes mixed with foreign substances—as dirt, and sticks or bark.

Gamboge has a slightly acrid smell and taste, and colors the saliva beautifully yellow. When pulverized it makes a fine, bright-yellow powder. It dissolves readily in water, and makes a superior paint for maps and pictures generally. Its composition is C_{40}, H_{23}, O_8.—(*Johnston.*)

THERAPEUTIC PROPERTIES AND USE.—Gamboge has heretofore been in use by some Reformers, on account of its activity, or rather the smallness of the quantity necessary for its cathartic action—having been for this reason combined with other less powerful cathartics to render them efficient in smaller doses. It is a hydragogue cathartic of very harsh and drastic action, and sometimes gives rise to severe griping and tormina; and has therefore been very justly laid aside since the concentrated indigenous cathartics have been introduced. Podophyllin will eminently well supply its place. Dose, gr. ij.—gr. v.

SCAMMONIUM.

Scammony is the concrete juice of the root of the Convolvulus Scammonia, a tree growing in Syria. There are several kinds of the drug found in our market. One kind, called *Aleppo Scammony*, has been considered the best. Another kind, called *Smyrna Scammony*, was regarded inferior; but at the present these distinctions are not maintained, as they now no more indicate the quality of the article.

Scammony is a gum-resin, of an ash-grey color, which comes to us in masses of various sizes, and shapes. It is difficult now to find it of pure or *virgin* character, since it is apt to be much adulterated with foreign substances, from motives of gain. In France, it is said to be manufactured out of base materials mixed with small quantities of the genuine drug.

PHYSIOLOGICAL EFFECTS.—Scammony has been the subject of some dispute as to the safety of its use. But it is now proven not to be possessed of poisonous properties, and but for its drastic power, might be classed among the innocent medical agencies. When given in large doses, it irritates the mucous membrane of the stomach and bowels, and is sometimes followed by inflammation of these parts. In quite small doses, no notable effect except that of a laxative or aperient, is observed.

APPLICATION AND USE.—Scammony is a powerful hydragogue purgative, too powerful for common use. It is apt to occasion pain and griping, particularly when the bowels are not well supplied with mucus. When employed it should be combined with other and milder articles, such as rhubarb, leptandria, etc. Dose.—Pure or virgin scammony will operate as a purge in doses of gr. v.—gr. x. But common scammony sometimes requires twenty grains. This uncertainty of strength in the commercial drug must inevitably, ere long, bring it into disuse.

COLOCYNTHIS.

This is the fruit of an herbaceous, annual vine, growing in Turkey, and the islands of the Archipelago. As brought to us, the colocynth is in globular form, consisting of the fruit of the plant denuded of its rind. It is quite full of seeds, and of a very spongy consistence and light color. It has little odor, but an exceedingly bitter taste. Water and alcohol extract its active principle, called *colocynthin*. But since the dose of the substance is very small it is scarcely necessary to have it concentrated.

Colocynth is a most powerful hydragogue cathartic, long in use by the Old School physicians. It is quite too powerful and drastic for common use. But since the objections against it have been simply laid against its *power*, and not its *quality*, many of the Eclectic practitioners have been in the habit of employing it in under doses, combined with milder articles, which by this means are improved in their activity.

The medicine is much in use by the Arabian physicians, and

by the German. In the United States, its employment is also much more general among the German physicians.

No narcotic or direct sedative effects appear to follow its use; and when given in over-doses, the symptoms are very like those that follow the excessive use of podophyllin: they are—vomiting, violent purging, griping, inflammation, with pain and tenderness in the bowels. Dose, gr. v.—gr. x. The Officinal Extract is mostly preferred. Of this there are two kinds—the *simple* and the *compound Extract of Colocynth.* The simple extract is made by the evaporation of the aqueous solution, and is of little account; the compound is an alcoholic extract of colocynth, scammony, aloes, and cardamom, with an addition of Castile soap. The dose of the former is gr. v.; and that of the latter, which is by far the better article, is gr. v.—gr. xxx.; generally gr. x.—given in pill form.

A large portion of Reformers object entirely to this article.

RHAMNUS CATHARTICUS.—Buckthorn Berries.

The fruit of what is called the *Purging Buckthorn*, a native of Europe, has been used a long time by the Old Profession as a hydragogue cathartic, in dropsical diseases. But they are nauseating and drastic, and have no advantages over any of our more prominent indigenous articles of this order. We do not need it. It is commonly given in form of syrup.

OLEUM TIGLII.—Croton Oil.

This is the expressed or fixed oil of the *Croton Tiglium*, a tree growing in Hindostan, Ceylon, the Moluccas, and other parts of Southern India. The oil, as brought to us, is seldom genuine. It is adulterated with other fixed oils.

Croton oil is perhaps the most active and powerful of all the cathartic agents known. When pure, it will operate in doses of from one to two drops, sometimes in less than one hour. In over-doses it is very severe, and often fatal; and from this circumstance and the uncertainty of its strength or purity, the article has of late been much less in use than formerly, even by the Old Profession, with whom it has been mostly employed.

Besides its activity and smallness of dose, there is, however, still one other advantage in its employment—that is, the circumstance of its operating principally through nervous influence. It is hence emphatically a *specific cathartic*, and operates without being introduced into the stomach, or even the alimentary canal. Its endermic application will prove cathartic in a very short time. When thus used, it is commonly applied over the abdominal region, conjoined, in the quantity of a few drops, with some other soft oil. It is a vessicant, also, to the skin; and for this purpose (vessication) those who use revulsives of this kind have employed it.

We can dispense with croton oil very conveniently; since our podophyllin will serve us in the object of smallness of dose, and oleum ricinus, or even senna, will answer all ordinary demands for promptitude.

SODÆ CHLORIDUM.

Synonyms.—Sodæ Murias, E. D.: Chloruro di Sodio, Sal Commune, *Ital.;* Chlorure de Sodium, Hydrochlorate de Soude, Sel Marin, *Fr.;* Sal, *Span.;* Chlornatrium, Kochsaltz, *Ger.;* Salt, *Eng.*

History.—Salt is a natural product, common to almost every portion of the world. It occurs mostly in solution with water, in certain springs, lakes, and the waters of the ocean. It is also found in the solid or crystalline form, in which it is called *rock-salt.* It is too common to need further description.

Action—Use.—Salt is the common preservative employed in curing meat, and is necessary with food for most of the superior animals. As a medicine it proves emetic, in large doses; hydragogue cathartic in smaller; and alterative and stimulant in doses of ʒj. As a hydragogue ℥j. is usually given, dissolved in water.

SODÆ ET POTASSÆ TARTRAS.

Synonyms.—Sodæ Potassio-Tartras, L., Potassæ et Sodæ Tartras, E.; Tartrate de Potasse de Soude, *Fr.;* Weinsaures Nation-Kali, *Ger.;* Tartarized Soda, Roschelle Salt, *Eng.*

Description.—This is a compound salt, discovered in 1672,

by Seignette, an apothecary of Rochelle. Having two alkaline bases, *i. e.* soda and potash, united with tartaric acid, it has been very unsettled in its name, and all the colleges differ in the names they give to it. It is colorless, crystalline; without odor, and of a mild saline, slightly bitterish taste. It is soluble in five parts of cold, and in less of hot water; also soluble in weak alcohol, but scarcely so in absolute alcohol. When pure, it is not much disturbed in the air, but as commonly seen it effloresces in it. Its composition is Tart. Pot. 40, Tart. Sod. 34.5, Aq. 25.5=100.

Action—Use.—One of the finest saline hydragogue cathartics, and is also diuretic. Dose, ʒij.—ℨj.; given also in effervescence, as in Seidlitz powders.

SODÆ SULPHAS.

Synonyms.—Sal Catharticus, Sal mirabile Glauberi, Sulphate de Soude, *Fr.;* Schwefelsaures, *Ger.;* Sulphate of Soda, Glauber's Salt, Cheltenham Salts, *Eng.*

History.—Sulphate of soda is found sometimes effloresced on the soil in India and other countries. It exists in sea-water, and in springs and lakes, in some plants, and in some of the animal secretions. It is colorless, transparent, and crystalline, when freshly prepared; but when exposed in the air it effloresces. Its composition is Na O 19.75 SO_3 24.69 Aq. 55.56=100. Soluble in water, slightly in alcohol.

Action—Use.—A hydragogue cathartic, very safe in its use, but less agreeable than the Sulph. Magnesia. Dose, ℨj.—ℨij.

SODÆ ACETAS.

Acetate of soda is a salt, supposed to occur in most vegetables containing the carbonate of soda. It is prepared from pyroligneous acid. It is, when fresh, a transparent, colorless salt, of a saline, bitterish taste, and is freely soluble in water, but sparingly in alcohol.

Action—Use.—A safe hydragogue cathartic, but not much in use. Dose, ʒj.—ʒiij.

Class III.—DIAPHORETICS.

Definition.—This class of remedial agents is variously called; *diaphoretica* (from *διαφορεω*, I transpire); sudorifica, (from *sudor*, sweat, and *facio*, I make); or *diapnoics* (from *διαπνοη*, perspiration). As these terms all indicate the elimination of the same materials from the system—upon the same general principles (so far as the vital action is concerned), it will do no violence to the present plan of classification, to consider them synonymous; and, indeed, this is the usual practice of our most popular therapeutists. "The terms *diaphoretic* and *diapnoic* have been used to designate substances which augment the insensible perspiration; while the word *sudorific* indicates a substance increasing the sweat or sensible perspiration. But, insensible perspiration and sweat differ in their physical conditions only—the former being the vaporous, the latter the liquid state of the same fluid. Hence, there can be no essential difference between diaphoretics and sudorifics." —(*Pereira*). It must be observed also, that the atmosphere, as to moisture and dryness, as well as temperature, very much modifies the process of perspiration; and thus, under some circumstances, the mildest diaphoretics may prove sudorific and *vice versa*.

Modus Operandi.—Dr. Edwards (De l'Influence des Agens Physiques sur la Vie, Paris, 1824) has shown, that cutaneous transpiration is effected in two ways—by a physical action or evaporation, and by an organic action, or transudation. *Evaporation*, or the physical action, is the consequence of the porosity of bodies, and takes place equally in the dead and living state. It is influenced by the hygrometric states of the surrounding air, by its motion or stillness, by its pressure, and by its temperature. Thus dryness, agitation, and diminution of the weight of the air, increase it. *Transudation*, or the organic action of transpiration, is a vital process, effected by minute spiral follicles, or sudoriferous canals, and depends essentially, on causes inherent in the animal economy, although it may be influenced, to a certain extent, by external agents. Thus, elevating the temperature of the surrounding

air, preventing its frequent renewal, and covering the patient with warm clothing, are means which promote the organic, but check the physical action of transpiration. Diaphoretics affect the transudation, or the vital processes. They affect the exhalents in one or both of two ways;—by increasing the force of the general circulation—or by specifically stimulating the cutaneous vessels.—*Pereira.*

Physiology.—Perspiration is very justly considered, one of the most important physiological functions, performed in the animal system. It has been supposed, that three-fifths of all the ingesta, after subserving the general purposes of the economy, are destined to find their exit through the pores of the skin: this, however, is overrating the matter. But the mere evacuation of recrementitious matter is not the only physiological purpose involved in the phenomenon of perspiration, for the *evaporation* thus sustained, is the grand means by which the physiological standard of the *temperature* of most of the larger animals, is maintained or regulated.

Diaphoretics, which are the agents calculated to promote perspiration, are, therefore, not only *physiological* in their effects, but extremely *important in their use.*

Application.—Perhaps no system of medicine ever introduced, has so fully contemplated the important use of this class of remedies, as the present Reformed or Eclectic system. A reference to any of our works on practice, discovers them among the most common applications that are made; and it may be remarked that this, perhaps, contributes no less than any other circumstance, to the remarkable success that attends the practice.

The grand purposes effected by the process of perspiration, which stand so intimately connected with all the organic functions of the system, fully warrant the Reformers in taking the position they have, in reference to this matter. Some of the old school, as if determined to oppose every measure adopted by the Reformers, have consigned this class of remedies to comparative neglect. Professor Chapman, of Philadelphia, remarks: "The practice so generally prevalent, at one time, of endeavoring to cure diseases of an inflammatory nature, by

extorting sweat by the profuse exhibition of the heating and stimulating articles, was productive of the most *mischievous effects*, and brought these medicines into discredit among regular practitioners." * In the next paragraph, he adds: "Of all the plans, however, of treating disease, the practice of sweating is, perhaps, the most popular and generally adopted. By the vulgar, it is constantly resorted to, as the safest and most effectual process. Nor is this opinion confined, altogether, to the low and illiterate orders of mankind. Every class of society seems, in some degree, to have acquiesced in the prejudice, and to entertain the same views."

In Inflammatory Diseases. — Diaphoretics are important remedies in febrile and inflammatory diseases generally. They not only promote the evacuation of the irritating and combustible matters, which serve largely to maintain the fever and inflammation; but, as already hinted, by means of the evaporation they sustain, they let down the heat of the body *directly*. In their application, some discrimination, however, is necessary, as it is evident that the stimulating order of this class of remedies is not so freely admissible, while the circulation is confined. But this matter is fully treated of in the consideration of the different orders of diaphoretics.

In Fevers.—In remittent and continued fever, a proper order of diaphoretics will be of great avail. That oppression, so common in these varieties of fever, which is dependent on the extreme dryness and heat of the surface, which is sometimes very much like that of incipient typhus, is often obviated by their use; and if early employed, they will frequently afford complete relief. Some order or other, of this class of remedies, perhaps, is always indicated in remittent, as well as every other variety of fever.

In Pneumonia Typhoides.—In pneumonia typhoides, in which there is, as in true typhus, such a manifest tendency of all the humors that contain nitrogen, to putrefaction, the emunctories of the skin should be kept free, and active. Diaphoretics, therefore, are among our most important remedies. Prof.

* Therapeutics, vol. I., p. 316.

Chapman remarks, that two leading modes of treatment have been adopted in this affection. "By one set of practitioners, the most profuse use of diffusible stimulants has been recommended; while, by another, the sweating plan is preferred." "My opportunities," says he, "have been sufficient to compare these different modes, and I do not entertain the slightest doubt of the superiority of the latter. The physicians of this city [Philadelphia] at least, are generally agreed on this point, and they all acknowledge the infinitely greater success which attends the early and steady employment of the more active diaphoretic measures."

In Typhus.—It is scarcely necessary, after what has just been stated, to mention the applicability of diaphoretics in typhus or typhoid fever. It is worthy of remark, however, that the agents of this class are much the most available in the incipient stages of those affections. In typhus gravior, it is often very difficult to procure diaphoresis. Nevertheless, it is still important that the means should be perseveringly applied. The vapor-bath will, in most instances, be indispensable, and should never be neglected. When the patient is too feeble to sit in the bath, a frame or other suitable fixtures, consisting of curved sticks, or sections of hoops, placed over him, while lying in bed, will keep off the covers so as to admit of the free application of the vapor, by means of the proper pipes.

In Acute Pulmonic Inflammation.—The very intimate sympathetic relation which subsists between the cutaneous surface and the lungs, renders the employment of diaphoretics particularly proper in the treatment of inflammatory affections of the latter. When the skin is moist with perspiration, the breathing is always more free, the pain and distressful feeling in the throat and chest, less severe, and expectoration easier. (Eberle.) It is evident, when the determination is changed to the surface, the inflammatory action in the lungs must abate in a corresponding degree. Eberle thinks, that in incipient phthisis pulmonalis, the most important remedial means are such as tend to keep up a regular action of the cutaneous emunctories.

In Visceral Inflammation.—Nor are diaphoretics less avail-

able in inflammatory affections of any of the other viscera, either of the *thorax* or *abdomen*, such as hepatitis, gastritis, enteritis, peritonitis, nephritis, cystitis, etc. Collaterally with their power to obviate inflammation, they have a manifest tendency to equalize the circulation, as well as the nervous action.

In Rheumatism.—These same remarks will hold good in reference to the application of diaphoretics in inflammatory affections of any other tissues. Hence, they may be freely used in rheumatism, gout, and all phlegmonous attacks of external organs.

Cholera, etc.—The advantage of diaphoretics in dysentery, or diarrhea, as well as cholera infantum, and the ordinary summer complaint of children, should, perhaps, not go unnoticed here. Vogler, Stoll, Akenside, and Richter, were among the first who called the attention of the profession to their utility in these affections. But at the present day, especially among Reformers, no encomium is necessary to insure attention to their claims. "The influence," says Dr. Eberle, "of the morbid condition of the cutaneous exhalents on those of the bowels, and vice versa, is often manifested in a very conspicuous way. We observe, for instance, dysentery, diarrhea, and inflammation of the bowels to ensue from the sudden suppression of perspiration: and on the contrary, these diseases, from whatever cause they may arise, are almost invariably attended with a dry skin. By exciting the cutaneous emunctories in these affections, therefore, we break the chain of morbid action, equalize the circulation, and give an exit to those recrementitious matters which nature designs to be cast off by the skin, and the retention of which can not but prove injurious to the animal economy."

In Dropsy.—Few at this day, doubt the applicability of those agents that promote the serous evacuations from the skin, in dropsy. It is very difficult, however, to excite perspiration in dropsy, and it will generally be in vain to depend on diaphoretics, unless aided by the vapor-bath.

In Diabetes.—In diabetes, it becomes an object likewise, to detract the serum to the emunctories of the skin, and hence

diaphoretics will also be found beneficial. They should be aided by frictions, and stimulating liniments.

In the Exanthemata.—As to the utility of diaphoretics in the exanthemata, there has been some diversity of opinion. During the prevalence of the exclusively humoral pathology, the use of all evacuents, as it must be presumed, was very popular. It was supposed that all diseased action was dependent upon the presence in the humors, of some specific virus, and hence every means of depuration was instituted for the purification of the fluids. In the treatment of eruptive affections, as well as others, therefore, diaphoretics held a high character. On the other hand, it is objected that diaphoretic measures are mischievous in the exanthemata, on the ground that as they maintain the determination to the surface, they enhance the inflammatory diathesis. The truth perhaps lies in the middle ground. It is probable that in specific affections of the skin, such as scabies, herpes, uticaria, etc., diaphoretics will be of little or no use, while the major exanthema, as variola, rubeola, scarlatina, erysipelas, etc., may require a treatment of this kind, at least in some of their stages.

Collaterals.—In the application of this class of remedies, the fact should not be unobserved that the simple administration of the best articles of the kind is not always sufficient to insure their specific effect. Various collateral means are often necessary, as warmth and moisture to the surface, the exclusion of the atmosphere, warm potations, etc. Among the most important adjuvants are the vapor-bath, or warm flannels, steaming bricks, bladders or jugs with hot water, placed to the feet and sides of the patient, etc. Sometimes, when the difficulty is dependent upon a spasmodic constriction of the cuticular emunctories, a cold or shower bath first, or the enveloping of the patient in wet sheets will take off the spasm, and then the usual diaphoretic remedies will be found to act promptly; and again it will be found that active collateral medicines are necessary. Thus, in cases in which the circulation is very languid, and the general vitality of the system is low, the most potent stimulants will be required in connection with the diaphoretics.

These matters are, however, further treated of under the different orders of diaphoretics, and hence, require no additional remarks here.

Order I. SPECIFIC DIAPHORETICS.

As was indicated under the general head contemplating diaphoretics as a class, it appears that these agents are not all equally dependent upon such physical causes as *stimulation*, *relaxation*, etc.; but some articles have a specific power over the functions of cutaneous secretion, or the sweat glands. These agents manifest their diaphoretic power with equal certainty, whether they are introduced into the stomach, or the rectum, or whether injected into the veins, or applied simply to the cutaneous surface in proper solution.

It is indeed perfectly in accordance with reason, to suppose that all the organs possessing peculiar powers, and holding specific uses, may also be influenced by specific agencies. To deny this position would be to deny the perfection of the laws of cure, and to empale the philosophy of therapeutics.

Any observation directed to the action of certain agents, will suffice to establish the claims here projected for the specific diaphoretics, without the aid of an *a priori* argument.

Sulphur, acetate of ammonia, and nitrate of potash, asclepias, and various other articles, are found to promote the elimination of perspiration, without the intervention of those intermediate conditions, *i. e.*, *relaxation*, *nausea*, increased *pressure of the circulation*, or *warmth of the body*.

The specific diaphoretics, therefore, can be made particularly available in cases where active stimulation, or the superinduction of nausea, or the inconveniences of external appliances are less admissible. The indications for their use would then appear to be in visceral inflammations, and in various forms of fevers.

ASCLEPIAS TUBEROSA.—The Root.

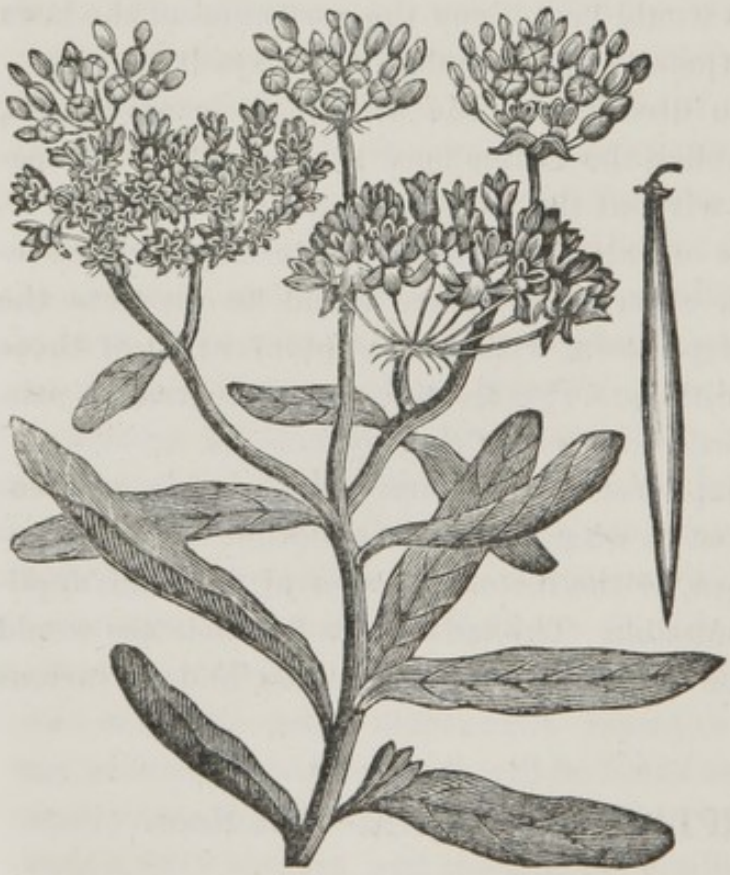
Synonyms. — Knollige Schwalbenwurzel, *Ger.*; Houatte Tubereuse, *Fr.*; Pleurisy Root, White Root, Butterfly Root, etc., *Vul.*

HISTORY.—This is one of the most gaudy species of the beautiful genus *Asclepias*, dedicated to Æsculapius, the ancient god of medicine, under his Grecian name of Asclepias. It attracted attention first by its beauty as a wild plant; but on investigation it was found of no less importance as a medicine. It is highly esteemed as a diaphoretic by the profession generally, and especially by the new school of practitioners. It has found a place in the secondary list of the U. S. P.

BOTANY.—*Sex. Syst.*—Pentandria Digynia. *Nat. Ord.*—Asclepiadaceæ.

Gen. Char. ASCLEPIAS. *Calyx* small, five-parted, *Corolla* rotate, five-parted, mostly reflexed. *Staminal crown* (*nectuary*), simple, five-leaved; leaflets opposite the anthers, with a sublate averted process at the base. *Stigmas*, with the five angles (*corpuscles*) opening by longitudinal chinks. *Pollinia* five distinct pairs. (*Torrey*).

Spec. Char. A. TUBEROSA.—*Root*, perennial, *large*, branched, or tuberous, yellowish and rough without, and white within. *Stems* from one to fifteen or more, upright or procumbent, pubescent, cylindrical, branched, from two to three feet high. *Leaves* scattered, supported on short footstalks, oblong lanceolate, entire, very hairy, of a green, thrifty color above, and paler below.



A. TUBEROSA.

Flowers of a beautiful orange color, and disposed in terminal clusters, or corymbose umbels; the corolla is reflexed, and of a very singular construction, peculiar to the genus: the nectaries, or reflecting petals, are conical or terete. *Perianth*, follicles two, about three-fourths of an inch thick, by three in length, swelling in the middle, tapering at both ends, acuminate at the apex, one-celled, one-valved, containing the seed and seed-down, or silk. *Seeds* numerous, flattish, circular, of a brown color, and attached to a tuft of silk, which, on the bursting of the follicle, spreads and carries the seed. Grows on sandy plains, in neglected fields, throughout the United States. It blossoms in July and August.

Analysis.—The root of this plant contains an *essential oil*, *bitter extractive*, *gum*, *fecula* and *resinous matter*. Its diaphoretic properties appear to reside in the extractive, but its expectorant in the resin. Water extracts its diaphoretic virtues but not the expectorant. Much boiling impairs the medicine, and so does long keeping.

Physiological Effects.—Asclepias Tuberosa, when taken in small quantities, produces no very sensible effects, excepting a slight bitterish, sweet and peculiar, but pleasant taste. In larger portions it slightly raises the pulse, and when taken for a few days improves the appetite, and increases the cuticular excretions. In large doses, repeated, the pulse is sensibly excited, the perspiration increased, the appetite strengthened, and the spirits revived. Over-doses produce nausea and vomiting, as well as purging if repeated.

Therapeutic Properties and Use.—This article, although not so active as some others, may, nevertheless, be regarded, one of our most valuable diaphoretics. It has a specific power over the excretories of the skin, which it excites gradually, but effectually. The medicine is withal very pleasant to the taste, and agreeable to the stomach, and may hence be taken in infusion copiously, and thus also we secure the advantage in part of a sympathetic diaphoretic. It is also valuable as an expectorant, having a manifest tendency to excite the pulmonary secretion, and seems to evince a soothing influence to irritated parts, analogous to that of an anodyne power. One

of its vulgar names indicates the estimation in which it has been held as a remedy in *pleurisy*. Its power in this disease is dependent on its diaphoretic effect, conjoined with its soothing and expectorant action upon the pulmonary organs.

"So many estimable qualities," says Barton,* "are usually attributed to this very favorite plant and popular medicine, that it is not easy to assign it a proper place in the materia medica. If the butterfly-weed is deserving of half its reputation, it is richly entitled to a distinguished rank in this work [Med. Bot.]; and so numerous and respectable are the authorities, in support of its celebrity, that it is with considerable diffidence, I venture to lessen, in the least degree, its elevated character as a medicine, by the intimation of any doubts of its just claim to its present undisputed reputation. My own experience with it is confined to a few trials in cases in which it is reported to be peculiarly beneficial; and these have resulted in an opinion, that there is some foundation for the encomiastic accounts of this medicine. It may be safely, nay, confidently recommended to physicians, as a mild cathartic, particularly suited to the complaints of children, as it leaves the bowels in a tranquil condition; and as a certain diaphoretic, attended with no inconsiderable expectorant effect."

The author has made many trials of this article in various cases, and under circumstances which would admit of a test of its powers. He has found it a certain diaphoretic and expectorant when taken in large draughts of its hot infusion, and when properly assisted by the situation of the patient. But the cathartic, diuretic, antispasmodic, and other virtues ascribed to it, though possessed of most of them in some degree, are not sufficiently prominent to be depended upon.

Asclepias Tuberosa is applicable in fevers generally, as well as in most inflammatory diseases, particularly those implicating the pulmonary organs, in which its infusion will serve well as an auxiliary means to be employed as a common drink, for maintaining a free perspiration and an equilibrium of the circulation, as well as a free condition of the lungs. As an

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* M. Botany, vol. I., p. 243.

expectorant it is best taken in substance, or the resinous extract (*Asclepidin*). The dose of the powder is about gr. xxx., taken in hot water, sweetened.

PHARMACEUTIC PREPARATIONS.—INFUSUM ASCLEPI. TUB.; *Infusion of Asclepias Tuberosa.* ℞ Asclep. Tub., in coarse powder, ℥j.; Boiling Water, Oj. Infuse for an hour, keeping it hot; and strain.

Action—Use.—This is the most common form in which the A. Tuberosa is taken as a diaphoretic, and when a suitable quantity of sugar and cream is added, it makes a drink by no means unpalatable. Very good as a common diaphoretic drink, in fevers, pleurisies, etc. *Dose*, a wineglassful once every hour, or as circumstances may require.

DECOCTUM ASCLEPI. TUBEROSÆ: *Decoction of Asclepias Tuberosa.* Boil ℥iij. of coarsely powdered Root of Asclepias Tuberosa, in Aq., Oiij., down to Ojss., and strain.

Action—Use.—A good diaphoretic and expectorant tonic, in the secondary stages of pneumonia and pleuritis. *Dose*, a tablespoonful, sweetened with honey, once in two, three or four hours, as the indications may warrant.

PULVIS ASCLEPI. TUBEROSÆ COMPOSITUS: *Compound Powder of Asclepias Tuberosa.* ℞ Asclepias Tuberosa, ℥xvj.; Capsicum, ʒj.; Lobelia, ℥ss.; Caryophylus, ℥ss. Pulverize and mix.

Action—Use.—A valuable diaphoretic in fever and inflammation of the lungs and pleura. *Dose*, ʒj. in hot water sweetened.

SYRUPUS ASCLEPI. TUBEROSÆ COMPOSITUS: *Compound Syrup of Asclepias Tuberosa.* ℞ Asclepias Tuberosa, in coarse powder, ℥xvj.; Aralia Racemosa, bruised, ℥viij.; Cort. Prunus Virginica, ℥viij.; Convolvulus Panduratus, ℥viij.; White Sugar, ℔iv.; Ess. Anise, ℥viij.; Aq., q. s. Boil for two hours and strain; boil down to Oiij. Add the Sugar and Ess. of Anise.

Action—Use.—An excellent diaphoretic and balsamic expectorant, very useful in bronchitis, pneumonia, pleuritis, etc. *Dose*, one to two tablespoonfuls.

EXTRACTUM ASCLEPI. TUBEROSÆ: *Extract of Asclepias Tuberosa.* ℞ Asclepias Tuberosa, in coarse powder, ℔. v.; Aqua., Cong. iv.; Alcohol, Oiv. Boil for three hours in the water; add the alcohol; stir, and boil for twenty minutes over a slow fire; remove the kettle and let it stand over coals to simmer for an

hour, and strain while hot; now boil down to the proper consistence.

This contains the diaphoretic and nervine tonic properties of the medicine, as well as the expectorant to a small extent; and is useful in most cases in which the root is recommended. The *dose* is gr. v.—gr. x.

EXTRACTUM ASCLEPI. ALCOHOLICUM: *Asclepidin.* Place the saturated tincture of Asclepias Tuberosa into a still, and distil over the alcohol until the remnant acquires the consistence of honey; remove it from the still into an evaporating dish; let it evaporate in the sun until it becomes thickened to the form of a thick extract. Thus prepared it is a wax-like substance consisting of the resin and extractive of the root, having its odor and taste.

The name *Asclepidin*, has been applied to this preparation and also to a powdered product of the asclepias. But the latter is very much inferior to this in all the properties common to the medicine, and the formula is therefore omitted here.

Action—Use.—This preparation contains all the active properties of the asclepias, and may be employed for any of the purposes proposed for the use of this excellent medicine. *Dose*, as a diaphoretic or expectorant, gr. iij.; as a cathartic, gr. v., given in pill form, or in emulsion.

PTEROSPORA ANDROMEDA.—The Root.

Synonyms.—Pterospore Paradox, *Fr.;* Crawley, Dragon's Claw, Fever Root, Albany Beach Drops, *Vul.*

History.—This singular plant, though long known to herbalists, was not generally known to regular botanists until 1816. Dr. James, who found it growing near Albany, called it *Monotropa procera.* In 1818, Nuttall established the genus *Pterospora*, embracing this species, which he named, from the resemblance of its flowers to those of the *Andromedea.* Of late it has become very popular as a diaphoretic in fevers, and although not officinal, is much used in practice, especially by physicians of the new school. The author is unable to find it in any regular treatise on materia medica.

Botany.—*Sex. Syst.*—Decandria Monogynia. *Nat. Ord.*—Monotropes.

Gen. Char. PTEROSPORA. *Calyx* five-parted. *Corolla* ovate, five-toothed. *Filaments* flat; *anthers* two-celled, two-bristled, sub-peltate. *Style* short; *stigma* capitate. *Capsule* sub-globose, five-celled. *Seeds* winged.

Spec. Char. P. ANDROMEDA. *Root* perennial (Raf.), fleshy, tuberculous, *tubers* many, resembling the claws of a fowl. *Stem* erect, from ten inches to two feet in hight, simple, straight, covered with short, viscid hairs, cylindrical, leafless, sparsely beset with scales. *Leaves* none. *Flowers* in a terminal raceme, ovate, with five reflex teeth, some fasciculated, axillary to linear bracts, *color* pale or reddish-white; *peduncle* curved, nodding. The entire plant is without verdure. If affords four varieties, viz: the *P. Flaviculis* or yellow-stalked, *P. Leucorhiza* or white-stalked, *P. Elatior* or high-stalked, *P. Pauciflora* or few-flowered.

The plant is found on barren hills and shady uplands, in the Northern States and Canada. The P. Leucorhiza and P. Pauciflora are found in the Western States. It blossoms in July.

THERAPEUTIC PROPERTIES AND USE.—The root of this plant is regarded, by many practitioners, as being one of the most prompt, certain, and powerful diaphoretics that we possess. It has been employed by the Indians, herbalists, and Shakers, of New Lebanon, says Rafinesque, as a valuable vermifuge, sudorific, anodyne, deobstruent and emmenagogue. But it is most highly esteemed as a diaphoretic and sudorific in fevers, especially typhus, and other continued as well as remittent fevers, of every variety. When taken freely it occasions the most profuse perspiration. Rafinesque also says that this article will relieve the night hectic fever, without debilitating the patient—that it avails in pleurisies and erysipelatous fever. —Is particularly good in low stages of fever.

"I verily believe," says Elisha Smith (Bot. Physician, Revis. Ed., p. 195), "that this root, properly administered, with such other medicines as may be necessary, will break up any fever in the space of two or three days, not excepting continued, typhus, or yellow fever; and, that death from any species of fever, would be rarely known." "With these powders—*powdered root*,"—continues he, "I have often given quick relief from

the excruciating pain of a supposed attack of liver-complaint; which, however, was caused by wind pent up in the bowels. It is an excellent medicine in pleurisy, and inflammations of the chest and brain, and is a sure remedy in erysipelatous fevers."

The medicine is usually given in substance, in the form of powders, commonly called "*fever powders.*" The dose is from gr. xx. to gr. xxx. It has never been analyzed, and hence its proper solvents are not known.

LIQUOR AMMONIÆ ACETATIS.

Synonyms.—Ammoniæ Acetatis Aqua, Ed., Dub.; Spiritus Mindereri; *Solution of Acetate of Ammonia. Spirit of Mindererus.*

Preparation.—Take of Acetic Acid, diluted, Oj.; Carbonate of Ammonia, in powder, q. s. Add the Carbonate gradually to the acid until it is saturated, or ceases to effervesce.

It may be proper to remark, that when common vinegar is employed for the preparation of this article, it must be *distilled*, and not be used in its impure state, as is often done.

Description.—Solution of Acetate of Ammonia is a limpid, colorless liquid, which has a faint odor, and a slight mawkish taste. If neutral, it will not change litmus or tumeric paper. But it is not always prepared so by the practitioner, being sometimes left a little acid or alkaline, according to the circumstances attending its use. If taken internally, it is more pleasant when the acid predominates. But it is better if left more alkaline, when the stomach inclines to acidity. Its formula is $N H^3, C^4 H^3 O^3$.

Physiological Effects.—This preparation, though manifesting, when taken in the quantity of an ounce or more, very considerable influence upon the system, and especially upon the secretories, is very mild and insinuating in its effects. If the skin is kept cool, or if the person taking it should exercise in the cool air, its action is directed to the kidneys, and free diuresis is produced; but otherwise its power is mostly displayed upon the excretories of the skin.

Therapeutic Properties and Use.—Acetate of Ammonia

is an excellent diaphoretic, possessing a specific power over the excretories of the skin. It is highly esteemed by many of the old profession as a diaphoretic in fever; and being an innocent article, as well as a potent remedy, may with all propriety, be embraced in the new Materia Medica. If the skin is kept warm while the medicine is taken freely, it will seldom fail to produce a free diaphoresis. The indications for its application are high fever and inflammation, when the more stimulating diaphoretics are less admissible. The dose is from f℥ss. to f℥jss., every two or three hours, diluted with water and sweetened with sugar.

Its effects are much promoted if, between the doses, some other good diaphoretics are used, and especially if the skin is kept warm, or the vapor-bath should be applied.

ICTODES FŒTIDA.

This article (described among the antispasmodics) seems to have quite a specific power to excite the cutaneous exhalents, producing a free and continued diaphoresis. It is certainly worthy of attention in this respect. The dose is from gr. v.—gr. x. of the recent root, shielded in some preserves. But when taken in the dried state, the dose must be double this quantity. It must always be taken in substance.

SULPHUR.

Synonyms. — Sulphur Sublimatum, D.; Schwefel, *Ger.;* Azufre, *Span.;* Zolfo, *Ital.;* Soufre, *Fr.;* Brimstone, *Eng.*

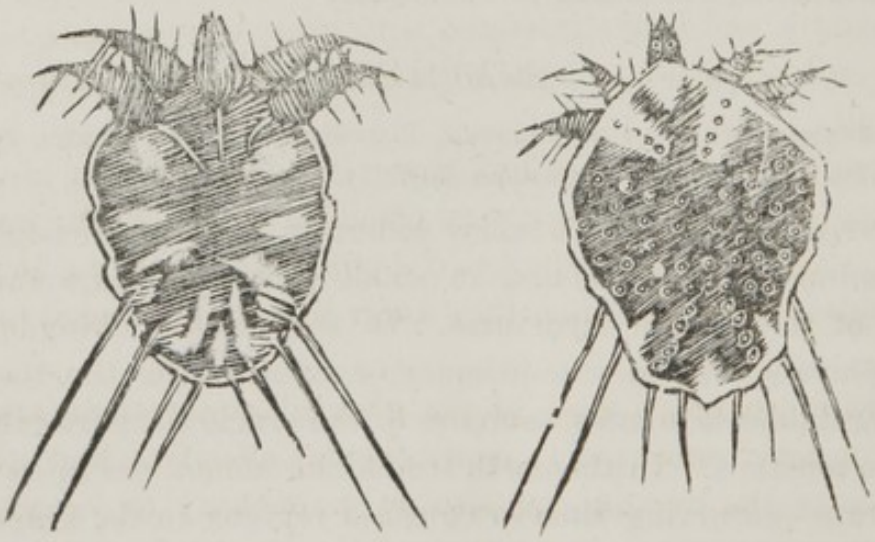
History.—Sulphur is very generally diffused throughout the mineral kingdom, and in small proportion, is found in most of the animal structures. In the vegetable kingdom it also plays a part in the primary organization of the tissues. In vegetables it is most common in the cruciferæ, particularly in the mustard. In the earth it is found sometimes in its virgin state—occurring thus in volcanic regions, in the kingdom of Naples, in Sicily, and elsewhere. Its most common natural combinations with other minerals are in the form of sulphurets of copper, iron, etc., called pyrites. It is found in solution in the sulphur springs, and lakes.

Sulphur, as it occurs in the shops, is in bars or cylindrical bodies, one inch and a fourth in thickness. It is of a pale-yellow color, and has a shining fracture and crystalline texture. It has a slight taste and smell, which latter is sensibly increased when rubbed with the hand. It is negatively electric; has a specific gravity of about 2; is soluble in alkaline solutions, petroleum, the fixed and volatile oils, and (when very finely divided) in alcohol and ether; but not in water. It begins to volatilize at 180° and melts at 225°. It burns with a blue flame, and combining with oxygen, forms sulphuric acid vapor or gas, which is irrespirable and exceedingly irritant.

Sulphur in the sublimed state is called *flowers of sulphur*. When the sulphur is precipitated from its solution with lime, by means of muriatic acid, it is variously called — *precipitated sulphur*, *milk of sulphur*, and *lac sulphur*.

Physiological Effects. — On vegetables sulphur appears not to have any effect different from other earths, as seeds will grow in it, and produce thriving plants.

On animals and man, no perceptible effects follow its administration in small quantities. An exception, however, obtains with reference to some of the parasites of the skin.



Sarcoptes Hominis (*Acarus Scabiei*) or *Itch Insect*, magnified many hundred times the natural size.

That on the right hand side, with dotted back, is the upper, and the other is the under side view.

The *sarcoptes hominis*, or *acarus scabiei*, is destroyed by sulphur in its application to the surface, or by its internal use. Such exceptions are not uncommon. The common spice, *black pepper* (piper nigrum), which is but a gentle stimulant, and is much in use as a condiment, is nevertheless very poisonous to various species of the *Diptera*. The common house-fly (diptera muscidæ), will take with apparently a high relish, sufficient of a sweetened solution of black pepper to kill it in an hour or two.

Sulphur is found to enter the circulation and passes off through the secretions, in which it may readily be detected by its smell. Silver coin, carried in the pockets of persons that have taken sulphur, is blackened with hydrosulphurous acid, proving the passage of the sulphur through the circulation, or the body generally.

In doses of half a drachm, it operates decidedly as a diaphoretic, and is slightly stimulant; and when the quantity taken is increased to one or two drachms, it will operate as a purgative. Its cathartic action is marked by the absence of fluids in the dejecta, and it has thus been considered by Dr. Paris (Pharmacologia) to produce these effects chiefly by its action on the muscular coat of the intestines.

Therapeutic Properties.—Sulphur is a safe and reliable diaphoretic, and is administered with great convenience, since it has so little taste, and the dose required for this purpose is so small.

There is a serious objection, however, to its common use, in practice—it gives rise to a very offensive odor from the body, in the character of sulphuretted hydrogen. Patients, therefore, object to its use when they know that it is intended to be given.

Sulphur promotes most of the glandular secretions, and it has been much esteemed in hemorrhoidal affections, and other diseases of the rectum, as also in pulmonary or bronchial diseases, when there is a want of the mucus secretion. It has also been regarded alterant, and has been employed against gout, rheumatism, syphilis, and scrofula.

But the greatest use that is now made of sulphur, in prac-

tice, is as a remedy in cutaneous diseases, as in *scabies*, *porrigo*, *impetigo*, *herpes*, *eczema*, etc.

Dose.—As a diaphoretic, ʒss., given in emulsion, syrup, or in milk.

POTASSÆ NITRAS.

Nitrate of potash or saltpeter, has been employed by some of the Reformed School, as a diaphoretic, and diuretic. Others have denounced it as poisonous.

As to the specific diaphoretic property possessed by this article, there is no doubt entertained by any persons acquainted with it; and it has also sustained its reputation as a reliable diuretic agency, useful in various nephritic diseases and other visceral difficulties.

Our resources in the class of diaphoretics being quite abundant, we can have no grounds justifying the use of articles which are pernicious in their effects. The question involving the character of the present article in this regard, should therefore be settled, as in all other cases, before authority is given for its use. That over-doses of the nitrate of potash may sometimes prove hurtful or even fatal, there can be no question. But this can be said of numerous other articles that are highly esteemed; and this certainly is no satisfactory evidence that the article is *intrinsically poisonous.*

Numerous cases are recorded, however, in which enormous quantities of it had been given without bad effects. Dr. Christison, who has long been regarded as one of the most expert to detect poisons, reports a case in which an ounce had been taken and retained for a considerable time in the stomach, without producing any other unpleasant symptoms than vomiting. Nor is the history of the general use of this salt, when employed in medical practice or in domestic economy, in any degree indicative of its being poisonous. Nearly all the packed meats now put up are in part cured by the use of this salt; and it is observed that it always freshens meat, and improves its smell and taste, even when it is tainted or soured. Its effect upon venous blood is very analogous to the action of oxygen, turning it red; and when applied to blood out of the

body, it keeps it in a red and fluid state, and also preserves it for some time from putrefaction.

Its antiseptic properties have been well tested by several of our most intelligent practitioners, who have employed it in yellow fever and other putrid forms of disease. Dr. Stottsberry, whose heroism led him to Savannah, Ga., at the time of the terrific prevalence of yellow fever in that city, a few years since, and who there won private and public honors, not only for his philanthropy, but for his preëminent success in the treatment of that formidable disease, told the author a few months afterward, that he believed his success was chiefly dependent upon his free use of this potent agent.

Dr. Stevens employed the nitrate of potash in very large quantities, in treating the malignant diseases of the West Indies some years since, and his reported success was astonishing alike to all. Dr. Cameron employed it with great benefit, in scurvy. (*Med. Chi. Review*, 1830.)

The sentiment of the general medical profession is doubtless rapidly changing now in regard to the physiological effects of this article. The author, however, can not add any thing from his own practice either for or against the reputation of this article, never having been in the practice of its use. The dose, as a diaphoretic, is from five to fifteen grains, given in powder, or in solution with water.

Order II.—NAUSEATING DIAPHORETICS.

In observing closely the operation of the various therapeutic agents that belong to the class denominated *Diaphoretics*, it will be discovered that several prominent principles of action are involved. We find that while the articles of the foregoing order are dependent for the production of their specific effect upon their absorption into the circulation, and their actual contact with the exhalent vessels, a second order of diaphoretics are observed, which, in producing the same effect, are not necessarily absorbed into the circulation, but seem to act through the nervous system. A peculiar sympathy, elsewhere explained, appears to exist between the stomach and cuticular

exhalents, and it is by virtue of this, that the latter order of diaphoretics produce their specific effect.

It has long since been observed that emetics and other nauseating drugs are very apt to occasion diaphoresis, and it is upon a knowledge of this fact, discovered by observation, that the use of nauseating "*fever powders*" has been established.* Emetics have also been discovered to be attended in their operation, not only by a diaphoresis, but a singular abatement of fever or inflammation, which could not be accounted for by the mere mechanical action attendant, nor the simple stimulating effect of the agents used; and it is certain that thousands of practitioners have been led by the good effects of emetics in fever and inflammation, to their general employment in these cases, without apprehending the truth, as to the principle on which the much admired effect is produced.

It is quite certain, from the foregoing facts, that there is sufficient reason for this division of the class, diaphoretics; though it is not certain that the term *nauseating* is more proper here than that of *sympathetic.*

The discrimination ever practiced in the use of diaphoretics, by the philosophical practitioner, moreover, clearly evinces the propriety of this division. We find that the articles of the stimulating and exciting order of this class of remedies, though not mischievous in *essence*, are nevertheless contra-indicated in all cases in which the inflammatory diathesis is clearly marked, and when the system is confined, at least until the tension of the fibrous tissues is modified, and the violence of the arterial excitement is abated. In such cases the nauseating diaphoretics are particularly applicable. Instead of enhancing the excitement of the heart and arteries, in producing their diaphoretic effect, they occasion the latter, by removing the very *cause* of the arterial perturbation; that is, by obviating the constriction of the capillary system. They

* This peculiar sympathy, however, does not necessarily require nauseating substances to produce this specific effect upon the exhalents of the skin. Any substance, particularly fluids, in filling the stomach may give rise to it. Thus a copious draft of cold water will sometimes produce free diaphoresis.

are admissible in the most violent forms of synochal fever, as well as the most aggravated states of inflammation. The first perceivable effect they produce, after the nausea, is a very perceptible modification in the pulse, showing their power to equalize the circulation. The fever or heat of the body will abate in a corresponding degree, and in a short time the perspiration will appear. As soon as the system is thus relaxed, the stimulating diaphoretics may be used without the risk of inducing any undue arterial excitement. Thus it appears that stimulants are not phlogistic in their action, and that they are contra-indicated only while the *circulation is confined.*

LOBELIA INFLATA,—As a Diaphoretic.

This invaluable article, possessing so many different virtues, though regarded chiefly as an emetic, is, nevertheless, entitled to a place at the very head of the nauseating diaphoretics. No article is more prompt than this, in procuring diaphoresis, or even the most satisfactory sudorific effect.

Application.—The chief application of this article, in view of its diaphoretic power, is in high grades of fever, and inflammation, when there is much spasmodic constriction, and dryness of the skin, and when the secretions are dried up. In these cases, it relieves the fever, and moderates the arterial excitement with astonishing promptitude. It should be given in small doses, frequently repeated, until it nauseates the stomach, when the doses are to be regulated according to circumstances. When the pulse moderates and the skin becomes soft and moist, the doses may be diminished. It seldom happens that lobelia, given in this way, fails of breaking up the most severe paroxysm of fever, or removing the urgent symptoms of inflammation. As congestion is incompatible with nausea of the stomach, lobelia is manifestly indicated in congestive fever, and all irregular conditions of the circulation attended with fever or inflammation. In remittent, bilious, or common autumnal fever, especially where their is much morbific accumulation in the vascular system, lobelia is an important remedy.

The dose as a diaphoretic, is gr. iij. to gr. x. of the pulverized

seed; from gr. v. to gr. xv. of the pulverized herb; from fʒss.—fʒij. of the tincture, and from one to three drops of the oil.

EUPATORIUM PERFOLIATUM.—The Herb.

Synonyms.—Eupatorium Virginianum (*Pursh*), Eupatorium Connatum (*Mich.*) Durchwachsener Wasserdost, *Ger.;* Eupatoire Perfoliee, *Fr.;* Thoroughwort, Boneset, etc., *Eng.*

History.—This plant is a native of this country, and was a favorite, and popular remedy among the Indians generally, for many years, and was also, one of the first that the early Colonial settlers became acquainted with. It was used as a febrifuge, and was taken in strong decoction to excite emesis, and to occasion a free perspiration; after which the doses were moderated, but the medicine was continued until a cure was completed. One of its vulgar names indicates some of its uses, being much applied as a vulnerary and relaxant in bone-setting.

Botany.—*Sex. Syst.*—Sygenesia Æqualis.—*Nat. Ord.*—Compositæ, Eupatoræceæ, *De Cand.*; Asteræceæ, *Lind.*

Gen. Char. Eupatorium. *Calyx* simple or imbricate, oblong. *Style*, long and semi-bifid. *Receptacle* naked. *Pappus* pilose, or more commonly scabrous. *Seed* smooth and glandular, quinquestriate. *Nuttall.*

Spec. Char. E. Perfoliatum. *Root* perennial, rather horizontal. *Stems* many, erect, from two to four feet high, one third of an inch in thickness, round, hairy, divided at the top into decussating branches, forming when in flower a dense, flat, fastigiate corymb. *Leaves* connate, pairs decussant, broad at the base where they join, from two to four inches long, from one to one and a half wide, rough, serrate, lanceolate, acuminate. *Flowers* small, terminal, white, sometimes tinged with purple, supported on short peduncles in bunches. The calyx, which is composed of imbricate lanceolate scales, embraces from ten to fifteen small florets which are campanulate, and have their border divided into five equal spreading segments. The *anthers* are five in number, black, united into a tube through which the bifid piliform style projects above the florets. Grows in meadows and wet places, throughout the United States. Its flowering time is in August and September.

Analysis.—Eupatorium contains a *free acid, tannin, bitter extractive, gum, resin, acetate of lime, azote.* It yields its virtues to water and alcohol.

Physiological Effects.—E. Perfoliatum, to the taste, is bitter, and somewhat nauseous. When taken into the stomach in portions of twenty to thirty grains, it at first excites the pulse, but in from fifteen to thirty minutes softens it, and lessens its frequency. When the dose is repeated it occasions nausea and diaphoresis. If it is still pushed further it will procure emesis. But no permanently unpleasant effects have yet been observed from its administration.

Therapeutic Power.—This article has justly gained the character of a very *certain* and *permanent* diaphoretic, as well as that of an emetic, tonic and aperient. It would be needless to collect all the testimony that has been gained in its favor; and if it be even admitted, that the medicine has been much overrated, it is nevertheless certain that it well merits the confidence of the profession. "The sensible properties," says W. P. C. Barton, "of the boneset, indicate its medical virtues; and it appears that the tonic and diaphoretic effects, both of which are unequivocal and powerful, are those the most deserving attention."

The tonic virtues of this article have long been esteemed, and have been celebrated as efficacious in intermittents and remittents. But it is very certain that while these are estimable, many results have been ascribed to them that have been the legitimate effects of the diaphoretic power of the medicine. The hot infusion of the plant, drank freely, will seldom fail to establish a diaphoresis that will continue profuse, sometimes for several days. After the stomach and bowels are evacuated, in the autumnal fevers, the infusion, drank freely, will generally complete the cure.

The author above quoted, very justly remarks also, that "the efficaciousness of boneset is not confined to the simple forms of intermittent fever. It has, beyond disputation, been successfully employed in remitting bilious, in yellow, and typhus fevers, particularly in the form of the latter disease, lately so rife throughout the United States. And it is in cases

of this disease that I have myself used it, and in which I can offer the additional experience of an excellent practitioner, the late Samuel C. Hopkins, M. D. The doctor was among those partial to the sweating plan of treating this fever, and his unusual success in a multitude of cases for five or six years in succession is strongly in favor of that mode of practice. The boneset was the medicine used in producing this effect."*

The Eupatorium is commonly prescribed in the form of infusion. This may be made by macerating an ounce of the herb in a pint of boiling water, for an hour, and straining; the tea may also be drank from the herb without straining, if prepared without pulverizing. This infusion is taken in doses of a wineglassful every half hour, or as the circumstances may require.

PHARMACEUTIC PREPARATIONS.—**EXTRACTUM EUPATORI, PERFOLIATUM:** *Extract of Eupatorium Perfoliatum.* Take of the herb of Eupatorium Perf., ℔. v.; Water, q. s.; Alcohol, Cong. ij. Boil the herb in the water for three or four hours and strain; now add the Alcohol to the herb, and simmer over hot ashes for two hours and strain. Distil off the spirit until there remains two pints, and after evaporating the liquor of the former process to a similar quantity, add the two, and evaporate by means of a water-bath to the proper consistence. The alcoholic extract is still more valuable.

Action—Use.—The same as the aqueous infusion. *Dose*, gr. iij.—gr. iv. A good article also for making pills with quinine.

The extract of eupatorium, as commonly prepared (aqueous extract) is much inferior to this. It is not only more feeble, and thus requiring a larger dose, but is also much much more nauseous to the taste and smell.

EUPATORIN.—Keith & Co., of New York, advertise an alkaloid preparation of the eupatorium perfoliatum under the above name, but the author has had no opportunity of learning much about its value.

ANTHEMIS.

BOTANY.—*Sex. Syst.* — Syngenesia Superflua.—*Nat. Ord.* — Compositæ, Senecionideæ, *De Cand.*; Asteræceæ, *Lind.*

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* Med. Botany, vol. II., p. 135.

Gen. Char. ANTHEMIS.—*Receptacle* chaffy. *Seed-down* none, or membranaceous margin. *Calyx* hemispherical, nearly equal. *Florets of the ray* more than five.—*Willd.*

Spec. Char. ANTHEMIS NOBILIS.—This species is the common *Chamomile* of the gardens. It is an herbaceous plant with a perennial root, and bushy, or finely-leaved top, with solitary white flowers, having a large yellow disk.

A. COTULA.

ANTHEMIS COTULA.—This is the common *Mayweed*, or Wild Chamomile, also sometimes called Dogfennel. It somewhat resembles the common chamomile in its appearance, but has an annual instead of a perennial root, and the plant grows somewhat larger, and is more regularly branched than the latter.

MEDICAL PROPERTIES AND USE.—Both these articles are nauseant diaphoretics, and when taken in large quantity, will excite vomiting. They are usually employed in the form of hot infusion, and taken freely until the desired effect is produced. The stimulant properties of these plants are found in the form of essential oil. But the oil is not so efficient for diaphoretic purposes as the infusion.

Extracts have also been prepared, from both of these plants, but they are inferior in effect to the infusion.

IPECACUANHA,—As a Diaphoretic.

Ipecacuanha (treated of under the head of emetics) is also a pretty good nauseating diaphoretic, useful in febrile and inflammatory affections, but it is inferior to lobelia in this respect. The dose is from gr. v.—gr. x.

EUPHORBIA,—As a Diaphoretic.

The different species of Euphorbia (noticed among the emetics), when given in doses, so regulated as to keep up

nausea will procure a diaphoretic effect, available in many cases. The general dose is gr. v.—g. x.

PULVIS SUDORIFICÆ COMPOSITUS. — (*Compound Sudorific Powder*) :—

℞ Lobelia Sem., ʒj.
Camphor, ʒij.
Papaverine, ʒj.

Pulverize and mix.

Use.—One of the best general diaphoretic powders that can be made. The dose required is small, and its action is very prompt, and also persistent. It is extremely useful in febrile and inflammatory diseases, in which the nauseants and relaxants are serviceable. Dose, gr. ij.—gr. v.

Order III.—STIMULATING DIAPHORETICS.

As obstructed perspiration may be dependent on various, or even *opposite* states of the general system, very different orders of the diaphoretic class of agents are required. Thus we find that the difficulty may involve a very high febrile action, characterized by an obstinate constriction and burning of the skin; and in other cases again, the circulation may be extremely languid, the skin cold, relaxed and inactive, and hence dry, as before.

In the first instance nauseants, or relaxant diaphoretics, are proper; but in the latter, the stimulant order are demanded.

Stimulating diaphoretics produce their effects on somewhat different principles from either of those upon which the other orders of this class of agents operate. Here we find simply a propelling power exerted upon the circulation, by which the blood is pressed into the capillaries; thus, in part, affording, upon mechanical principles, the means of more extensive secretion of the perspirable fluid.

But the more notable principle of action involved in the operation of stimulant diaphoretics is a law of the living economy, sometimes called the law of *correspondence*, or the law of *sympathy*, which we often have to invoke in attempting to explain the more occult phenomena of animal life. The law

referred to here, is the affinity between the states of vascular repletion and the function of secretion. No one who has been any thing of an observer, has failed to remark how much more active the secretory functions are when the circulation is full, than when it is otherwise. Thus simple potations, even of cold water, but especially of stimulant infusions, will, in a very short time, occasion perspiration. This effect arises also from the ingestion, even of dry food to the stomach.

All pure stimulants are more or less diaphoretic, in their effects on the system. They are general *excitants*, and evince their influence on all the living tissues in a manner corresponding with the functions that the different organs are destined to perform. Their most obvious and immediate effects chiefly involve the circulation, as this is the point of their first general contact. But, being thus carried forward to the capillaries and external exhalents, before their exciting power is much exhausted, they stimulate the latter to increased activity.

The diaphoretics of this order, like those of the preceding, are not, in the strictest sense, specific in their effects. But these, in virtue of their general exciting power, promote the functions of every organ with which they come in contact.

According to the principles already discussed, it will appear that the agents of this order are not applicable in every case in which diaphoretics are indicated. Thus, in the sthenic diathesis, when there is much vascular excitement while the skin is constricted, and when there is, in consequence, a congestive tendency, pure excitants are contra-indicated, and hence, if used at all, they must be premised by the *nauseants*.

Stimulating diaphoretics are indicated in all low forms of fever, in which a deficient action of the cutaneous emunctories is chiefly dependent upon an enfeebled condition of the circulation, as in typhus, typhoid pneumonia, typhoid fever, etc.

POLYMONIUM REPTANS.—The Root.

Botany.—*Sex. Syst.*—Pentandria Monogynia. *Nat. Ord.*—Polymonaceæ.

Gen. Char. POLYMONIUM.—*Calyx* campanulate. *Corolla* monopetalous, wheel-form. *Stamens* bearded at the base, on five valves, closing the bottom of the tube. *Stigma* three-cleft. *Capsule* three-celled, roundish, many seeded.

Spec. Char. P. REPTANS.—This is a beautiful wild plant, commonly called *Greek Valerian* or *Blue-Bells*, and sometimes *Sweat-Root*. It grows in wet places, along streams, in new

POLYMONIUMS REPTANS.

meadows or woods. It has a perennial, white, fibrous root, and many radical, pinnate leaves on slender footstalks, among which rise the flower-bearing stems that are surmounted with fine, delicately blue, campanulate or wheel-shaped flowers.

MEDICAL PROPERTIES AND USE.—Polymonium Reptans has ever borne a good character as a diaphoretic. In its general medical properties it compares with the polygala. Its properties are readily imparted to alcohol and water. It is employed

in pleuritic and febrile diseases generally. It has also been prescribed in rheumatism, and scrofulous diseases. It may be prepared by infusion, or be tinctured in whisky or wine. Dose, gr. xx. of powder; fʒj. of tincture; or a wineglassful of the infusion.

POLYGALA SENEGA.—The Root.

SYNONYMS.—SENEGA, U. S., L. E.; Polygale de Virginie, *Fr.;* Klapperschlangenwurzel, *Ger.;* Seneka Snake-root, *Eng.*

BOTANY. — *Sex. Syst.* — Diadelphia Octandria. *Nat. Ord.* — Polygalaceæ.

Gen. Char. POLYGALA.—*Calyx* five-leaved, with two leaflets, wing-shaped, and colored. *Legume* obcordate, two-celled.—*Willd.*

Spec. Char. POLYGALA SENEGA.—This is a very modest-looking perennial plant, growing wild in every variety of soil throughout most parts of the United States, but most abundantly in the Western States. It has a branched root, with a knotty head, from which arise annually, one or more erect, simple, round, smooth, leafy stems, from nine inches to a foot in hight. Sometimes the stems are colored red or purple at the base, but they are green above. The leaves are alternate or scattered, lanceolate, pointed, smooth, subsessile. The flowers are small, white, and disposed in a close spike on the top of the stem.

POLYGALA SENEGA.

ANALYSIS.—The root has been analyzed by Trommsdorf, Gehlen, and others; and the following is the result: 1, a peculiar acrid principle, called *polygalic acid;* 2, a *yellow coloring matter;* 3, a *volatile principle*, supposed to be a *peculiar essen-*

tial oil; 4, *pectic acid;* 5, *tannic acid;* 6, *gum;* 7, *albumen;* 8, *wax;* 9, *fixed oil;* 10, *lignin;* 11, various earthy materials, among which were *lime*, *potassa*, *alumina*, *magnesia*, *silica*, and *iron*.

The active principle or principles have not yet been satisfactorily indicated; but if we are to judge from the character of the menstruums to which the virtues are yielded, we are left to infer that the activity of the root is dependent upon something analogous to extractive, since we find that water, alcohol, and ether will equally well extract them.

MEDICAL PROPERTIES AND USES.—This article has for many years, in the estimation of all classes of physicians, held a position in the very first rank of the stimulant diaphoretics. It is also pretty generally admitted to be a good pectoral, and an emmenagogue. When given in large doses, it proves emetic and cathartic. It has been generally employed in pneumonia, catarrh, croup, asthma, and amenorrhœa.

It is exceedingly acrid to the taste, and will cause the saliva to flow in great abundance when it is chewed or kept in the mouth. It therefore constitutes a good sialagogue.

The dose of the powdered root is gr. x.—gr. xx. That of the decoction, made by boiling slightly for an hour, an ounce of the root in a pint of water, is f℥j. A syrup may be made of the seneka-root, by adding one pound of white sugar to a pint of its tincture, made with wine or whisky, and flavoring with any of the essential oils. The dose of this is f℥j.—f℥ij. The watery infusion of seneka is taken in wineglassful doses.

ARALIA.

BOTANY.—*Sex. Syst.*—Pentandria Pentagynia. *Nat. Ord.*—Araliaceæ.

Gen. Char. ARALIA.—*Flowers* umbelled. *Calyx* five-toothed, superior. *Petals* five. *Stigma* sessile, subglobose. *Berry* five-celled, five-seeded.—*Torrey.*

Spec. Char. ARALIA SPINOSA: *Angelica Tree.*—This is an indigenous shrub or tree, commonly called *Southern Prickly-Ash*, and *Tooth-ache Tree.* The tree grows in rich soil, mostly in the Southern States; and is cultivated here. Its hight is about

12 feet. It has an upright stem, which is thickly beset with prickles. The leaves are compound, and bi or tri-pinnate, and are situated at the top of the stem. The flowers are small, white, and situated in very large hemispherical umbils upon the top of the stem. The bark is the medical portion.

ARALIA RACEMOSA: *Spikenard.*—This is a very luxuriant herbaceous plant, growing in rich soil in most parts of the United States. It has a thick fleshy root, several feet in length, of a light color, and of quite an aromatic, balsamic

ARALIA RACEMOSA.

odor. The stem is very branched, smooth, and of purplish color. The leaves are decompound or tri-ternate. The flowers are in terminal clusters, and are succeeded by beautiful, dark, fleshy berries, of a sweetish, aromatic taste.

The root is the officinal portion.

ARALIA NUDICAULIS: *False Sarsaparilla.*—A pretty little species of aralia, growing in rich soil, in woodlands, in the Middle and Western States. It has a very long, creeping, fleshy root, of a light ash color, and about the thickness of a pipe-stem. The stem is more slender than the root; upright; about a foot in hight; and divided, at the top, into three

equal branches, which again divide, each into three more branches, thus forming a triternate top of leaves. The leaflets, like those of the *spikenard*, are ovate, lanceolate, acuminate, serrate, entire. The scape is naked, and bears a cluster of small, greenish-yellow flowers, which are succeeded by a corresponding cluster of berries, of the size of the elder-berry. The root is the part employed.

ARALIA HISPIDA: *Dwarf Elder.*—This is a dwarfish shrub, with a stem not over two feet high; the lower part woody, and the upper herbaceous and branching. The stem is beset with stiff bristles. The leaves, like the other species are decompound. The fructification is also terminal, and resembles that of the spikenard. The root and top are both employed. The root is diuretic and alterative, and the leaves diaphoretic. The dose of the powdered root is gr. xx., that of the decoction of the leaves is f℥ij.

MEDICAL PROPERTIES AND USE.—All the above-named species of the Aralia are diaphoretic in some part. The bark of the root and stem of the A. Spinosa is very acrid, or pungent to the taste, and is one of the very best diaphoretics that we possess: indeed, it is commonly denominated a sudorific. It has acquired great celebrity as a remedy in Cholera, and was much in demand by the Eclectic practitioners in this city during the prevalence of this disease in the summer of 1850. The dose of the powder is gr. x.—xx: of the tincture, f℥j.—f℥ij.

The root of the Spikenard is considerably diaphoretic, but is much more valued for its balsamic expectorant properties. It is eminently useful in pneumonia, pleurisy, and phthisis. It is commonly employed in syrups, with other expectorant remedies. It may, however, be given alone in tincture, or in the form of hot infusion. The dose is a tablespoonful of the alcoholic tincture, or three fluid ounces of the infusion.

The Aralia Nudicaulis is mostly employed as an alterative, but it is not of much account for this use; and there is no doubt but its credit has, in a large measure, arisen from one of its common names, *Sarsaparilla*. The author is informed that Townsend, the elder, made this the principal constituent of his

Sarsaparilla Specific. The dose of the syrup of A. Nudicaulis is f℥iii.; that of the tincture, f℥ij.

XANTHOXYLUM.—The Bark.

SYNONYMS.—XANTHOXYLUM AMERICANUM, *Miller;* X. Ramiflorum, *Mich.;* X. Fraxinifolium, *Marshall;* Frene Epineum, *Fr.;* Radice Lopeziana, *It.;* Prickly-Ash, *Eng.*

BOTANY.—*Sex. Syst.*—Diœcia Pentandria. *Nat. Ord.*—Xanthoxylaceæ.—*Lind.*

Gen. Char. XANTHOXYLUM.—MALE. — *Calyx* five parted. *Corolla* none. FEMALE. — *Calyx*, five-parted. *Corolla*, none. *Pistils*, five. *Capsules*, five, one-seeded.— *Willd.*

Spec. Char. There are quite a number of species belonging to this genus, most of them are southern or tropical, and all are possessed of very nearly the same properties.

The X. FRAXINEUM is the officinal species. This is a shrubby tree, growing from five to ten feet in hight, and is considerably branched. It is beset all over with strong, sharp prickles. The leaves are alternate and pinnate, with from four to five pairs of leaflets, and one terminal one. The prickly-ash grows in most of the Middle and Western States. It is found in open woods, and rocky places.

XANTHOXYLON.

MEDICAL PROPERTIES AND USE.—The bark of the root and

stem, and the berries, when ripe, afford one of our most reliable stimulant diaphoretics or sudorifics. It has been in very extensive use by our reformed profession for the last twenty or thirty years. A common form of its employment is in syrup, combined with other articles, as a remedy for cholera, and dysentery. In 1850, when the cholera prevailed in this city, the author disposed here of nearly 200 pounds of the berries, which were all manufactured into syrups and other compounds intended for use in treating cholera.

Prickly-Ash has also maintained a good reputation as a remedy for rheumatism. In dyspepsia, dependent upon atony of the stomach, the tincture of the berries has given much satisfaction.

But one of the most important applications of the medicine is in low fevers; in the malignant forms of *remittent*, in *typhus*, in *yellow fever*, and also in *typhoid pneumonia*.

PHARMACEUTIC PREPARATIONS AND USE.—**TINCTURÆ XANTHOXYLI**: *Tincture of Prickly-Ash.* ℞ Prickly-Ash Berries (or powdered bark), ℥viij.; Proof Spirit, Oij. Macerate 12 or 14 days; pour off the tincture, and filter.

Dose, f℥j.—f℥ij. In cholera, extremely large doses are given; f℥j. has been poured down in cases of collapse, and often with good effect.

SYRUPUS XANTHOXYLI COMPOSITUS: *Compound Syrup of Prickly-Ash.*

℞	Xanthoxylum,	2 ounces.
	Capsicum,	1 ounce.
	Zingiber,	1 "
	Hydrastis,	1 "
	Cypripedium,	1 "
	Myrica Cer.,	1 "
	Treacle,	8 pts.
	Best Rum,	4 "
	Tinc. Myrrh,	3 "

Place the dry articles, all in the powdered state, into a percolator, pass the rum through repeatedly, and displace with water; now mix this tincture with the tinc. of myrrh and treacle.

This is a slightly modified process for the preparation of what was formerly called *Hixson's cholera mixture*, as given in Howard's Bot. Med., Vol. II., p. 432, and which has been highly esteemed in the treatment of cholera, cholera-morbus and dysentery. The dose is one tablespoonful.

OLEUM XANTHOXYLI : *Oil of Prickly -Ash.*—Obtain a saturated high proof Alcoholic tincture of the berries of Prickly-Ash; filter; place in a still and distil over, with a slow fire, two-thirds of the Alcohol; then remove and place the residuum into a shallow evaporating dish, and evaporate it spontaneously in a place free from dust, to the consistence of fixed oil.

PROPERTIES—Use.—This oil possesses the active properties of the berries from which it is obtained, and may be employed as a very convenient substitute, in doses of five to ten drops.

XANTHOXYLIN.

There are two methods by which the oleo-resinous principle of the prickly-ash bark may be obtained. For both processes, the first step to be taken is to obtain a saturated tincture from the bark, with alcohol of the highest proof. Then in order to obtain the best product, this tincture must be evaporated in vacuo. But it will answer to let it evaporate spontaneously in flat vessels placed in a situation free from dust. After the evaporation is conducted to the extent that furnishes a thick oil, this is to be thoroughly shaken with cold water so as to wash out the extractive, coloring matter, etc., as much as can be done. The oily substance can then easily be separated from the water by the use of a *separator*. This product is what is now called *Xanthoxylin*, although it is by no means a pure or simple principle. A similar principle can also be obtained from the berries of the prickly-ash by the same processes.

In the other method, instead of conducting the evaporation in the above way, that wastes the alcohol, this is distilled off, and the residuum is then washed as above. Ether has been employed, instead of the alcohol in this preparation, and being more volatile, facilitates the process. But as it is much more expensive, without affording any improvement upon the product, it will not be employed generally in this preparation. It, moreover, leaves its odor with the product.

The profession are informed, in the Eclectic Dispensatory, that they are indebted to Mr. Wm. S. Merrill, of this city, for the preparation of *Xanthoxylin*. This is probably true. But they are also indebted to other persons for preparing it, nearly forty years since.

TABULAR LIST OF STIMULATING DIAPHORETICS.

1. *Stimulating Diaphoretics, whose properties are contained in an* Oleo-Resinous *principle, and are hence more permanent in their effects.*	*Dose.*
Pul. Capsicum,	grs. v.—xx.
Pul. Zingiber,	grs. x.—xxx.
Pul. Piper Nig.,	grs. x.—xxx.
Pul. Myrrha,	grs. x.—xxx.
Pul. Guaiacum,	grs. x.—xxx.
Pul. Ammoniacum,	grs. x.—xxx.
Pul. Canella,	grs. x.—xx.
Tinc. Asafœtida,	f℥j.—f℥ij.
Tinc. Liatris,	f℥j.—f. dr. ij.

2. *Stimulating Diaphoretics, whose virtues are dependent upon an* Essential Oil, *and which are therefore much less permanent in their effects.*	*Dose.*
Pul. Caryophylus,	gr. x.—xx.
Pul. Cinnamomum,	gr. x.—xx.
Infus. Menthæ,	f. oz. j.—f. oz. iij.
Infus. Nepeta,	f. oz. ij.—f. oz. iv.
Infus. Hedeoma,	f. oz. j.—f. oz. iij.
Infus. Origanum,	f. oz. j.—f. oz. iij.
Infus. Salvia,	f. oz. j.—f. oz. iij.
Tinc. Camphora,	f. dr. j.—f. dr. ij.
Essential Oils generally are given in doses of min. v.—min. xx.	

PULVIS DIAPHORETICUS: *Diaphoretic Powder.* ℞ Myrica Cerifera, ℥xvj.; Zingiber, ℥viij.; Capsicum, Caryophylus, āā., ℥j.; pulverize and mix.—(Dr. S. Thomson). *Dose, gr.* xx., in hot water, sweetened.

℞ Myrica Cerifera, Zingiber, Cort. Pinus Canadensis, Cort. Populus Tremuloides, āā., ℥xvj.; Cort. Quercus Alb. vel Quer. Rub., āā., ℥viij.; Capsicum, ℥iij. Caryophylus, ℥ij.; pulverize and mix.—(Dr. J. Thomson). *Dose*, gr. xx., in hot water, sweetened.

℞ Asclepias Tuberosa, ℥xvj.; Myrica Cerifera, ℥xvj.: Rad. Cort. Laurus, Sassafras, ℥iv.; Rad. Liatris Spicata, ʒiv.; Rad. Zingiber, ℥xvj., Caryophylus, ℥ij.; Capsicum, ℥ij.; pulverize and mix.—(Howard). *Dose*, gr. xx., in hot water, sweetened.

℞ Papaverine, ʒij.; Camphor, ℥ss.; pulverize and mix. *Dose*, gr. ij.—gr. iij. A very superior stimulant diaphoretic.

Class IV.—DIURETICS.

The term *diuretic* (from *Διουρητικος* or *διουρησις*, "a discharge of urine") is applied to that class of medicines which, when taken into the system, produce an increased discharge of urine.

Modus Operandi.—A history of the operation of diuretics comprises the consideration of several special principles that are concerned. This may particularly be said of their *methodus medendi*, or remedial action. When the exclusive humoral pathology was most popular, it was supposed that diuretics, as

well as other remedies, necessarily enter the circulation and produce their effects by direct action on the organs concerned. This, as already explained, is true in *part*, of remedies in general, but is, by no means, the sole method of their action.

The functions of the kidneys sustain an intimate relation to those of various other organs of the system, and indirectly to certain external circumstances. Thus, when some of the other excretions are checked, as, for instance, those of the skin, the kidneys vicariously remove them, and thus their own secretions are augmented. All external influences, as cold, etc., which are calculated to obstruct the perspiration, will indirectly increase the urinary evacuations. We have an illustration of this fact in the gradual increase of the urine in the autumn as the cold weather sets in, and in all sudden changes of the weather, from warm to cold. This cause of increased diuresis is, therefore, equivalent to a fluid ingestion, which, as is well known, generally increases the urine to a proportionate extent.

Diuretics may be considered to produce their common effect on at least two principles, viz: 1, that of entering the circulation and directly stimulating the kidneys to the increased performance of their normal functions; 2, that of operating on these organs indirectly through the nervous system. Most of the latter, however, also obviously operate to some extent on the same principle that involves the action of the former: yet it may nevertheless be expedient to divide diuretics into two orders; one of the orders may very properly be denominated *saline diuretics*. The other, for the sake of distinction, is called *stimulating diuretics*.

The chief application of diuretics is in dropsies, especially in anasarca. They are also available in some gravelly complaints, strangury, syphilis, fevers, visceral inflammations, and suppressions of urine.

Order I.—STIMULATING DIURETICS.

This order embraces that part of the class, *diuretics*, which are characterized by their more stimulating properties, and

which depend for their action principally upon an essential oil. They are all organic agents.

The articles of this order produce their effects partly through the nervous system, and partly by a direct influence on the kidneys, by means of their absorption into the circulation.

EUPATORIUM PURPUREUM.—The Root.

SYNONYMS.—Queen of the Meadow, Gravel Root, etc., *Vul.*

HISTORY.—The genus Eupatorium was dedicated to Eupator, or Mithridates, King of Pontus, who first used some one of its species as a counter poison. The genus is very extensive; a number of its species are medicinal. But if we except the E. *Perfoliatum*, none, perhaps, is more valuable than this.

E. PURPUREUM.

This article had never received its merited attention by the profession, although it had formerly gained a place in the secondary list of the United States Pharmacopœia. In the reformed profession, however, it has for a number of years been highly esteemed.

BOTANY. — *Sex. Syst.*— Syngenesia Æqualis. *Nat. Ord.*—Compositæ-Eupatoriaceæ, *De Cand.* Asteraceæ.—*Lind.*

Gen. Char. EUPATORIUM. —Same as E. Perfoliatum.

Spec. Char. E. PURPUREUM. — *Root* perennial, horizontal, woody, with many long, black fibers. *Stems*, from one to a doz-

en, upright, from three to six feet high, from a quarter to half an inch or more in diameter, round, smooth, of a purple color, simple, giving off at the top, at different hights, several sets of short, divergent branches, bearing the flowers. *Leaves* in whorls, at the distance of about six inches apart, from three to nine at a whorl: they stand on petioles, from half an inch to an inch in length; they are from three to six inches long, from one to two inches wide, oblong, lanceolate, acuminate, rough, entire, serrate. *Flowers* purple, consisting of umbelliferous clusters, which are disposed in little bunches of five or more, to an involucre or scaly calyx, like those of the E. Perfoliatum. Found in meadows and other low grounds, throughout the United States. Flowers in August and September.

Medical Properties and Use.—The fibers of the root of the E. Purpureum are actively diuretic. The caudex also possesses the same properties, but is woody and hard to prepare. The chief application is in dropsical diseases, in which its effects are astonishing. The author has also found it to give very prompt relief in some cases of gravelly habits. A gentleman in the eastern part of Ohio, who, for many years, suffered extremely with paroxysms of pain and suppression of urine, and who had sought for medical aid in vain for years, was relieved very promptly by drinking freely of a strong infusion of the fibrous portion of the root of this plant. The medicine may be used, with confidence, in all cases in which diuretics are indicated. The dose is f℥j.—f℥iij. of the infusion, made by macerating an ounce of the coarsely-powdered root in a pint of boiling water. The plant yields its virtues readily to boiling water or to alcohol.

Keith & Co., of New York, advertise an alkaloid preparation of the E. Purpureum, which has been in use by Prof. R. S. Newton of this city, and is reported by him to be of very great value. This firm of New York, in their Manual of 1857, set forth the properties and application of this article as follows:—"Diuretic Stimulant, Astringent and Tonic. Useful in strangury, gravel, and all chronic urinary disorders, gout, rheumatism, hematuria, hematamesis, hemoptysis, dysentery, etc.

It has been found of great value in the treatment of the latter disease, and in pertussis, asthma, and all affections accompanied with dyspnœa. Dose, two to four grains."

The *Eupatorium Verticillatum* (Tall Boneset; Joepye), which is a much larger plant than the E. Purpureum, but otherwise bears considerable resemblance to it, is of nearly equal value as a diuretic. Besides this, there are other species still, that possess similar properties, though of a feebler power. Among them are: *E. Maculatum*, or Spotted Boneset; *E. Trifoliatum*, Wood Boneset; *E. Sessilifolium*, Bastard Boneset; *E. Urticifolium*, Deerwort Boneset; *E. Violaceum*, Violet Boneset.

JUNIPERUS COMMUNIS.—The Berries and Tops.

SYNONYMS.—JUNIPERI CACUMINA ET FRUCTUS. *Lond.;* ἀρκευθις, Greek; Abhool, *Arab;* Ginepro, *Ital.;* Genevrier commun, Baies de Genievre, *Fr.;* Gemeiner Wachholder, Wachholderbeeren, *Ger.;* Enebro, Bayas de enebro, *Span.;* Juniper, *Vul.*

HISTORY.—Juniper was employed by the Greeks and Arabians, and has been in use ever since its medical virtues and economical purposes were first discovered. In medicine it is esteemed as a diuretic, stimulant, and emmenagogue; in the arts, the berries, or essential oil, are used in the manufacture of gin. Native of the northern parts of Europe, Asia, and America. Evergreen.

BOTANY.—*Sex. Syst.*—Diœcia Monodelphia. *Nat. Ord.*—Pinaceæ or Coniferæ.

Gen. Char. JUNIPERUS.—MALE.—*Amentum* ovate. *Calyx* a scale. *Corolla* none. *Stamens* three. FEMALE.—*Calyx* three-parted. *Petals* three. *Styles* three. *Berry* three-seeded, irregular, with the three tubercles of the calyx.—*Willd.*

Spec. Char. J. COMMUNIS.—A bushy *shrub* or *tree*. *Branches* smooth, and angular toward their extremities. *Leaves* evergreen, three in a whorl, crowded, linear, channeled, subulate, stiff and sharp-pointed, longer than the fruit, of a shining green color on their lower surface, but having a broad glaucous line along the center of the upper, which is resupinnate. *Flowers* axillary, sessile, the males discharging much polen, of a yellow color. Females on a separate shrub, green, on scaly

stalks. *Fruit*, globular, dark when ripe, ripens in the autumn of the second year. There are many other species of Juniper, all of which are very good and reliable diuretics.

ANALYSIS.—The entire plant seems to be possessed of nearly the same principles, varying mostly only in the chlorophylle, which is contained in the leaves, and the greater proportion of lignin in the trunk and branches. Trommsdorff, who analyzed the berries in 1822, obtained *volatile oil* 1·8, *wax* 4·0, *resin* 10·0, *a peculiar species of sugar with acetate and malate of lime* 33·8, *gum with salts of potash and lime* 7·0, *lignin* 33·0, *water* 12·0, (excess 3·7).

PHYSIOLOGICAL EFFECTS.—Much the same as those of the turpentines generally.

THERAPEUTIC PROPERTIES AND USE.—The berries, essential oil, or tops of the branches, are diuretic and stimulant, considerably excitant to the renal circulation and secretion. The oil is most commonly used, for practical purposes. The application of juniper is in dropsies generally, particularly in anasarca and ascites. It is also available in gonorrhœa, gleet, leucorrhœa, and cystirrhœa. The dose of the berries is ʒj.—ʒij, triturated with white sugar. The infusion, prepared from an ounce of the berries or tops, to a pint of boiling water, which is the most convenient way of using them, is taken in doses of fʒiv. every four hours.

PHARMACEUTIC PREPARATIONS.—**OLEUM JUNIPERI**: *Oil of Juniper.* Prepared by distilling the fruit, tops, or wood with water. Composition C^{10} H^{8}.

Action—Use.—Same as the berries. *Dose*, from five to ten drops or more. This is the best form in which to exhibit the Juniper.

SPIRITUS JUNIPERI COMPOSITUS.—L. E. D. U. S. *Compound Spirit of Juniper.* Macerate *bruised Juniper Berries*, ʒxv. (℔j. E. D.) bruised *Caraways* and bruised *Fennel Seed* āā ʒij. (ʒjss. E. D.) in *Proof Spirit*, Cj. (Ovij. E.) *Aq.* Oij. (q. s. to prevent empyreuma, D.) for two days (twenty-four hours, D.,) (then add the water, E. D.), and with a gentle heat, L. distil Cj. (Ovij. E.).

Action—Use.—An aromatic diuretic. *Dose*, fʒij.—fʒiv.

COPAIBA. The Juice, or Oleo-Resinous Exudation.

SYNONYMS.—COPAIFERA OFFICINALIS, Resina Liqua, *Dub.;* Copaiva-Balsam, *Ger.;* Bolsamo di Copaiba, *Ital.;* Baume di Copahu, *Fr.;* Balsamo de Copayva, *Span.;* Copavia, *Vul.*

HISTORY.—It appears that the first account of the Copaiba tree is that given by Marcgrav and Piso, in the year 1648. In 1763 Jacquin described a species of Capaifera, which he denominated C. officinalis, growing in the island of Martinique. Numerous species are now discovered, and their products have become very popular as a medicine, in almost every country. It is a native of South America, and the West Indies.

BOTANY. — *Sex. Syst.*—Decandria Monogynia. *Nat. Ord.*—Leguminoseæ, *Juss.;* Amyridaceæ.—*Lind.*

Gen. Char. COPAIBA.—*Calyx* none. *Petals* four. *Legume* ovate. *Seed* one, with an ovate arillus.—*Willd.*

Spec. Char. The *Copaiba* Officinalis, described in the U. S. Dispensatory, is an elegant lofty *tree*, much branched at the top, crowned with a thick canopy of foliage. "The *leaves* are alternate, large, and pinnate, composed of from two to five pairs of ovate, entire, obtusely acuminate leaflets, two or three inches in length, rather narrower on one side than the other, smooth, pellucidly punctate, somewhat shining, and supported on short foot-stalks. The *flowers* are whitish, and disposed in terminal branched spikes. The *fruit* is an oval, two-valved pod, containing a single seed."

There are many different species discovered, among which Royle gives the following, with their localities:

1. C. Langsdorffi, *Desf.*	San Paulo and Minas.	6. C. Nitida, *Mart.*	Minas, Geraes. Cujaba, and Goyaz.
2. C. Coriacea, *Mart.*	San Paulo and Minas.		
3. C. Guianensis, *Desf.*	Rio Negro, Para.	7. C. Beyrichii, *Hayne.*	Rio & Mountains of Estrelia.
4. C. Multijuga, *Hayne.*	Para.		
5. C. Martii, *Hayne.*	Para, Maranhao.	8. C. Officinalis, *Lin.*	West Indies, and Venezuela.
		9. C. Jacquini, *Desf.*	

DESCRIPTION.—The commercial drug is an oleo-resinous liquid of about the consistency of honey, and is improperly called *Balsam* of Copaiva. It has a pale straw-color, strong,

and peculiar odor, and disagreeable, nauseous, acrid taste. On keeping it, it becomes more dense, and darker. It is soluble in alcohol, ether, and oils; but, like other oleo-resins, it is insoluble in water. It is obtained from the tree by making incisions into the bark, when the balsam runs out, and is collected and put up for the market.

Analysis.—Stolze and Gerber found the Balsam of Copaiva to contain *volatile oil* from 32 to 34 parts, *yellow resin* 38 to 52, *viscid resin* 1·65 to 2·13, the *rest* being *water* in 100 parts.

Adulterations.—Copaiba is said not to be so much adulterated in this country as in Europe. The fixed oils, especially the Castor oil, are the most common articles used in this fraud. It becomes an object with those that adulterate this drug, to use Castor oil, on account of its being, like the copaiba, soluble in alcohol, and, hence, less easily detected. Spirits of turpentine is also sometimes mixed with the copaiba. This may be detected by its smell, especially if the adulterated drug is heated. Castor oil may be detected by boiling with water. If the balsam, after the evaporation of the liquid, be hard and resinous, no oil is present; but if soft or greasy, there is no doubt of it. The extent of this adulteration will correspond with the consistence of the residue after evaporation.

Physiological Effects.—Copaiba, when swallowed, produces an acrid sensation in the mouth and throat. When taken in quantities of ten to twenty drops, it slightly excites the pulse, as well as the mucous secretions. In larger portions, as from half a drachm to a drachm, it proves diuretic and stimulant, with a very marked tendency to the mucous surfaces. In over doses, it is said to produce irritation of the mucous membranes generally, attended with pain, vomiting, purging and strangury.

Therapeutic Properties and Use.—This article is now in general use among Eclectics. It is a stimulant diuretic, useful in dropsies, and chronic affections of the urinary organs, etc., having also a specific tendency to the mucous tissues; is hence prescribed in gleet, leucorrhœa, gonorrhœa, and syphilis. It is also considered available in various chronic bronchial, gastric and enteric difficulties, of an inflammatory character.

Gonorrhœa is the disease in which the copaiba is most frequently employed, and there is good reason for its popularity in this application, since it seldom fails to give satisfaction.

The doctrines, in reference to stimulants, which govern the old profession, do not admit of the application of copaiba, during the inflammatory stage of gonorrhœa, and it is, hence, prescribed by them in the onset of the symptoms only, or after some depletion is effected, by the interposition of cathartics.

In the Eclectic practice, there is less discrimination in this regard, since the exciting cause of inflammation holds less importance, than the proximate. Their aim being direct for the subversion of the proximate cause, especially where the appliances required, do not tend much to aggravate the exciting causes, as is the case with this article, it is freely applied. When there is much inflammation, however, this state should be by no means disregarded. The Podophyllin and Irisin is thence brought into requisition.

The dose is min. xx. to ʒj.

GALIUM.—The Herb.

Synonyms.—Clevers, Goose-grass, Bed-straw, Catch-weed, etc., *Vul.*

History.—This article owes its popularity, as a medicine, chiefly to the new-school physicians. It is not generally known to the practitioners of the old school. The author is unable to find it in any of their works, except a mere notice of three of the species, in the appendix of the U. S. Dispensatory.

Botany.—*Sex. Syst.*—Tetrandria Monogynia. Nat. Ord.—Ribiaceæ.

Gen. Char. Galium.—*Calyx* four-toothed. *Corolla* flattish, four-cleft. *Fruit* dry; nuts, two; one-seeded.

Spec. Char.—The Galium genus affords many species that possess nearly the same medical virtues, and also bear a close resemblance to each other in their physical character and habits. Among those generally used, are the G. asprellum, G. aparine, and G. trifidum.

Clevers mostly agree in having slender, trailing, herbaceous, branched, quadrangular, scabrous *stems;* and small, whorled,

nearly sessile, oblong, lanceolate, or ob-lanceolate, entire, and mostly scabrous *leaves*, with from four to eight in a whorl. The *flowers* are small, white or yellow, scattering or clustered. The *seed* is contained in a thin capsule, is black or dark, curved, small.

Medical Properties and Use.—Galium is an excellent diuretic, applicable in all cases in which this class of remedies are available. It is particularly useful in suppressions of urine, dependent upon either chronic or acute inflammation of the kidneys. The dose is f℥ij.—f℥iv. of an infusion, made by macerating an ounce and a half of the bruised herb in warm water for two hours.

LEONTODON TARAXACUM.—The Root.

Synonyms.—Löwenzahn, *Ger.;* Tarassaco, *Ital.;* Pissenlit, Dent de Lion, *Fr.;* Diente de Leon, *Span.;* Dandelion, *Vul.*

History.—This plant is supposed to grow native in every country of the globe. It has been long known as a medicine, and its popularity as such has been various.

Botany.—*Sex. Syst.*—Syngenesia Æqualis. *Nat. Ord.*—Compositæ—Cichoraceæ.—*De Cand. Lind.*

Gen. Char. *Receptacle* naked. *Calyx* double. *seed-down* stipitate, hairy.—*Willd.*

Spec. Char. *Root* perennial, fleshy, terete, branched, milky. *Leaves* radical, long, pinnatifid, generally runcinate, with the divisions toothed, smooth and of a fine green color, reddish midrib. *Scape* long, cylindrical, hollow, naked, simple, smooth. *Flowers* large, of a golden yellow, with many florets; receptacle convex and pitted; *seed-down* stipitate, and when mature, forming a spherical cluster, is easily disengaged, and carries the seed with great facility. The entire plant exudes a milky juice, on being wounded. Grows

L. TARAXACUM.

abundantly throughout this country, in meadows and other low grounds.

ANALYSIS.—The milky juice contains *bitter extractive*, *gum*, *caoutchouc*, *saline matters*, *resin*, and a *free acid*. The root, in addition to these, contains *starch*, *sugar*, and a *peculiar principle* called *taraxacin*. Water takes up its virtues.

PHYSIOLOGICAL EFFECTS.—In small quantities no particular effect is produced. In large portions, as that of gr. x. to gr. xxx. of the extract, it proves diuretic and aperient.

THERAPEUTIC PROPERTIES AND USE.—Dandelion is a mild diuretic, aperient, and tonic. It is very useful in chronic visceral affections, especially those of an inflammatory character, implicating the kidneys and liver. It appears also to exert an influence over the glandular system generally, and is regarded as a highly important article of our materia medica. It has been highly esteemed for its benefits in the treatment of chronic hepatitis. But the medicine is not possessed of much medical activity; it should generally be combined with other more active articles, according as the indications may require. Some physicians esteem dandelion much in the treatment of tubercular consumption, especially when accompanied with dropsical effusions. The usual dose is gr. xx. to ʒss. The extract is much the preferable form of its use.

PHARMACEUTIC PREPARATIONS.—DECOCTUM TARAXACI: *Decoction of Taraxacum.* ℞ Taraxacum, ℥vij.; Aq., Oij. Boil together down to Oj. Press out and strain.

Action—Use.—Same as the root in substance. *Dose*, f℥jss.

EXTRACTUM TARAXACUM: *Extract of Taraxacum.* ℞ Taraxacum, tops and roots fresh, ℔. v.; Aq., Cong. v. Boil until the virtues are extracted; press and strain. Boil down the liquid to the proper consistence. This is the common officinal extract. *Dose*, gr. x.—ʒss.

EXTRACTUM INSPISSATI TARAXACUM: *Inspissated Extract of Taraxacum.* ℞ Taraxacum, roots and tops, any quantity, fresh. Bruise and press out the juice. Evaporate spontaneously to the proper consistence.

This is the best preparation of the dandelion that is used. The dose is the same as that for the common extract.

ASCLEPIAS FIBROSA.—The Root.

Synonyms.—Meadow Silkweed; Fibrous Asclepias; Narrow-leaved Cotton-weed; Indian Hemp, *Vul.*

Botany.—*Sex. Syst.*—Pentandria Digynia. *Nat. Ord.*—Asclepiadaceæ.

Gen. Char. Vide Asclepias Tuberosa.

Spec. Char. *Root* perennial, horizontal, fibrous, white; *fibers* very long and numerous. *Stems* many, upright, smooth, round, shining, branched at the top, with a green-colored, flaxy bark. *Leaves* opposite, petiolate, lanceolate, pointed at both ends, smooth, entire, three inches long, by one in width; those on the top double or two joined laterally at the base. *Flowers*, in their organization, exactly resembling those of the A. Tuberosa, but of a dusky yellow color, appearing in clusters on the top of the stem and branches. They appear in July. Grows in meadows, and on the banks of streams, in most parts of the United States.

Medical Properties and Use.—This is a mild diuretic, alterative, and aperient. Useful in dropsies, visceral obstructions, especially those of the urinary organs. *Dose*, f℥iij.—f℥v., of an infusion made with ℥jss. of the root, to Oj. of Aq., three to six times a day.

A. QUADRIFOLIA.

Another very pretty little species of Asclepias, much less common than the others spoken of in this work, was found by the author in the interior of Ohio, growing in wood-lands, in sandy soil. It is the *A. Quadrifolia.* A true engraving is here given of this plant, in the hope that it may gain the attention of the profession, so as to lead to the discovery of its virtues.

From the little attention given it by the author, he is of

opinion that it possesses some diuretic properties, and the plant is therefore noticed in this connection.

The A. Quadrifolia is a small and delicate species, growing about twelve to twenty inches in hight, with an upright stem, and four leaves. The flowers are small, white, and situated on piliform, pubescent peduncles.

TURPENTHINA.

All the turpentines are powerful diuretics. They were described under the head of Stimulants, and are, indeed, inferior to but few other agents of the Stimulant class. But they are also equally valuable as diuretics, being very certain and prompt in their effects.

The oil of turpentine, which is known in commerce as *spirits of turpentine*, is the article commonly employed, when the turpentine diuretic is to be invoked. It will operate with great promptitude and certainty, but is liable to irritate the urinary passages when given in very large doses, or when long continued.

The dose of oil of turpentine is from five to ten or twenty drops. It is given in emulsion, or it may be dropped on sugar, and thus administered.

APOCYNUM CANABINUM.—The Root.

Synonym.—Indian Hemp, *Eng.*

Botany.—*Sex. Syst.*—Pentandria Digynia. *Nat. Ord.*—Apocynaceæ.

Gen. Char. Apocynum.—Vide Apocynum Androsæmifolium.

Spec. Char. A. Canabinum.—In general appearance and character, this plant bears a very close resemblance to the A. Androsæmifolium. The stems are, however, more brown. The leaves are acute at both ends, and somewhat downy beneath. The cymes are also pubescent, and the tube of the corolla in this, is of about the same length as the calyx, while that of the other species is longer; the corolla is also somewhat greenish without, and pinkish or purple within, while the flowers of the Andros. are white without, and tinged with

red within. The Indian Hemp grows in similar situations with the other species, and like it abounds in milk.

Medical Properties and Use.—The Indian Hemp is diuretic, and in large doses, powerfully emetic and cathartic, rather too violent for use. In small doses, as that of gr. v. to gr. x.; it will operate sufficiently mild as a diuretic, aperient, and alterative. The medicine is highly recommended by some practitioners, in dropsy. It is also available in visceral obstructions generally, especially those of the kidneys, spleen, and liver. Some esteem it in fever. The dose, as a diuretic, is from five to ten grains, either alone, or in combination with some other diuretic. The plant yields its virtues to water and to alcohol.

ERIGERON.—The Herb.

Synonyms.—Fleabane, Scabious, *Vul.*

Botany.—*Sex. Syst.*—Sygenesia Superflua. *Nat. Ord.*—Compositæ, Asteroideæ.—*De Cand.* Asteraceæ.—*Lind.*

Gen. Char. Erigeron.—*Calyx* imbricated, sub-hemispherical, often reflected. *Florets of the ray* linear, narrow, numerous. *Receptacle* naked. *Pappus* double, exterior minute, interior pilose, of few rays.—*Nutt.*

Spec. Char. There are many species of the Erigeron genus that possess analogous properties. All of them are highly medicinal, and have, perhaps, only been neglected on account of the commonness of the plants. The *E. heterophyllum* and *E. Philadelphicum*, which very much resemble each other in their appearance, are here more particularly intended to be represented. They are indigenous, herbaceous plants; the first is biennial, and the second perennial. They have branching roots, and erect, round, and very branched *stems*, from two to three feet or more in hight. The lower *leaves* of the first are ovate, acute, deeply toothed, and supported on long, winged foot-stalks; the upper ones are lanceolate, acute, deeply serrate in the middle, and sessile; *floral leaves* lanceolate and entire; all except the radical are ciliate at the base. The *flowers* are in terminal corymbs; *florets of the disk* yellow; those

of the ray numerous, slender, and of a white, pale-blue, or purple color. Flowering time from June to October.

The *E. Philadelphicum* has a top like the above. The lower leaves are ovate, lanceolate, nearly obtuse, entire, or remotely serrated, ciliate on the margin, and supported on long foot-stalks; the upper ones are narrow, oblong, cuneate, entire, sessile, or slightly embracing the stem; *floral leaves* small and lanceolate. *Flowers* numerous, radiate, disposed in a panicled corymb, with long peduncles bearing from one to three flowers, which resemble those of the above species, and appear about the same time. These plants generally grow together in fields and open places, in various parts of the United States.

The author has discovered various other species of a very close resemblance to the above, some of which, perhaps, are new, as he has not been able to find any description of them in any works on botany. They all have a peculiar odor, which they readily give out on being bruised, and which is somewhat similar to that of *ligusticum*.

Medical Properties and Use.—The *erigerons* are mostly diuretic, tonic, and some of them astringent. They have, of late, very justly gained much attention by our practitioners. They are, at least, only second in rank among all our indigenous medical plants. The species just described are very certain in their effects, and seldom disagree with the stomach, even after other articles that are considered mild, may have proved objectionable. In their operation, they appear to possess a specific influence over the secretions; not only those of the glandular system generally, but also, of the mucous and serous tissues, as well as of the lymphatics. Their diuretic power is pretty constant, and is quite available in dropsical and kidney affections, and especially in irritability of the bladder. Professors Wistar, Physick, Barton, and Eberle, all add their testimony to their power in hydrothorax, anasarca, etc.; and some of them recommend them in gout, associated with a lithic diathesis. The medicines have even been declared to dissolve urinary calculi. The herbs should be collected while in blossom, and carefully dried and preserved in close jars. Age impairs their virtues. The latter are taken up by water,

but more readily by alcohol. The usual form of exhibition is by infusion, made by digesting an ounce and a half of the herb in a pint of boiling water, until cool. The dose is a wine-glassful, repeated as may be necessary.

UVA URSI.—The Leaves.

SYNONYM.—Bearberry, *Vul.*

BOTANY.—*Sex. Syst.*—Decandria Monogynia. *Nat. Ord.*—Ericaceæ.

Gen. Char. ARBUTUS.—*Calyx* five-partite, pale-red. *Corol* rose-colored, ovate-urceolate, five-cleft, border revolute. *Stamens* ten, inclosed; *filaments* flattened. *Anthers* compressed, with two pores at the apex, and furnished laterally with two reflexed arms. *Ovary* globose, supported by three scales. *Style* short. *Stigma* obtuse. *Berry* globose, scarlet, with five single-seeded cells.

UVA URSI.

Spec. Char. UVA URSI.—An evergreen, procumbent shrub. *Leaves* coriaceous, obovate, obtuse, entire, shining, of a deep-green above; lighter color, and covered with a net-work of veins on the under surface; hence reticulated. *Flowers* in terminal clusters of eight or ten, each supported by three small bracts. Grows on stony alpine hights, in the United States, Europe, and Asia.

The leaves are the parts employed, and are usually collected in autumn. "They have sometimes been adulterated with the leaves of Vaccinium Vitis Idæa, or Whortleberry; but these are *dotted* on their under surface, and have their margins revolute and somewhat crenate, and may thus be detected. Uva Ursi leaves, when dried and powdered, have an odor not unlike that of hay; the taste is bitter and astringent. The active properties are extracted both by water and spirit. They contain *gum*, *resin*, *extractive*, some *gallic acid*, and about

thirty-six per cent. of *tannin*. The watery infusion is precipitated by gelatine, and a bluish-black color is produced, with the sesquichloride of iron. The leaves are employed in tanning, in some parts of Russia."

THERAPEUTIC PROPERTIES AND USE.—A rather mild diuretic, tonic, and astringent, supposed to have a specific direction to the urinary organs. It has also been reputed to be antilithic. It is recommended in diabetes, catarrh of the bladder, incontinence of urine, gleet, leucorrhœa, and menorrhagia. The dose is ℈j.—ʒj. of the powder, or fʒj.—fʒiij. of a strong decoction.

DIOSMA.—The Leaves.

SYNONYMS.—BUCHU, D.; BUCKU, E.; Barosma, *Lind.*; Buchu, *Eng.*

BOTANY.—*Sex. Syst.*—Pentandria Monogynia. *Nat. Ord.*—Rutaceæ.

Gen. Char. BAROSMA.—*Calyx* five-cleft. *Petals* five, with short claws. *Filaments* ten. *Style* as long as the petals. *Stigma* minute, five-lobed. *Fruit* composed of five cocci, covered with glandular dots at the back.—Abridged from *Lind.*

Spec. Char. There are various species of the Barosma that are medicinal; they are natives of Southern Africa. They are described as being small perennial, shrubs, growing about two feet in hight. The leaves are small, opposite, scattered, ovate, acute, of a dark-green color above, paler beneath, crenated, and beset with small, transparent punctures, which are most observed near the crenations. Flowers whitish, or of a faint red, terminal to the branches.

B. CRENATA.

The *Barosma Crenate*, *B. Crenulata*, and *B. Serratifolia*, are the species which constitute the commercial Buchu.

DESCRIPTION.—The leaves of the several species above named, come to us together, under the name of Buchu. They are generally intermixed with stalks and fruit. They are small, aromatic, pale, or yellowish-green leaves, with coarsely toothed or crenated edges, smooth on the upper surface, and beset on the edges, especially between the teeth and under edges, with glands filled with an essential oil.

ANALYSIS.—Brande's analysis, which was made as early as 1827, and is that which is still, perhaps, most relied upon is as follows:

1. Pale yellow Volatile Oil,	0.88
2. Resin,	2.34
3. Bitter Extractive (*Diosmin*),	3.78
4. Chlorophylle (*Coloring matter*),	4.77
5. Gum,	12.71
6. Lignin, or Woody Fiber,	45.00
7. Brown Substance, extracted by Potash,	1.36
8. Nitrogenous Matter, extracted by Potash,	2.45
9. Albumen,	0.58
10. Malic Acid and Matter, precipitated by Tannin,	1.56
11. Bassorin, with Oxolate and Phosphate of Lime,	4.53
12. Various Salts of Potash and Lime,	2.07
13. Water,	12.94
14. Acetic Acid, and loss,	3.86
Leaves of Diosma Crenata,	100.00

THERAPEUTIC PROPERTIES AND USE.—Buchu has been mostly classified with the tonics and stimulants, but as in these respects it seems not to be possessed of any advantages over many other similar vegetable agents, and since it has proved, on the other hand, to be of very specific use in various nephitic diseases, and difficulties of the genital organs, and of the urinary bladder; and proving, moreover, to be very certain in its action as a diuretic, it has been placed in this class and order, in the present arrangement.

The natives of the Cape of Good Hope have long been known to prepare a beverage which they call *buku brandy*. This is made by distilling the leaves of these plants with the dregs of wine, digested in water. This beverage they employ in chronic diseases of the stomach and the bladder.

Attention was first directed, in England, to the buchu as a remedy in urino-genital diseases. Dr. Reece, in the "Gazette of Health," had, at various times, from the year 1821 to 1824, called attention to it. Since then the article has gone into general use, and is now a constant occupant of the shelves of every drug-store.

Those forms of diseases of the mucous membranes of the

urinary passages, which are marked by morbid mucous secretions, as gonorrhœa, leuchorrhœa, gleet, chronic inflammation of the bladder, and spasmodic stricture, are the forms in which the medicine is most likely to prove its good effects. It has also been prescribed, it is said, with benefit in rheumatism, and even in skin diseases. Water and alcohol will take up its virtues. The dose of the buchu in powder is ℈j.—ʒss. It is mostly prescribed in wine, by old-school practitioners, but is better in the form of infusion, or in some state of concentration.

Pharmaceutic Preparations.—**TINCTURA BUCHU**: *Tincture of Buchu.* ℞ Buchu, ʒv.; Proof Spirit, Oij. Digest seven days; pour off the clear liquor, and filter. *Dose*, fʒj.—fʒss. The Tincture may be most readily made by percolation.

EXTRACTUM BUCHU ALCOHOLICUM: *Alcoholic Extract of Buchu.* ℞ Buchu, powdered, ℔j.; Proof Spirit, Oiv. Percolate and evaporate the filtered solution, either by distillation or otherwise, to the proper consistence of solid extract.

Use—Dose.—Gr., iij.—gr. v., employed in some cases in which the powder is used, but is more eligible from the smallness of the dose required.

DIOSMIN.—℞ Powdered Buchu, ℔j.; Aq., Oviijss; Galls, powdered, ʒj. Boil the powdered Buchu in one gallon of the water for two hours; pour off the liquid, and filter while hot. Then, having made a hot infusion of the galls in the remainder (half pint) of the water, add this infusion, when both liquors are cold. A precipitation of the *Diosmin* takes place. Dry this on flat glass dishes in the sun. It is a light powder.

Use—Dose.—Gr. iij. Employed in the same cases for which the powder is used. Will operate promptly in this small dose.

AJUGA.—The Leaves.

Synonyms.—Chamæpitys; Ground Pine; Bugle; Germander.

Botany.—*Sex. Syst.*—Dydynamia Gymnospermia. *Nat. Ord.* Labiatæ.

Gen. Char. Ajuga. *Corol* with upper lip minute and two-toothed. *Stamens* longer than the upper lip. *Anthers* all reniform, one-celled.

Spec. Char. A. Chamæpitys. A low, annual, creeping, labiate plant: a native of Europe, but common in the southern parts of the United States. *Leaves* linear; resembling those of the pine, whence one of its common names; very odorous

or balsamic. *Flowers* axillary, solitary, shorter than the leaves. *Stem* diffused. There are several other European, medical species, the *A. Repens*, and the *A. Pyramidalis*, which, it is said, possess about the same medical properties.

MEDICAL PROPERTIES.—The author has found no analysis of this plant, but it is very certain that its virtues are found in the volatile oil, and the extractive; for in the recent state they yield to water, and in the dried, readily to alcohol. The medicine is in considerable favor with some as a remedy in strangury, and in rheumatism and gout. Others have employed it in amenorrhœa, and praised it much for its power in this application. The dose of the leaves in powder, is ʒj.—ʒij. But it is most commonly employed in the form of tincture, in wine, of which a wineglassful is a dose.

PARTHENIUM.—The Root.

SYNONYMS.—Nephritic Plant, Cutting Almond, *Vul.*

BOTANY.—*Sex. Syst.*—Syngenesia Polygamia Necessaria. *Nat. Ord.*—Corymbyferæ.

Gen. Char. PARTHENIUM. *Involucre* five-leaved. *Rays* very small. *Receptacle* chaffy, minute, outer scales dilated. *Akenes* obovate, minutely three-armed.—*Eaton.*

Spec. Char. P. INTEGRIFOLIUM. This is the only medical species yet brought to notice. It is a Southern plant, but is also found in the Western States. It has a tuberous or knotty root, giving off fibers from the larger portions; is black or dark outside, and lighter or bluish-gray within. *Stems* one or

P. INTEGRIFOLIUM.

more, upright, round, hard, of a dark red color, and from inches to 2 feet in hight. *Leaves*, some radical, others cauline, elliptical or lanceolate, obtusely dentate, rough, entire; lower ones petiolate, upper ones sessile or clasping. *Flowers* terminal, cymous, obicular. A, the receptacle. B, the unfolded flower.

MEDICAL PROPERTIES AND USE.—The root of this plant has been very highly esteemed, by some of our profession, as a diuretic, and especially, in its application in strangury, or inflammation of the urinary passages, as cistitis, urethritis, nephritis, etc., and also in fevers. It has been prescribed, it is said, with much success in amenorrhœa. It has usually been employed in its recent state, cut into slices, and infused in cold water, and the infusion then was taken freely. The root may however be dried and used in powder or in tincture. It has not been analyzed.

ERYNGIUM.—The Root.

BOTANY.—*Sex. Syst.*—Pentandria Digynia. *Nat. Ord.*—Apiaceæ or Umbelliferœ.

Gen. Char. ERYNGIUM.—The generic name is derived from the Greek ερυγγιον, the name of a prickly plant spoken of by Dioscorides, as a specific against flatulency. *Calyx* five-parted, permanent. *Petals* oblong, inflexed at the apex. *Flowers* sessile, capitate. *Involucre* many-leaved.

Spec. Char. There are quite a number of species that are medicinal. Rafinesque, in his Medical Flora, mentions three American species, the *E. Aquaticum*, *E. Fœtidum*, and the *E. Yucefolium*, which he says are possessed of analogous properties.

E. AQUATICUM.—This is the officinal species. It is commonly called *button-snake root*, and sometimes *corn-snake root*. The plant grows abundantly on the Western prairies, in sandy soil. It has a perennial, bulbous or premorse root, and round and somewhat branched stem, two to five feet high, surmounted with large, button-like white flowers. The leaves are long, lanceolate, or sword-shaped, and beset along the edges with bristly spines.

MEDICAL PROPERTIES AND USE.—An account was given of

the high medical worth of this plant by Dr. Horton Howard, in his Botanic Medicine, as early as 1832. But this was several years after the observations of Rafinesque in this country, who gives testimony to the Indian reputation of this plant, as a remedy in fevers and dropsies.

The root is a reliable stimulating diuretic and diaphoretic. The author, having given it thorough trial, can add his own testimony to this. The Indians, it is said were in the practice of conjoining the properties of this plant with those of the *iris versicolor*, in the form of a decoction, and used the medicine with great success. This is altogether in accordance with the known virtues of both these plants. The effects in such an application, if persevered in, must be thoroughly cathartic, diuretic and somewhat tonic, and hence eminently adapted to the proper indications in treating dropsy, and also the malignant forms of fever, formerly known in the fever districts along the Western rivers. The button-snake root has also been highly extolled as a remedy for animal poisons, or bites from venomous serpents. For this use the root was bruised or chewed, and placed in substance upon the wound. The alcoholic tincture is the best form in which to use the medicine. *Dose*, ʒj.

EPIGÆA.—The Leaves.

Botany.—*Sex. Syst.*—Decandria Monogynia. Nat. Ord.—Ericaceæ.

Gen. Char. Epigæa.—*Calyx* double; outer three-sepaled; inner five-parted. *Corolla*, salver form; border five-parted, spreading; tube villous within. *Capsule* five-celled, many-seeded.

Spec. Char. E. Repens; *Trailing Arbutus.*—This is a perennial, woody creeper, growing on sandy soil, commonly on hillsides of northern exposure, and in slightly shaded places. Found from Canada to Kentucky. It is an evergreen, with a pubescent or hirsute stem, a foot or more in length. The leaves are ovate, cordate, entire, about two inches in length, and one or more in width. The flowers are white, or tinged with red, very fragrant. Blooms in May, or earlier in Ohio.

The plant is also known by other names, as *Mountain Pink*, *Ground Laurel*, *Winter Pink*, *May-flower*, etc.

Medical Properties and Use.—A most valuable diuretic and astringent. Useful in all cases in which the Buchu or Uva Ursi are employed.

Pharmaceutic Preparations.—The most convenient form for its use is the fluid extract, made by evaporating the saturated alcoholic tincture to one half. By conducting the process to an extent as to form a solid extract, and combining this with one-fourth the quantity of German Elaterium, a most powerful and certain remedy for dropsy is formed; the dose of which is one grain. The fluid extract of the epigæa is, f℥ss to f℥j.

LOBELIA SIPHILITICA.—The Entire Plant.

Synonyms.—Lobelia Syphilitique, Cardinale Bleue, *Fr.;* Lobelia Sifilitica, *Ital.;* La Siphilitica, *Span.*; Blaue Kardinals Blume, Gemine Lobelie, *Ger.;* Pokkige Lobelia, *Dutch;* Kopper Lobeliæ, *Dan.;* Cardinal Flower, Blue Cardinal Flower, Blue Lobelia, *Eng.*

History.—This plant was noticed by (Flor. Am. vol. ii. p. 447), Pursh Moris (Hist. ii. p. 466), Boerhaave, Chisholm, Schœp, Michaux (Flor. Boreal-Am. vol. ii. p. 151), Tournefort (Rapuntium Americanum, Woodville vol. i. p. 177, tab. 63), Elliot (Flor. Car. and Geo. vol. i. p. 266), Coxe (Dis. 3rd ed. p. 404), Thatcher (Dis. 3rd ed. p. 271), Nutall (Gen. Am. vol. ii. p. 77), Barton (Med. Bot. vol. ii. p. 207, tab. 47), Rafinesque (Med. Flor. vol. ii. p. 25).

The North American Indians, have a traditional history of this plant, which goes to prove its high value as a remedy in syphilis. This disease was not readily cured by them, and whatever remedies they found of utility in this disease, they labored to keep secret. This plant involved one of these secrets. A knowledge of it was purchased by Sir William Johnston, an English gentleman, who reported it to the profession in Europe. It was then tested in England and France, in reference to its antisyphilitic properties, but failed to sustain its reputation.*

* Desbois de Rochefort, reported very adversely to its value in the treatment of syphilis.

The Indians employed this article in combination with other agents, some of which are active antisyphilitics, and this may explain the cause of the deception in regard to its power in this way. The combinations, here alluded to are with Podophyllin, Prunus Vir., and Ceanothus Am.

BOTANY.—*Sex. Sys.*—Pentandria Monogynia. Nat. Ord.—Lobeliaceæ.

Gen. Char. LOBELIA.—Vide Lob. Inf.

Spec. Char. L. SYPHILITICA.—A very common, wild plant, growing in uncultivated grounds in the Western States, and indeed in most parts of the United States.

LOBELIA SIPHILITICA.

It has a perennial, fibrous root; an upright, somewhat angled stem, two to three feet in hight; sometimes, but rarely branched, and hirsute above. The leaves are entire, sessile or nearly so; larger below than above, crenulate, lanceolate, elliptical, serrate. The flowers are in a leafy, terminal spike, situated on short bractated pedicels. The corolla is of a bright blue color; its flowering time is in July. The entire plant is lactescent and acrid; when wounded the milk is freely exuded.

ANALYSIS.—As analysed in France, this plant was found to contain a very *peculiar principle*, which was compared to butter in its appearance, and characteristics; also *sugar*, *mucilage*, *malic acid*, *amarine*, *silex*, *iron*, *lignin*, *muriate and phosphate of*

lime. Its virtues yield readily to water, while in the recent state. When dry, alcohol is the best solvent, yet boiling water will take up its medical virtues to a very considerable extent. A decoction will prove emetic, diaphoretic, and diuretic; and when given in over-doses, will cause much nausea.

PHYSIOLOGICAL EFFECTS.—It is a notable fact, that the old profession still persist in their incorrigible perversity, in reference to their statements concerning the properties of the Lobelia plants. Dr. G. B. Wood, of the University of Pennsylvania, in his late treatise on Therapeutics and Pharmacologia, 1856, pronounces lobelia inflata, a "*violent poison*," and Alphonso Wood of N. H., in his Class-book of Botany, pronounces all the lobelias poisonous, and urges great caution in their use. "*Less than a teaspoonful of the seeds or the powdered leaves, would destroy life in a few hours.*" This is a quotation he makes from *Gray.* G. B. Wood says (Ther. and Phar. vol. ii. p. 136), "From all that I have seen, I should infer that a drachm of the dried herb would be a dangerous dose, which ought not to be hazarded at once!" In confirmation of this position, he makes allusion to several criminal prosecutions in England, which had been predicated upon allegations of the reckless use of lobelia. Thirteen cases of poisoning appear to have been reported by Dr. Letheby, of London, to have occurred from this article, within three or four years; in six of which, the Coroner had brought in verdicts of manslaughter. Dr. Wood adds, that in America, numerous other cases of poisoning have occurred, from the reckless use of this article by "a certain class of uneducated empirics."

How much the "*education*" of Dr. Wood, or how far his *acquirements*, in reference to the practical facts, pertaining to the therapeutic action of our indigenous medical plants, may be in advance of those "*uneducated empirics*" he alludes to, the experience of hundreds of thousands, citizens of the United States will, perhaps, readily suggest.

In this country there have been over 1600 graduates, from institutions teaching the use of Lobelia, in *full emetic* doses: and there are at least 20,000 people in the States and Canadas, who are in the habitual use of this article, in doses much

larger than what is represented by these gentlemen as being hazardous or fatal doses.

The author has been in the professional use of lobelia, upward of twenty years, and must bear testimony to the absolute safety of the employment of all the medical species of lobelia in any reasonable doses.

THERAPEUTIC PROP. AND USE.—The Lobelia Siphilitica is stimulant, anti-spasmodic, expectorant, diaphoretic, and diuretic. It bears a closer resemblance in its therapeutic properties to the L. Inflata than any other of the species, and will give good satisfaction in its use to fulfill the indications observed for that article. This is especially true in regard to its employment in inflammations, acute or chronic, of the viscera. In hepatitis, splenitis, nephritis, pneumonia, carditis; also in gout, rheumatism, and even in febrile diseases, this article will be found of eminent service.

It has also been available in amenorrhœa, leuchorrœa, gonorrhœa, and in dysentery.

The entire plant possesses the same virtues, but the root is most persistent and powerful. It is mostly employed in the form of alcoholic tincture, But a very good preparation is made by tineturing the root in any of the stronger wines.

In the treatment of chronic diseases, this is the preferable form of its use. The dose is ʒj.—ʒiij.

POLYTRICHUM.—The entire Plant.

SYNONYMS.—POLYTRICHUM, JUNIPERINUM; Hair-Cap Moss, Ground Moss, Bear's-Bed, Robin's Eye, *Vul.*

BOTANY.—*Sex. Syst.*—Cryptogamia Musci. *Nat. Ord.*—Musci.

Gen. Char. *POLYTRICHUM, from *Πολυς*, "many," and *Τριχος* "hair." *Peristome* very short. *Teeth* 16, 32, or 64. *Mouth of germ* covered by a dry membrane which is connected to it by the teeth of the peristome. *Calyptre* very small, with a large villous or hairy covering.

Spec. Char. P. JUNIPERINUM.—*Stem* generally simple. *Leaves*

*Eaton & Wright, Lower Cryptogamia. N. A. Bot., Eighth Ed.

lance-linear, entire, flattish, somewhat spreading; the upophysis depressed. (*Eaton.*)

A perennial moss, growing in dry, airy places, and mostly on poor soil. It is found in most parts of the U. S., very common in the Middle States. *Stem* slender, simple, or divided, of a reddish color, and from three to six inches in hight. *Leaves* small, linear-lanceolate, flattish, entire, with reflexed margins. *Capsule* oblong, four-sided, acute-angled. *Peristome* sixty-four toothed.

MED. PROPERTIES AND USE.—This is a new remedy, as is believed, since at least there is no notice of the medical properties of the plant by any of the old-school authorities. With some of the Eclectics of Pennsylvania and Ohio, however, it has been employed as a diuretic, with much success.—Its chief application is in dropsical diseases, in which it is given in the form of strong infusion, given in doses of f℥j.—f℥ij. The virtues consist in a purely extractive principle, which may be prepared in a concentrated form, by exposing a filtered infusion of the plant in shallow glass or earthen dishes, in the hot sun, for evaporation. The dried extract thus obtained is to be triturated in a mortar, and put up for use. The dose is gr. v.

This extract combined in equal proportions with that of Sambucus Canadensis, and given in doses of five grains, once an hour, will produce astonishing effects.

The polytrichum has, in addition to the certainty of its action, another good characteristic, which is the absence of every thing disagreeable in taste or smell.

HYDRANGEA ARBORESCENS.—The Root.

BOTANY.—*Sex. Syst.* Decandria Digynia. *Nat. Ord.*—Saxifragaceæ.

Gen. Char. HYDRANGEA.—*Calyx* five-toothed, superior. *Corolla* five-petaled. *Capsule* two-celled, two-beaked.

Spec. Char. H. ARBORESCENS.—A shrubby plant, growing in hilly places, among rocks or along streams, in the Middle, Southern and Western States. It is commonly called *seven*

bark and *nine bark*, from the lamelated character of its bark, which peels off in different layers, and is of different shades of a brown or cinnamon color. It grows from five to eight feet in hight, with many branches, and opposite, petiolate, ovate, entire leaves, and white, fertile flowers, growing in fastigiate cymes. (*Hydrangea Vulgaris.*—Eaton, Michaux, Pursh.)

Med. Properties and Use.—This article is here introduced on account of its popularity in some sections, as a remedy for gravel or stone in the bladder. Dr. Butler, of Burlington, N. J., first introduced it as a remedy of this kind, and some other persons have sustained his views. The Dr. considered a syrup made of the root, with honey, a reliable means to relieve the pain and anguish which often attends the passage of urinary calculi through the urethra. When the calculus is small, or in a gravelly state, he thought this syrup had the power of dissolving it, and if employed early, will always obviate the lithic diathesis. This is promising much, perhaps more than the common professional sentiment would second without trial. It would be well, however, for the profession more generally to test this article. The medicine has considerable power, and must not be taken in over-doses. The dose is a teaspoonful of the syrup three times a day. The leaves of the plant are cathartic and diuretic.

HELIANTHUS.—The Leaves and Seed.

Botany.—*Sex. Syst.*—Syngenesia Frustranea. *Nat. Ord.*—Heliantheæ.

Gen. Char. Helianthus.—*Involucre* imbricate, leafy. *Receptacle* flat, chaffy. *Egret* two-leaved, chaff-like, caduceous.

Spec. Char. There are several species of this extensive genus that have been invoked for remedial resources. The H. Anuum, or common *sun-flower* of our gardens, is the article, however, here particularly referred to, and which is intended here to be continued in its position in the Mat. Med. It is too well known to require further description.

Medical Properties and Use.—The leaves and the seed of the sun-flower afford a good diuretic, and are also a fine pectoral. The leaves are to be tinctured in wine, or other spirits.

or they may be employed in the form of infusion. The extract, either alcoholic or aqueous, is however quite the most eligible form of taking the medicine. The alcoholic extract has this advantage, that it requires less bulk to be taken to insure its operation.

RUDBECKIA.—The entire Plant.

BOTANY.—*Sex. Syst.*—Syngenesia Frustranea.

Gen. Char. RUDBECKIA. *Involucre* consisting of a double order of leaflets or scales. *Receptacle* chaffy, conic. *Egret* a four-toothed margin.

Spec. Char. There are several species that are medicinal.

R. LACINATA. (*Cone Sun-flower; Thimble-Weed.*) This is a common perennial, herbaceous plant, growing in damp places, from five to ten feet in hight. It is a rank and showy plant, with large compound or partite leaves; lower ones pinnate, with its leaflets three-lobed, or partite; upper ones three-obed or tri-partite. *Flowers* large, yellow, with a large conical dish. Barton gives a fine drawing of this plant in his Flora, vol. 1. page 56, Tab. 16.

The R. PURPUREA has different medical properties, which are noticed among the Alteratives.

MEDICAL PROPERTIES AND USE.—The rudbekia lacinata is regarded with much favor by many of our practitioners, as an invaluable diuretic. It has been specifically employed in certain renal diseases—*Bright's disease*—strangury and chronic inflammation of the kidneys. It is taken in the form of decoction, *ad libitum*.

CHIMAPHILA.—The Herb.

SYNONYM.—Pippsissewa, *Vul.*

BOTANY.—*Sex. Syst.*—Decandria Monogynia. *Nat Ord.*—Pyrolaceæ.

Gen. Char. CHIMAPHILA.—*Calyx* five-toothed. *Petals* five. *Style* short, buried in the germ. *Stigma*, annular, orbicular, with a five-lobed disk. *Filaments*, stipitate. *Capsules*, five-celled, opening from the summits.

Spec. Char. C. UMBELLATA.—A small evergreen, procumbent shrub. *Leaves* coriaceous, with short petioles, cuneate, lanceolate, coarsely serrated, smooth and shining. *Flowers* drooping, in small corymbs, with linear bracts. Grows on mossy turf in the woods, in northern latitudes of America, Europe and Asia. There is another species possessing nearly analogous properties growing, more commonly throughout the United States. It is a smaller plant, has fewer and more lanceolate leaves, which are marked by white lines along the midrib and lateral nerves. Otherwise the plant bears a very close resemblance to the above. It is also an evergreen, and is likewise vulgarly called Pipsissewa. It is the *C. Maculata.*

CHIMAPHILA UMBELLATA.

CHIMAPHILA MACULATA.

It may be remarked here, that these plants are often placed in the genus *Pyrola*, since Dr. Bigelow has maintained that Pursh called them chimaphilas from a mistaken notion of their botanical character. But many critical botanists, have followed Pursh; and as innovations

should ever be avoided, unless science demands them, these plants should remain where they were first placed.

The name *chimaphila* comes from χειμων, 'winter' and φιλος 'lover,' *winter-lover*, in allusion to its thrifty and evergreen appearance in the winter-season. The name *pyrola*, comes from the latin *pyrus*, the 'pear,' in allusion to the shape of the leaf. Now, it would seem to take quite a stretch of the imagination, to compare the shape of the leaves of either of these plants to a pear. On the other hand they seem to answer well to the Greek name, as above indicated.

MEDICAL PROPERTIES AND USE.—These plants are both diuretic, tonic, and astringent, and in their therapeutic as well as botanic character, are very closely allied to the Uva Ursi. They may be used in the same way and for the fulfillment of the same indications. In addition, however, to the virtues ascribed to the article just spoken of, these are supposed to be possessed also of active antiscorbutic powers.

SAMBUCUS.—The Bark, Flowers, and Berries.

SYNONYMS.—Elder, Sweet Elder, *Vul.*

BOTANY.—*Sex. Syst.*—Pentandria Trigynia. *Nat. Ord.*—Caprifoliaceæ.

Gen. Char. SAMBUCUS.—*Calyx* five-pointed.—*Corolla* five-cleft. *Berry* three-seeded.

Spec. Char. S. CANADENSIS.—A well known indigenous shrub, growing about ten feet high, with a branched stem, containing a large, spongy pith. The leaves are opposite and pinnate, and the flowers white, small, and in large umbelliferous clusters, succeeded with small, globular, juicy berries, black or purple when ripe.

MEDICAL PROPERTIES AND USE.—Elder is a good, and pretty certain diuretic. The inner bark of the root is the most active, but all the parts, except the woody portion and pith, are diuretic. The decoction of the bark is eminently useful in dropsy. Numerous cases are reported to be cured by this article that had resisted the power of many other esteemed remedies

The knowledge of the value of Elder in Dropsy is said to have been first obtained from the Indians. The extract is the best form in which to use the medicine. This is prepared from the bark in the same way directed for that of Cornus Florida. The inspissated juice of the berries is also good as a diuretic. The dose of this is ʒj.—ʒij. The dose of the extract is gr. v.—gr. x. That of the decoction, made by boiling two ounces of the bark in two pints of water down to one, is from two to three fluid ounces; that of the watery infusion is a wineglassful, often repeated, until the desired effect is produced. The active properties are readily taken up by water and by alcohol, being contained mostly in an extractive.

APIUM PETROSELINUM.—The Root and Seed.

Synonyms.—Parsley, Garden Parsley, *Vul.*

Botany.—*Sex. Syst.*—Pentandria Digynia. *Nat. Ord.*—Apiaceæ or umbelliferæ.

Gen. Char. Apium.—*Fruit* ovate, striated. *Involucre*, one-leafed. *Petals* equal.

Spec. Char. A. Petroselinum.—A well known indigenous garden plant, with a perennial *root*, and a round, furrowed, jointed, branched *stem*, compound pinnated ternary *leaves*, and small umbelliferous *flowers*.

Medical Properties and Use.—A pretty certain and active diuretic, useful, and highly recommended by Dr. Chapman, in dropsy. It is generally taken in strong infusion, freely. The virtues of the plant are readily taken up by water, consisting in part, of an essential oil (combined with the juices of the plant, and hence soluble in water), and of an extractive. The medicine is not generally depended upon, alone, in difficult cases, being chiefly used as a collateral agent with other remedies.

ASPARAGUS OFFICINALIS.—The Root.

Synonym.—Asparagus, *Vul.*

Botany.—*Sex. Syst.*—Hexandria Monogynia. *Nat. Ord.*—Asparagi.

Gen. Char. ASPARAGUS.—*Corolla* inferior, six-parted. *Style* short. *Berry* three-celled; cells two-seeded.

Spec. Char. A. OFFICINALIS.—An indigenous, herbaceous garden plant, about three or four feet high, with many bristle-shaped leaves.

MEDICAL PROPERTIES AND USE.—A diuretic, formerly much esteemed, and still valued by the French. It is chiefly valuable as an auxiliary means in the treatment of dropsical and nephritic complaints. It has been usually prepared in syrup or extract, by expressing the juice and adding sugar, or evaporating spontaneously. Boiling, without doubt, much injures its virtues. The bruised root should simply be digested in hot water for a few hours, and then the infusion, thus prepared, drunk freely. The dose of the syrup is f℥j.—f℥ij.; that of the extract from ʒss. to ʒj.

CUCURBITA.—The Seeds.

BOTANY.—*Sex. Syst.*—Monœcia Monadelphia. *Nat. Ord.*—Cucurbitæa.

Gen. Char. CUCURBITA.—STAMINATE FLOWERS. *Calyx* five-toothed. *Corolla* five-cleft. *Seeds* flat, smooth.

Spec. Char. This genus embraces many species, the seeds of most, if not all of which, are medicinal. They are all naturalized, annual, herbaceous plants or vines. The most prominent are the following: 1, C. citrullus (*Watermelon*); 2, C. pepo (*Pumpkin*); 3, C. ovifera (*Egg-squash*); 4, C. Melopepo (*Flat-squash*), etc.

MEDICAL PROPERTIES AND USE.—The seeds of these plants are safe and prompt diuretics, very useful in dropsy and urinary obstructions. They may be taken in strong infusion, as auxiliary means to other remedies of this class. The virtues of the seeds reside chiefly in a fixed oil and extractive, and consequently are not entirely given up to water or spirits. The oil may, however, be obtained by expression or by boiling the bruised seeds, enveloped in a linen bag, in water, when the oil will rise to the top of the water, and may be separated when the water cools. This oil is actively diuretic, in doses of from ten drops to a teaspoonful.

SECONDARY DIURETICS.—There are, in addition to the many articles already treated of in this class, numerous others that have been favorably regarded by various practitioners and private persons; but the object of this work, although contemplating the most ample medical resources, does not propose an unnecessarily large list of agents to the exclusion of what is so much more important—critical and ample therapeutic detail. Still, however, as persons looking over an index of a book are always disappointed when they fail to find what they look for, a very brief notice is given of articles of secondary importance, in the classes where they will admit of such notice.

PLANTAGO MAJOR: *Plantain.* A well known herb, growing in meadows, yards, and in moist grounds generally. The expressed juice of the recent plant is diuretic, refrigerant, and vulnerary. The dose is f℥j.—f℥iij. If the expressed juice is dried upon glass plates in the sun and then put up for use, the medicine may serve a convenient purpose in medical practice; otherwise this plant must hold its position only among the domestic remedies. The dose of this extract is ℈j.—℈ij.

The bruised leaves of the plantain, applied to poisoned wounds, have proved of eminent service, as can be testified to by many practitioners. The author has relieved several alarming cases of poisoned bites of serpents by means of this plant and lobelia, in equal parts, bruised in the recent state and applied to the wound.

VACCINIUM: *Whortleberry; Huckleberry.* The many different species of the Whortleberry are considered as possessing nearly the same medical properties, but none have much activity. The leaves are diuretic and astringent, and the fruit esculent and diuretic. The fruit is beneficial in scurvy and dysentery; and the fruit and the bark of the root, digested in gin, have been employed as a prophylactic to dropsy. It will answer as a substitute for Buchu.

CYTISUS SCOPARIUS: *Broom.* The European or English *Broom* possesses medical properties. The leaves, or verdant tops and seeds, are considerably diuretic. When given in overdoses, they prove emetic and cathartic.

IMPATIENS: *Touch-me-not.* There are two indigenous species of the *Impatiens*, the I. PALLIDA and the I. FULVA, that have about the same medical properties. Both are *Emetic*, *Cathartic*, and *Diuretic;* useful in hepatitis, jaundice, and dropsy. The recent juice of the I. BALSAMINA, or naturalized garden *touch-me-not*, possesses properties valuable for endermic application, and the two native species are also accredited with the same. The recent juice is said to improve the texture and color of the skin in sun-stain, freckles (ephelides), and blotches. It is also said to cure porrigo, herpes, and eczema, and to remove warts.

The extract, made by inspissating the juice of the plant, forms the proper state for the professional use of the impatiens. Dose, gr. iij.—gr. v.

DIERVILLA CANADENSIS: *Bush or Wild Honey Suckle.* A hot infusion of the leaves, twigs, or root of this shrub will prove diuretic, and has been employed in domestic practice as a remedy for gleet and inflammation of the bladder. Taken *ad libitum.*

URTICA DIOICA: *Nettles.* The root and leaves of the common nettle are diuretic and astringent. A hot infusion is drunk freely, as a domestic remedy for gravel, nephritis, diarrhœa, nemorrhoids, hemorrhagia, and scorbutic affections.

The sting or smarting of the nettle when applied to the skin may be relieved with strong alkalies, as aqua ammonia and a solution of potash.

EQUISETUM HYEMALE: *Scouring Rush* or *Horse-tail Rush.* The stalks of this plant impart diuretic properties to water, by hot infusion. The infusion is taken freely for suppression of urine.

NASTURTIUM PALUSTRE: *Yellow Water-cress.* A mild stimulant, diuretic and antiscorbutic, when employed in the fresh state. Infuse in cold water and drink freely.

Order II. SALINE DIURETICS.

Saline substances appear to possess a peculiar tendency to the kidneys. Whether this arises in virtue of the intrinsic

power of these agents, or whether it is a consequence of the laws of the economy which seem to prove the kidneys to be destined to the collection of the saline portions of the blood is a question of some interest, in view of the therapeutic value of this order of diuretics.

Digestion must be regarded as a *chemico-physiological* process. The chemical agents are mainly two, the *acids* and the *alkalies*. The action of the former is evinced in the agency of the gastric juice, and in the fermentative process of the digestion. Then the alkalies become necessary to dissolve what is insoluble in the acids. The alkaline digestion occurs in the duodenum, where the saline matters are furnished in the bile. The acid seems to become exhausted in the digestive process. But the alkaline materials necessarily superabound, and their removal is provided for, in part, in the renal secretion. Now, it is but reasonable to conclude, that any artificial addition of alkaline material to the circulation, will find exit by the same means provided for the elimination of the natural product.

The question now arises whether, when alkalies or saline substances are administered, there is only an increase of the alkaline property of the urine, or whether there is also a real augmentation of the volume of the urinary secretion? Observation clearly demonstrates the affirmative to the latter. Then the alkalies, or saline substances, possess a power to excite the kidneys to their normal action, i. e., their urinary secretion.

The action of saline diuretics thus appears to be direct, or primary, upon the kidneys; and not like that of the former order, which is chiefly through the nervous system, or reflex action.

From these views, it will readily be seen that saline diuretics are quite topical in their effects, and have their application mostly in the treatment of dropsy and diseases of the urinary organs.

POTASSÆ ACETAS.—Acetate of Potash.

This salt is found ready formed in many vegetables; indeed,

in all which yield carbonate of potash by incinneration. It is described elsewhere.

Medical Properties and Use.—A very certain diuretic in doses of ℈ss.—ʒj. Useful in dropsy and urinary affections, and supposed to be particularly applicable in the uric acid diathesis.

POTASSÆ BITARTRAS.—Cream of Tartar.

This article was described in the order of hydragogue cathartics, but also merits a place here. It is a mild diuretic in doses of ʒss.—ʒij. repeated. Useful as an auxiliary to other diuretics.

Citrate of Potash, prepared by saturating lemon-juice with carbonate of potash, is also diuretic, and may be used in the same way, and for the same purposes, as the acetate.

Class V.—EXPECTORANTS.

The term *expectorant* is derived from the Latin *expectoro*, from ex, '*out*,' and pectoreus, '*breast*,' i. e., 'out of the breast,' implying the source of the evacuation. Thus, the term is applied to such medical substances as are considered to have the power to promote the elimination of matter from the bronchial surface or lungs. A physiological consideration of the function of expectoration, however, makes it doubtful whether, indeed, there can be any rational claim for a class of medicines possessing a constant specific expectorant power, and whether expectorants should not be considered as mere relative agents.

It is very certain, however, that this function can be promoted, and that to a very considerable degree, by obviating certain morbid conditions that may obstruct it, as well as by stimulating the organs with general and local means, as is done in other cases, in which no specific action can be sustained.

Hence, the propriety of continuing the class of expectorants which, of late, has been the subject of so much controversy, does certainly not depend, altogether, upon the specific char-

acter of the means employed to effect the end. It is proper, sometimes, to consider the importance of the object to be accomplished *itself;* and then, when this becomes a desideratum, and it be acceded also that there are indirect means to gain it, the questions arise, whether there is *choice* in those said means? and whether any practical advantage can be gained in the systematic arrangement of them? It is on this ground, alone, that the class is retained in the present arrangement.

It has been very correctly remarked, that expectorants must be regarded only as relative agents. There is scarcely one of the prominent classes that does not contribute in furnishing this. If the bronchial mucous membrane be inflamed, as in acute bronchitis, its normal secretions may be wholly arrested; in which case the nauseants will be required. If the inflammatory action should be feeble and chronic, and there should be a collection of cold, tough phlegm, as in protracted winter coughs and the peculiar bronchitis of old persons, stimulants may be required. When there is much irritation and a tendency to spasm; antispasmodics, balsams, or nauseants, may be most indicated. Thus it may be very convenient to arrange such articles of the different classes, into such orders of *this* as will be best suited to fulfill the various indications that demand expectorants.

Order I.—TOPICAL EXPECTORANTS.—Inhalations.

Inhalation is the most direct method by which the bronchial surface may be reached by medical agents. In order to effect our purpose, therefore, by this, it only becomes necessary to bring our remedies into a sufficient state of rarity to admit of being inhaled without becoming obnoxious. For this purpose, if of a proper quality, they may be converted into a state of *vapor* or *gas.* Thus, the vapor of vinegar or water, may be inhaled by means of a proper apparatus, in cases of dry asthma, with the most happy effects.

Persons have also experienced great relief, in spasmodic asthma, from a general vapor-bath, in which they are placed

completely in the vapor, so as to compel them to breathe the steam. The same kind of cases, as well as bronchitis, may also be much relieved by smoking lobelia leaves, in a common clean tobacco pipe. Stramonium leaves have also been used in the same way, and, it is said, with great effect, but this is rather a suspicious remedy. The fumes of resin, pitch, or tar, tolu, benzoin, resin of asclepias, etc., dropped on hot coals, have also been highly esteemed in pthisis and chronic bronchitis.

Order II. NAUSEANT EXPECTORANTS.

Nauseants are the most valuable expectorants that we possess. They are available in most cases in which other kinds have been found useful. Thus in all inflammatory conditions of the lungs or bronchia, in which expectorants are required, the articles of this order forcibly recommend themselves. Nausea promotes all the secretions, and those of the mucous surface of the lungs especially, to no *small* extent.

This order of expectorants are particularly applicable in asthma, pertussis, cynanche trachealis, bronchitis, catarrhs, the coughs attending scarlatina, or rubeola, etc.

LOBELIA INFLATA.

Lobelia is the best expectorant that we possess. It serves as a good example of this order. If there is a single article in the expectorant class that can be relied upon in all cases, it is this. But it is particularly available in croup, asthma, bronchitis, pertussis and catarrh, especially if there be much spasm or inflammation present. It is very much improved by combination with the papaverine. The dose is gr. v.—gr. xv.

PAPAVERINE.

This article, combined with any of the other nauseant expectorants, invariably improves them. It should enter in such proportion with the other articles as to make about half a grain of this to each dose. For preparation, see under proper head, among the nervines.

IPECACUANHA.

The indigenous, as well as the South American Ipecacuanha is expectorant, and may be used in all cases where lobelia is indicated, in doses of gr. v.—gr. x.; but these are both inferior in this respect to that potent article.

SANGUINARIA.

The blood-root is a popular expectorant with the old-school practitioners. They consider it well adapted to the treatment of cynanche trachealis, but it is inferior to lobelia. The dose is from ten to thirty drops of the tincture, to a child three years old.

OXYMEL LOBELIA.

For formula, see p. 89.

Action—Use.—An excellent nauseating expectorant. Dose, from a teaspoonful to a tablespoonful, repeated.

PULVIS EXPECTORANS.

℞ Lobelia herb, ℥j.; Ictodes Fœtida, ℥ij.; Papaverine, ʒj. Pulverize and mix.

Action—Use.—A very efficient nauseant and antispasmodic expectorant, useful in all cases in which expectorants are indicated. Dose, gr. v.—gr. x., taken in honey or molasses.

Order III.---STIMULATING EXPECTORANTS.

It has already been remarked, that expectorants are properly only relative agents, and that the articles that are designed to promote this effect must be selected from other classes, according to the indications of the several cases in which they may be required. All proper and general stimulants may, therefore, under certain circumstances, prove expectorant; and this fact is fully corroborated by the experience of every practitioner. No one can have failed to observe, how prompt and efficient capsicum will act, as an expectorant, under some circumstances. Nevertheless, among the many different stimulants, we find some that seem to be much more specific, in this effect, than the mass appear to be. It is,

therefore, this variety of stimulants that are here intended to be represented separately. They are more particularly applicable in chronic pulmonary, and bronchial affections.

ARUM.—The Root or Cormus.

SYNONYMS.—ARISARUM, *Tourn.;* Dreyblattrise Aron, *Ger.;* Pied-de-Veautriphylle, *Fr.;* Dragon-root, Indian-turnip, Wake-robin, *Eng.*

BOTANY.—*Sex. Syst.*—Monœcia Polyandria. *Nat. Ord.*—Araceæ.

Gen. Char. ARUM.—*Spath* one-leafed, cowled. *Spadix* naked above, female below, stamineous in the middle.—*Willd.*

Spec. Char. A. TRIPHYLLUM.—*Leaves* radical, ternate, folioles sessile, oval, acuminate, entire, smooth. *Scape* with one spath, ovate, acuminate, inflexed. *Spadix* club-shaped, shorter. *Flowers* polygamous, tricœcious.—*Raf.*

Cormus (root) perennial, round, flattened, fleshy, solid; covered with a loose, wrinkled epidermis; with lateral fibers, and on the under side plano-convex, and somewhat granulated. *Leaves* one or two tri-foliate; leaflets oval or rhomboidal, oblong, entire, sometimes undulated. *Scape* leafless. *Spath* large, upright, tubular at the base, hooded at the top, green or variegated purple. *Spadix* cylindrical, obtuse at the top, bears the beautiful berries, green when immature, bright scarlet when ripe.

There are several varieties known by the color of the spath and spadix.

Other species of similar medical properties — A. DRACONTIUM — has a large pedate leaf with from 5 to 15 oblong segments; grows in the Southern and Western States. This is called also, Arum Polyphyllum.*

ARUM DRACONTIUM.

* This cut was, by mistake, given on page 173, as Podophyllum Montanum.

A. Virginicum — has wide, cordate leaves; grows in Virginia.

A. Sagitifolium — has sharp, long, sagitated leaves; grows from New York to Carolina.

A. Maculatum — a spotted European species.

Analysis.—The recent root contains: 1, a very peculiar *volatile acrid principle;* 2, a large quantity of *starch;* 3, *gum;* 4, *sugar;* 5, *extractive;* 6, *lignin;* 7, salts of *potassa* and *lime.* The starch, which constitutes about twenty or twenty-five per cent. of the root, may be readily obtained by infusing the scraped root in water, and proceeding as in preparing it from the raw potato. The acrid properties are entirely dissipated by heat, the root may therefore be eaten when boiled or roasted. The Indians were in the practice of eating it thus as an article of food. What is in England called *Portland arrow-root*, or *Portland sago*, is obtained from the Arum Maculatum.

Pharmaceutic Preparations.—The art of pharmacy has hitherto done but little for this article. The virtues are in a peculiar acrid principle, which is so very volatile as to become dissipated by heat, and even by the process of drying. It is inflammable, and consists of a gaseous substance not yet analyzed, but has most probably hydrogen for its base. It is not taken up by water, alcohol, ether, acids, alkaline solutions, or any other menstruum commonly in use.

Since, therefore, the properties elude the action of *heat*, and all the *menstruums*, there is but one form of the use of the the arum—that is the substance of the fresh or recently dried root. There is one happy circumstance, however—the root or rhizome can be kept when buried in sand, for months or even for a year or more, and thus will ever be in a state requiring but little attention for application; requiring only to be grated and given in emulsion. The necessary dose being small, it can readily be so enveloped as to be taken with the greatest facility. Licorice emulsion is a very desirable vehicle, being a good medical adjunct and at the same time palatable, and sufficiently mucilaginous and adhesive to protect the tongue and palate from the acrid properties.

When first dried, or for a few months after the root is dried, it retains about a fourth or less of its medical properties, and may thus be given in the powdered state in larger doses, as gr. x.—gr. xx. The dose of the fresh root is gr. iij.—gr. v.

From these facts, it is evident that no confidence can be placed in any proposed preparations of this article into which it does not enter properly in substance.

Arum can serve no good purpose in syrups, cordials, extracts, etc., in which it is either decocted or otherwise heated, or simply digested, in view of the extraction of virtues.

THERAPEUTIC PROPERTIES.—The fresh root, or that which is preserved in the recent state, is an acrid and powerful stimulant and expectorant, very useful in catarrhal affections, asthma, pertussis, chronic pneumonia, phthisis, and even in rheumatic affections and gout, particularly when these latter diseases implicate the stomach, and the organs of the chest. The medicine requires to be frequently repeated in its application, as the virtues lack much in persistence.

ICTODES.

The root of the *Ictodes Fœtida*, either in the recent or dried state, is a reliable expectorant. It is indeed questionable whether we have a non-nauseant expectorant superior to this article. The plant is described under the head of the Antispasmodics.

It must be observed that the ictodes, like the arum, requires application or use in substance, in view of the development of its expectorant powers; no menstruum having ever yet been found capable of extracting these virtues from the arum or the ictodes.

In the recent state, the root is much more acrid and expectorant than in the dried, and thus requires a much less dose.

Dose, in recent state gr. v.; in the dried gr. x.—gr. xx.

GLYCIRRHIZA.

Licorice root is a demulcent expectorant, and being of very agreeable taste, is much employed in this way. It is given in form of powder, infusion, decoction, extract, and con-

fection. It enters into a great many officinal preparations of the expectorant, cathartic, and alterative classes.

The extract, commonly called *Licorice-Ball*, when well prepared, is a very acceptable demulcent expectorant, and is much esteemed as a popular remedy in coughs, and pectoral diseases generally.

SCILLA.—The Bulb.

Synonyms.—Scilla Maritima, *Dub.;* Meerzwiebel, *Ger.;* Scilla, *Ital.;* Seille, *Fr.;* Cebolle Albarana, *Span.; Squill, Eng.*

Description.—Squill as brought to us, is in irregular oblong pieces, sometimes contorted, of a dull or pale yellowish-white color, interspersed with rosy or reddish tints. It is brittle and friable when perfectly dry, but inclines to a tough or leathery consistence, from its affinity for moisture.

In the recent state, the squill is in large, scaly bulbs, that are taken up from the wet soil on marine coasts in France, Spain, Italy, Greece, and other countries bordering on the Mediterranean. The plant belongs to *Sex. Syst.* Hexandria Monogynia, and *Nat. Ord.* Liliaceæ.

Therapeutic Properties and Use.—In former times squill was much employed as an expectorant; but being quite nauseous, and also uncertain in its effects, it has of late gone somewhat out of use. It is also diuretic, and has been prescribed in dropsy; but is objectionable in this application, on the same grounds. In large doses, it proves emetic, and also purgative. As an expectorant, it is given in the form of *vinegar of squill:* ℞ Squill, bruised, ℥iv.; Distilled Vinegar, Oij.; Alcohol, ℥j. Macerate seven days;—and of *Oxymel, i. e.*, a syrup made of squill, vinegar and honey—℞ Vinegar of Squill, Oij.; Clarified Honey, ℔iij.; Mix and evaporate to proper consistence. Dose, of either, f℥j.—f℥ij.

MARRUBIUM.—The Herb.

Synonyms.—Marrubium Vulgare, U. S.; Weisser Andorn, *Ger.;* Marrube blanc, *Fr.;* Marrubio, *Ital., Span.;* Hoarhound, *Eng.*

Botany.—*Sex. Syst.*—Didnamia Gymnospermia. *Nat. Ord.*—Lamiaceæ or Labiateæ.

Gen. Char. MARRUBIUM. — *Calyx* salver-shaped, rigid, ten-streaked. *Corolla* with the upper lip bifid, linear, and straight.

Spec. Char. M. VULGARE. — *Root* perennial, fibrous. *Stems* annual, numerous, quadrangular, erect, very downy, from 12 to 18 inches high.

A very common door-yard or way-side plant; native of Europe, but found in most parts of the United States in old settlements. It flowers in July and August.

THERAPEUTIC PROPERTIES AND USE.—The *Hoarhound* has for many years held a position among pectoral remedies, and has been a prominent constituent in syrups, for pulmonary diseases, not only in domestic practice, but also in the regular way. It holds a place in the secondary list of the U. S. P. But, it is certain that its medical properties have been far misjudged. Its expectorant powers are very feeble indeed, while on the other hand it is a good tonic.

There is certainly less propriety in its combinations, in expectorant syrups and other formulas designed for use as expectorants, than what the common practice of physicians would indicate; for it is very disagreeable in its taste and flavor, and can add but little to the uses of the remedies with which it is thus combined.

The dose is from gr. xxx. to ʒj., of the powdered plant, and thus is almost entirely inadmissible in this form. The extract is more applicable. Water will extract its virtues.

Order IV. ANTI-SPASMODIC EXPECTORANTS.

This order of expectorants is chiefly available in cases where there is much irritation and spasm of the bronchial vessels, as in spasmodic asthma, pertussis, etc.

1. LOBELIA.

2. ICTODES FŒTIDA.—*Dose*, gr. iij.—gr. x. of the recent root; or gr. x.—gr. xxx. of the recently dried root, taken in powder, with honey or molasses.

3. ASAFŒTIDA.—*Dose*, gr. v.—gr. x.; fʒss.—fʒj. of the tincture.

4. GALBANUM.—*Dose*, gr. x.—gr. xx.

Order V. BALSAMIC EXPECTORANTS.

Balsamic expectorants are regarded to be soothing and healing to the lungs, and hence applicable in irritable, abraded or ulcerated conditions of the lungs, as in chronic bronchitis, typhoid pneumonia, phthisis; rubeola, scartalina, pertussis, dry asthma, catarrh, etc.

MYROXYLON.

SYNONYMS. — BALSAMUM PERUVIANUM; Peruvianischer Balsam, *Ger.;* Baume de Perou, *Fr.;* Balsamo del Peru, *Ital.;* Balsamo negro, *Span.;* Balsam of Peru, *Eng.*

HISTORY.—The Balsam of Peru is one of the very finest of the aromatic soft resins, or balsams, of the Tropics. It is brought to us from the warmer portions of South America, as Peru and New Grenada, where it is called *Quinquino.* The tree from which it is obtained yields it from incisions made through the bark with knives.

BOTANY.—*Sex. Syst.*—Decandria Monogynia. *Nat. Ord.*—Myroxylaceæ.

Gen. Char. MYROXYLON. *Calyx* campanulate, five-toothed, persistent. *Petals* five. *Stamens* ten, free. *Ovary* stipitate, oblong, membranous, with 2 to 6 ovules.—*DeCand.*

Spec. Char. M. PURIFERUM. *Leaves* coriaceous, persistent, smooth, as well as the *branches.* Wing of the *legume* very thick, not veined. *Style* deciduous.—*DeCand.*

The tree affording the balsam of Peru, according to the authorities, is tall and beautiful, with a straight, smooth trunk, and spreading branches. The bark is of a gray color, compact and heavy, and highly resinous: it has the aromatic flavor of the balsam. The leaves are alternate and composed of from 2 to 5 pairs of leaflets. The flowers are white, or slightly tinged with rose color, and are in axillary racemes, longer than the leaves. The fruit is a pendulous straw-colored legume.

DESCRIPTION.—The Balsam of Peru brought to us is of several varieties, depending on the method by which they are obtained and kept, and which will be best considered separately.

α. White Liquid Balsam of Peru. — This is obtained from the tree by incisions made into the bark of the tree, from which the balsam will run. It is taken up and put into bottles. If thus kept it will remain liquid and limpid. If it is exposed to the air it will dry up and furnish what is sometimes called *Dry White Balsam of Tolu.* This is found in mats or calabashes. The liquid white balsam is the finest and best variety of all, and is exceedingly aromatic and rich in taste.

β. Black Peruvian Balsam.—This variety of the balsam is obtained by means of boiling, or decoction of the branches or twigs in water. The resinous principle or balsam is thus separated and is put up into tin canisters and sent to market. It is a translucent or semi-transparent fluid, of a brown or blackish color, and of the common flavor of these balsams, but less fine than that of the white variety.

Analysis.—Several analyses have been made by Stoltze and Fremy. That of the former is the most definite in tabular form as given by Pereira ; but Fremy's is much the most referred to, most likely on account of the accuracy of its qualitative character and the subanalyses of the proximate constituents of the balsam. The proximate principles found in the clear balsam of Peru are : *A brown resin*, an *oil* (cinnaméine), *benzoic acid* (cinnamomic acid), *extractive.*

1. *Oil of Balsam of Peru.* This is the *Cinnaméine* of Fremy, obtained by treating the balsam with alcohol and potash. Its constituents he sets down as follows : *carbon* 79.0, *hydrogen* 6.26, *oxygen* 14.74. Its formula, which Pereira thinks is doubtful, is $C^{58}H^{26}O^{8}$.

2. *Resin of Balsam of Peru.*—This is a spontaneous formation in the balsam by the union of the oil or *cinnaméine* with the elements of water. It is, therefore, a *hydrate* or *hydruret* of *cinnamyle.* Its composition is, *carbon* 71.82, *hydrogen* 6.78, *oxygen* 21.40. Its formula is $C^{54}H^{30}O^{12}$.

Medical Properties and Phar. Prep.—As the South American Balsams are all so nearly alike in their medical virtues and general properties, these will be treated of together after they are severally described. See under this head after *Bals. Tolu.*

TOLUTANUM.

SYNONYMS.—MYROXYLON; BALSAMUM TOLUTANUM; Tolu Balsam, *Ger.;* Bolsamo del Tolu, *Ital.;* Baume de Tolu, *Fr.;* Balsamo Tolu, *Span.;* Balsam of Tolu, *Eng.*

HISTORY.—The Balsam of Tolu is the product of a South American tree, growing upon the mountains of Tolu in Turbaco, and on the banks of the river Magdalena. It has been a standard balsam in the materia medica for years, and is likely to continue such, since it is not only a superior medicine, but is also very agreeable in its taste and smell. It has even been employed in the confectionary as a flavoring agency.

BOTANY.—Idem Myroxylon Puriferum.

Spec. Char. M. TOLUIFERUM.—*Branches and leaves* smooth. *Leaflets* oblong, acuminate, equilateral, rounded at the base.—*De Cand.*

This tree belongs to a noble family of balsam-yielding trees, still the species are not yet all sufficiently defined for ready recognition.

DESCRIPTION.—The Balsam of Tolu is a thick, brown, tenacious, aromatic, sweetish-tasted substance. It is, however, found somewhat variable as to consistence. When fresh, or when warm, it is thin enough to run, but as it acquires age, and when cold, it is of a consistence similar to wax. It readily melts over the fire, and burns with a very agreeable odor.

ANALYSIS.—Very similar to the foregoing (Bals. Peru), having a peculiar essential oil, resin and various acids.

MEDICAL PROPERTIES AND USE.—All the virgin balsams of the tropical regions, as the Peruvian, Tolu, Benzoin, Storax, etc., are stimulant, aromatic, antispasmodic, tonic and fine balsamic expectorants, which are eminently useful in various pectoral diseases, as *asthma*, *bronchitis*, *catarrhs*, *phthisis*, *pertussis*, also in the sequelæ, implicating the lungs and pleura, in *rubeola*, *scarlatina*, and some other eruptive diseases.

The balsams, by their antispasmodic power, obviate the irritation, attending whooping-cough, and the nervous asthma, as well as the hacking cough in consumption. They are expectorant, and will relieve the air-cells of effusions, and the

bronchial tubes from phlegm and other adhesive accumulations, that occur here, from the drying effect of respiration over these surfaces.

The balsamic property is healing or soothing to sore and irritated parts, and tends to the restoration of lesions.

The Tolu has ever been much in use, since the discovery of its virtues. It is considered to have a special tendency in the display of its powers, to the lungs or organs of the chest, and is much relied upon by some practitioners, in chronic affections of the bronchia and the lungs generally.

These balsams are also of some considerable advantage in chronic inflammations of the mucous membranes of other organs, aside from those of the chest. Thus in affections of the urinary organs, as gleet, leucorrhœa, gonorrhœa, cistitis, nephritis, etc., they have given much satisfaction, and have, by some, been considered as equal to the copaiba.

As an external application, the Peruvian and Tolu balsams have been found useful in indolent ulcers and cancer. In these cases it is applied in form of a plaster. On applying it the margins must be covered with tallow so as to prevent too much adhesion. The dose of Tolu is gr. x. to gr. xx. dropped on sugar.

PHARMACEUTIC PREPARATIONS.—There are several valuable preparations of the Tolu that require special notice.

TINCTURA TOLUTANI: *Tincture of Tolu.* ℞ Balsam of Tolu ℥iij. Alcohol, Oij. Macerate until the balsam is dissolved.

Use.—Same as the balsam. *Dose.*—f℥j. to f℥ij.

SYRUPUS TOLUTANI: *Syrup of Tolu.* ℞ Tincture of Tolu, f℥j. Syrup, Ojss. Mix and boil down in a water-bath to a proper consistence.—U. S.

This is an objectionable mode of preparing the syrup, since the boiling impairs the product, on account of the volatility of the active or medicinal qualities of the Tolu. The Tincture of Tolu needs simply to be sweetened with moist, clarified sugar (Havana sugar), to suit the taste. Or the simple syrup may be heated, and then the tincture of Tolu stirred into it while hot, in the quantity of an ounce of the tincture to a pint of the syrup. The dose of this latter is ℥ij. to ℥iij. That of the sweetened tincture is the same as the simple tincture.

STYRAX.

Synonyms. Styrax Officinale; Usteruc, *Arab.*; Στυραξ, *Gr.*; Storace, *Ital.*; Estoraque, *Span.*; Storax, *Ger., Fr., Eng.*

History.—Hippocrates, Theophrastus (*Hist.* Plant lib. ix. cap. 40, 55) and Dioscorides speak of this article; and there is no question, but that it was in use from very early periods of civilization. The trees yielding it grow in the countries about the eastern coasts of the Mediterranean, occupied by the earlier nations.

Botany.—*Sex. Syst.*—Decandria Monogynia. Nat. Ord.—Styraceæ.

Gen. Char. Styrax.—*Calyx* inferior, *Corolla* funnel-shaped, *Drupe* two-seeded.—*Willd.*

Spec. Char. S. Officinale.—*Leaves* ovate, villous beneath, *Racemes* simple, shorter than the leaf.—*Nees.*

A small tree growing in Syria, Palestine and Greece. Cultivated in Italy, France and Spain.

Description.—There are several varieties of Storax brought to us, which require a separate notice.

α. Storax in the Tear; *Storax in grains.* This is the best kind of storax. It occurs in yellowish-white tears about the size of peas, and which are sometimes tinged with a reddish hue. This variety is not, however, common in our market.

β. Amygdaloid Storax. This sort occurs in compact masses, of a yellowish or reddish-brown color. It is also rarely brought to our country.

γ. Storax Calamita. This, which in Europe, is considered as a variety of the *amygdaloid storax*, is found in our market in masses of various shapes and sizes, of a reddish-brown color. It is somewhat tenacious, yet is easily broken, and softens in the mouth. When exposed it becomes whitened, with an efflorescence of benzoic acid.

This seems to be a mixture of the virgin storax and other substances, principally sawdust, and is what European authors call *Scobs Stracina.*

Pereira gives four varieties of this, viz.: 1, *Common Storax* or *Styrax Vulgaris*; 2, *Solid* or *Cake Storax*; 3, *Drop* or *Gum Storax*; 4, *Brown Storax* or *Hard Storax.*

δ. Liquid Storax. This is the kind of storax most employed in the United States. It is a semi-fluid substance of a greyish color, but which on exposure changes to a dark or

blackish appearance. It somewhat resembles grained honey. It is brought to us in jars.

ANALYSIS.—The calamite storax, in three of its varieties, has been analyzed by Reynsch, and the following shows the result:

1. *Volatile Oil*, two kinds, obtained by distillation with water, and collected with ether from the product; one kind solid, the other fluid.
2. *Resin*, soluble in alcohol; insoluble in water: constitues a large proportion.
3. *Sub-Resin*,—Not well defined.
4. *Benzoic Acid.*
5. *Gum* and *Extractive.*
6. *Matter Extracted by Potash*, not defined.
7. *Woody Fiber;* constitutes a large proportion.
8. *Ammonia.*
9. *Water.*

THERAPEUTIC PROPERTIES AND USE.—Storax is now much less in use than formerly. It possesses similar properties to the balsams above described, and being less active, less agreeable, and not in any degree more economical, it has been superseded, in a large measure, by the fine *American* balsams. The purified or strained storax is given in pill form, in doses of ℈j. But the tincture is more eligible. *Dose*, ʒj.

Strained storax is also sometimes applied to ulcers, in form of a plaster, to good advantage.

BENZOINUM.

SYNONYMS.—STYRAX BENZOIN: Benzoe, *Ger.;* Benjoin, *Fr.;* Benzoino, *Ital.;* Benjui, *Span.;* Benzoin, *Eng.;* Balsam of Benjamin, *Vul.*

BOTANY.—Idem Styrax.

Spec. Char. S. BENZOIN. *Leaves* oblong, acuminate, tomentose beneath. *Racemes* axillary, compound nearly the length of the leaves. (*Per.*) A tall tree of quick growth, common to Sumatra, Java, Laos, Siam, and Borneo.

DESCRIPTION.—There are two varieties of the medicine called benzoin, brought to us. One is in whitish tears, uniting by a reddish-brown connecting medium. The other variety is not in tears, but is in dark brown masses of irregular shape and size. The first is the most valuable.

Benzoin has a fine odor, which is very marked when the substance is heated. It has but an indifferent taste at first, but leaves an acrid impression upon the mouth.

THERAPEUTIC PROPERTIES AND USE.—The benzoin possesses balsamic and expectorant properties quite similar to the tolu, but inferior to that article, and is now mostly displaced by it in medical practice.

It is still retained, however, in one or more officinal compounds.

One of these is the TINCTURA BENZOINI COMPOSITI: ℞ Benzoin, ℥iij.; Purified (strained) Storax, ℥ij.; Aloes, in powder, ℥ss.; Alcohol, Oij. Macerate 14 days and filter. This is the Balsamum Traumaticum, sometimes called Jesuit's or Friar's Balsam.

Use.—A stimulating expectorant employed in chronic catarrh. *Dose*, f℥j.—f℥ij.

Benzoin is employed as a means for fumigating rooms, ships, hospitals, etc. For this use it is simply to be heated on coals, or on a hot iron, or stone.

INULA.—The Root.

SYNONYMS.—INULA HELANIUM; Alantwurzel, *Ger.;* Aunée, *Fr.;* Enula Campana, *Ital., Span.;* Elecampane, *Eng.*

BOTANY.—*Sex. Syst.*—Syngenesia Superflua. *Nat. Ord.*—Compositæ Asteroideæ.—*De Cand.* Asteraceæ.—*Lind.*

Gen. Char. INULA. *Receptacle* naked. *Seed-down* simple. *Anthers* ending in two bristles at the base.—*Willd.*

Spec. Char. I. HELANIUM. *Root* large, perennial, branched, flattened, somewhat fleshy, aromatic. *Stem* annual, upright, branched at top, 3 to 5 feet high. *Leaves* large, entire; ovate, serrate, prominently veined; radical ones largest, petiolate; those on the stem sessile and embracing; all smooth above and pubescent beneath, with a large fleshy midrib. *Flowers* large, of a golden yellow, somewhat resembling a small sunflower (helianthus); disposed singly on the tops of the stem and branches. *Seeds* striated, quadrangular, and furnished with a simple, slightly chaffy pappus. A native of Europe, long

introduced, and cultivated in gardens, for medical use. But from its prolific character, and the facility with which its seeds are scattered, it has become a door-yard and way-side plant, and is often found in great abundance in old settlements, growing in open places and pasture-grounds.

ANALYSIS.—The root of the inula contains several very active and valuable medical principles, which are peculiar; these are, 1st, an *essential oil;* 2d, *soft resin;* and 3d, a *peculiar principle* called *inulin.* Besides these it contains a *bitter extractive,* soluble in water and alcohol, *gum*, *albumen*, *lignin*, *wax*, and various *saline substances.*

THERAPEUTIC PROPERTIES AND USE.—Inula is prominently stimulant, anodyne and balsamic expectorant in its action, but possesses also additional powers, much esteemed by some practitioners: thus it is tonic, diaphoretic, diuretic, emmenagogue, deöbstruent and alterative.

Its application is mostly in diseases of the organs of the chest, as in the secondary stages of peripneumonia, pneumonia, phthisis, bronchitis; and the sequelæ of rubeola, scarlatina, etc. The dose of the powdered root is gr. x. It may be remarked that inula is an agent of considerable power and persistency of action, and that it will do duty in much smaller doses than are usually given.

PHARMACEUTIC PREPARATIONS.—OLEUM INULÆ: *Oil of Elecampane.* This is obtained from the recent root, or that which has not been long kept, by the ordinary process of distillation with water. It is not obtained in large quantity, however, and possesses no properties, in any considerable degree, distinctive from the soft resin, which is a much more economical preparation. The dose of the oil is five to ten drops, taken on sugar. It is stimulant, anodyne, balsamic and emmenagogue.

RESINA INULÆ: *Resin of Elecampane.* ℞ Inula, powdered, ℔v.; Alcohol, highest proof, Cong. ij.; obtain a tincture by percolation, place in a retort or still; distil slowly until two-thirds of the Spirit has passed over, and finish the evaporation by exposure to the air in a shallow vessel.

In a small way the evaporation of the tincture may be

conducted by the latter method from the first; the distillation being practiced only for economy. The product of spontaneous evaporation is perhaps somewhat superior.

This is the most eligible and most powerful preparation of the inula, and will give universal satisfaction, in all cases in which the root has been found serviceable. As prepared in either of the above processes, it is a soft resin, of a dark brown color, and of an aromatic, acrid and peculiar balsamic taste, being intermediate between camphor and oil of anise.

Resin of Inula is powerfully stimulant, also expectorant, balsamic, anodyne, diaphoretic, emmenagogue, diuretic and tonic.

Dose, gr. iij.—gr. v. A powerful remedy, and sustains its action for 12 hours.

INULIN.—When a strong decoction of the root of the elecampane is filtered while hot, and then set aside, it will precipitate a yellowish-brown powder, which, in cold weather, will remain in a powdered state, but in hot becomes concrete. This article has been variously named—*helanin*, *alantin*, and *inulin*, as above. It consists of several organic constituents of the root, so much of the *resin* as is soluble in hot, but not in cold water, some of the *extractive*, some *fecula* or *starch*, *gum*, etc.

It is possessed of some medical activity, and may be used as a substitute for the resin, above noticed, but is less efficient than that article. The dose is gr. v.—gr. x.

The elecampane enters as an ingredient into several very valuable expectorant and balsamic syrups, but is liable to precipitate its active principles, unless the syrups contain considerable alcohol or sugar.

BALSAMUM GILEADENSE.

This is the "*Balm of Gilead*," of sacred history, and *Βαλσαμον* of Dioscorides. It is produced, as an exudation from a tree growing on the coasts, along the eastern extremity of the Mediterranean, and in Arabia; in which latter place the balsam is called in the Arabian tongue, Akooyeeläsémoonroomie. By the Persians it is called Roghén bulsān. The latter, or bulsān, is the Persian and Arabic name of the tree itself.

In ancient times, very wonderful properties were ascribed

to this balsam, and even now the Arabians esteem it much; and the Egyptians consider it a panacea. It is employed there, that is, in Egypt, and also in Arabia, internally as a stomachic and anti-dyspeptic. It is also considered a great nervine, and is employed in pulmonic diseases, and as a remedy or prophylactic against sterility. Externally it is applied to fresh wounds, cuts, bites, venomous stings, as of the *asp* and *scorpion;* also to ulcers.

It is possessed of analogous medical properties to those of our balsams now in use, but is not brought to our market in a regular way.

It is much esteemed in Asia, and in Egypt, as a cosmetic.

LIQUIDAMBER.—The Balsam.

HISTORY.—The *Liquidamber*, of Europe, is the same substance here called *Sweet-gum*, and is the produce of a tree growing in this country, in various parts from Maine to Texas, or Mexico. The balsam, however, is not yielded spontaneously by the trees growing north of Tennessee, in any quantity justifying an attempt at its collection.

BOTANY.—*Sex. Syst.*—Monœcia Polyandria.—*Nat. Ord.*—Amentaceæ.

Gen. Char. LIQUIDAMBER.—STAMINATE FLOWERS.—*Ament* conic, surrounded with a four-leaved involucre. *Corolla* none. *Filaments* numerous. PISTILLATE FLOWERS.—*Ament* globose, also surrounded with a four-leaved involucre. *Scales* one-leaved; *styles* two; *carpels* two.—*Eaton.*

Spec. Char. L. STYRACIFLUA.—*Stem* upright, large. *Branches* spreading. *Leaves* palmate, with acuminate lobes, serrate, villous at the union of the veins beneath.

The *Sweet-gum* is a beautiful forest tree, less common in the Middle than in the Southern States. In appearance the trunk and branches resemble somewhat the poplar. The leaves, in form, are similar to the maple, and it bears a globular, rough, compound seed-vessel, or ball with many seeds. The tree grows very luxuriantly on the Southern river-bottom . here the author has seen it in size equal to the largest] as.

Medical Properties. — The balsam which runs from wounded parts of the trunk of the tree, in Southern parts, is a beautiful, limpid, or slightly tinged, thick, honey-like excretion; is a fine stimulating balsamic expectorant, useful in phthisis, chronic affections of the lungs, resulting from rubeola, or scarlatina, spasmodic asthma, bronchitis, pertussis, etc.

It may be applied in various ways—by inhalation of the fumes arising from it in boiling with water; in form of alcoholic tincture; in simple state, dropped in sugar; in confection, or, when inspissated or thickened, as it dries, when left remaining for some time upon the surface of the tree, it can be chewed, and the parts thus dissolved by the saliva, may be swallowed. This latter is the most common way that it is used in the South, where it is collected.

The dose of the tincture is ʒj.—ʒij. In substance, taken *ad libitum.*

GALBANUM.

This is a gum-resin, or concrete juice of an umbelliferous plant growing in Africa, on the eastern coast from Nubia to the Cape of Good Hope. The gum somewhat resembles that of assafœtida, and has rather similar properties, but perhaps more expectorant. It has been employed in bronchial affections, and in amenorrhœa and rheumatism. The dose is gr. x.—gr. xx. in pills. Externally it is applied in form of plaster to swellings and suppurations.

OPOPONAX.

This is a gum-resin produced by an umbelliferous plant called *Pastinaca Opoponax*, a kind of parsnip, growing in Turkey, Greece, Italy, and the South of France. The drug brought to us is the inspissated juice which flows from the base of the stem, when wounded. It is brought here from Turkey, and occurs in tears, in lumps, or various-shaped pieces, of a reddish-yellow color, speckled with white. It has a strong odor, a peculiar, unpleasant, and bitter taste. It is inflammable, and burns with a bright blaze. It is only

partially soluble in alcohol or water. But dilute alcohol will dissolve more of it than either water or strong alcohol alone.

Opoponax was formerly considerably employed as an antispasmodic and deöbstruent, and applied in asthma, hysteria hypochondriasis; also in chronic visceral affections, and as an emmenagogue. But it is now almost entirely neglected. Other articles, of domestic origin, and which are equally available, have taken its place. The dose is gr. x.—gr. xxx.

SAGAPENUM.

This is another gum-resin brought to us from Asia. It is the product of a plant supposed to belong to the *Umbellifera*. The drug comes from Alexandria and Smyrna. It possesses properties somewhat analogous to *Asafœtida*, but is inferior to it, and is now almost entirely in disuse. Dr. Ainslie in his Mat. Ind., states that it is employed by the Arabians as a lithontyrptic.

LEDUM PALUSTRE.—Marsh tea.

The leaves of this plant, which is a small evergreen shrub, growing in low or wet places in the northern parts of the United States, are balsamic aromatic, stimulant and expectorant. The tincture is a valuable adjunct to other remedies of the kind in asthma, whooping-cough and phthisis. The L. LATIFOLIUM, or Labrador tea, is quite similar in its virtues, and may be indiscriminately employed with this species. They are also considered useful in various eruptive diseases.

SISYMBRIUM OFFICINALE: ERYSIMMUM OFFICINALE.—Hedge Mustard.

This is a small annual plant, common in this country, growing in old grounds, along fences, roadsides, and among rubbish. It belongs to the *Class* Tetradynamia, and *Order* Siliquosa; *Nat. Ord.* Cruciferæ. The herb is employed as a domestic remedy in chronic coughs, hoarseness, and in catarrhal affections generally. The juice of the plant is mixed with honey or sugar,

and given in this way, in doses as large as are agreeable to the stomach. The seeds, in substance, may also be employed in asthma to advantage. But, like many other secondary remedies, this article has not been sufficiently tested to enable us to fix an exact value upon its virtues.

There are several other articles, most of which hold their position, and are described in other classes, in the present arrangement, that are valuable balsamic expectorants; among these might be named the ASCLEPIAS TUBEROSA, ARALIA RACEMOSA, POPULUS BALSÆMIA, LIATRIS SPICATA, ALIUM SATIVUM, ALIUM CEPA, ALIUM PORRUM. The expressed juice of the three latter articles, *i. e.* of the *Garlic*, *Onion* and *Leek*, when obtained without the employment of heat, is of great value as a therapeutic agent. These articles have been long in use in domestic practice, as a remedy in cough, catarrh, humid asthma, pertussis, etc. The juice of either of these plants is also actively cathartic, even in small doses.

Order VI. MECHANICAL EXPECTORANTS.

Emetics prove expectorant by virtue of their mechanical influence over the lungs, and are more effectual in relieving them when choked with phlegm, than any other means that can be employed. They, however, are not dependent for all the effect in this way, simply upon their mechanical action, but partially, upon their stimulant and nauseating power. They are particularly applicable in asthma, whooping cough, etc.

Class VI.—EMMENAGOGUES.

The term *emmenagogue* (from εμμηνια 'the menses,' and αγω 'I drive') is applied to such agents of our Materia Medica as possess the power to promote menstruation, or the natural periodical discharge common to adult females of the human species.

The specific action of emmenagogues has been a matter of question with many. But it is probable that this want of agreement has arisen entirely from a deficient knowledge, alike

of the physiology of the menstrual phenomenon, and of the principles involved in the operation of the agents designed to promote the process: for many of the agents used as emmenagogues, unquestionably possess a specific action over the secretory functions of the uterus.

If menstruation were a mere incidental or accidental occurrence—a result of plethora, congestion, etc., and if it consisted simply of a discharge of common blood, as in cases of *epistaxis* and *hæmoptysis*, the facts concerned would be widely different. Then, indeed, there would be much more reason to doubt the general specific character of the agents used to promote it. But we find menstruation to be the effect of a specific function of the uterus, *i. e. secretion;* and, hence, that the fluid thus eliminated, although in its general appearance, similar to blood, is nevertheless of a peculiar character, possessing various characteristics not common to the latter; the color is not constant, like that of blood; its odor is very different; it does not coagulate like blood, possesses no fibrine, and, *above all*, its chemical analysis gives different results.

This view of the matter, it is thought, will place emmenagogues in equal rank with other agents that are destined to promote the specific functions of organs, as *diuresis*, *diaphoresis*, *catharsis*, etc. A peculiar aptitude may as properly be admitted here as in any other case.

But if reasoning *a priori* is not satisfactory, *actual experience* may suffice, as it is well known that emmenagogues are marked with a *uniformity of effect* when properly applied. But here it may be remarked, that much more discrimination is necessary in the use of these agents than is generally supposed, and it is from this very circumstance that the confusion in reference to the specific power of emmenagogues has emanated. Prof. Chapman has made some very judicious remarks on this point. "Hitherto," says he, "our practice has been, for the most part, exceedingly *empirical*. We have advanced blindly on, prescribing for the disease only, without adverting to those various circumstances which modify the action of remedies, and influence, most materially, the ultimate results." (Ther. vol. i. p. 468.)

No class of remedies, therefore, will show more clearly, the propriety of distinguishing the different varieties of the agents concerned, into orders, the application of which fully contemplate these various important circumstances that should regulate their use. Thus it needs no extra discrimination to discover that when amenorrhœa is dependent on debility, or a want of action in the uterus, that a different order of emmenagogues is required, from those which are indicated in an inflammatory condition of the system, as from the effects of cold or exposure.

The importance of emmenagogues as a class of medical agents may in some degree be estimated by the amount of mischief which is liable to result from menstrual obstruction, and which admits of remedy by the use of these agencies.

The very peculiar and extensive uterine sympathy developed in the female at the age of puberty, and in the state of gestation, well suggests how much the general system may be influenced by the condition of the peculiar organs of this sex. But *a priori* arguments are by no means the best grounds for the portrayal of this point. Chlorosis, amenorrhœa, and dismenorrhœa, in all their various and distressing symptoms will afford the proper means of an estimate correspondent to the object and importance of the present class of agents. The distressing indications, for the use of emmenagogues, are alas! too often apparent to go unobserved.

If the age of puberty is one of interest to the common observer, it is certainly not less so to the experienced mother. But how different is the cause of her interest at this period: she watches for the change of features in her child with intense feeling, lest a static form occur. If in the mornings there should be apparent any signs of fading color; if listlessness, languor, or debility should supervene; if depraved appetite, constipation of the bowels, headache, palpitation, and pain in the side be complained of, the fears of amenorrhœa will be confirmed, and all the gloomy symptoms of chlorosis are not far behind. The debilitated habit will now be confirmed; the patient becomes the object of general sympathy, and the sentiment of all parties places that person who so lately, perhaps,

was noted for sprightliness and healthy vigor, into the unhappy list of *invalids*. Peevishness, irritability, or perhaps total dejection and passiveness may now be the characteristics, and the poor sufferer may endure the wearisome months, or perhaps *years*, of affliction with a blanched, green, yellow, or perhaps spotted face, staring eyes, swollen or œdematous lids, dropsical limbs, tumid abdomen; perhaps attended with hectic fever, night-sweats, emaciation, and insupportable prostration.

These symptoms are seldom developed to this extent without being complicated with other visceral disease.

Such are some of the symptoms of chlorosis. Dismenorrhœa may not indeed give such notable external signs of affliction, but no one but the poor sufferer herself can tell what has to be endured in her case. The lunar paroxysms become to her ordeals of intolerable anguish and dread.

The sequelæ of uterine derangement are also very serious. Hysteritis, cancers, epilepsy, paralysis and a great variety of nervous diseases, phthisis pulmonalis, and death are not unfrequent consequences.

Order I. STIMULATING OR SPECIFIC EMMENAGOGUES.

This order is designed to embrace those articles of the present class which evince, in their operation, a specific emmenagogue effect, and which are indicated in all cases of amenorrhœa, dependent upon debility, or deficient vital action of the uterus. Their modus operandi is easily understood, as it can not be difficult to conceive that the uterus, like all other organs, must be possessed of special sensitive endowments, which render it susceptible of special impressions from particular agents.

It is hardly necessary to remark that the articles of this order are not only inefficient, but must be even pernicious in cases of amenorrhœa, associated with an *inflammatory condition*, either of the uterus itself, or any organs so related as to command powerful sympathetic influence over it. This may, of course, also, be said of their applicability in obstruction of the menses, that may be collateral with any variety of fever.

BOTROPHIS RACEMOSA.

A representation of the top of the stem, the characteristic form of leaves, and the tassel in its progressive stage of development. Taken from Nature by the Author.

BOTROPHIS RACEMOSA.—The Root.

SYNONYMS.—CIMICIFUGA RACEMOSA, *U. S., Torry, Grey;* MACROTRYS RACEMOSA, *Eaton, De Cand.;* ACTEA RACEMOSA, *Linn.;* CIMICIFUGA SERPENTARIA, *Pursh;* Schwartz Schlaungewurze, *Ger.;* Serpentaire Noire, *Fr.;* Black Cohosh, Rattle Weed, Black Snake-Root, Squaw-Root, *Vul.*

HISTORY.—This is a well known indigenous plant, that contributes largely to enrich the verdure of our forests, and wild lands. It was a popular medicine among the American Aborigines, who were acquainted with it for centuries. They considered it an emmenagogue and abortive, and gave it to their squaws in parturition, whence one of its vulgar names. Among the profession there has been much controversy, both in regard to its virtues and its proper generic name. All, however, admit it as an important article of the Materia Medica.

BOTANY.—*Sex. Syst.*—Polyandria Monogynia. *Nat. Ord.*—Acteæ, *Rafin.;* Renunculaceæ, *Lind,*

Gen. Char. BOTROPHIS.—*Calyx* four-leaved. *Corolla* with many minute, flat petals. *Stamina* many. *Pistil* one. *Capsule* dehiscent, longitudinal. *Seeds* many, lateral.—*Rafin.*

The generic name *Cimicifuga* is adopted in the U. S. Dispensatory; and our late writers have generally followed suit. But, it is certain that the original name *Actea* was as correct as the one now officially adopted. Professor Eaton rejects the name *cimicifuga:* "I yield to authorities, in most cases," says he, "but in this case, I can not submit to the absurdity, as no one can be better acquainted with the *cohosh* than myself." The only argument that can be presented in favor of either of the old names, beside that of the propriety of avoiding innovation, is the idea and convenience of having the *cohoshes*, all of which so nearly resemble each other, still retained in the same genus. A strict adherence to science, however, precludes this idea. When, then, our regard for science compels us to forego this convenience, we ought not to stop half-way of what is strictly correct, we of course should have no affinity for the name *macrotrys*, andought not to stop short of a correct botanical name. This is provided in the institution of

Rafinesque's new genus *Botrophis*, which makes this article its type. Prof. Griffith says, "The genus *Botrophis* of Rafinesque, founded on the single pistil and single dehiscent capsule would now be adopted, were it not that the officinal species is still recognized in the U. S. Pharmacopœia as *Cimicifuga*, as well as by our highest botanical authorities." But does he consider the immortal LINNÆUS (the founder of this system), DE CANDOLLE, PURSH, WILDENOW, EATON, WRIGHT, and RAFINESQUE mean authority? These are all opposed to the name *Cimicifuga*. Now, as the adoption of either of the old names will utterly fail to reconcile the authorities, and as the plant in question can not, in justice to science, be placed in either the *actea macrotrys*, or *cimicifuga* genera, it is very proper to adopt the new genus of Rafinesque, which is expressly created for it, and which is important also to the systematic arrangement of other plants.

BOTROPHIS RACEMOSA.

Spec. Char. C. RACEMOSA.--*Root* perennial, large, tortuous, black outside, with many long black fibers. *Stem* simple, upright, from three to six feet high, furrowed, terminated with from one to six spikes. *Leaves* few, very large, ternately decompound; leaflets sessile, oblong, lanceolate, incised or deeply toothed; end ones trilobed. *Flowers* in long terminal racemes; racemes cylindrical, white,

when young always curved or reclining at the top, lower flowers maturing and disappearing first. The calyx of the flower is white, petioloid, like a corolla. The true petals are small and shorter than the calyx. The capsule is dark and dry, with one cell, and a longitudinal receptacle, opposite to the opening, to which the flat seeds are attached. The old stalks, with their long capsuled racemes, sometimes remain standing through the winter. Grows throughout the United States in rich soil, in woods and new grounds.

Analysis.—The following results were obtained by the analysis of Mr. Tilghman: 1, *Fatty matter;* 2, *Gum;* 3, *Starch;* 4, *Resin;* 5, *Tannin;* 6, *Wax;* 7, *Gallic acid;* 8, *Sugar;* 9, *Oil;* 10, *Black coloring matter;* 11, *Green coloring matter;* 12, *Lignin;* 13, *Salts of lime, iron, magnesia* and *potassa*. He did not determine, however, in which of these principles the active properties reside, or whether he discovered the principle possessing them, at all. The virtues, however, yield to alcohol, water, and still better, to ether, and are found chiefly in the resin.

Physiological Effects.—The Botrophis is capable of producing some very marked or decided effects upon the system. Its taste in the mouth is peculiar, but not very strong. In small doses it produces no visible effects; but when taken in portions of from one to two drachms, it occasions at first an excitement of the pulse, and an exhilerating effect upon the spirits, somewhat resembling intoxication, which is followed by vertigo, imperfect vision and headache, attended with much relaxation of the nervous and muscular systems. Over-doses are, without doubt, capable of doing mischief.

Therapeutic Properties.—The virtues of this plant have been variously regarded, as it respects their relative prominence. Some have considered the medicine chiefly *emmenagogue*, others, merely *tonic*, and some again have regarded it most valuable as an *expectorant*, or as an *antispasmodic*. It is, without doubt, one of the best emmenagogues that we possess. It also possesses valuable alterative powers, and evinces an extensive influence over the secretions generally, especially those of the skin and the bronchia. Its action upon the nervous system is very manifest, by the symptoms arising from an

over-dose, giddiness, intoxication, headache, imperfect vision and general relaxation. It may possess tonic powers, but its relaxing effect so far predominates, that they are seldom much developed in the operation of the medicine.

When used as an emmenagogue, the medicine should be combined with stimulants, or some of the permanent tonics, according to circumstances.

As this article is not treated of in any other place, it may be proper here to mention its value in the treatment of rheumatism, and chronic pulmonary affections. The author has succeeded better with this article, combined in equal proportions, with guaiacum, in those affections, than with any other remedies he has ever used. It may be given in the concentrated form (Botrophin), which is entirely the most eligible form of its use, or taken in substance, by infusion, tincture, or decoction. The dose of the powder is gr. x.—gr. xxx.; that of the tincture f℥j.—f℥iij.; that of the infusion, prepared by an ounce of the powder in a pint of boiling water, f℥j.—f℥iij.; that of the decoction, formed by boiling ℥iij. of the root in Oij. of water, down to Oj., is ℥ss.—℥j., repeated once in three hours, or as circumstances may indicate.

BOTROPHIN: (*Macrotin.*)—This is prepared from the root of the Botrophis, in precisely the same manner as the *Podophyllin* is made: see p. 176. When properly prepared, it is in light or grayish-white powder, somewhat resembling that of the root. It has a very decided taste, and smell peculiar to the root. It is of a resinous or resino-extractive character, and possesses the medical properties of the root, in a highly concentrated form. It is a very powerful agency, and requires to be used with care.

Action—Use.—Same as that of the root; emmenagogue, abortive, antispasmodic, emetic, cathartic, anodyne, diaphoretic, expectorant, and tonic. Very useful in amenorrhœa, parturition, hysteria, coughs, rheumatism, gout, fevers, etc. Dose, gr. ss.—gr. jss.

ACTEA.—The Roots of the Actea Alba, and Actea Rubra.

Synonyms.—White and Red Cohosh, Bane-berry, etc., *Vul.*

History.—These are two species of the Cohosh, that grow in this country, in similar places to those in which the black,

ACTEA ALBA.

An engraving of the *Actea Alba*, or White Cohosh, representing the top of the stalk, leaves and raceme of berries. It was taken from Nature, by the Author.

or foregoing species is found, although they do not grow so plentifully. They have also been used by the Aborigines, for the same purposes to which they applied the other, and were very much esteemed by them. They have, however, not been much in use by the *whites*,—have never been officinal, nor much spoken of by writers on the Materia Medica; indeed, with most of them, they have entirely escaped notice.

Botany.—*Sex. Syst.*—Polyandria Monogynia. *Nat. Ord.*—Acteæ, *Rafin.* Ranunculaceæ, *Lind.*

Gen. Char. Actea.—*Calyx.*, four leaved. *Corolla* with four large flat petals. *Stamens* many. *Pistil* one. *Berry* not opening. *Seeds* lateral.—*Rafin.*

Spec. Char. Both the A. alba, and the A. rubra, very much resemble the Botrophis, except in their fructification. Before the plants are in blossom, they can scarcely be distinguished from each other, nor from the foregoing plant, even by the best botanists. These, however, do not attain quite the size of the botrophis. Their fruit alone, differs much from that plant. This in both species, consists of oblong, or globular, smooth berries, fleshy without, about a quarter of an inch in diameter, and half an inch in length. They are disposed in a loose raceme, and stand on thick, colored peduncles. The berries of the A. Alba, are of a beautiful white, and their peduncles red, while the berries of the A. rubra are red, as the name denotes. The fruit of both species is considered poisonous, and hence, the name Bane-berry.

Medical Properties and Use.—The medical properties of both these plants, are regarded to be identical with those of the botrophis, and are used for the same purposes, in the same way. Some have regarded their emmenagogue virtues more active than those of the latter article. Others, again (Griffith, etc.), have considered the white and red cohoshes poisonous, like the helebore. The author has never used them to a sufficient extent to know from his own experience that they are positively free from pernicious effects. But as he has never seen any thing wrong with them, and as they have proved themselves possessed of such valuable emmenagogue powers, they have been admitted to a place here. Should their further trial,

however, prove them to be poisonous, they must, of course, be expunged from the Materia Medica.

GOSSYPIUM.—The Bark of the Root.

SYNONYMS.—Paratie Vayr, *Tamool;* Kapās ké jurr, *Dukhanie;* Ussul ul koten, *Arab.;* Puttie vayroo, *Tell.;* Watta, *Japanese;* Cay-boung, *C. Chi.;* Karpasi, *Sanscrit;* Βάμ Βάκ, *Mod. Gr.;* Baumwolle, *Ger.;* Algodon, *Span.;* Cotone, *Ital.;* Coton, *Fr.;* Cotton, *Eng.*

BOTANY.—*Sex. Syst.*—Monodelphia Polyandria. *Nat. Ord.*—Malvaceæ.

Gen. Char. GOSSYPIUM. — *Calyx* cup-shaped, obtusely five-toothed, surrounded by a three-parted involucre, with dentate-incised, cordate leaflets, cohering at the base. *Stigmas* three to five. *Capsule* three to five-celled, many seeded. *Seeds* surrounded by a tomentose wool.—*De Cand.*

Spec. Char. G. HERBACEUM.—There are many species possessed of nearly the same properties, yet the above is the one which is most employed.

Cultivation makes so much change in the character and growth of the cotton-plants, that it is somewhat difficult to give a description of their specific character, without extending the subject too much. They are natives of Tropical Asia and Africa, but are cultivated in many other parts of the world. It will grow in any of the torrid and temperate regions, but the seeds will not mature in a distance more than 30° from the equator. The species of the cotton-plant are mostly shrubby, and biennial or perennial, and one of them forms a tree. They are very branched, and have alternate leaves, more or less palmate. They are marked with little black dots, and on the under side the nerves have one or more glands. The young branches also have the dots. The flowers are large and showy, yellowish, or red, with fine spreading petals united at the base, and more or less cordate. *Stamens* numerous. *Capsule*, or pod, round, oval, or pointed, three to five-celled, and opening at the apex.

The root, which is the object of the present attention, is fusiform, and gives off small radicles throughout its length.

The bark is of a reddish-brown color, and the woody portion is white. The bark has a sweet, astringent, and rather agreeable taste.

Analysis.—H. B. Orr, of Nashville, Tenn., analyzed the root of the cotton-plant cultivated in that State, and found the following results:—*Gum*, *Albumen*, *Starch*, *Tannic Acid*, *Gallic Acid*, *Chlorophylle*, *Iodine*, *Caoutchouc*, *Black Resin*, *Red Extractive*, and a considerable *oily matter*.

Medical History.—It has been known for many years, that the black women in the South, used an infusion of the root of the cotton-plant for various diseases among themselves especially amenorrhœa and dismenorrhœa, and they would take it in parturition. It was also observed, that they would sometimes drink copiously of it, to produce abortion; that they often succeeded in effecting it.

These facts became notable, and the profession in Mississippi gave the matter some attention. The result was, that they found this plant possessed of most remarkable emmenagogue, and even abortive powers. Drs. McGown and Bonchell were the first to give public notice of the matter. The latter wrote a communication to the West. Jour. of Med. and Surg., about 1842. Still, however, there was no particular interest manifested upon the subject, except by a few Southern physicians, until attention was again called to the claims of the medicine in 1852, by Dr. J. Travis, of Marlborough, Tenn., who reported a case to the Nashville Jour. of Med. and Surg., in which the cotton-root gave the most satisfactory emmenagogue effects, where menstruation had been suspended for ten months. In July, 1855, Thom. J. Shaw, M. D., gave a communication in the same paper, in which he set forth the merits of this article in such a way as could not fail to awaken a general interest upon the subject. Among Eclectic physicians, this article is now in very extensive use.

Therapdutic Properties and Use.—From the above history of this new medicine, it appears that in it we are to have a very important accession to the emmenagogue class of medical agents. This is a desideratum, certainly, since we have had no agents of very decided powers in this way that were

free from objections. The secale cornutum, which, though not considered to be really poisonous, since it is found not to give rise to any unpleasant symptoms when given even in very large doses to *males*, has been found, nevertheless, to have a very peculiar and dangerous power (if indiscreetly used), over the uterine system: and, besides this, it is not by any means certain as an abortive or expulsive agency; while the propriety of its admission to the title even of an emmenagogue, has been often questioned.

Botrophis Racemosa, is emmenagogue and abortive, but requires so large a dose as to be disagreeable, from the nausea it occasions, and besides it is somewhat narcotic. None of all the other articles could be absolutely relied upon.

But in the gossypium, we now have at once an emmenagogue and abortive, or expulsive agent, of very fair promise. We can but hope that further experience may continue as creditable to this new article as that now recorded, and accorded *for*, and *to* it.

Since this is a new article of Materia Medica, and as *all the light*, in such cases, that can be reflected from experience, will be commonly appreciated, a few paragraphs from the communication of Dr. Shaw to the Nashville Journal of Medicine and Surgery, will be here given: "Its action in amenorrhœa, I think superior to any other emmenagogue in the Materia Medica, though it would be proper to pay some attention to the general health of the patient before its exhibition. It is superior to any thing I have tried in the way of emmenagogues.

"I have had cases in which I have first tried the usual emmenagogues with but little effect (or success), when I would determine on trying the decoction of this root, which far surpassed my expectation, by acting with the most marked effect; menstruation being produced on the following day after its exhibition. All of the symptoms disappeared on the exhibition of the medicine. I believe this to be the best emmenagogue that we can employ in mere suppressio mensium, where there is no other disturbance of the general health.

"With the usual emmenagogues, I was enabled to produce the catamenia on a young lady, which continued for about 24

hours, then suddenly becoming very sparse and painful; and in a few days after this period had passed, I employed the infusion of the cotton-root as a means of exciting this function, which it did on the following day, a plentiful discharge being produced, which continued for five or six days. She has been regular at every period since that time, and has enjoyed good health, with the exception of a few simple attacks, which caused no derangement of the menstrual function. For about 12 months previous to the exhibition of this medicine, her health was very much impaired, but she commenced improving, and soon recovered her health. I could detail other cases similar, in which I have tried the decoction with the same effect, but I deem it unnecessary to mention its action in each individual case.

"*As a parturient agent*, I think it superior to ergot, in one sense of the word, and in another about its equal, its action being about as prompt as that of ergot, and attended with much less danger. I have tried both in parturition, and found the cotton-root decoction to act with as much efficacy as ergot. In some cases in which I have tried it, the pain was, to some extent, allayed, and labor promoted with as much speed as when ergot was administered. It appears to be perfectly harmless, from the fact that its action is almost unattended with pain. It causes neither gastric distress nor acceleration of the pulse; if it does it is not perceptible; both of which are occasioned by ergot, to some extent.

"I have witnessed its action in retained placenta, with good effect, which was an expulsion of the mass in about 20 minutes after the exhibition of the first dose. It may be proper to say, that I gave two doses before the placenta was thrown off. I believe it to be safer as a parturient, or an emmenagogue, or at least as safe, as any other article of the Materia Medica."

The seeds of the cotton-plant are oily and mucilaginous, and are sometimes fed to cattle. In Jamaica they are employed as a medicine in dysentery. Its oil, obtained by expression, is a fine cosmetic; it softens the skin, and is said to remove specks, blotches and freckles. The cotton wool, which is the great

object of its culture, for its use in fabrics, is also medicinal. It has been discovered, not long since, that when applied, raw, to a burnt or scalded surface, it will obviate the irritation and pain. In erysipelas it is almost equally serviceable as a topical application.

PHARMACEUTIC PREPARATIONS.—**DECOCTUM GOSSYPI**: *Decoction of Cotton-Root.* ℞ Cotton-root, ℥iv.; Water, Oij. Boil for an hour; strain; boil down to Oj. Dose, a wineglassful once an hour.

An Emmenagogue and Parturient.

TINCTURA GOSSYPI: *Tincture of Cotton-Root.* ℞ Bark of Cotton-Root, dry, ℥viij.; Proof-Spirit, Oij. Digest 14 days; filter. Dose, ʒj., three or four times a day.

An Emmenagogue and Parturient.

CAULOPHYLLUM THALICTROIDES.—The Root.

SYNONYMS.—LEONTICE THALICTROIDES (*Linn*); Blau Cohosch, *Ger.;* Cohoche Bleu, *Fr.;* Cohosh, *Indian;* Blueberry, Blue Cohosh, *Eng.;* Papoose-root, Squaw-root, *Vul.*

BOTANY.—*Sex. Syst.*—Hexandria Monogynia. *Nat. Ord.*—Barberideæ.

Gen. Char. CAULOPHYLLUM (LEONTICE); *Calyx* colored, with six equal sepals. *Corolla* six-petaled, shorter than the sepals. *Fruit* a globular, one-seeded drupe.

Spec. Char. C. THALICTROIDES.—*Root* perennial, very fibrous, and matted. *Stem* annual, upright, smooth, about two to three feet in hight, divided at top into petioles and peduncles. *Leaves* compound, ternate; leaflets sinuate, divided or lobed, smooth, terminal one largest, sometimes five-lobed or nearly palmate. *Flowers* small, in a loose corymb axillary to the petioles of the leaves, of a greenish-yellow color. *Fruit* a cluster of beautiful blue berries, one-seeded. A luxuriant wild plant, resembling the Actea somewhat; grows in rich soil in open woods, on hill-sides, and rich bottoms, in most of the States. It flowers in May and June.

MEDICAL PROPERTIES AND USE.—Although this plant has been long in use by various native Indian tribes, and the earlier white settlers of this country, and has been considered

CAULOPHYLLUM THALICTROIDES.

one of the most important of our indigenous plants, it has not received much attention by the old profession. It is not mentioned in the U. S. Dis., nor by Barton, Bigelow, Christison, Pereira or Royle. Among Reformers, however, it is much employed, and holds a high position as a remedial agent. It has very decided properties, which may be judged of by the impression imparted to the taste. It gives an acrid and peculiar sensation to the tongue and fauces, which is very persistent, and causes a flow of the saliva.

Caulophyllum is stimulant, diaphoretic, antispasmodic, emmenagogue, parturient, and tonic, and has been found of great service in a large variety of diseases. Its most common use is in obstetrical practice, in which it has been much relied upon by some Eclectics, as the late Professors Morrow and Hill; esteemed also by Beach, Jones, Baldridge, and others. It was in much favor among the Thomsonians—Smith, Howard, Curtis, Hance, Perry, and others. The diseases in which it has been found useful, are—amenorrhœa, dismenorrhœa, hysteria, leuchorrhœa, rheumatism, epilepsy, singultus, chorea, and in fevers, particularly the eruptive and typhus. The dose of the powdered root is gr. x.—gr. xx.

Pharmaceutic Preparations. — The caulophyllum was mostly employed at first, in the form of *Infusion*, *Decoction*, and *Syrup*. No formula, however, is given, the practice having been to obtain the full strength of the root, taking large proportions of it in the preparations. Of late, however, several pharmaceutic preparations have been made, and which have gained some reputation in the Eclectic profession.

EXTRACTUM CAULOPHYLLI ALCOHOLICUM: *Alcoholic Extract of Blue Cohosh.* Prepared by evaporation of the saturated Alcoholic Tincture of the Caulophyllum, to the consistence of *Fluid Extract.* This preparation has been improperly called Caulophyllin.

A precipitated extract has also been prepared, by adding water in excess to the fluid extract, so as to cause a precipitate, which is then dried in the air. This is in powder, and is nearly of equal activity to the above, and has the advantage of convenience in its use.

Action — Use.—Same as the powdered root or decoction. Dose, gr. iij.—gr. v.

CAULOPHYLLIN.—There have been several preparations offered to the public under the name of *Caulophyllin*. That which has been mostly used under this name, is the precipitated extract above spoken of. But last year, Keith & Co., of New York, announced a new *Neutral Principle* obtained from caulophyllum, which they call *caulophyllin*, and they confidently claimed attention to it.

At the present time, the article put up by this House, is stated to be a re-composition of the active, organic principles of the root, that are first separated in the forms of *resin*, and *neutral principle*. The friends and patrons of this House have much to say in favor of this last preparation. Professor R. S. Newton informed the author, a short time since, that he gave it a thorough trial in his clinic, and has found it to be excellent—possessing the properties of the root thus definitely isolated.

SENECIO GRACALIS.—The entire Plant.

SYNONYMS.—CACALIA; CINERARIA; Life-root; Female-Regulator, Unkum, etc., *Vul.*

HISTORY.—Much confusion has existed in reference to the identity of this very valuable plant. It has been confounded with an European species of Senecio, the *S. Vulgaris* or *groundsel*, although it bears no botanical resemblance to it. Various other incompatible species of this extensive genus have also been mistaken for this plant, and have been assigned a common medical application.

This article has been long in use by several Indian tribes, who gave the decoction to their squaws about the time of expected delivery. It was kept by their "*medical men*," and carried about as a very precious remedy.

Some itinerant empirics, in the earlier periods of Western life, were often encountered, who called themselves "*Indian Doctors*," and they would always have sacks of *roots* with them. The Senecio Gracalis is one of the most valued of these.

BOTANY. — *Sex. Syst.* — Syngenesia Polygamia Superflua. *Nat. Ord.*—Compositæ.— *Wood.*

Gen. Char. SENECIO.—*Involucre* of many unequal leaflets, or invested with scales at base, the scales withered at the points; *receptacles* not chaffy; *pappus* simple, capillary, and copious.—*Wood.*

Spec. Char. S. GRACILIS.—*Leaves* orbicular, on long petioles, cauline few, linear-oblong, incisely dentate; *peduncle* short, pilose, with small, few-rayed heads.— *Wood.*

A small plant, growing on low, wet grounds along streams in meadows, and along the banks of rivulets in woodlands. Found in most of the Western States. It has a round leaf, slightly cordate, serrate, and is supported on long petioles. The root is horizontal, beset with many fibers, and has a peculiar spicy taste and smell, which is somewhat persistent. The caudex, or main root, is notable for having a deep blue line in its center, extending through the entire length. The petioles are bluish or purple at the base.

MEDICAL PROPERTIES.—Few of the native productions have been held in higher esteem by those who first employed them, than this. The Indians of this section, as before stated, set very great value upon it, and there is little doubt but that it has merit. The author gave it some trial in his earlier practice, and his recollection is, that it gave great satisfaction. Several of his friends also had used it some thirty years since, and they also spoke in commendable terms of it.

The taste of the medicine is quite sufficient to warrant us in supposing it to be possessed of active properties. This is somewhat balsamic and stimulant. It is very similar to the taste of the Asarum Canadensis, and that article has an established reputation in the way this is recommended.

The properties of the Senecio may be set down as stimulant, emmenagogue, anodyne and tonic, and its applications are in amenorrhœa, dysmenorrhœa, irritability of the gravid uterus, or premature labor-pains, colic in children, and general nervous debility.

It has been given in form of decoction, and this was the manner of its use entirely, in earlier times, in the West. But it is

much more constant and reliable in its action in form of alcoholic or wine tincture. ℞ Root of Senecio, ʒij.; Alcohol or strong Wine, Oj. Digest fourteen days. Dose, ʒij. three times a day.

SARRACENIA PURPUREA.—The entire Plant.

Synonyms.—Side-Saddle-Plant, Fly-trap, Huntsman's Cap, *Vul.*

Botany.—*Sex. Syst.*—Polyandria Monogynia. *Nat. Ord.*—Sarracenieæ.

Gen. Char. Sarracenia.—*Calyx* double, permanent, 3 and 5 sepaled. *Corolla* five-petaled, caducous. *Stigma* peltate, permanent, very large, covering the stamens. *Capsule* five-celled, five-valved, many seeded.

Spec. Char. S. Purpurea.—*Leaves* radical, short, gibbous-inflated or cup form, contracted at the mouth, having a broad, arched, lateral wing; the contracted part of the base hardly as long as the inflated part; scape with a single, large, nodding flower.—*Eaton.*

A very odd-looking, perennial water-plant, growing also in marshes; one to two feet in hight. Flowers purple, appear in June. Grows in the Middle and Southern States.

Medical Properties and Use.—This plant has been highly esteemed by several Eclectic physicians, as a remedy in certain diseases of females, particularly *chlorosis*, *leuchorrhœa*, *amenorrhœa* and *dysmenorrhœa.*

It is also esteemed to be of good service in dyspepsia and sick-headache.

The plant is astringent, tonic, nervine, and emmenagogue. It is commonly given in form of infusion. The dose is half a wineglassful of the strong, watery infusion.

Bidens Bipinnata.—This is an annual plant, one of the common weeds of the rich bottoms of the West. It is commonly called *Spanish Needles.*

This plant, and one or two other species of the Bidens, the *B. Frondosa* (Beggar's Tick), and the *B. Tripartita* (Swamp Beggar's Tick), have been employed in a medical way. The seeds are considered a valuable emmenagogue. Some have

also attributed expectorant properties to them. The decoction is the form in which it has been used. But the tincture would seem to be more eligible.

POLYGONUM HYDROPIPER.—The Herb.

SYNONYMS.—POLYGONUM PUNCTATUM, *Elliot;* POLYGONUM HYDROPIPEROIDES, *Eich.;* Flehe Kraut, *Ger.;* Smart-Weed, Knot-grass, Water-Pepper, etc., *Vul.*

HISTORY.—This is an humble indigenous plant, growing in door-yards, and about brooks and water-courses. It has been treated with neglect until brought into notice by Dr. Eberle, as an emmenagogue.

BOTANY.—*Sex. Syst.*—Octandria Trigynia. *Nat. Ord.*—Polygonaceæ.

Gen. Char. POLYGONUM.—*Perigone* simple, unequal, colored, five-parted. *Stamens* six to eight. One to three *styles*. *Seed* one.

Spec. Char. P. HYDROPIPER.—*Root* white, fibrous. *Stems* jointed, slender, of a reddish or greenish-brown color, redder at the joints, and about a foot in hight. *Leaves* alternate, long, lanceolate, acuminate, petioloid, entire, smooth, very pungent to the taste; *petioles* sheathing. *Flowers* small, white or reddish, and disposed in loose, terminal racemes.

There are a number of species of polygonum that very closely resemble each other, but, although possessed of nearly the same virtues, they differ very materially in their potency as medical agents. The P. persica is the species most valued by Rafinesque, but is much inferior to the P. hydropiper. The former may be known by its growing larger, with a redder or more deep-colored stem; larger leaves, which are also marked by a circular dark spot in their center. The flowers are redder, and disposed in larger and more compact racemes. The P. hydropiper may be known by the biting or pungent taste of its leaves.

MED. PROPERTIES AND USE.—Dr. Eberle considered this one of the best emmenagogues that we possess. "I have employed," says he, "this plant in perhaps twenty cases of amenorrhœa; and I can affirm, that with no other remedy or mode of treatment, have I been so successful as with this. I have seldom

ASCLEPIAS SYRICA.

An engraving of the *Asclepias Syrica* or Cottonweed, representing the top of the plant in flowering time. Taken from nature by the author.

found it necessary to continue its use for more than six or seven days, before its emmenagogue powers were manifested." The author has also proved it successful in a number of cases. Dr. Eberle used it in a saturated tincture, in teaspoonful doses. It will answer just as well to use the cold watery infusion. But the plant should never be scalded, as this impairs its medical virtues. Long keeping also injures it. The medicine is perfectly safe, and may be taken freely until the desired effect is produced.

ASCLEPIAS SYRICA.—The Root.

Synonyms.—Cotton-Weed, Silk-Weed, Milk-Weed, *Vul.*

History.—This is the most common species of the Asclepias, growing in great abundance in most parts of the United States, delighting in rich, sandy soil. As a medical agent, it has been classed with the A. tuberosa, and the other species. But it has never gained much popularity with the profession, although it had obtained an admission into the United States Pharmacopœia.

Botany.—*Sex. Syst.*—Pentandria Digynia. *Nat. Ord.*—Asclepiaceæ.

Gen. Char. Vide Asclepias Tuberosa.

Spec. Char. A. Syrica.—*Root* perennial, horizontal, long, creeping, white, of the thickness of the little finger. *Stem* erect, simple, round, smooth, and about three or four feet high. *Leaves* opposite, large, petiolate, oblong, obtuse, entire. *Flowers* resembling in their organization, those of the A. tuberosa, of a pale purple color, sweet-scented, disposed in globular clusters on axillary peduncles. *Pericarp* oblong, pointed at both ends, covered with prickles, opening longitudinally, and containing the seed, and a large quantity of silky seed-down. *Seed* flat, of a brown color. The entire plant abounds with a thick, milky juice, resembling cream. Its blossoming time is July and August.

Medical Properties and Use.—The root of this stately plant, although not possessed of any very active properties, is nevertheless medicinal, and may be regarded as emmenagogue, anodyne, and alterative. It has generally been considered as

analogous to that of the A. tuberosa, in its medical virtues. The author has never exhibited it, except in some cases of amenorrhœa, in combination with some other articles. But it has been favorably reported of in these, as well as in some other cases, by some very respectable practitioners.

Water and alcohol take up its virtues. The dose is gr. xx.—gr. xxx. of the powder; f℥ij.—f℥iij. of a decoction, prepared with ℥jss. of the root to Oj. of boiling Aq. The inspissated milky juice is used for the same purposes in doses of from gr. v.—gr. x.

LEONURUS CARDIACA.—The Root.

LEONURUS CARDIACA.

Synonyms. — Mutter Kraut, *Ger.*; Motherwort, *Vul.*

Botany.—*Sex. Syst.*—Didynamia Monogynia. *Nat. Order.*—Labiateæ.

Gen. Char. Leonurus.—*Calyx* five-angled, five-toothed. *Corolla* upper lip erect, villose, flat, entire; lower lip three-parted; middle division undivided. Lobes of *anthers* parallel, having shining dots. Exotic. Naturalized.

Spec. Char. L. Cardiaca.—*Root* perennial. *Stems* numerous, square, upright, from 12 to 18 inches or more high. *Leaves* opposite, on long petioles, rough, three-lobed, serrate. *Flowers* whitish red, in axillary clusters, beset with the prickly calyx. Blossoming time in June.

Med. Properties and Use.—Motherwort is an emmenagogue and tonic, which has long been a remedy in domestic practice.

It is not very active in its effects, and is chiefly applicable in cases of amenorrhœa, dependent upon general debility. It is usually taken in the form of infusion or tincture. The dose of the infusion, prepared with the leaves of the plant ʒij., and Aq. Oj., is a wineglassful, three or four times a day; or, from fʒj.—fʒiij. of the tincture.

Besides these, there are other articles of this order that are occasionally prescribed by practitioners as emmenagogues, and used as domestic remedies, among the most prominent of which are the following:

1. Hedeoma Pulegioides.
2. Tanacetum Vulgare.
3. Rosemarinus Officinalis.
4. Rubia Tinctorum.
5. Polygala Senega.
6. Aloe.
7. Myrrha.
8. Asarum Canadense.
9. Capsicum.
10. Sabina. This article is rather too severe.

Order II.—RELAXANT AND TOPICAL EMMENAGOGUES.

It has already been stated that the specific agents of this class are inadmissible in some cases of amenorrhœa, in which other articles of a different order may nevertheless be, not only safely, but very profitably invoked. This remark relates to cases that are complicated with conditions involving febrile and inflammatory action. Here it would be in vain to expect any benefit from the specific emmenagogues, as it is evident that secretion is incompatible with fever and inflammation. We are left then, to hope for success alone from those means which possess the power to obviate collateral difficulties. These are found in the use of *emetics*, *nauseants*, *baths*, and *frictions*.

EMETICS,—In Amenorrhœa.

Emetics and nauseants, especially lobelia and its kindred

articles, are of the greatest importance, in the treatment of those varieties of amenorrhœa, which are attended by fever, and inflammation. But it is not from the primary action of emetics, that is, the mere mechanical effect of emptying the stomach, that we are to expect the good results of these agents. Their constitutional effects alone, will insure the object here sought. The general relaxation of the system, and consequent modification of febrile and inflammatory action, is always necessary in these cases, to reëstablish the secretions.

Nevertheless, it appears, sometimes, when a topical impression is indicated, that an infusion of lobelia injected to the uterus, which may be done by means of a catheter and syringe, for virgins, and the common female syringe for married ladies, will occasionally produce the most happy effect.

Chapman considers emetics useful, also, in amenorrhœa, dependent upon *debility*. "Emetics in these cases," says he, "are more effectual [than the fetid remedies] and seem to operate as well by the general renovating impression which they make on the system, as by awakening sensibility in the uterus to the action of emmenagogues. Two or three times repeated, in the course of a week, I have known active vomiting, of itself, in several instances, to restore the menstrual secretion, and still oftener prepare the way, as stated above, for the successful use of the specific remedies."

VAPOR-BATH,—In Amenorrhœa.

As to the utility of the vapor-bath, in the treatment of amenorrhœa, brought on by cold or any other cause capable of inducing an inflammatory condition of the system, and thus checking the secretions, there can be no rational dispute. No agent is more effectual in obviating this condition, and exciting the secretions, than heat and moisture conjointly applied. This has been fully tested by thousands of practitioners.

The vapor may be applied to the entire body in a common bath-room, commencing the bath at a temperature of about 100° F., and raising it gradually as high as it can be borne by the patient. It should be continued for from fifteen minutes

to an hour, according to the circumstances which regulate vapor-bathing in general.

VAPORIZING APPARATUS.

The adjoining cut represents a very convenient apparatus for the generation of vapor, for medical use. It consists of three compartments: — 1st, a small *spirit-lamp;* 2nd, a *furnace* part, into which the spirit-lamp is placed, and which is so constructed as to support the vessel containing the water to be evaporated, and which also confines the heat of the lamp; 3rd, the *evaporating basin* or *cup* which rests upon and within the furnace, by means of a phlange adjustment, and having a movable, perforated cap. The entire apparatus is small and convenient; the furnace and evaporating basin are each required only of the size of a pint-measure, and the former receives the spirit-lamp — so that all need not be of greater dimensions than that of a quart measure. By constructing it so that the evaporating basin may be of slightly larger dimensions than the furnace, and setting the phlange adjustment so as to adapt it to the latter, a still smaller compass is obtained in packing it for carriage or transportation; for the furnace containing the lamp may thus be placed within the evaporating basin.

This apparatus is designed for use, where the conveniences of a common vapor-bath are not to be had. In its employment, nothing more is necessary than placing the subject upon a chair, shielded from the air by the use of a quilt or blanket, when the apparatus, having its basin two-thirds filled with boiling water and the spirit-lamp lighted under it, is placed under the chair. A dense hot vapor is thus produced, which can be conveniently confined to the entire surface, excepting that of the head, by the surrounding envelop, if it is nicely adjusted around the neck and the floor.

In many cases it may be most advisable to apply the bath to the lower extremities, and hips only—what is generally

called the *Hip-bath.* This is effected by means of a bathing apparatus prepared for the purpose. A temporary means may also be prepared, by surrounding the lower extremities of the patient with blankets, so adjusted round the body as to confine the vapor (which may be applied by means of a pipe) to the hips and lower parts. By this arrangement, the vapor can be raised to a much higher temperature, which, in virtue of the great topical relaxation thus produced, may be more available, in some cases, than a general vapor-bath.

MEDICATED VAPOR-BATH,—In Amenorrhœa.

This bath has the double advantage of the hot vapor, and the various medical substances with which it may be medicated. In view of their specific action, some of the volatile emmenagogues are generally used, such as the oil of *pennyroyal*, and *rosemary*. The vapor should be applied to the entire body, in view of impregnating the system as much as possible with the medicines.

RUBEFACIENTS AND FRICTIONS,—In Amenorrhœa.

Remedies of these kinds may be successfully invoked in amenorrhœa, as well as in other cases. Some of the active stimulating liniments, applied with friction, are most available. ℞ Ol. Hedeoma, f℥j.; Ol. Rosmarinus, f℥j.; Alcoholic Tinc. Lobelia, f℥iv. Mix.

These applications should be perseveringly practiced until the desired effect is produced, seeing that their effects are not produced at the expense of the living powers.

Class VII.—ANTHELMINTICS.

Anthelmintics (from *αντι*, 'against,' and *ελμινς*, 'a worm') are a class of remedies that are used to destroy intestinal worms, or for expelling them from the alimentary canal.

It is, however, still disputed, whether there are substances possessing a specific power to remove worms. "There is no topic," says Professor Reese, "upon which the profession is so justly

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

* Medicines, their uses, etc., p. 39.

Others again, are alike confident in the specific virtues of anthelmintic remedies. Dr. Paris in his admirable pharmacological work, considers the vegetable bitters absolutely poisonous to worms, and thus maintains the specific power of such remedies in worm complaints; and Prof. Eberle, in his Therapeutics, in speaking of anthelmintics, states, also, that "some of them act in the manner of poisons on these animals—that others destroy them by mechanical action on them—and that others again, simply expel them from the bowels, by producing strong purging;" which is corroborative of the views, not only of the gentlemen just named, but of many others.

General observation seems to establish the fact, as stated by Prof. Reese, that there are unequivocal signs of worms in some cases, when the patient may be otherwise in good health; and it is equally evident that, in numerous instances of this kind, quite a uniformity prevails in the anthelmintic effect of some of these remedies. In such cases, therefore, it would be difficult to prove, that the medicines produce this effect by obviating that "*depraved condition of the system*" supposed to favor the generation of parasites.

The fact should not be overlooked however, that although instances occur in which worms are found in persons who seem to enjoy good health, yet, in other cases, perhaps the majority, they follow as the remote consequence of some other morbific cause; and hence, a dependence upon specific worm medicines, in all cases, must necessarily lead to disappointment, as they are seldom found to remove all the symptoms, much less to effect a permanent cure.

Five different species of worms are known to be generated in the intestinal canal: 1, The tænia solium; 2, The tænia lata; 3, The trichocephalus, or trichuris; 4, The ascaris vermicularis; and, 5, The lumbricoides. These different species require a corresponding modification in the treatment. Thus, this class of medicines has been divided into several orders.

When an anthelmintic remedy, devoid of cathartic power, is used, it will generally be necessary to follow its exhibition with a purgative remedy, with a view to remove the worms.

In reference to doses, in the employment of anthelmintics, it may be remarked; that although it can not be supposed that intestinal worms can be destroyed in children, or small persons any easier, i. e., that it will require less power to kill a worm in one person, than another, yet we are ever in the practice of giving under doses to young children, and our observations of the results of this practice, appear to fully justify it.

The explanation of the matter appears to be, that small bodies, and consequently small capacities of the enteræ must hold the solutions of any articles given in a more concentrated state; or, in other words, small children have less aggregate quantity of fluid, or other material in their alimentary canal, than larger persons have, and that any medical ingesta must necessarily be less diffused, or attenuated in them, than in the latter.

The solutions of the anthelmintic agency, of a given quantity, are thus stronger in children, than in larger persons.

CHENOPODIUM ANTHELMINTICUM.—The Seed and Herb.

Synonyms.—Wurmsamen, Gansefuss, *Ger.;* Anserine Vermifuge, *Fr.;* Wormseed, Goosefoot, *Vul.*

Botany.—*Sex. Syst.*—Pentandria Digynia. *Nat. Ord.*—Chenopodiaceæ.

Gen. Char. Chenopodium.—*Calyx* five-leaved, five-cornered. *Corolla* none. *Seed* one, lenticular, superior.—*Willd.*

Spec. Char. C. Anthelminticum.—*Root* perennial, branched. *Stem* upright or procumbent, branched, even from the ground up, from one to three feet or more in hight. *Leaves* subsessile, scattered, attenuated at both ends, oblong, rather thick or fleshy, dotted beneath, large below, larger ones sinuated by large, unequal, obtuse teeth, upper ones entire, and small, nerves very conspicuous. *Flowers* very small, numerous, and yellowish-green, disposed in large, loose, leafy pannicles, composed of many alternating small spikes, which are again beset with small glomerules, containing from five to twelve sessile flowers. *Seed* flat, lenticular, shining, and covered by the persistent calyx. The whole plant possesses a very strong, peculiar

odor, ungrateful to most persons, but very agreeable to some. This is dependent upon an essential oil, which is obtained by distillation with water.

THERAPEUTIC PROPERTIES.—The Chenopodium Anthelminticum is the best anthelmintic that we possess. The only objection that can be urged against it, is that of its disagreeable odor, which makes it difficult of administration to many persons, and especially to children. The medicine expels speedily the Lumbricoides and other intestinal parasites, and may be used with confidence, as a general vermifuge. A dose of it is usually given before breakfast in the morning, and at bedtime, in the evening, for three or four days successively, and then followed by a brisk cathartic, as Ol. ricini, in large doses. Should a single course of the medicine not prove satisfactory, and there should be unequivocal evidence of the existence of worms, the same course is repeated.

The dose of the powder, prepared from the leaves and racemes, containing the seed, is from ℈j.—℈ij., to a child three years old. The oil is now almost exclusively used. The dose of this, for a child, is from fifteen to twenty drops, mixed with sugar, or given in the form of emulsion.

PHARMACEUTIC PREPARATIONS.—PULVIS CHENOPODII COMPOSITUS: *Compound powder of Wormseed.* ℞ Chen. Anth. Semina, ℥j. Oranti Cort. ʒj. Anisum Sem. ʒj. Pulverize and mix.

Action—Use.—An excellent anthelmintic. *Dose*, ℈j.—℈ij.

OLEUM CHENOPODII: *Oil of Wormseed.* This is prepared by distilling the dried herb with water. The oil is of a light yellow color, when fresh, but becomes brownish when kept. Its specific gravity is 0·946, according to Baumé, but according to Brande, 0·931.

Dose, from min. x.—min. xv., followed by a brisk cathartic.

OLEUM CHENOPODII COMPOSITUM: *Compound Oil of Wormseed.* ℞ Ol. Chenop., ℥ij. Ol. Terebinthinæ, ℥j. Ol. Anisii, ℥ss. Ol. Ricinii, Oj. Mix.

Action—Use.—This is an excellent preparation, as a common vermifuge, and will meet every reasonable expectation. *Dose*, a teaspoonful, to a child three years old, every morning and evening, for three days, when, if it does not operate, it should be followed with a dose of oil.

KOUSSO.—The Flowers.

SYNONYMS.—BRAYERA ANTHELMINTICA (*Kunth*); BANKSIA ABYSSINICA (*Bruce*); HAGENIA ABYSSINICA (*Kirk*); KOOSSO (*Abys*).

HISTORY.—This is a new anthelmintic in our country, but has been long in use by the natives of Abyssinia, Africa. The plant was described by Bruce in his travels (Vol. vii., App.), but was not generally known in Europe or America until it was made a subject of publication in Paris, in 1823, by Dr. Brayer, who had returned from Constantinople, where he had practiced his profession, and had gained a knowledge of this great remedy. It was investigated by Dr. Küchenmeister, and reported to be far superior to every other known anthelmintic in the removal of the tape-worm. In 1847, it was favorably reported upon by the French Academy of Medicine, and has since become generally and favorably known in our own country.

DESCRIPTION.—The flowers are imported, packed in boxes. They retain their shape, or clustered appearance, somewhat, and are of a greenish-yellow color. Their odor is fragrant, and the taste at first slight, but afterward acrid and disagreeable. It is supposed that their active anthelmintic properties were in a resinous principle; but as water extracts the virtues to a considerable extent, in the dried state, it is not certain yet how this may be.

APPLICATION.—In a domestic way, the flowers are boiled in milk, in quantity of about four drachms to a pint of milk, and this decoction is given in divided doses, at intervals of a few hours, until a cathartic effect is produced. If catharsis does not take place in four to six hours, a dose of some active purgative is given, while the kousso is discontinued for the time.

In a professional way, the medicine is administered in powdered form, in doses of one to two drachms, stirred up in half a pint of warm water. It is always to be taken upon an empty stomach. If the desired effect is not secured by a single trial thereof, it is to be repeated in a few days afterward.

The experiments of Küchenmeister seem to prove that the

superiority of the kousso to most other anthelmintics is only in its application against tapeworm, and that its use against the common round worm (*ascaris lombricoides*), is inferior to spigelia or chenopodium.

These observations are rather corroborated by the results of general practice in this country. But as a remedy against tænia, it is, it seems, quite unrivaled.

SANTONIN.

Santonin is a peculiar principle obtained from the immatured fruit or flowers, peduncles and small leaves or bracts, of several species of Artemesia (*Wormseed*), growing in Asia and the north of Africa. The *wormseed* of commerce is variously called *Aleppo*, *Levant*, *Alexandrian*, or *Barbary wormseed*, according to the port or country from whence it is brought.

Formerly, the crude vegetable product or flowers, leaves, etc., improperly called *semen contra*, or *semen santonica* (*it is not seed*) was employed, in substance, in doses of ten to thirty grains, repeated at intervals. But since the discovery of the active crystalline principle, *santonin*, the crude substance is scarcely ever employed in this country. The santonin if genuine, is an article of very great power, and requires quite a small dose. In over-doses, it causes severe abdominal pain, vomiting, purging, cold sweats and great prostration. It is, however, not known to be specifically poisonous to the human species.

Preparation.—The knowledge of the preparation of this article can, at present, be of but little importance to the profession, since the plant is not here found in quantities to justify its preparation. It is said to be obtained by treating the wormseed with hydrate of lime and alcohol, evaporating the tincture to one quarter, filtering to separate the resin, and treating it, while hot, with concentrated acetic acid. On cooling, the santonin is deposited in crystals (see Am. Journ. Phar., vol. xv., p. 278).

Application.—Santonin is, perhaps, the best general anthelmintic that we possess. It proves effectual against all species of intestinal worms.

Dose; from one-half of a grain, to two grains, is a full dose, which is to be repeated once in six to twelve hours, and then followed with an active cathartic. As the santonin is insoluble in water, it is best to administer it dissolved in oil. From two to five grains of the powdered santonin may be dissolved in an ounce of castor oil, and may then be given in doses of a teaspoonful to an adult, and in half or a fourth the quantity to young children.

OLEUM TEREBINTHINÆ.

This article is one of the most efficient anthelmintics that we possess, but is rather harsh in its operation, and is objected to by very many of our practitioners. It is, however, perhaps, the most certain article we can use for the expulsion of tænia, and is almost equally sure in removing every other species of intestinal worms. The dose is ʒss., twice a day, for four or five days in succession; and then to be followed with castor oil. The dose advised for tænia, in the United States Dispensatory, is fʒj. to fʒij., followed by castor oil, if it does not operate in three or four hours.

SPIGELIA.—The Root.

Synonyms.—Spigelia Marylandica, *Dub.;* Spigelie, *Ger.;* Spigelia, *Ital.;* Spigelie de Maryland, *Fr.;* Pink, Carolina Pink, *Eng.*

Botany.—*Sex. Syst.*—Pentandria Monogynia. *Nat. Ord.*—Gentianæ.—*Juss.* Spigeliaceæ.—*Martius, Lind.*

Gen. Char. Spigelia.—*Calyx* five-parted. *Corolla* funnel-shaped, border five-cleft, equal. *Capsule* didymous, two-celled, four-valved, many-seeded.—*Nutt.*

Spec. Char. S. Marylandica.—"*Root* perennial, branching, fibrous. *Stems* erect, four-sided above. *Leaves* opposite, sessile, ovate-acuminate, smooth, with the margins and veins a little pubescent. *Racemes* terminal, one-sided, three to eight-flowered. *Calyx* persistent, five-parted; *segments* linear, subulate, finely serrulate, reflexed on the fruit. *Corol* scarlet, funnel-shaped, much longer than the calyx; the tube inflated and angular at

the top, the limb in five acute spreading divisions, with the five stamens spread between them. *Anthers* oblong, heart-shaped, converging. *Ovary* superior, ovate. *Style* longer than the coral, jointed near its base, and bearded at the extremity. *Capsule* smooth, didymous, or composed of two cohering, one-celled, two-valved, globular carpels attached to a common receptacle. *Seeds* numerous."

Analysis.—The roots and tops, analyzed by M. Fenuelle, "yielded a *fixed* and *volatile oil*, a *little resin*, a *bitter extractive matter*, supposed to be the active principle, with *mucilaginous* and *saccharine matter*, and *some salts*. The leaves afforded the same principles, but a less quantity of the bitter principle."

Physiological Effects.—It is contended by many persons that the pink root is narcotic and poisonous. Others again, who have used the medicine for many years, have declared it perfectly innocent. The author has used it considerably, and has never observed any bad effects from it. But, should it become settled that it is really poisonous, it must be expunged from our Materia Medica.

It is also remarked, that all the bad effects that have been observed in the use of this article have been caused by another plant, which is inadvertently or fraudulently collected and sold, mixed with the spigelia.

Therapeutic Properties and Use.—Spigelia is a valuable anthelmintic, much used in this country. It is not very unpleasant to take, and is pretty certain in its effects.

It may be given in powder, gr. x.—gr. xx. to a child three or four years old; ʒj.—ʒij. to an adult; or of the infusion, (ʒiv. to boiling Aq. Oj.); fʒiv.—fʒj. may be given to a child. A quantity of Senna equal to the Spigelia is usually added, to insure a cathartic effect.

FILIX MAS.—The Rhizoma.

Synonyms.—Aspidium Filix Mas. *Lond., Dub.* Johannis wurzel, *Ger.;* Felce machio, *Ital.;* Helecho, *Span.;* Fougere male, *Fr.;* Male Fern, *Eng.;* Male Shield Fern, *Vul.*

History.—This article, although used by the ancients, and

mentioned by Dioscorides, Theophrastus, Galen and Pliny, did not appear to be known generally to the profession, until attention was attracted to it in the year 1775, by the publication of the mode of treating tænia, employed by Madame Nouffer, the widowed lady of a surgeon in Switzerland, who had acquired great celebrity in the cure of tape-worm by a secret nostrum. Her singular success was such, as to attract the attention of the medical profession at Paris, and some of the most eminent physicians of that city were deputed to examine into the subject. Upon their favorable report the secret was purchased by King Louis the XV., at the price of 18,000 francs.

The plant, though supposed to be a native of Europe and Asia only, is found in the north of Africa, as well as in the United States, growing in pine forests from New Jersey to Virginia.

BOTANY.—*Sex. Syst.*—Cryptogamia Filices. *Nat. Ord.*—Filices, *Jussieu.* Filicales, *Lind.*

Gen. Char. ASPIDIUM. — *Fructification* in roundish points, scattered, not marginal. *Involucre* umbilicated, open almost on every side.—*Smith.*

Spec. Char. A. FILIX MAS (*Pursh*); A. GOLDIANUM (*Hooker*). —*Rhizoma* horizontal, thick, with numerous tufts (the bases of the fronds) ranged along the common axis, separated from one another by brownish-yellow, silky scales. The true *roots* emerge from between these tubercles, and descend downward. The *fronds* or *leaves* ascend upward in tufts of one to four feet high. *Fronds* bipinnate, rising in a circle from the tufted rhizoma; *pinnules* obtuse and serrated, only slightly narrowed downward, and the lowest leaflet of considerable size, lobes usually a little combined at the base. *Veins* distinct, after leaving the midrib, not uniting with those of the adjoining pinnule. *Stipes*, or footstalk and midrib, either glabrous, yellow, or densely clothed with purple scales. *Sori* roundish, scattered, covered by an indusium, which is reniform, attached by the sinus. *Sori* placed in two rows, near the central nerve, and below its lower half.—*Nees von Esen.*

Analysis.—The Rhizoma was analyzed by Geiger, and was found to contain of a "*fat oil* 6·9, *resin* 4·1, with *tannin*, *starch*, *gum*, *uncrystallizable sugar*. Morin, of Rouen, indicates a volatile oil. M. Pescheir, of Geneva, found its *active principle* soluble in ether, an *aromatic and strong smelling fixed oil*, *adipocire*, etc. Ether extracts the adipocire along with the active ingredient, but deposits the former on standing."

Medical Properties and Use.—The Rhizoma of this plant has been very popular as an anthelmintic, especially as a remedy for tænia; and it is still highly esteemed by many practitioners as a remedy against worms. M. Ronzel (*Jour. de Pharm.* 3*e. ser.*, iv. 474) seems to have been very successful, with this article, in the treatment of tænia, having removed more than a hundred, and never found it to fail. Doctors Peschier and Ebers also speak favorably of its success in the removal of this order of entozoa (U. S. Disp.). It is also said to be still more efficient in the removal of the *bothriocephalus latus* than our species, or *tænia solinum*. The dose of the powder is from ʒj.—ʒiij., to be given in the form of electuary or emulsion, repeated, morning and evening, for one or two days successively. It is usual to follow the medicine with a brisk cathartic. M. Ronzel gives half an ounce to adults, made into boluses, and to be swallowed in the space of fifteen minutes in the morning, on an empty stomach.

Pharmaceutic Preparations.—**EXTRACTUM FILICIS MARIS:** *Etherial Extract of Male Fern.*—℞. Buds of Filix Mas. ℥iij.; Ether ℔ij.; digest, filter, and evaporate to the proper consistence. The Ether may be saved, by conducting the evaporation in a still. This is Dr. Peschier's preparation, so much esteemed.

Action—Use.—A remedy for tænia. *Dose*, ʒss.—ʒj.

℞. Rhizoma Filix Mas. ℥iij.; Alcohol, Oij.; digest, filter, and evaporate to proper consistence.

This preparation is, perhaps, equally good as the above, but the product of the process is not so successful, as two and a half pounds of the Rhizoma will only yield about ʒxiij. of the extract; while a pound of the Rhizoma, when treated with ether, will yield an ounce and a half.

Action—Use.—Same as the above.

PUNICA GRANATUM.—The Bark of the Root,—Rind of the Fruit,—Flowers.

SYNONYMS.—Granatbaum, Granat-rinda, *Ger.;* Ecorce de Grenade, *Fr.;* Malicorio, Scorza del Melograna ti, *Ital.;* Corteza de Granada, *Span.;* Magilam palam, *Tamool;* Anār, *Pers., Hin., Dukanie;* Rānā, *Arab., Rom.;* Dādima pundoo, *Tellingoo;* Daime, *Malayan;* Gangsalan, *Java;* Roma, *Portugal;* Delunghedie, *Cyngalese;* Deleemb, *Mahratta;* Ροα Σιδη, ancient *Gr.;* Ροδια, modern *Gr.;* Nar, *Turkish;* Pomegranate, *Eng.*

HISTORY.—The bark of the root of Pomegranate was employed as an anthelmintic by Dioscorides, and by Celsus. This early knowledge of it is still continued in some parts of the East. The medicine was introduced into the West by Doctors Buchanan and Anderson, and is now a popular remedy in various countries, especially in Germany.

BOTANY.—*Sex. Syst.*—Icosandria Monogynia. *Nat. Ord.*—Myrtaceæ.

Gen. Char. PUNICA.—*Calyx* five-cleft, superior. *Petals* five. *Pome* many-celled, many-seeded.—*Willd.*

Spec. Char. P. GRANATA.—*Stem* arborescent and irregular, in arid situations rather thorny. *Leaves* usually opposite, often fascicled, oblong, inclining to lanceolate, quite entire, not dotted, smooth, shining, and of a dark green. *Flowers* commonly solitary, of a brilliant scarlet. *Calyx* thick and fleshy, adhering to the ovary, turbinate, five to seven cleft. *Petals* five to seven, crumpled. *Stamens* numerous, often double. *Style* filiform; *stigma* capitate. *Fruit* of the size of a large apple, with a thick, leathery rind, and crowned by the tubular limb of the calyx. *Cells* several, arranged in two strata, separated from each other by an irregular transverse diaphragm, lower division of three cells, the upper of from five to nine cells. *Seeds* numerous, involved in pellucid pulp, with foliaceous, spirally convolute cotyledons.—*Nees von E.*—A native of Asia, but has been introduced into the East and West Indies, where it flourishes. Is is also cultivated in Europe and in the United States.

FRUIT OF THE POMEGRANATE.

Analysis.—The bark of the root was analyzed by Mitouart and Latour de Trie, and others; but the source of its peculiar anthelmintic powers has not been discovered, and the subject requires further investigation. It contains *tannin* (about 20 per cent.), *gallic acid*, *resin*, *wax*, *fatty matters*, *and mannite*.

Description.—The root itself is heavy, knotted and of a yellow color; its bark is often sold in strips, sometimes with parts of the root still adhering to it. On the outside, of a grayish-yellow color; on the inside, yellow, something like that of the barberry. It has little smell, when chewed colors the saliva yellow; has an astringent taste, without any disagreeable bitterness.

Adulterations.—The bark is apt to be adulterated with the barks both of box and of barberry. The former is white and bitter, but not astringent; the latter yellow, very bitter, and is not affected by the tests of the genuine article. An infusion of the bark of the root of the pomegranate yields a deep "blue precipitate with the salts of iron, a yellowish-white one with solution of isinglass, and a grayish-yellow one with corrosive sublimate; and potash or ammonia colors it yellow."

Therapeutic Properties and Use.—Although all parts of the pomegranate tree are astringent, and useful in diarrhœa and dysentery, yet the medicine is chiefly valuable as an anthelmintic. It is regarded by the Germans to be one of the most successful articles known to the profession, for the removal of tænia. It is also available for the expulsion of other kinds of worms.

Dr. Ainslie (*Mat. Ind.* vol. i., p. 323), says that the Mahometan physicians consider the bark of the root a "perfect specific in cases of tapeworm." They give it in strong decoction—their formula is: ℥ij. of fresh bark to Ojss. of water, boiled down to f℥xij.—of this they give a wineglassful every half-hour, until it carries away the worm. It will often sicken the stomach, but they say it will be sure to be effectual, and the sickness must therefore be endured.

"The Arabians and Persians," says the above-named traveler, "hold the pomegranate fruit in great estimation; placing the juice among their Cardiacs *Mokewyat-dil*. The flowers of the

male plant *gulnar*, they rank among their styptics *Manyatroaf-wuisshuluddum.*"

It may be given in doses of ℈j., in powder; or a decoction may be formed by steeping for twelve hours, *fresh Root-bark of Pomegranate*, ℥ij. in *Aq.* Oiss., and boiling down to Oj. Of this f℥ij,—f℥iv. may be administered in the morning, fasting, and repeated every two hours, until three or four doses have been taken; pursuing the same course another day, if not efficient at first, with occasional doses of castor oil, or some other active purgative.

MELIA AZEDERACH.—The Bark of the Root.

Synonyms.—Azederach, U. S.; Pride of China, Bead tree, *Vul.*

Botany.—*Sex. Syst.*—Decandria Monogynia. *Nat. Ord.*—Meliacæ.

Gen. Char. Melia.—*Calyx* five-toothed. *Petals* five. *Nectary* cylindrical, toothed, bearing the anthers in the throat. *Drupe* with a five-celled nut.—*Willd.*

Spec. Char. M. Azederach.—A beautiful *tree*, rising 30 or 40 feet in hight, with a trunk near a foot in diameter. *Leaves* large, doubly pinnate, consisting of smooth, acuminate, denticulate, dark green leaflets. *Flowers* of a lilac color, very fragrant and delightful, and are disposed in axillary clusters near the tops of the branches. *Fruit* a round drupe, yellowish, and about the size of a cherry, when ripe.—A native of Syria, Persia, and India. Cultivated as ornamental trees throughout the Southern States.

Medical Properties and Use.—The bark of the root is said to be a very good anthelmintic. It is used in the form of decoction; ℥iv. of the bark are boiled with Oij. of Aq. to Oj. *Dose*, a tablespoonful every hour or two, until its effects as a cathartic are manifested.

It is said by some to be narcotic in its effects, when large portions are taken, and is hence of dubious utility.

LOBELIA CARDINALIS.—The Root.

Synonyms.—Rapuntium galeatum Virginianum (*Moris*); Rapuntium Maxium (*Max.*); Lobelia Coccinea (*Stokes*); Rothe Kardinals blume, *Ger.*;

Kardinaals bloem, *Dutch.;* Lobelia Cardinale, La Cardinale, *Fr.;* Fior Cardinale, Cardinalizia, *Ital.;* Escurripa, *Span.;* Cardealina, *Portugal;* Scarlet Cardinal, Red Lobelia, *Eng.*

BOTANY.—*Sex. Syst.*—Pentandria Monogynia (Monadelphia Pentandria.—*Barton*). *Nat. Ord.*—Lobeliaceæ (Campanaceæ. *Barton*).

Gen. Char. LOBELIA.—*Calyx* five-cleft. *Corolla* monopetalous, irregular, on upper side cleft, nearly to its base.

L. CARDINALIS.

Spec. Char. LOBELIA CARDINALIS.—*Root* perennial, fibrous. *Stem* annual, upright, simple, pubescent. *Leaves* ovato-lanceolate, acuminate eroso-denticulate. *Flowers* magnificent, brilliant, carmine, in a terminal spike. One of the very finest of our wild or native plants, growing in low or wet grounds, in meadows, along streams, and in open woodlands, in the Western States. The adjoining cut represents the flowering top of the plant in full development, and also a figure of a flower and calyx, separate.

MEDICAL PROPERTIES, USE.—The *Lobelia Cardinalis* was employed by the Cherokee tribe of Indians, as a remedy for the expulsion of worms, and also in connection with the *L. Syphilitica*, as a remedy in Syphilis. The late Prof. Drake spoke of this plant as an anthelmintic, and antisyphilitic, and so did Schoepf and Rafinesque. It is, however, considerably nauseant to the stomach in the doses required, to be successful

LOBELIA CARDINALIS.

An engraving of the upper half of the plant, from a drawing taken from nature by the author, in the last of July at the commencement of its flowering.

in the expulsion of worms; and it is, therefore, still likely to continue as heretofore, to be but little used in this way.

It is useful in the treatment of remittent fever, and in acute inflammation of the liver and spleen. The author has not had any experience in its use in other inflammatory visceral diseases, but has no doubt, from its active properties, and its effects in those cases in which its virtues have been tested, it will prove itself, on fair trial, to be a most valuable agent.

The medicine has as yet been mostly employed in the form of decoction and tincture. In fevers, the tincture or decoction is to be given in doses as large as is admissible without occasioning too much nausea, until a free diaphoresis is produced. As an anthelmintic, it is given with spigelia in doses of ʒj.—āā in powder, or a wineglassful of the decoction; ʒj.—āā to Oj. of water, once in three hours; to be followed by a cathartic of senna or podophyllum, after three doses of the anthelmintic are taken.

Order II.—MECHANICAL ANTHELMINTICS.

This order of anthelmintics is designed to embrace all those articles that are used, either to destroy entozoa, or remove them from the intestines on purely mechanical principles.

MUCUNA.—The Spiculæ of the Pods.

Synonyms.—Dolichos Pruriens, Pubes leguminis, *Dub.;* Ruhkratze, *Ger.;* Pois a gratter, *Fr.;* Dolico Scotante, *Ital.;* Cow-itch, Cowhage, *Eng.*

Botany.—*Sex. Syst.*—Diadelphia Decandria. *Nat. Ord.*—Fabaceæ, or Leguminoseæ.

Gen. Char. Mucuna.—*Calyx* with two long caducous bracteoles, campanulate, two-lipped, under lip entire, lower trifid. *Vexillum* shorter than the wings and keel. *Keel* terminated by a polished acute beak. *Stamens* diadelphous, alternately longer. *Legume* hispid, oblong, few-seeded, with partitions of cellular substance between the seeds. *Seeds* oval, roundish, or reniform, with a narrow, oblong line, the hilum.—*Twining plants of the tribe Phaseoleæ.*

Spec. Char. Royle gives two species: 1, M. prurita, a native

of East India; 2, M. pruriens, which is indigenous in the West Indies.

"M. PRURIENS, *Dec.*—*Leaflets* ovate acute, the middle one rather rhomboidal, the latter ones oblique at the base. *Racemes* lax, many-flowered, interrupted, 1—1½ feet long. *Flowers* with a disagreeable alliaceous odor, standard flesh-colored, wings purple or violet, keel greenish-white. *Calyx* hairy, pink, with lanceolate segments. *Legume* about three inches long and roundish, as thick as the finger, with somewhat keeled valves, densely covered with strong and stiff, sharp-pointed, brown hairs.—Native of the West Indies. Bot. Reg. 1838, t. 18, Steph. and Churchill, iii. t. 179."

"M. PRURITA, *Hook.*—*Leaflets* smaller, more obtuse, the middle one truly rhomboidal, the lateral ones dilated on the upper edge. *Raceme* ovate, compact, more often three-flowered. *Flowers* dark purple. *Calyx* with short triangular teeth. *Legumes* oblong, much broader, curved and compressed, without any raised keel on the back of the vales, densely covered with sharp, stinging hairs; which, white and soft when young, become brown and stiff when ripe.—Native of the East Indies. Hooker, Bot. Misc. ii. 348; Suppl. t. 13."

DESCRIPTION.—The pod is about three or four inches long, and about the thickness of the little finger, compressed, and in general shape like that of the italic *f*. It is covered with small, short spiculæ or hairs, which constitute the medical portion. These are of a brown color, and when handled, penetrate the skin in soft parts; thus occasioning the most intolerable itching.

PHYSIOLOGICAL EFFECTS.—The spiculæ seem to be poisonous when applied to any portion of the body not protected by a mucous membrane, as they produce such excessive smarting. But when taken into the system, in view of its anthelmintic power, it is regarded very innocent, as it appears that the mucous coat of the intestinal canal is a perfect barrier to their action on the bowels or parietes of the primæ viæ.

THERAPEUTIC PROPERTIES.—The spiculæ are a very certain anthelmintic. Their action appears to be simply mechanical. They penetrate the worms, and thus destroy them. That this

is the principle of their action, is very certain from the result of experiments performed with the article upon the worms out of the body, as well as by the fact that the tincture or decoction does not possess the least anthelmintic power.

When worms which have been killed by the *cow-itch* are examined, after their passage, by the microscope, they are found to be penetrated by the spiculæ as by so many spears, and the points where thus penetrated, present appearances of having been highly inflamed.

The usual mode of preparing the spiculæ for use, is to dip the pods, which are covered with them, into molasses or honey, and then scraping them off with the liquid, which is in a proper state for use when it has attained considerable thickness with the cow-itch. A tablespoonful of this is a proper dose for an adult, and a teaspoonful for a child three or four years old, every morning and evening, for three days, and then followed by a brisk cathartic.

CATHARTICS—As Anthelmintics.

Cathartics may be reckoned with the mechanical anthelmintics. They are generally depended upon to carry off the worms even when the ordinary anthelmintics are used, and are often very efficient in expelling them when given alone, especially the more active kind of purgatives. Aloes is particularly serviceable in expelling the *ascaris vermicularis*. It is used by injection into the rectum as well as administered per stomach. Gamboge, though too drastic for common use, has been highly esteemed for its anthelmintic virtues. Castor oil is one of the most serviceable articles of the cathartic class that are given to expel worms. To insure their success, they should be taken so as to produce active purging.

Order III.—PROPHYLACTIC ANTHELMINTICS.

This order of anthelmintics is intended to embrace those articles of this class that most generally are regarded, rather as preventatives of the generation of worms, than as agents for their removal when they become a source of annoyance.

There are, however, two principles on which the articles of this order are considered to display their anthelmintic powers. 1, They consist, universally, of bitter substances, which, although conducive to the health and propagation of almost every other species of animals (especially those whose digestion makes a biliary apparatus necessary), are not only offensive intrinsically, but actually *destructive* to intestinal entozoa. 2, Bitters being almost universally tonic, are calculated to tone up the system, and thus tend to environ, or dispose it against their generation, or morbid accumulation. Indeed, the doctrine is not without plausible foundation, that worms are dependent entirely for their generation upon a debilitated or ill habit of the system. Some, in the investigation of the pathology of their existence, have invoked various plausible abnormal conditions of the intestines, for evidence in favor of a theory which contemplates the "*cold slime*," or mucous accumulations of the intestines, as the essential grounds of their existence, and which supposes that without this nourishment the worms could not find means of subsistence, and that by consequence their being would be ephemeral, or at least very contingent. The prophylactic power of bitter tonics against worms was therefore chiefly ascribed to their power of improving the physiological condition of the intestines, so as to change their secretions, and thus remove their liability of being infested by these parasites.

The following articles are among the bitter tonics that have proved themselves the best prophylactics against intestinal worms :

1. Artemisia.
2. Absinthium.
3. Aloes.
4. Liriodendron Tulipifera.
5. Populus Tremuloides.
6. Sabadilla.
7. Tanacetum Vulgare.
8. Hydrastis.
9. Colombo.
10. Cornus, etc.

Class VIII.—SIALAGOGUES.

The term *Sialagogue* (from *σιαλος*, 'saliva,' and *αγο*, 'to drive or excite), is applied to such medical agents as are used for the purpose of promoting the flow of saliva. In producing their sialagogue effect, they evince no peculiar power, except that which characterizes all the more pungent stimulants, and prominent nauseants. They are applicable in fever, when the mouth is dry and parched, as well as in various inflammations of the mouth and throat.

Sialagogues simply involve the topical application of stimulants and nauseants. They may be divided into two orders, viz.:

I.—*Stimulating Sialagogues.*

1. Capsicum.
2. Xanthoxylum.
3. Polygala Senega.
4. Canella.
5. Aralia Spinosa.
6. Myrica Cerifera.

II.—*Nauseating Sialagogues.*

1. Lobelia.
2. Tobacco, etc.

Class IX.—ERRHINES.

Errhines (from *εν*, 'in,' and *ρεν*, 'the nose'—Errhinas, Lat.) as already stated, do not constitute a very important class of remedies. They have but a limited application, it being only in a few affections of the head, as in catarrh, cephalalgia, and in cases of mechanical obstructions in the nasal fossæ.

The modus operandi of Errhines is very simple, consisting solely of an irritation and stimulation of the nerves supplying the Schneiderian membrane, as the olfactory and the nasal branch of the trigeminum, and thus occasioning a flow of the natural secretion. When the irritation produced by Errhines is extensive, it is reflected upon the respiratory nerves, or phrenic, par vagum, pneumogastric, etc., and thus a kind of a convulsive motion, *sneezing* is occasioned. This latter effect is generally promoted when the thorough effects of Errhines are desired.

ASARUM EUROPÆUM—The Leaves.

SYNONYMS.—Ἄσαρον, *Gr.*; Asaroon, *Arab.*; Assaro, *Ital., Span.*; Hazelwurzel, *Ger.*; Asaret, Cabaret, *Fr.*; Asarabacca, *Vul.*

BOTANY.—*Sex. Syst.*—Gyandria Decandria, *Eaton, etc.* Dodecandria, *Linn.* *Nat. Ord.*—Aristolochiades, *Juss.*

Gen. Char. ASARUM.—*Calyx* three or four-cleft, sitting on the germen. *Corolla* none. *Capsule* coriaceous, crowned.—*Willd.*

Spec. Char. A. EUROPÆUM.—*Rootstock* creeping, with numerous branched root-fibres. *Stems* very short, round, each bearing two kidney-shaped leaves, which are of a dark green color, shining above, but a little hairy, with long downy footstalks. In the axil of the two leaves there is a single drooping flower, about an inch long, fleshy, lurid in aspect. *Perianth* coriaceous, campanulate, three-lobed; *segments* incurved. *Stamens* twelve, inserted on the ovary; anthers attached to the inner side of the filaments, below the summit, each of two round separated cells. *Ovary* turbinate; style short. *Stigma* stellate, six-lobed. *Capsule* coriaceous, six-celled. *Seeds* ovate with horny albumen. Hilly woods, mountains of England, etc., flowers in May; said to be collected near Kirby Lonsdale, Westmoreland, [England].—*Royle.*

DESCRIPTION, ETC.—The root-fibres, when bruised, have a spicy odor and an acrid taste. The leaves are scentless, but have a bitter and acrid, slightly aromatic taste. Both are employed on the continent, but the leaves only are officinal, though the whole plant is usually sold. Analyzed, the root was found to contain a *volatile oil*, *bitter extractive* (which will itself excite nausea), a *camphor-like body* named *asarine*, which is volatile, has an acrid taste, excites nausea and vomiting. The leaves yield a volatile oil.—*Royle.*

PHYSIOLOGICAL EFFECTS.—The European asarum is acrid and irritant. When taken, it will occasion violent vomiting and purging. It is unsafe for general use.

THERAPEUTIC PROPERTIES.—This article is a very powerful and certain errhine, occasioning a copious flow of mucus, which continues sometimes for several days. The leaves should be

finely pulverized and snuffed up the nostrils in portions of from gr. j.—gr. iij.

PHARMACEUTIC PREPARATIONS. — **PULVIS ASARI COMPOSITUS:** *Compound Asarabacca Powder.* ℞ *Dried leaves of Asarum*, ℥j. *Dried lavender flowers*, ʒj. *Dried marjoram leaves*, ʒj. Rub together into powder.

Action—Use.—A good aromatic errhine.

ASARUM CANADENSE.

The leaves of this article will also act as an errhine when used freely. The application of this is the same as that of the A. Europea.

Besides these, tobacco, lobelia, capsicum, mezereon, etc., are also examples of this class of remedies.

SUB-DIVISION—SECOND.

IMMUTANTIENTS: NON-EVACUENTS.

This subdivision of physio-dynamic remedies embraces all those articles of that *grand division*, which, in their effects upon the system, do not occasion any sensible evacuation, but which exert their remedial influences directly upon the tissues, or the organs, modifying their essential condition, and promoting and regulating their motive powers and several functions, according as they may be deficient or deranged. No part of the Materia Medica furnishes remedies of greater importance.

This sub-division embraces the following important classes, viz.: *Stimulants*, *Tonics*, *Astringents*, *Nervines*, and *Alteratives.*—*Rubefacients*, *Derivatives*, or *Revellents*, etc., are not admitted here to the character of classes, as they furnish no articles that are not contained in other classes, or whose virtues are peculiar. Our active and pungent stimulants, as capsicum, sinapis, and the essential oils, are among the best rubefacients and revellents that we possess. All, therefore, that could be said of them under those several separate heads would only relate to their application. The judicious and intelligent practitioner, therefore, does not require such specifications. The terms rubefacient, revellent, derivative, etc., nevertheless, are

convenient, and may still justly be used in speaking of the topical application of stimulants, etc.

Class I.—STIMULANTS: INCITANTS.

DEFINITION.—The term stimulant comes from *stimulus* (a 'goad' or 'spur'), and is synonymous with *incitant* or *excitant* (from *incito* to 'spur on' or incite to activity). The literal meaning of the term, therefore, is to promote action, and to aid the living powers and vital processes. In its widest sense the term stimulation might be regarded as involving the action of all remedies, for certainly there are none that are absolutely passive, all stimulate in some sense. We must, therefore, take the present class of agents into a more restricted sense; and thus it is meant to represent in this class the *general stimulants*, that is, incitants, which tend in no special way to affect particular organs, apparatuses, or functions, as cathartics, diaphoretics, nervines, etc. Stimulants are thus simple excitants which tend to affect all organs, so far as their own specific power is concerned, *alike;* and where special results follow, these are to be referred to peculiarities in the organization or endowments of the parts that are operated upon by the general excitant.

Even with the above definition there is still a question as to the arrangement of the different general stimulants, so as to define their respective peculiarities. Thus there is much difference in the development and the persistence of the action of the different stimulants. Some are prompt and diffusive, others are gradual in the inception of their effects, but are very persistent.

Some authors thus comprise under this head, and into this immediate class, all the tonics, astringents, nervines, and diffusive stimulants. But in the present case there is much more restriction made in the arrangement, and it is the kind of stimulants denominated by such persons, the *diffusive stimulants* that are here intended to be treated of. Those other agents whose peculiarities entitle them to separate, or independent classification, are hence disposed of, so as to offer the highest

possible facilities to the student of Materia Medica and Therapeutics.

By reference to the treatises given on the introduction of these respective classes, the characteristics and merits of each will be found set forth, it is hoped, in a satisfactory way.

Modus Operandi. — It is evident that the quality of the impression of stimulants is dependent as in the case of all the physio-dynamic agents, upon the endowments of the nerves; for we are not only driven to this position by an *a priori* view, but our constant observations in practical medicine would by no means admit of any other conclusion. We find the effects of the stimulants very much modified by the different states of the habit.

On the other hand, however, we find also that medical agents have some properties which are peculiar to them, and which secure to them *their* characteristic effects. Thus the various articles may be often recognized by the experienced observer, by means of their effects on the body.

These remarks apply to stimulants in as full a sense as to any other agents.

Physiology.—If by the term stimulant, the simple idea of *force* exciting the vascular action is meant, as seems to be implied by the positions taken by most authors of the old school, in their treatises upon this class of agents, then indeed but a very partial and unjust view is taken of the matter.

That doctrine in therapeutics which limits the use of these agents to what are called asthenic forms of disease, or which interdicts them wherever there may be vascular activity above the normal standard, is most unquestionably erroneous.

Whatever may be the essential character of the conservative force (*vis conservatrix*), or whatever may be the character of the vital essence itself, it is evident that the phenomena of life are in great *variety*. We know, moreover, that the conservative processes, *i. e.* the vital resistances, or reaction to foreign disturbing causes, are by no means confined to what is observed only in the vascular movements. But on the other hand, we know that *all structures* have inherent powers of resistance to disturbing causes, and of maintaining their

own structural integrity. So also it is with the functions. As we ascend from the structural endowments to the *phenomena* of organic life, we are able to trace a peculiar elasticity, if we can be permitted to use such a term in this connection: or in other words, there is such an integrity of principle as that any foreign interference is ever counteracted by these laws, in their own peculiar order.

Assuming then, that all parts of the economy are characterized by conservative principles, and that all the parts develop these principles in their own order, it will require no very great stretch of conception to apprehend the philosophy of the action of agents (*stimulants*) that are calculated as general incitants to the normal vital forces—the universal conservative powers.

Thus the relation of general stimulants to a specific function, *i. e.* that of circulation, is not to be considered in the limited or restricted sense, as practically, and in some instances avowedly maintained by our brothers of the old school. Stimulants refer to *all functions*, and to *all forces*, among which that of the circulation is only *one among the many*.

Those who have been educated in the old theories, which force the application of stimulants into such narrow limits, must put themselves without the trammels of dogmatism to such an extent as that when simple facts are proposed to them, which look toward a more consistent philosophy, they may avail themselves of them.

Who has ever thought of encompassing the rationale of the action of other general agents, as *tonics* and *alteratives*, in their relations only to one single function? Or what kind of sense would it indicate to maintain that tonics and alteratives affect the *circulation only?* Any one assuming such a position, and yet claiming to be scientific, would be set down as a *madman!* Yet this very same position is taken, in principle, by those who uniformly proscribe the diffusive stimulants in the sthenic forms of disease, since it is a fact that it is entirely because of the state of the circulation in this case that the stimulants are ruled out.

Nor do the doctrines here projected commit the writer into

any entanglements on a question in the opposite extreme: that is to say, the position here taken does not assume that we are not to be governed in our application of stimulants by the states of the circulation. This is one of the many, and it ought to be said the most *important* of the many conditions to be considered in the administration of stimulants—*but it is not all.*

When a stimulant is given in the febrile state the effect in general is, that *all the functions are promoted*, and in most instances that of the circulation to a larger extent than any other. But this effect upon the circulation is nevertheless still an inferior proportion of the aggregate stimulant action of the incitant agency. If mathematical rules are admissible in such an inquiry, it may then be stated, that when in the febrile state any effect is to be accomplished that can not be attained by any other means, and when the inconveniences interposed by the preternatural vascular excitement present is yet less than the aggregate good otherwise resulting, *then* it is *certainly* proper to give the stimulants, even in the febrile state. But the indications do not usually so exist as to demand the potent stimulants in fever.

Application.—After the disquisition of the physiological action of stimulants, in such a way as to contemplate their influence in the sthentic states, much that would come under the present head may be said to have been anticipated, and hence what is here to be considered in that regard, may be somewhat limited. Nevertheless, there are many circumstances even in the sthentic states, which make the liberal employment of stimulants highly judicious. This, which according to the old theories, is really paradoxical, is yet in the most notable way corroborated by many practical facts, as has often been proven.

These facts have not passed without note by the reflecting part of the profession. The anginosæ affection of scarlatina, and the *common* anginose, quinsy, yellow fever, and other forms of fever, afford ample ground for these remarks.

When the reports first were made from the service in the West Indies, to the profession in England, in reference to the successful application of capsicum, in the high grades of inflam-

mation of the throat and fauces, there was much surprise, but at present the rules of medical application in those affections, contemplate the most liberal employment of this most powerful stimulant in those inflammatory diseases of the throat.

Still, however, it is wished that the sentiments here intended to be given in regard to the applicability of the stimulants in the sthenic forms of disease, should not be misunderstood.—They are not proposed to be applied in this case, in view of the correction, directly of the vascular activity, and only when indicated in such cases by other conditions, i. e. by the passive or feeble and insensible state of other organs, and their endowments, whose demands may thus be responded to, with an effect for good, that is paramount to all the direct or immediate evils they cause in the acceleration of the circulatory functions.

There is a principle, on which the application of the stimulants has been projected by some theorists, still to be discussed. This has been invoked for the explanation of the good effects of the stimulants in the anginosæ—the facts of which are so much in conflict with the cardinal doctrines of the old theory. This principle is, in part, a revision of the Brownonian theory. It looks to the direct exhaustion of the excitability by the action of the incitants, with a view to the speedy and certain establishment of the state of relaxation and passiveness, thus secured by the exhaustion of the excitability; in other words, they propose to bring on the crisis by the use of the stimulants.

Homœopathy projects the same plan of procedure, but involves a different principle of therapeutics. The rationale, according to them is, that no organs of the body are possessed of duplicate susceptibilities of the same species—that one species of action alone, can go on upon an organ at the same time, and that by consequence, whenever a medicine tending to produce the same kind of effect, can be brought into action, it must, of necessity, subvert the former of that same species of action—hence the language, "*similia similibus curantur.*"

However much any of these theories, or these statements of facts, may come short of giving satisfaction to those who are wedded to the old theories, it must be confessed that those theo-

ries are by no means more satisfactory to very many that still practice and write under its sanctions.

Some of these authors are not a little troubled to find the proper place for the diffusible stimulants in their application, since their utility in various high grades of inflammatory diseases has been so apparent. Professor Chapman, in his Therapeutics (vol. ii., 4th ed., p. 104), states: "Nothing, perhaps, in the exercise of our profession is more difficult than to fix the period in the progress of disease, or to ascertain the circumstances in which it becomes proper to prescribe stimulants." He then states that the object in their use is "*to overcome an existing action by a new and stronger one.*" But here the old doctrines make him *trouble*, and he proposes that their use should be premised by evacuations in the violent forms of disease.

In the Asthenia.—When we contemplate the application of stimulants in those forms of disease characterized by enfeebled vital reaction, we are in a province where our neighbors habitually show us *kindred sentiments* and *kindly feeling*. All agree that when the system shows direct evidences of debility and exhaustion, as in typhus, cholera, the passive hæmorrhagia, palsy, etc., then the stimulants are to be freely employed.

It is unnecessary, however, to enlarge here on what is to be said of this their *chief* application, for the reason that this is illustrated in the several introductions to the different orders and in the therapeutic treatise upon the individual articles of the orders. See physiological effects and therapeutic properties and use of capsicum, page 385, *et seq.*

Stimulants afford many orders and varieties, as appears in what follows here.

Order I.—SPICY STIMULANTS:—PUNGENT INCITANTS.

This order, which embraces capsicum, zingiber, piper, etc., is the most important of the class. Its articles are those always invoked, when stimulants of a potent and permanent character are required. They are all very permanently pungent in their

taste, and hold their virtues chiefly in an oleo-resinous principle, and a volatile oil; although, in a few cases, they are found in an extractive, to some extent. In many instances, as in the above-named articles, *peculiar principles* are found, that appear to possess the virtues of the article from which they are obtained. Alcohol and ether are the general solvents; nevertheless, in some instances, as in capsicum, zingiber, etc., the virtues yield, to a considerable extent, to water.

The articles of this order of stimulants can alone be depended upon in violent forms of disease; others are *convenient*, and sometimes *important*, but these are *indispensable*. They, like all others of this class, are generally agreeable to the stomach, but, when given in large portions, sometimes occasion excruciating pain in the stomach, owing to their acidity, or pungency. This is usually of short duration, and may also be relieved by liberal potations of sweet milk, warm or cold water, or, if persistent, by an emetic.

CAPSICUM.—The Fruit.

SYNONYMS. — Καπτω, *Greek;* Móllághāi, *Tamool;* Mérápákāia, *Tellingoo;* Brahn maricha, *Sanscrit;* Lāl mirchie, *Hindos.;* Fulfili súrkh, *Pers.;* Felfel-achmar, *Arab.;* Meneshéna, *Cánárese;* Lombok, *Java;* Lada mira, *Malay;* Tabia, *Isle of Bali;* Gasmiris, *Cyngalese;* Tambhudda meerchingay, *Mahratta;* Pepperone, *Ital.;* Poivre d'Inde, *Fr.;* Der Spanische Pfeffer, *Ger.;* Spaan-cheper, *Dutch;* El Pimentero, *Span.;* Pimenteo, *Port.;* Villia-Capo-Molazo, *Malab.;* Perez, *Russ.;* Chilli, *Mexican;* Red or Cayenne Pepper, *Eng.*

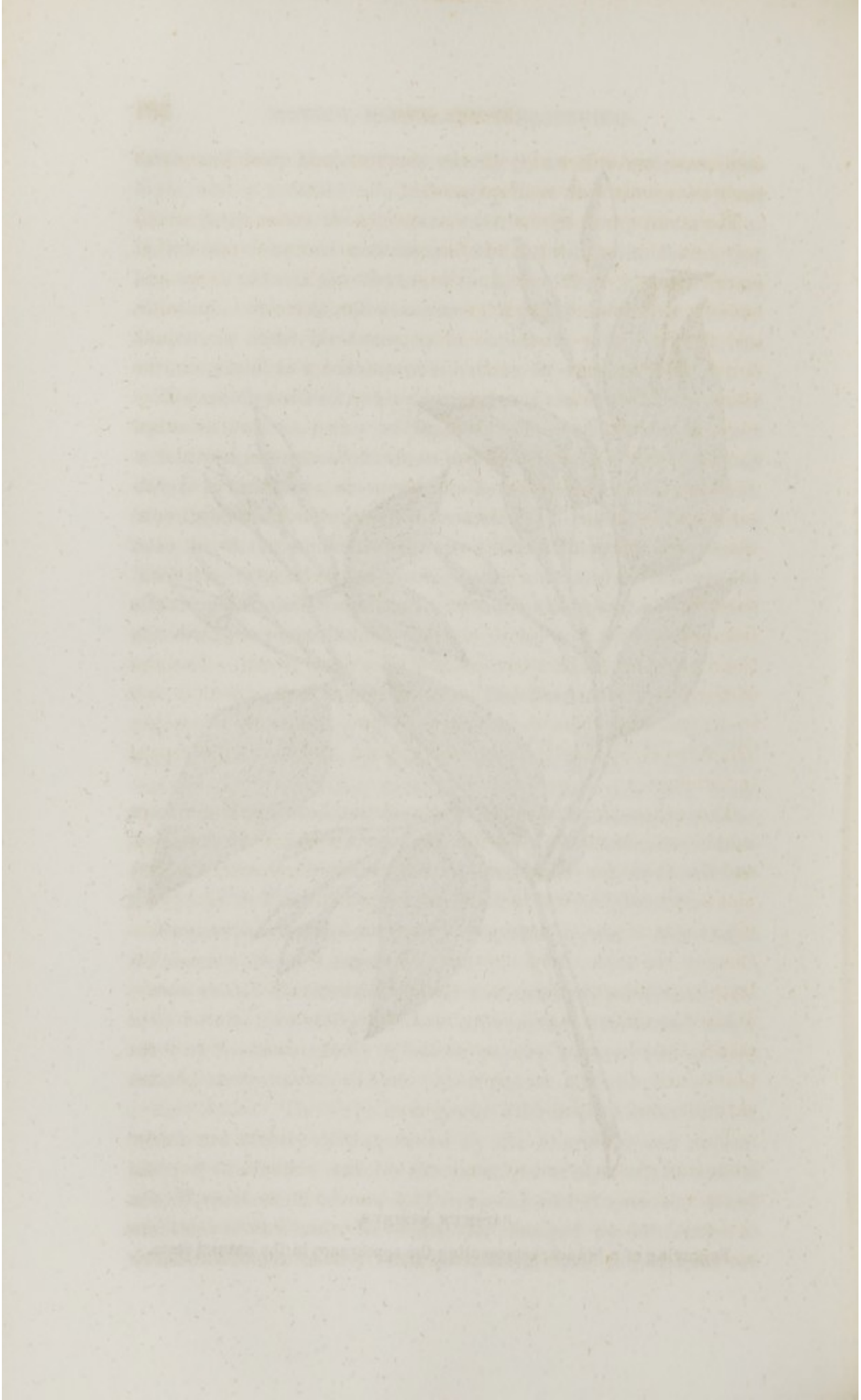
BOTANY. — *Sex. Syst.* — Pentandria Monogynia. *Nat. Ord.* — Solanaceæ, *Juss.;* Laurideæ, *Linn.*

Gen. Char. CAPSICUM. — *Calyx* five-toothed, persistent. *Corolla* rotate, five-cleft. *Anthers* converging, two-celled, dehiscent by fissures. *Berry* juiceless, papery, hollow, two or four-celled, many-seeded, naked. *Seeds* naked.—*Nees.*

Spec. Char. The Capsicum genus affords numerous species, which are mostly distinguished by the character and appearance of the fruit. Among the most prominent of the species are *C. minimum*, *C. baccatum*, *C. frutescens*, and *C. annuum*. Many varieties of the latter have also so changed by cultivation as to entitle them to the rank of species. All the species are

CAPSICUM MINIMUM.

Engraving of a branch, representing the appearance in the natural state.



medicinal, and differ only in the degrees and permanency of their stimulating or excitant power.

The C. annuum, which is the species so extensively cultivated in this country, and Europe, is an annual plant, that grows usually from one to three feet high. The *stem* and *branches* are smooth, dark green in color, furrowed, angular, and forked. *Leaves* ovate, acuminate, sometimes lanceolate, entire, shining, and in some instances, hairy beneath, on the veins. *Flowers* small, white, axillary, solitary, drooping. *Calyx* five-cleft. *Corolla* rotate, equal. *Stamens* five; *filaments* short; *Anthers* dark-colored, connivent, opening longitudinally. *Fruit* firm, succulent, two-celled; *Seeds* flat, numerous, of yellowish-white color. The form of the pods differs, according to the improvement that cultivation has made in the varieties of the species. They are round, oblong, conical, terrete, or horn-shaped; the latter kind is most common. Their color varies from a beautiful scarlet to a deep yellow, when mature. In their growing state, their color is of a deep green. The size of the pod varies likewise, being from one inch to four inches in length, and from a half-inch to two inches in diameter. The flowers appear in July and August, and the fruit ripens in October.

The other three species of Capsicum here spoken of are inhabitants of the tropical regions, in Africa, South America, and the East and West Indies. They are perennial, shrubby plants, whose berries or pods are very small, when compared with those of the C. annuum. Nees makes the following distinction between these species. He says that sometimes the fruit is globose or lobed; the variety is then called *C. baccatum.* When the fruit is small, elongated, and pointed, the variety is called Bird-Pepper, and botanically, *C. minimum.* When the plants are allowed to grow beyond the year, they become shrubby, and are called *C. fructescens.*

This description of the *baccatum* species differs somewhat from that given by many writers, but the probabilities go far to confirm the views of Nees. The name comes from Bacca, '*a berry,*' which indeed may apply to the fruit of all the species; but it usually means a *small round* or *globular* berry,

as that of the elder, bay, or myrtle. If a distinction of this kind can not be made, from the *name* for this species, it must be confessed that there is little propriety in its use, and that it has other than its true Latin meaning.

History.—The C. annuum is supposed to be a native of the warmer parts of America, and was, perhaps, not known to the ancients. Some of the species of capsicum, however, were well known to the Romans, Greeks, Hindoos, the inhabitants of the East Indies, and others, as the numerous synonyms indicate.

The *Siliquastrum* of Pliny answers to the description of the C. fructescens, which according to Rheede, is the C. indicum. The latter, whatever species it may be, was known in the East from time immemorial. It is said to grow wild in the East India Islands.

The fruit of the capsicum is much in use in the tropical countries, both as a medicine and condiment. The inhabitants consider it peculiarly adapted as a remedy in debility of the stomach, and various other impaired conditions of the digestive apparatus. In some places, hardly a single meal is taken without its use in some form or other. Some even eat it raw, with a relish. It is almost certain to restore the appetite so generally lost by individuals, who go from more temperate parts to those torrid climes. It was not, however, introduced into any of the modern pharmacopœias as an officinal article, until a comparatively late day. Dr. Adair Makitrick, according to Cox, first attracted the notice of the profession to it. He found it useful in depraved conditions of the system, which he called *Cachexia Africana*. It gained great popularity in the West Indies as a remedy in cynanche maligna, during the alarming prevalence of Scarlatina on those islands. From the flattering reports of Dr. Stephens, the medicine also acquired great character in England, as a remedy in malignant anginose affections.

It however remained for Dr. Samuel Thomson, to introduce the medicine into general practice. Before his day, nothing more could be claimed for it among the profession, than the character of a specific or empirical remedy for certain forms of

disease. But Thomson gained for it a place at the very head of one of the most prominent classes of medical agents. It is now an article of considerable character in commerce, and is exported from the East Indies, Hindostan, Africa, West Indies and South America. The Capsicum Annuum, however, as already remarked, is cultivated in this country and Europe. It supplies part of our market, but is far inferior to that produced in warmer climates. The fruit of all the species is indiscriminately ground up together, generally sprinkled with salt, and put up in barrels. In this condition it is known in our market as *cayenne pepper*, or capsicum. When brought in the pod, it is imported in bags, and is known by the common name of *chilly peppers*, or *chillies*. The green fruit is also preserved in vinegar, and kept under the name of *pepper-sauce*.

Physical Properties.—The dried fruit kept by druggists, and commonly called *chillies*, consists of small, long, tapering, conical, oblong, or round berries, which are more or less wrinkled and flattened. They are from three-quarters of an inch to two inches or more in length, independent of the adhering calyx or stalk, and from a quarter to three-quarters of an inch in diameter. Their color varies from a bright scarlet to a yellow. The epidermis is tough and leathery, and the seeds flat, and of a yellowish-white color. They have a faint, but peculiar aromatic odor, and an extremely pungent and hot taste, which continues in the mouth for many minutes. The powder commonly called *cayenne pepper*, is moderately fine, when fresh, of a bright color, varying from a beautiful red to a brown or yellow. The color fades on exposure to light, and will ultimately almost disappear. The color will assist much in judging the quality of the medicine. The odor of the powder is more obvious than that of the pods, and when snuffed into the nostrils, will produce distressing irritation and sneezing. Its pungency is more readily perceived than that of the berries. It will yield its active properties very readily to alcohol, ether, acetic acid, and water, and to hot water much more readily than to cold. The animal, fixed, and essential oils, also take up its pungent properties. When burned on a stove, it will give off very acrid fumes, and the

least quantity will, in a few moments, impregnate the air of a large room, so as to make it absolutely irrespirable, on account of the irritation it produces in the trachea and bronchial tubes.

IMPURITIES.—The only article with which capsicum is adulterated, that is likely to do much mischief, is the red oxide of lead. This may be detected by digesting the powder in diluted nitric acid, filtering, and adding a solution of sulphate of soda, when, if it contains any oxide of lead, a white precipitate will be formed. When it contains logwood, as is sometimes the case, it may be known by adding a little sulphuric acid to the filtered infusion; then, if it contains logwood, the infusion will turn red. Other impurities must be detected by the appearance of the powder, and the taste.* If it contains much salt, it is not fit for general medical purposes. At the present time the chief adulteration is with corn meal, which is sometimes found to constitute four-fifths of its bulk or weight.

ANALYSIS.—The proximate principles of capsicum, are *gum*, *wax*, *resin*, *essential oil*, *an extractive*, *fibrine*, *starch*, and *water*. Its ultimate principles are, *oxygen*, *carbon*, *hydrogen*, *chlorine*, *potash*, *phosphorus*, and perhaps some other elements.

Bucholtz and Braconnot, who analyzed it, the first in 1816, and the other in 1817, obtained the following results:

BUCHOLTZ'S ANALYSIS.		BRACONNOT'S ANALYSIS.	
Wax,	7·6	Wax, with red col. matter,	0·9
Resin, soft and acrid,	4·0	Acrid oil,	1·9
Extractive, bitter, aromatic,	8·6	Brownish starchy matter,	9.0
Extractive with gum,	21·0	A peculiar gum,	6·0
Gum,	9·2	Animalized matter,	5·0
Albuminous matter,	3·2	Woody fiber,	67·8
Water,	12·0	Salts (citrate of potash 6·0, phosphate of potash, and chlor. of potass, 3·4),	9·4
Woody fiber,	28·0		
Loss,	6·4		
Fruit of C. Annuum, without seeds,	100·0	Fruit of C. Annuum,	100·0

The essential oil, obtained by distillation with water, possesses the aroma and peculiar taste of capsicum, but has nothing of

* A microscope will enable any one at once, to detect foreign substances in powdered capsicum.

its pungency. This latter consists in a soft resin (*capsicin*), which may be obtained by evaporating the alcoholic tincture to the consistence of an extract, digesting this in ether, and evaporating as before. The product, while hot, is pretty thin, but on cooling, forms a thick oily substance, of a reddish-brown color, and tremendously acrid and penetrating taste, possessing all the active properties of the capsicum in a very small compass. On exposure to the air, it is converted into a hard resin. It is slightly soluble in acetic acid, very sparingly in water while soft, not in any degree when hard; but it is completely soluble in ether and alcohol. The author has obtained two ounces of this from a pound of capsicum. It has been supposed that the active properties of the capsicum can be obtained in the form of an alkaloid, by treating it successively with alcohol and a solution of potash, etc.; but the author never could succeed in this way, for as soon as the resinous substance is taken up with the potash, and then washed away, as the process requires, the active properties of the capsicum will be found to have gone with it.

Physiological Effects.—Capsicum evinces the most marked characteristics of a prompt and general excitant. Its topical effects are, however, much more obvious than its general impression; when applied to the skin it is actively rubefacient and irritant; —the capillaries become gorged with red blood, the temperature is somewhat raised, and the epidermis slightly elevated; but there is no dryness nor yet effusion, as in inflammation. This excitement and irritation, after continuing some thirty minutes or an hour, disappears, although the cause may still be applied. In the mouth, the effect is the same as when applied to the surface, but the burning, although instantly experienced, is sooner over, and is not near so intolerable as when applied to parts externally, where the integuments are thin and very vascular. This difference is dependent on the intervention of the mucus and saliva in the mouth. When taken into the stomach in moderate quantities, it, at first, only produces a local impression of warmth, but this is almost instantly succeeded with a genial and pervading glow, which imparts vigor to the circulation and activity to the secretions,

and various other functions. The appetite is promoted, the spirits are exhilerated, and the mind rendered more placid—in a word, as may be expected from a pure and healthy stimulant, all the normal functions are promoted, and particularly those of digestion.

When the stomach is empty, or deficient in its mucous covering, the medicine will sometimes occasion intolerable pain; but, happily, it is generally of short duration. It may be obviated by drinking some cream, milk, or any other article that will either modify the pungency of the capsicum, or serve as a shield to the stomach. It is proper to remark, however, that aside from the inconvenience of the pain merely, there has not been observed any unpleasant effect, even from very large quantities. If the use of the medicine is always commenced in small doses, it will seldom disagree with the most delicate stomach; and if the doses are alternated, with suitable drinks, an incredible quantity may be taken, without the least inconvenience.

Capsicum is regarded, by our old-school friends, as being exceedingly imflammatory in its effects on the system.

Dr. Murray says, that the practice of using capsicum as a gargle in cynanche, though it has been successful in the West Indies, "is not without danger from the *violent inflammation* it is liable to induce." Hooper says it produces *visceral obstructions*, especially of the *liver*. Vogt declared that it would bring on *gastritis*. Rafinesque, Thatcher, Pereira, and indeed almost all their authors, ascribe to its effects, *fever*, *inflammation*, *thirst*, *headache*, *vessication*, etc.

This doctrine affords not a little amusement to those reformers who have given the subject their attention. It has been demonstrated in numerous instances that the parts acted upon topically by capsicum, become proportionately more insensible to its irritant impression as it may be continued in its application. In its endermic application the irritation or smarting gradually increases for some hours, and the skin becomes red and somewhat tumid from the fullness of the capillaries and other vessels. But there is a limit to the stimulant and irritant impression, and when this limit is attained,

then the irritation and stimulation gradually declines until it is not in the least degree appreciated, although the application be continued by means of renewed portions. The redness also disappears, and the fullness of the vessels subsides in the same time. The author has made numerous trials in this way, and has never in a single instance been able to trace the characteristic signs of inflammation from the action of a simple aqueous or proof-spirit solution of the capsicum. So then we have here the assertions of the parties in conflict, and the question can now only be on the fidelity of the tests—certainly *skill* in making the tests is not in fault, for the characterizing signs of inflammation are not so obscure as to admit of deception.

If the redness and fullness attendant upon the topical application of capsicum be pronounced to be inflammation, *then we must also pronounce the cheek of every blushing lady inflamed* when these signs appear! *Query*, what are the various "*terminations*" of these acute inflammations? Inflammation does not by any means uniformly terminate by resolution! *Query* again, whether there is not sometimes, "*effusion*," "*induration*," or "*mortification?*"

If all who are implicated in the above misrepresentation of the physiological effects of Capsicum, had put themselves to half the trouble, in the investigation of the subject, there would, at least, have been an evidence of *solicitude*, or a sense of *responsibility* on their part. But the circumstances go far to show that they have rested their assertions on an hypothesis having no other foundation than *unproven analogies.* Thus some earlier authors, in treating on this article, have pronounced it phlogistic, and succeeding writers, from the idea of its exciting properties, have followed suit without further inquiry. Were it necessary, the faithfulness of these remarks might be made abundantly evident by a simple reference to the statements of those authors themselves, of which the following, from the much renowned English Therapeutist, Pereira, may serve as an example. "*In excessive doses*, WE CAN EASILY BELIEVE *that vomiting, purging, abdominal pain, and gastric inflammation, ascribed to it by Vogt, may be induced by it*, THOUGH

I AM UNACQUAINTED WITH ANY CASES *in which these effects have occurred.*" He says that he can "*easily believe*" it; but upon what *evidence?* Has he investigated its effects by actual experiment? It seems *not!* But *authors* have thus spoken of it, and from its plausibility, the profession generally believe it.

For a more particular exposition of the *modus operandi* of these agents, see *stimulants.*

THERAPEUTIC PROPERTIES AND USE.—Capsicum is very justly reckoned the best general stimulant that we possess. It is a simple excitant, and the circumstance of its fulfilling different and *contra*-indications is to be explained on the principle of its concert of action with the physiological laws, which correspond to every rational intention of cure.

The medicine is exceedingly prompt in its action, and were its general impression equal with its local effects, it would be still more valuable as a medical agent. It is, nevertheless, placed at the head of the stimulants. As an agent of this kind, it evinces its power remarkably in equalizing the circulation, and thus obviating congestions, arresting hæmorrhages, and relieving local inflammations.

Capsicum is particularly applicable in all cases in which the vital force is far exhausted, as it will assist in recovering a reaction, with less expense to the tissues than most stimulants will, and hence its utility in typhus, typhoid, low remittent, and epidemic yellow fever. Dr. Wright speaks in high terms of its efficacy in arresting the *black vomit.* In Asiatic cholera, cholera morbus, palsy, asphyxia, etc., it is also of signal benefit. Its active stimulating and exciting power will produce a reaction, promote the circulation, and maintain the vital principle. The author might here relate numerous instances of such cases, in which, by the faithful use of this article, both internally and externally, the patients have been recovered from apparent death, to the astonishment of all present.

In many chronic affections, as rheumatism, gout, and various other inflammatory diseases of parts remotely situated from the general circulation, it will be found that capsicum will be of benefit.

In dropsies, it proves serviceable by exciting the absorbents, and promoting cutaneous transpiration; and in phthisis, hepatitis, nephritis, etc., by equalizing the circulation, and thus promoting a tendency to resolution. These same advantages obtain in its use in pleuritis, peritonitis, carditis, and various other inflammatory affections of the serous surfaces, and muscular structures among the viscera. In carditis, especially, the author has observed some of the most happy effects from its use: in many instances this article gave complete relief after the usual means had failed. In intermittents, especially in the cold stage, capsicum is a good medicine, and in many cases will prevent the chill.

There is no complaint, however, in which capsicum has established a greater reputation than in scarlatina and cynanchæ maligna. Its usefulness in scarlatina was first discovered in the West Indies. Dr. Stephens made the most flattering report of its efficacy in this disease, when it prevailed there. He says that he used it in four hundred cases, in which it gave the most satisfactory results—that "it seemed to save some whose state had been thought desperate." It promoted the separation of the sloughs, and soon improved the constitutional symptoms. Dr. Pereira, though he, like the rest, denounces capsicum as a *phlogistic agent* of the most violent kind, corroborates the exalted views of Stephens, Collins, Headly, and most other authors, as to its utility in various inflammatory diseases of the throat. Among reformed practitioners, its value in this, as well as all other inflammatory and malignant anginose affections, has been fully tested, and their superior success in the treatment of those affections is much owing to the use of this potent agent.

It has long been a popular domestic remedy in *colds* and various acute attacks. Thus, what is called "*pepper tea*" is a common medicine for hoarseness, catarrh, and the chills tnat usually attend the incipient stages of fever.

Dyspepsia is another form of disease in which capsicum has proved itself a special remedy. It stimulates the nerves of the stomach, promotes the secretion of the gastric and pancreatic

juices, as well as the bile, and, although without any cathartic power, will very much assist the peristaltic motion.

Sprinkled on the surface of indolent ulcers and cancers, it will often procure a healthy action in the parts, cause them to clean off, and heal up. It may also serve as a constituent of plasters, to be worn over the sores for similar purposes.

As a rubefacient, there are few articles in the Materia Medica equal to it. Its effects are very durable, and are never attended with vessication.

Capsicum, like most other remedies, though more serviceable in some forms of disease than in others, can not be considered in the light of a specific, but must rather be regarded as a general remedy, which must be selected to fulfill various indications that may appear in many different varieties of disease. Like all simple stimulants, it is serviceable in all cases of diminished vital action, and may either be used for the direct fulfillment of given indications, or it may be combined with other remedies, with a view of promoting their action. Thus capsicum is known to promote alike the operation of emetics, cathartics, diuretics, diaphoretics, expectorants, tonics, etc., by exciting the organs upon which these agents severally act. It is usually taken by infusion. From gr. x. to gr. xx. are macerated in Oss. of boiling water, and taken at two doses, a few minutes apart. The powder is taken in like quantities, either in a little mucilage or sweetened water. It is also taken down, simply stirred in cold water.

Contra-indications.—The only cases in which capsicum is particularly contra-indicated, is in synochal grades of fever, as well as inflammations that are attended with a high heat of the general system, accompanied with a contracted and husky skin, and violent headache. In these cases, the medicine should not be given until the system is well relaxed by other appropriate means; for while the muscular parts are so firmly contracted upon the vessels, the increased momentum, produced by this excitant, may augment the violence done to the more delicate structures by the force of the circulation, while the system is thus confined.

PHARMACEUTIC PREPARATIONS.—The preparations of capsicum, or those into which it enters as an ingredient, are numerous. The most prominent only will be noticed.

TINCTURA CAPSICI: U. S., Lond., Dub. Ed.—*Tincture of Capsicum.* ℞. Capsicum in coarse powder, ℥ij.; Alcohol, Oij.; macerate for ten days and filter; or if prepared by percolation, the powder may be made into a pulp with a little of the spirit, and then placed into the percolator or instrument of displacement, and the spirit passed through it. The U. S. Dispensatory directs only half the quantity of the capsicum to the same quantity of diluted alcohol; and the English pharmacopœia directs ʒx. of capsicum to Oij. of proof-spirits. The *dose* is from fʒj. to fʒij. Used for the same purposes to which the powder is applied. This is the form in which capsicum is commonly used as a rubefacient.

OLEUM CAPSICI: *Oil of Capsicum.*—An impure oil of capsicum may be prepared by digesting the alcoholic extract in ether and evaporating the etherial solution. This oil is extremely pungent, containing all the active properties of the capsicum. It is powerfully rubefacient; too much so for common use; but makes an excellent application in paralysis, and in all cases in which a counter-irritant is required. Introduced into the hollow of a tooth, it will, generally, stop it from aching. It is a valuable ingredient in stimulating liniments, as well as stimulating pills.

Oil of capsicum is commonly prepared by the evaporation of the highest proof alcoholic tincture, to the state of oil. But this is not so fine for internal use. If however, this oil (*extract*), thus prepared is redissolved in ether, decanted and evaporated, it will afford a fine product for professional use. The dose of oil of capsicum is from one to five drops.

PILULÆ CAPSICI: *Capsicum Pills.*—These are made from a mass, prepared by working a suitable quantity of fine capsicum into thick molasses. If an extract, made from some of the permanent tonics, is substituted for the molasses, the pills will be much more permanent in their stimulant effect. The pills, while fresh, should be rolled in flour, pulverized licorice root, or the dust of slippery-elm bark, so as to obviate their pungency while being taken.

Use.—Capsicum pills are found beneficial in dyspepsia, and many other chronic diseases, as carditis, phthisis, etc. Various articles are combined with capsicum in making pills, according to the use for which they are intended. Thus, in chronic nervous affections, scutelaria, or asafœtida, and in dyspepsia and habitual constipation, a laxative, as the extract of juglans cinerea, are used.

When capsicum is used as a gargle in sore throat, it is usually prepared with vinegar and salt : ℞. Capsicum, ʒij. Chlo. Sod., ʒij., diluted Acetic acid, Oss.

ZINGIBER.—The Rhizomæ.

Synonyms.—Zingiber Officinale (Roscoe); *Ζιγγιβερις, Gr.;* Zinjabil, *Arab.;* Sookoo, *Tam.;* Sont, *Duk., Hind.;* Alia, *Mal.;* Inghroo, *Cyng.;* Jai-aking, *Jav.;* Jahetuh, *Bali.;* Sonti, *Tel.;* Zungebeel, *Persh.;* Sonty, *Can.;* Wooraka, *Ternat.;* Gora, *Tidor;* Siwe, *Amb.;* Sohi, *Band.;* Sunthi, *Sans.;* Ingwer, *Ger.;* Zengero, *Ital.;* Gengibre, *Span.;* Gingembre, *Fr.;* Ginger, *Eng.*

Botany.—*Sex. Syst.*—Monandria Monogynia. *Nat. Ord.*—Zingiberaceæ. (*Lindly*); Scitamineæ (*R. Brown*).

Gen. Char. Amomum.—*Corolla* with the outer limb three-parted, inner one-lipped. *Filament* lengthened beyond the anther into a simple incurved beak. *Capsule* three-celled, three-valved. *Seeds* numerous, arillate. *Rhizocarpal* plants. *Rhizomata* tuberous, articulated, creeping. *Stems* annual, inclosed in the sheaths of distichous leaves. *Leaves* membraneous. *Spikes* cone-shaped, radical, or rarely terminal, solitary, consisting of one-flowered, imbricated bracts.—*Blume.*

Spec. Char. A. Zingiber.—*Leaves* subsessile, linear-lanceolate, smooth. *Spikes* elevated, oblong. *Bracts* acute. *Lip* three-lobed.—*Roxburgh.*

Rhizoma biennial. *Stems* erect and oblique, and invested by the smooth sheaths of the leaves; generally three or four feet high, and annual. *Leaf-sheaths* smooth, crowned with a bifid ligula. *Scapes* solitary, six to twelve inches high. *Spikes* the size of a man's thumb. *Lip* dark purple. *Ovary* oval, with numerous *ovals; style* filiform; *stigma* funnel-shaped, ciliate. *Capsule* roundish, unilocular. *Seeds* numerous; mostly abortive.—(*Brown, Hist. of Jamaica*).

History and Habitation.—Ginger is supposed to be a native of the East, but is now found in most of the tropical regions, where it is a native product, or has been the subject of transplantation. It has been known from time immemorial. Dioscorides * and Pliny † speak of it. The former called it *Ziggiberis:* the latter *Zingiberi*, or Zimpiberi. The Chinese and

* Lib. ii., cap. 190. † Hist. Nat. lib. xxii.

Arabians also had an early knowledge of it. The ginger of commerce is chiefly derived from India. A superior variety is, however, brought to us from the West Indies, by way of England; and, of late, a very good article is brought from Africa.

Ginger is propagated by planting cuttings of the root-stock of the plant.

Description.—The *Rhizome*, or Radix Zingiberis, as it occurs in our market, consists in flattish-cylindrical, branched or lobed pieces, called *races*, which seldom exceed four inches in length, and are usually somewhat curved. The color and external appearance of these races is dependent on the mode of preparation, and perhaps on a difference in the plants that produce them. This latter idea is supported by Dr. P. Brown, who has already been mentioned. Dr. Wright* states that two sorts are also cultivated in Jamaica. We have, then, two varieties, called the *white* and *black* ginger, which may be noticed separately. Both varieties have the peculiar and very agreeable aroma, which is quite durable.

a. White Ginger: (*Radix Zingiberis albi*).—This is of a superior quality, brought to us chiefly from Jamaica. It is divested of its epidermis, and has, externally, a yellowish-white, and internally, a pale-buff color. The pieces, owing to the loss of their bark, are somewhat smaller, and are also rounder than the other variety. The purchaser should exercise some caution in the selection of this article, as there is much trickery practiced in its preparation. The root is sometimes dipped into a preparation of whiting and water, and is thus *white-washed*, or covered with a coat of whiting, which, however, can be easily detected. But when, as is often the case, the root is bleached with chloride of lime, or is whitened with the fumes of sulphur, the imposition is not so easily detected. Either of these processes are calculated to impair the virtues of the article.

We occasionally have specimens of several other kinds of ginger that are classed with this variety. The *African ginger* is also of a whitish color, and is partially scraped. The races of this are somewhat smaller than the other. The author has a specimen of this, that is equally as strong as any Jamaica ginger he has ever seen. The *Barbadoes ginger* is somewhat

* Lond. Med. Jour. vol. viii.

darker, and its races are shorter, flatter, and are covered with a corrugated epidermis.

β BLACK GINGER: (*Radix Zingiber nigri.*)—This is the common ginger of commerce, and is imported principally from the East Indies, and Hindostan; but some is brought from the West Indies. It occurs in races like the *white*, but they are of a dirty, dark, yellowish-gray color, with a wrinkled epidermis, and are usually worm-eaten, and rotten at the ends. When the epidermis is removed, some places exhibit darkish or black spots, of a resinous, or horny consistence. The interior is usually whitish or farinaceous. These roots, which are brought in sacks weighing about one hundred weight each, are ground up and put in kegs and barrels. The color of this flower is a yellowish-brown; and besides the dirt, bark, and rotten parts, the drug is often rendered still less valuable by shameful adulterations with meal and flour.

With this variety, we find the *Tellicherry ginger*, and *Malabar dark ginger*, which are all very analogous in their properties, and need no further description.

COMPOSITION.—According to M. Morin, ginger contains a *greenish-blue volatile oil; resinous matter*, which is soft, acrid, aromatic, and soluble in ether and alcohol; a *sub-resin*, insoluble in ether; a small portion of *osmazome; gum; starch;* a *vegeto-animal matter; sulphur; acetic acid; acetate of potassa;* and *lignin*. The analysis of Bucholtz* is as follows:

Pale-yellow volatile oil,	1·56
Aromatic, acrid, soft resin,	3·60
Extractive, soluble in alcohol,	0·65
Acidulous and acrid extractive, insoluble in alcohol,	10·50
Gum,	12·05
Starch (analogous to bassorin),	19·75
Apotheme, extracted by potash (ulmin?),	26.00
Bassorin,	8·30
Woody fiber,	8·00
Water,	11·90
White Ginger,	102·31

The odor of ginger is dependent upon its volatile oil, which may be procured by distillation, and a soft resin, which may also be obtained by digesting the alcoholic extract of ginger,

* Gmelin's Hand. b. Chem.

first in water, then in ether, and evaporating the etherial tincture.

Physiological Effects.—In the mouth, ginger produces a hot or pungent sensation, and gives rise to a flow of saliva. When taken into the stomach, in moderate quantities, it occasions a sensation of warmth and stimulation; the pulse is accelerated, the spirits raised, and a genial warmth pervades the body, which is succeeded with a relaxation and moisture of the skin. It promotes digestion, and evinces a calming influence over the nervous system. When taken in large doses, it seems to excite, more especially, the organs of respiration; but this is most probably the effect of the increased action of the circulation, and, is, hence, secondary. Over the genital organs, it manifests, also, an exciting influence. When applied to the Schneiderian membrane, or the skin, it produces its purely stimulating effects.

Therapeutic Properties.—Ginger is a pure aromatic stimulant, and, as such, makes a very valuable medicine, although its chief use, until of late, has been as a *spice* and *condiment*. In all cases of debility and enfeebled vital reaction, this article serves an important purpose: especially, in cases of enfeebled digestion, that are dependent, simply, upon a want of tone in the organs. Few articles are more valuable in cholera, cholera morbus, or cholera infantum. In these cases, it should be prepared in the form of a cordial, or syrup. With rhubarb, it is invaluable in dysenteries, and summer-complaints, among children. As a stimulating carminative, it is eminently adapted to flatulent habits, and hysteria. It relieves nausea, pain and cramp in the stomach and bowels, and obviates tenesmus. With ulmus fulva, it forms an excellent cataplasm for parts affected with gangrene; and, used in this same way, it is of eminent service in various ill-conditioned ulcers, fistula, scrofula, carcinoma, etc. Ginger is often found convenient as a corrector of the taste of less pleasant medicines. The Persians supposed ginger to have the property of clearing the brain; they consequently, in all their works, place it among their *cephalica*.

Pharmaceutic Preparations.—Ginger is usually taken in the form of a warm infusion or tea; commonly with other

articles. The dose of the powder is gr. x. to gr. xx., of the best article of white ginger; but it must be remembered that there are some kinds in market, that have not the strength in an ounce, that should be contained in a single dose. The tea is prepared by infusing ʒj. to ʒij. in Oj. of boiling water.

TINCTURA ZINGIBERIS: *Tincture of Ginger.* ℞. Ginger, in coarse powder, ℥ijss.; rectified spirit* Oij. Macerate for eight or ten days. The *dose* of this is fʒj. or fʒij.

Essence of Ginger is prepared in the same way as the tincture, only that a greater proportion of the ginger is taken. Some have attempted to increase its strength by distilling off some of the spirit; but this impairs the medicine, as the oil is driven off in the process.

Spirits of Ginger is prepared by distillation from the tincture in the common way, so long as the volatile properties of the ginger pass. It generally requires the distillation of about one third of the tincture.

Action—Use.—The tincture of ginger and those other preparations are applicable in most cases in which the root is given, and have the advantage of the smallness of the dose required. They serve well as a vehicle for other medicines. The most common use of the tincture, or essence and spirits, is in cases of colic, gastric pains, hysteria, flatulency, rheumatism and gout.

SYRUPUS ZINGIBERIS: *Syrup of Ginger.* ℞. Bruised ginger, ℥ijss.; boiling water, Oj.; sugar, ℔ijss. Macerate the ginger in the water for four hours, and strain; then add the sugar, and dissolve it. This is the officinal preparation of the London College, but it is not strong enough to be of much account, except as a vehicle in which to take other medicines, or as a means of flavoring stomachics.

A very good preparation of this kind may be made by dissolving a suitable quantity of white sugar in a strong tincture of ginger.

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* If prepared with proof-spirit, it becomes turbid by keeping, in consequence of the mucilage it contains.

PIPER NIGRUM.—The Fruit.

Synonyms.—Πεπερι, *Greek;* Pepo Nero, *Ital.;* Poivre Noir, *Fr.;* Schwarzer Pfeffer, *Ger.;* Germeine Pepper, *Dutch;* Pimenta Negra, *Span.;* Filfil Uswud, *Arab;* Lada, *Malay;* Miricha, *Java;* Sahan, *Pelambang;* Mellaghoo, *Tam.;* Gammiris, *Cyng.;* Mirialoo, *Tel.;* Meeritch, *Hind.;* Kali mirche, *Duk.;* Filfil seeah, *Persh.;* Micha, *Bali.;* Pimenta, *Port.;* Kaly meerchingay, *Mah.;* Hootseaou, *Chin.;* Black Pepper, *English.*

Botany.—*Sex. Syst.*—Diandria Trigynia. *Nat. Ord.*—Piperaceæ.

Gen. Char. Piper.—*Spadix* covered with flowers on all sides. *Flowers* hermaphrodite, rarely diœcious, each supported by a scale. *Stamina* two or more. *Ovarium* with one solitary, erect *ovule*. *Stigma* punctiform, obtuse, or split. *Berry* one-seeded. *Embryo* dicotyledonous, monocotyledonous, inverted—(*Blume*).

Spec. Char.—P. nigrum.—*Stem* trailing or climbing, shrubby, radicant, terete, dichotomatous, with tumid joints. *Leaves* alternate, distichous, ovate, acuminate, dark green and shining above, paler beneath; five to seven nerved, reticulate, coriaceous. *Spikes* opposite the leaves, situated near the extremities of the branches, pedunculate, long, slender, drooping. *Fruit* ripening irregularly throughout the year, sessile, green at first, then red, and ultimately black.

History and Habitation.—Black Pepper was known to the Greeks. Hippocrates* used it, and Dioscorides speaks of it. It was called πεπερι by both of these. Pliny† speaks of it as a condiment. But the Hindoos were the first who more thoroughly investigated its medical virtues.

The pepper plants are found growing native in various parts of the East Indies, and are cultivated for their fruit in Sumatra, Java, Malabar, etc., but are confined, it seems, to the longitude of from 90° to that of 115° E., and 5° S. latitude to 10° or 12° N., beyond which limits it is said not to be found.

The following estimate of the comparative production of

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* Enum. Plant. Javæ, p. 64.

† *Hist. Nat.* lib. xii., cap. 14, ed. Valp.

pepper, in the various parts in which it is cultivated, is made by McColloch—(*Dic. of Commerce.*)

Sumatra (*West Coast*),	20,000,000 lbs.
Do. (*East Coast*),	8,000,000
Siam,	8,000,000
Malabar,	4,000,000
Malay, peninsula,	3,733,333
Islands in the Straits of Malacca,	3,600,000
Borneo,	2,666,667
Total,	50,000,000

The pepper vine is propagated by cuttings, and is supported by props or trees. It begins to bear fruit the third or fourth year after it is set. The berries are gathered before they ripen, and are dried in the sun.

DESCRIPTION.—Black pepper consists of round, corrugated berries, of about the size of a small pea. Their shriveled appearance is caused by the drying of the succulent portion of the berry, and its thus shrinking upon the harder part. The bark may be easily removed when the berry ripens, and thus may be formed what is called *White Pepper*. The white pepper is also manufactured in this country and England, by soaking the pepper in water, to crack and loosen the integument, and then subjecting it to trituration when dry, and then winnowing.

COMPOSITION.—In 1819, a peculiar principle, called *piperin*, was discovered by Oersted, in which the active properties of the medicine was supposed chiefly to reside, especially its anti-intermittent properties. Luca, who analyzed the white pepper in 1832, could not procure the piperin, and concluded that it is contained alone in the succulent part of the berry. Pontet subsequently discovered it in the white pepper.

Piperin may be obtained by evaporating the alcoholic tincture of black pepper to the consistence of an extract, submitting the extract to the action of a strong alkaline solution, by which the oleaginous matter is converted into a soap, washing the undissolved portion with cold water, separating the liquid by filtration, treating the matter left on the filter with alcohol, and allowing the solution obtained in this way to evaporate

spontaneously. The piperin is deposited in impure crystals, which may be further purified by alternately dissolving and crystalizing it with alcohol or ether. The elementary constituents of piperin are C^{34} H^{19} NO^{6}. When pure, piperin is white, but as found with the druggists it is usually of a straw yellow. When perfectly pure, it is almost tasteless; but when it contains a portion of the resinous matter, it is proportionally pungent to the taste.

Besides *piperin*, black pepper, according to the analysis of Pelletier, contains an *acrid soft resin*, *volatile oil*, *extractive*, *gum*, *bassorin*, *starch*, *malic acid*, *tartaric acid*, *potash*, *calcareous* and *magnesian salts*, and *woody fiber*.

According to Luca, white pepper contains:

Acrid resin,	16·60
Volatile oil,	1·60
Extractive, gum, and salts,	12·50
Starch,	18·50
Albumen,	2·50
Woody fiber,	29·00
Water and loss,	19·29
White Pepper,	100·00

Physiological Effects.—The physiological effects of this article are very analogous to those of zingiber, only that they are less general in their extent through the system, or, in other words, they are more confined to the parts on which the primary impression is made. It was supposed by Van Swieten, Wilmer, Wendt, Lange, Jager, Pereira, and others, to have a tendency to produce an inflammatory condition in those to whom it was administered in full doses; and a number of other pernicious influences are said to result from its use. But it would seem, that, if it were possessed of properties capable of acting in this way, much more evidence would obtain on the point, from its very extensive and almost universal use as a condiment, as well as a domestic remedy. In their conclusions, these gentlemen no doubt were much influenced by the gratuitous idea, that all stimulating substances are phlogistic in their tendency when taken into the system.

THERAPEUTIC PROPERTIES.—Black pepper is a very active stimulant, but is less permanent and diffusive in its effects than the capsicums. When we wish to produce the prompt effect of a *powerful* stimulant, this article recommends itself. The medicine is more particularly adapted to languid conditions of the stomach and bowels, as in cases of chronic dyspepsia and flatulent colic. The author has witnessed the most prompt and decided benefit from its use in cases of the latter kind. It has long been in favor as a remedy in intermittents, and some have regarded it even a specific for those complaints; but it is not now much depended on as a febrifuge, in this country. Of late it is gaining some character with many of the profession as a remedy in gonorrhœa, and is considered by some, to be little inferior to the P. cubeba in those cases.

The piperin, in general practice, has very unjustly superseded the pepper, especially when prescribed as an intermittent; and it is certain that there are no other grounds for this than the force of book authorities. But since *dogmatism* has extinguished the spirit of inquiry among our authors, and they have become contented while within the tracks of their predecessors, it is easy to see that a *reiteration* of statements is necessary to every full volume on the science. Thus an article, once successfully introduced, will not soon lose its character. Nothing is more certain than that piperin lacks much of the activity of the pepper itself, and that it will in no case answer as a good substitute. It is not, however, here intimated, that, to insure all the good effects of pepper, it must necessarily be taken in substance; but, on the contrary, we may accomplish every object, in the use of an alcoholic extract (see *Oil of Black Pepper* below), that may be effected by the exhibition of the pepper in substance. This extract may be formed into pills, and in this way we may have every advantage that is claimed for piperin over the crude article, which is the *smallness of the dose.* This extract, made into an ointment, will destroy lice, and cure tinea capitis. If mixed with molasses, in proper proportions, it will destroy house flies. The dose of the powdered pepper is gr. x. to gr. xx., that

of the tincture, f℥j. The extract may be given in doses of gr. iij.—gr. v.

An invaluable confection for the cure of *piles* and *fistula* is made by incorporating well together, one part each, of the fine powder of piper nigrum, rad. inula helaneum, rad. glycyrrhiza, two parts of white sugar and honey, and three parts of fennel seeds. The dry articles are first well mixed, and then incorporated with the honey. Given internally. *Dose*, ℥j.—℥iv.

Oil of Black Pepper.—An oily extract may be obtained from the black pepper by evaporation of its Saturated Alcoholic Tincture to the proper consistence.

Action—Use.—A powerful stimulant and tonic, available in intermittents, remittents, neuralgia, colic, gastralgia, etc. Dose, gr. v.—gr. x.

PIPER LONGUM.—The Fruit.

Synonyms.—Pepe lungo, *Ital.;* Pimiento larga, *Span.;* Poivre longue, *Fr.;* Tipilie, *Tam.;* Pipuloo, *Tell.;* Pipilie, *Duk.;* Pipel, *Hind.;* Pippali, *Sans.;* Dar filfil, *Arab.;* Filfili dar az, *Persh.;* Tabee, *Mal.;* Chabi-jawa, *Jav.;* Langer Pfeffer, *Ger.;* Pipula moola, *India;* Long Pepper, *Eng.*

Botany.—*Sex. Syst.*—Diandria Trigynia. *Nat. Ord.*—Piperaceæ.

Gen. Char. Piper.—Vide P. Nigrum.

Spec. Char. P. Longum.—*Stem* shrubby, climbing. *Leaves* lower ones ovate-cordate, three to five-nerved; upper ones on short petioles, oblong, acuminate, oblique, slightly cordate at the base, obsoletely four to five-nerved and veined, coriaceous, smooth, grayish-green beneath. *Peduncles* longer than the petiole (Blume).* *Flowers* in dense, short, terminal, and nearly cylindrical spikes.

History and Habitation.—Piper Longum was early in use among the Hindoos, and is still extensively employed throughout the East. It is a native of South-Eastern Asia, and grows abundantly in Bengal and Hindostan. The fruit, which is green when immature, becomes red when it ripens. It is

* Enum. Fl. Javæ, p. 70.

gathered before it is mature, as it is then more pungent than when quite ripe.

Description.—There are several varieties of the long pepper, that have been described by travelers. In that produced in Bengal and Hindostan, not only the catkins or long berries are useful, but the thicker parts of the vine and root are also cut up and cured, and are equally pungent with the fruit. This variety has not quite so strong an odor as the common black pepper. The fruit of the long pepper that is indigenous to the Philippine and Sunday Islands, and is cultivated in Java and Sumatra, is very aromatic and pungent, even more so than that of the P. nigrum. The catkins are of a grayish-brown, or a pale cinnamon color, thick and terete. There are also other varieties named, as the *P. chapa* (Hunter), *P. sylvesticum* (Roxburgh), but which, perhaps, are identical with the two latter.

Composition.—Vide P. nigrum.

Physiological Effects.—As might be inferred from the proximate identity in the specific character, as well as composition, of the long with the black pepper, the physiological effects are very analogous. The permanency of the impression of the agent is somewhat dependent on the variety of the long pepper which is the subject of experiment—the Phillipine and Java pepper being the strongest.

Therapeutic Properties.—Piper longum is much esteemed throughout the East, particularly in Hindostan, as a stimulant and stomachic carminative. But it is still more extensively used for culinary purposes, in the character of a spice. In this country it has not been much introduced as a medicine or condiment. It may be given as a substitute for black pepper, in similar doses. It serves as an ingredient in several officinal preparations, as the *Pulvis Aromaticus*, of the Dub. and Lond. Pharmacopœias, *Pulvis Creta Compositus*, of the same, and the *Tinctura Cinnamomi Composita*, of the Lond. and Ed. Pharmacopœias.

Dr. Ainslie says that the Vytians on the coast of Coromandel, prescribe the infusion of this plant (the entire plant) with honey in catarrhal affections, when there is oppression from

phlegm (*Mat. Ind.*). The physicians of Hindostan, according to the observations of this traveler, prescribe the piper longum, which they call *pippali-mula*, in cases of palsy, tetanus and apoplexy.

PIPER CUBEBÆ.—The Fruit.

Synonyms.—Cubebe, *Ital.;* Kubeben, *Ger.;* Cubebas, *Span.;* Cubebe, *Fr.;* Kebabeh, *Arab.;* Kubab-chini, *Hindoo;* Vāl mellaghoo, *Tam.;* Dūmke mirchie, *Duk.;* Komoonkoos, *Mal.;* Salavamirrialoo, *Tel.;* Wal-gummeris, *Cyng.;* Sugandhă marichŭ, *Sans.;* Kumukus, *Jav.;* Lada burekor, *Malay.;* Koebeben, *Dutch;* Cubeb, *Eng.*

Botany.—*Sex. Syst.*—Diandria Trigynia. *Nat. Ord.*—Piperaceæ.

Gen. Char. Piper.—Vide P. Nigrum.

Spec. Char. P. Cubebæ.—*Stem* a perennial, climbing, terete, jointed, smooth, flexuous vine. *Leaves* petiolate, obovate, entire, acuminate, rounded or oblique, cordate at the base, nerved, coriaceous, smooth. *Peduncles* almost equal to the petiole. *Berries* with elongated pedicles. (*Blume.*)*

History and Habitation.—When the cubebs were first introduced into medical practice, is a matter not definitely known. We have no account of their use by the early Greeks. Some, however, contend that the καπησιον of Galen is the same as our commercial cubeb, and that it is also identical with the *round pepper* of Theophrastus, and with the *pepper* of Hippocrates. "The Arabians," says an English writer (*Hill.* Hist. of Mat. Med., p. 473), "are at the head of these blunders. Serapion has translated all that Galen says of capesion into his chapter of Cubebs, and attributed all its virtues to it, and has even added every thing to the account that Dioscorides has left us of the *Ruscus.* Avicenna is also in the same error, and calls the carpesium, *Cubeb;* and from these authors Actuaris and the other Greeks, have collected their accounts. It is plain from all this, that either the carpesium of the Greeks, and the cubeb of the Arabians, are the same thing, or else that the Arabians have been guilty of confounding

* Enum. Flor. Javæ. p. 70.

different things in a strange manner together. If the latter be the case, there is no judging of any thing from what they say; and if the former, it is very evident that our cubebs are not the same with theirs—that is, with the carpesium of Galen; for he expressly assures us that this was not a fruit or seed, but, as he tells us, a kind of slender, woody twig, resembling in smell and virtues the root of the valerian. Nothing is more evident, than that the carpesium, therefore, was either a fibrous root, or the small twigs and branches of a climbing plant, [the vine or root of the piper longum of the Hindoos?] not a round, small fruit. If the Arabians, therefore, were acquainted with our cubebs at all, it appears that, not knowing what the carpesium and ruscus were, they ignorantly attributed the virtues, ascribed by the Greeks to those medicines, to these fruits."

The native countries of this species of pepper are Java, Penang, and some parts of Africa. It is a wild plant growing in the woods, and does not appear to be cultivated. "The female plant is often distinguishable from the male, by habit and form of the leaf, but always by the catkins being thicker, and presenting, at maturity, an almost clustered appearance."

It is uncertain whether the cubebs of commerce are the products of a single species of the piper genus. Indeed, it has been affirmed by Blume, that none of the fruit of the officinal or p. cubeba, although of good quality, are ever sent to Europe, but that the *cubeba cania*, another species, which is more pungent, and has a smaller and shorter-stalked berry, and a distinct anise flavor, furnishes the most of the drug of commerce. Dr. Lindly, however, observes that he can not perceive any difference in the taste of the dried fruit of the former (p. cubeba), and the cubebs of the shops. Griffith* states that "cubebs are also furnished by *C bourboniensis* of the Isle of Bourbon," and which Fee referred to P. candatum, but which is a Brazilian species. The cubebs from the Cape of Good Hope, according to Miguel, are from *C. capensis*, and those from Guinea, from *C. clusii;* this latter is probably *piper of*

* Med. Bot. p. 568.

zelii, which is stated by Smith in Rees' Cyclopedia, and by Nees and others, to furnish Guinea cubebs, and which Lindly says is very different from the above (*piper cubeba*), and the quality of whose fruit is still to be ascertained. Miguel, in addition, believes that the cubebs of commerce are also in part from *C. sumatrana*, *C. nessii*, and *C. wallichii*.

It is very probable that the drug brought to us is not produced by one species, for, besides the opinion of the gentlemen above named, the evidence afforded on this point by the variety of effects, reported of its physiological and therapeutic action, goes far in its support.

Description.—The berries of the piper cubeba, which are the medical portion, are spherical, about the size of a pea, of a grayish-brown color, and have a stalk or peduncle attached, about two or three lines in length. They resemble the p. nigrum fruit, only that they are somewhat lighter colored, and of a little larger size. The cortical portion of the berry, which, in the recent state forms the fleshy part, appears to sustain a smaller proportion to the remainder, than the same part of the fruit of the p. nigrum does to its other portions. Within it, is a hard, spherical, whitish, oily seed. The taste of cubebs is acrid or pungent, like the other peppers, and the odor is camphorous and peculiar.

Analysis.—The constituents of Cubebs, according to Vauquelin and Monheim, are as follows:

Vauquelin's Analysis.	Monheim's Analysis.	
1. Volatile oil, nearly solid.	1. A green volatile oil . .	2·5
2. Resin, like that of copaiba.	2. A yellow volatile oil, .	1·0
3. Another colored resin.	3. Cubebin, ...	4·5
4. A colored gummy matter.	4. Balsamic resin, . . .	1·5
5. Extractive.	5. Wax, ...	3·0
6. Saline matter.	6. Chloride of sodium, . .	1·0
	7. Extractive, . . .	6.0
	8. Lignin, ...	65·0
	Loss, ...	15·5
Cubebs.	Cubebs.	100.0

Physiological Effects.—The effects of cubebs on the healthy system, are very analogous to those of black pepper, only

that they are more mild; or, in other words, cubebs are not so active a stimulant as is the black pepper. But while cubebs are less active as a general stimulant, their specific action is much more marked. They seem to have an obvious tendency to influence the kidneys and urino-genital organs. Given in full doses, they often produce active diuresis, and communicate their smell, or odor, to the urine, as well as deepen its color. Some have considered cubebs an acro-narcotic poison, and have reported effects of this character. These reports have, however, not been satisfactorily confirmed; and what is more, equally as much has been said, in this way against that species (P. nigrum), of this genus, which has been so long used in this country as a condiment, without any apparent unhappy effects; and the cubebs, likewise, themselves, have been, and are still, in very extensive use as a spice and condiment throughout the East; and we have never heard of any deleterious effects from such use. It is not denied, however, that there may be some species of this genus which may act in this way, when taken in large portions. The *Micropiper methysticum*, of the South Sea Islands, has narcotic properties. Dr. Griffith says, that when the bruised fresh root is macerated in water, it forms an intoxicating drink, which is in universal use among the inhabitants of the Pacific Archipelago.*

THERAPEUTIC PROPERTIES.—Cubebs are stimulant, carminative, stomachic, and occasionally diuretic. They, as already stated, are much used in the East as a stimulating spice, as well as a medicine. As a general stimulant, they are very analogous to black pepper, for which they may be substituted. Their chief application has, however, been confined, of late, especially in this country, to the treatment of affections of the urino-genital organs. As a remedy in gonorrhœa, the medicine has gained a high reputation. When given in large doses,

* The inhabitants of these islands consider this article a cure for syphilis. They drink it in quantities sufficient to produce intoxication, after which the patient breaks out with a copious sweat, which they promote till the cure is effected. M. Lawson remarks, that it is curious, that in so many countries, which have no communication with each other, this species of piperaceæ is used as a remedy for venereal affections.

in the onset of the disease, the discharge will usually soon cease, without the appearance of any other unpleasant symptoms; although some have stated, but perhaps without due investigation, that they have observed in the medicine a tendency to produce swelling of the testes. Dr. Pereira, of London, says, that he has never observed this affection to be more frequent after the use of cubebs, than when they were not employed; and Dr. Broughton states, that he gave them to fifty patients, and in forty-five they proved successful. Of these, he remarks, that only two had swelled testicles. Dr. Ainslie says that the Mahomedans use the cubebs in the treatment of gleet.

The control this medicine has over inflammation of mucous surfaces, does not confine its use to gonorrhœa, but it seems to be almost equally efficient in leucorrhœa and gleet. It is also recommended by Sir B. Brodie, in abscess of the prostate gland. Pereira recommends it in bronchial discharges. Their applicability in cases of gastric derangements, dependent on atony and relaxation of the organ, need scarcely be mentioned. Of late, cubebs have been found eminently useful in mucous dysentery.

The Indians macerate cubebs in wine, it is said, and take them to excite sexual feelings. The dose of the powder is ten grains to three drachms.

Pharmaceutic Preparations. **OLEUM CUBEBA**: *Oil of Cubebs.* This is procured by distilling the coarsely powdered berries with water, when they will yield about fifteen per cent. of a clear volatile oil, which is lighter than water, and seems to possess all the valuable properties of the fruit itself. It is composed of carbon and hydrogen, in the same proportion as in the oil of turpentine; its formula is C^{15} H^{12}. On keeping, deposits of camphorous crystals are formed, whose primary form is the rhombic octohedron. They possess the same odor of the cubeb, as well as its medical properties. The phenomena of crystallization are here dependent on the absorption of oxygen to produce, with the carbon, the water of crystallization.

Oil of Cubebs is an excellent and very convenient substitute for the powder. The dose, in the commencement of its use, is from ten to twelve drops, to be gradually increased as long as agreeable with the stomach. It has been given, without any obviously bad effects, in quantities as large as a fluid drachm.

It may be given in mucilage, or dropped on sugar. But the most common form of its exhibition in cases of gonorrhœa, is in connection with copaiva.

EXTRACTUM CUBEBA OLEIO-RESINA: *Oleo-resinous extract of Cubebs.* —This is made by digesting ℥iij. of the coarsely powdered berries, in Oj. of Alcohol, for six days in the sun, and then decanting carefully, pressing the dregs, and filtering the products, and then evaporating the whole to the proper consistence. The spirit may be saved by means of a retort.

This extract possesses most of the strength of the powder, in a much smaller and more convenient form. The dose is from five to ten grains.

TINCTURA CUBEBA; *Tincture of Cubebs.* ℞ Proof-spirits, Oij., coarsely powdered cubebs, ℥v. Macerate fourteen days and filter. The dose is ʒij. three times a day, or more. Its application is in all cases in which the powder is indicated.

CARYOPHYLLUS.—The Unexpanded Flowers.

SYNONYMS.—Καρυόφυλλον, *Greek;* Kerunfel, *Arab;* Craumboo, *Tam.;* Laong, *Duk.* and *Hind.;* Warrala, *Cyng.;* Lăvănga, *Sans.;* Chankee, *Malay;* Lawangum, *Tel.;* Mykhék, *Persh.;* Thenghio, *Chin.;* Wohkayulawang, *Jav.;* Buwah-lawang, *Bali;* Gewurznelken, *Ger.;* Garofani, *Ital.;* Girofle, Clous de Girofles, *Fr.;* Clavos de espicia, *Span.;* Cravo da India, *Portuguese;* Kruidnagle, *Dutch;* Cloves, *Eng.*

HISTORY.—We have but little account of the early history of our Clove. Paulus Ægineta and Myrepsius, however, mention it. It is thought by some, that as this is a native only of a few of the East India Isles, the Greeks and Romans probably did not find it very early. But although it is supposed by Royle, that they were not much acquainted with native plants east of the Bay of Bengal, yet it is certain that there are at least some articles that are peculiar to the most eastern parts of Asia and the East Indies, with which they were well acquainted at a very early day.

The Clove tree is a native of the Moluccas, where it grew in considerable abundance before their conquest by the Dutch, who, from motives of monopoly, had them destroyed, except those on a few islands over which they held exclusive control.

It is stated, that just before the Portuguese took possession of Amboyna, the seeds of the tree were secretly carried to Amboyna, Ceram, etc., from Machian, and in fifty or sixty

years, these islands were covered with young plants. On the conquest of these places by the Dutch, they extirpated them, with the exception of those in Amboyna, Ternate, and two or three other neighboring islands, in order that the product might not be too plentiful. In 1769, they ordered that the number of trees should not exceed 500,000, and a few years afterward, one-tenth of these were ordered to be destroyed, "Notwithstanding, however, the jealous vigilance of the Dutch, a French governor of the Isle of France and of Bourbon, named Poivre, succeeded, in the year 1770, in obtaining plants from the Moluccas, and introducing them into the colonies under his control. Five years afterward, the clove tree was introduced into Cayenne and the West Indies; in 1803, into the Island of Sumatra; and in 1818, into Zanzibar. It is now cultivated largely in these and other places; and commerce has ceased to depend on the Moluccas for supplies of this valuable spice."

Botany.—*Sex. Syst.*—Icosandria Monogynia. *Nat.—Ord.* Myrtaceæ.

Gen. Char. Eugenia.—*Linn.* Caryophyllus.—Tube of the *calyx* cylindrical; limb four-parted. *Petals* four, adhering by their points in a sort of calyptra. *Stamens* distinct, arranged in four parcels, inserted in a quadrangular, fleshy hollow, near the teeth of the calyx. *Ovary* two-celled, each cell containing twenty ovules. *Berry*, when ripe, one or two-celled, one or two-seeded. *Seeds* cylindrical or semi-ovate; *cotyledons* thick, fleshy, concave externally, sinuous in various ways internally; *radicle* arising from the center of the cotyledons, straight, spurious, hidden by the cotyledons.—*Trees. Leaves* opposite, coriaceous, dotted. *Cymes* terminal, or in the forking of the branches; somewhat corymbose.—*De Gand.*

Spec. Char.—C. Aromaticus.—A magnificent tree, with a trunk from fifteen to thirty feet in hight. The leaves are about four inches in length, with a strong midrib, and parallel lateral nerves: flowers odorous.

Rumphius (Herbarium Ambroi, tom. ii. p. 1), in speaking of the clove tree, says, "It appears to me to be the most beautiful and precious of all known trees."

In form the clove tree somewhat resembles the laurel. It has a smooth bark like the beech, and a straight trunk. Its leaves have a shining green color, and when bruised have a highly fragrant odor. The author had an opportunity of seeing several fine clove trees in the green-houses of Mr. Collins, of Macon, Georgia, whose taste in the culture of exotic plants is highly commendable.

DESCRIPTION.—Cloves consist of the unexpanded flowers of the clove tree, which are collected with the hands, or beaten down with reeds, in their proper season, and then quickly dried. Thus, when the commodity is not much handled, the long calyx contains the undeveloped corolla within its projecting points in a spherical form. The clove is something more than half an inch in length, and bears the fancied resemblance of a nail, and hence its name, from the French, *clou* (*a nail*). The best cloves are of a very dark brown color, perfect in their parts, not much shriveled, of a penetrating odor, exceedingly pungent taste, and which, when bruised, exude a small quantity of oil. Those brought from the East Indies, are usually the most esteemed.

IMPURITIES.—Cloves are never adulterated with other substances, but a fraud is sometimes practiced by the distilling their oil, and then drying and putting into market. Cloves thus treated are of a paler color, weaker flavor, and exude no oil on being pressed.

ANALYSIS.—Cloves, as analyzed by Trommsdorff (Gmelin, *Hand. de Chem.*), were found to contain, *volatile oil* 18, *resin* (almost tasteless) 6, *tannin* (a peculiar kind) 13, *extractive, with tannin*, 4, *gum* 13, *woody fiber* 28, and *water* 18.

M. Lodibert subsequently discovered a *fixed oil* (aromatic, and of a green color), and a *white resinous substance*, which crystallizes in fasciculi, composed of very fine, diverging, silky needles, without taste or smell. It is soluble in ether and boiling alcohol, and exhibits no alkaline reaction. This substance, called by M. Bonastre, *caryophyllin*, was found in the cloves of the Moluccas, of Bourbon, and of Barbadoes, but not in those of Cayenne. Berzelius considers this a stearoptene, and probably identical with that deposited by the oil of cloves

when long kept. Another crystalline principle was discovered by M. Dumas, which forms in water distilled from cloves, and is gradually deposited. It is soluble, like the above, in alcohol and ether, but differs from that substance in assuming a red color when touched with nitric acid. The name of *eugenin* is proposed for it by M. Bonastre. (*Jour. de Pharm.*, xx., 565.)

Water extracts the odor of cloves with comparatively little of their taste, and all their sensible properties are imparted to alcohol. The tincture, when evaporated, leaves an excessively fiery extract, which becomes insipid when deprived of the oil by distillation with water, and yet the oil which comes over is mild. It has hence been inferred, that the pungency of this aromatic depends upon a union of the essential oil with the resin.

Physiological Effects.—The physiological effects of cloves are very analogous to those of ginger, and differ little from the same of capsicum, only that they are not so notable.

Therapeutic Properties and Use.—Like its physiological effects, the therapeutic properties of this article also bear a similarity with the same of capsicum and zingiber, and may be used in the fulfillment of the same indications. Its aromatic properties, in many instances, recommend it in preference to either, as an ingredient of compounds, or as an accompaniment of other articles, the effects of which it is designed to modify or promote. The dose of the powdered cloves is from gr. x. to gr. xx., but may with impunity, be taken in larger quantities.

Pharmaceutic Preparations.—INFUSUM CARYOPHYLLI: *Clove Tea.* ℞ Cloves, ʒij.; Boiling Water, Oj. Macerate for two hours in a covered vessel; strain, and sweeten with white sugar. *Dose*, fʒj. to fʒij.

Action—Use.—Excellent in flatulent colic, weak stomach, gout, dyspepsia, and in such cases generally in which an active stimulant is required.

OLEUM CARYOPHYLLI: *Oil of Cloves.* This is prepared by distillation with water, and consists of two varieties—one heavier, the other lighter than water: both possessing all the active properties, taste, and peculiar odor of cloves. These two varieties of oil are usually mixed together, and form the oil kept in

the drug-stores. When fresh, it is of a light yellow color, but when old, becomes brownish or of a brandy color. It is exceedingly pungent, considerably volatile, and will thicken by evaporation. It is soluble in alcohol, ether, concentrated acetic acid and the fixed oils. Its composition, according to Ettling, is *Carbon* 74·6279, *Hydrogen* 8·1531, and *Oxygen* 17·2189. Cloves abound in oil, and will yield four ounces to the pound, by repeated cohobations.

Action—Use.—Stimulating and rubefacient. Internally, it may be used for the same purposes for which the cloves are prescribed. It is considerably used in the formation of cathartic pills, to prevent their griping, and to promote their operation. Put into a carious tooth it will often check it from aching. But by far the most important use of the oil of cloves is as a rubefacient; it enters into various liniments and bathing preparations. The *dose* is from five to ten drops, on sugar.

TINCTURA CARYOPHYLLI: *Tincture of Cloves.* ℞ Cloves, in coarse powder, ℥ij., alcohol, Oj. Macerate three days, and filter. *Dose*, min. x. to f℥j. Useful in sore-throat, colds, pain in the breast and stomach, flatulence, colic, etc.

ESSENTIA CARYOPHYLLI: *Essence of Cloves.* ℞ Oil of Cloves, ℥ij.; alcohol, Oj. Shake together. The dose and use of this is the same as those of the tincture.

CINNAMOMUM.

Synonyms.—Κιννάμωμον, *Greek;* Canella, *Ital., Port.;* Caneel, *Dutch, Dan.;* Canelle de Ceylon, *Fr.;* Kanahl Zemmet, *Ger.;* Cynamom, *Pol.;* Canela, *Span.;* Koriza, *Russ.;* Kárrúwā pūttay, *Tam.;* Kulmie darchinie, *Duk.;* Darchinie, *Per.* and *Hind.;* Kúrúndū, *Cyng.;* Sánálinga putta, *Tel.;* Kāìmanis, *Malay;* Darasita, *Sans.;* Darsini, *Arab;* Cinnamon, *Eng.*

History.—Cinnamon was known to the ancients. The Kinnemon of Exodus, xxx: 23, is our cinnamon. According to Herodotus, it seems that the Greeks learned the name *κιννάμωμον* from the Phœnicians.

Thus it appears that the knowledge of cinnamon was by no means confined to Asia, nor its growth to the island of Ceylon.

Pliny states that it grew in Ethiopia, and history informs us that Vespasian, on his return from Palestine, dedicated to the Goddess of Peace, in one of the temples of Rome, garlands of cinnamon, inclosed in polished gold. In the temple on Mt.

Palatine, built by the Empress Augusta, in honor of Augustus Cæsar, her husband, there was a root of the cinnamon tree set in a golden cup.

BOTANY.—*Sex. Syst.*—Enneandria Monogynia. *Nat. Ord.*—Lauraceæ.

Gen. Char. LAURUS: *Linn.* CINNAMOMUM.—*Flowers* hermaphrodite or polygamous, panicled or fascicled, naked. *Calyx* six-cleft, with the limb deciduous. *Fertile stamens* nine, in three rows; the inner three with two sessile glands at the base: *anthers* four-celled, the three inner turned outward. Three capitate *abortive stamens* next the center. *Fruit* seated in a cup-like calyx. *Leaves* ribbed. *Leaf-buds* not scaly.—*Lindley.*

Spec. Char. There are a number of species which yield the cinnamon of commerce, the most important are the following:

1. C. ZEYLANICUM or *true cinnamon tree.* This is a native of the island of Ceylon. Royle gives the following description from Nees, of this species: "The cinnamon tree of Ceylon is about thirty feet high. The root has the odor of cinnamon as well as that of camphor, and yields this principle upon distillation. The *twigs* are somewhat four-cornered, smooth, shining, and free from any downiness. The *leaves* are liable to variation, ovate or ovate-oblong, terminating in an obtuse point, triple or three-nerved, that is, there are three principal nerves, which some times remain separate to the very base, but usually approach each other a little above the *base*, but without uniting; there are moreover in many cases, two shorter nerves external to these. *Leaves* reticulated on the under side, smooth, shining, the uppermost the smallest, with a good deal the taste of cloves. The leaf-buds are naked. *Panicles* terminal and axillary. *Flowers* usually bi-sexual, rather silky. Perianth six-cleft, segments oblong, the upper part deciduous. *Fertile stamens* nine in three rows, the three inner with two sessile glands at the base. *Anthers* ovate, four-celled, the three interior opening outward. Three abortive capitate *stamens* (staminodia) in the interior of all. *Ovary* one-celled, with a single ovule. *Stigma* disk-like. *Drupe* (or berry) one-seeded, seated in the cup-like, six-lobed base of the perianth. *Seed* large, with large, oily cotyledons, embryo above. Native of Ceylon, now cultivated elsewhere, as on the Malabar coast, in Java, Cayenne, etc.

2. C. AROMATICUM.—This species affords a tree of about the same size and description as the former. The leaves, however, "differ" somewhat "in being oblong-lanceolate and pointed, and in exhibiting under the microscope a very fine down upon the under surface. The footstalks and extreme twigs are also downy," and the flowers are disposed in narrow silky panicles. The tree grows in China, Sumatra, and probably elsewhere in the East of Asia.

DESCRIPTION.—The cinnamon of commerce consists of several varieties, depending on the species of the plant from which it is obtained. These varieties are usually and justly considered separately.

α. CEYLON or TRUE CINNAMON: Cinnamomum Zelenicum.—This occurs in long, cylindrical fasciculi, consisting of numerous quills, the larger enveloping the smaller, which are about three feet long. They are of a light brownish-yellow color, smooth, nearly as thin as paper, somewhat pliable or tough, breaking with a splintery fracture. Its odor is exceedingly pleasant, and its taste sweet, aromatic, pungent, and slightly astringent. It yields but little oil, but what it *does* yield, is of a very superior quality, having an exceedingly fragrant and grateful taste.

This variety of cinnamon bears a very high price, and is hence not generally kept in the drug-stores of this country. It pays a duty in England of three shillings per pound. It is known by inspection and tasting. It may be observed, however, that this variety of cinnamon also admits of different sorts, and is hence distinguished in the London market into *firsts*, *seconds* and *thirds*, which are known by the thickness of the bark, the flavor and taste. The more inferior sorts are thicker, more pungent, darker colored, and somewhat bitter to the taste. Pereira says that Ceylon cinnamon may be known by its quills being cut obliquely at the bottom, while the other kinds are cut transversely.

β. CASSIA, or CHINESE CINNAMON.—This article, which is also sometimes called *Cassia Lignea*, supplies our market under the name of Cinnamon, when brought from any other port except Canton or other Chinese ports. When imported from the latter places it enters the custom-house as cassia. This is obviously produced by a different species from that yielding the true cinnamon. It is supposed to be the exclusive product of the *C. Aromaticum* already described.

As found in our market, cassia usually is in single tubes of various sizes, from an eighth to a full inch in diameter. The tubes are very rarely more than double, and are thus distinguished from the true cinnamon. Sometimes the bark is rolled upon itself in several folds, but again it is not even completely quilled. It is of a darker red color than the true Ceylon cinnamon; and is also thicker, rougher, denser, and breaks with a much shorter fracture. This, although its taste is somewhat similar to the other, is much less sweet, and less aromatic and grateful. But, on the other hand, it is much more pungent and permanently stimulant.

This is the kind of cinnamon kept in our shops or drug-stores, and is much cheaper than the Ceylon cinnamon. It is not much inferior to the other as a medicine, being stronger

and more permanent in its effects. This is the variety of cinnamon that furnishes much of the cinnamon oil of our shops.

Besides these three varieties, there are others, of less importance, as 1, The *Tellicherry* or *Bombay* cinnamon, which, however, is produced in small quantities, and perhaps seldom imported to this country; 2, The *Madras* or *Malabar*, which is of like character with the *cassia;* 3, The *Java*, which is said to be equal in quality to the *Ceylon;* 4, The *Cayenne*, which is not much known as yet.

Production.—In Ceylon, Java, and other places, the cinnamon tree is cultivated in what are called *cinnamon gardens.* The principal gardens on the former island lie in the neighborhood of Columbo (Percival). At peeling time, the *Choliahs* or *peelers*, select proper trees, and cut off such branches as are three years old, and which are straight and smooth. These branches are usually from half an inch to two inches in diameter. They are peeled by making longitudinal incisions through the bark, only two, opposite each other, on the smaller ones, and three or four on the larger. The bark is then raised by means of a peeling-knife. When it does not readily peel off, this is facilitated by friction, with the knife-handle. In twenty-four hours after, the outer bark is scraped off, and the quills of the Ceylon cinnamon are introduced within one another, thus forming a congeries of quills of considerable magnitude. After the bark is completely dried, it is tied up in bundles, with pieces of split bamboo twigs.

Commerce.—The amount of cinnamon imported is very astonishing. It seems, according to Dr. Wood, that the treasury returns, from the year 1820 to 1829, show an average annual import of six hundred and fifty-two thousand pounds from China, twelve thousand pounds from England, nine thousand pounds from the British West Indies, three thousand pounds from the West Indies, and small quantities from other ports, with an addition of twelve thousand nine hundred and thirty-eight pounds brought one year from the Philippines.

Analysis.—According to Bucholtz, 100 parts of *cassia lignea*

contain 6·8 of *volatile oil*, 4·0 of *resin*, 14·6 of *gummy extractive*, 64·3 of *lignin* and *bassorin*, and 16·3 of *water*, including *loss*. Vauquelin made a comparative analysis of the two cinnamons of Ceylon and Cayenne, and found the following to be constituents of both, viz: *Volatile oil*, *tannin*, *mucilage*, *coloring matter*, *resin*, *an acid*, and *ligneous fiber*. For the composition of the volatile oil, see *Oleum Cinnamomum*. Sesquichloride of iron precipitates the tannin of the infusion of cinnamon in the form of the *tanate of iron*, which is of a greenish flocculent consistence. The solution of gelatine also causes a precipitation of the tannin, and so perhaps will the acetate of lead.

Physiological Effects.—The physiological effects of true cinnamon well serve as an example of those of the species generally. On the mouth, it evinces a pungent, stimulating effect, more acrid, but not so powerful and permanent, as that of capsicum. In the stomach, it is warming and diffusive, producing a gentle glow over the body, and an acceleration of the pulse. The general functions of the system are promoted, but more particularly those of the digestive apparatus. Externally, it is actively rubefacient.

Therapeutic Properties and Use.—Cinnamon is a valuable aromatic stimulant, which, from its very agreeable taste, is preferable to most other articles of this class. Capsicum, zingiber, and perhaps a few others, only are more valuable because they are more permanent in their effects. Cinnamon is serviceable in all cases in which a pure stimulant is indicated, as in cases of feeble vital reaction. Low and putrid fevers, palsy, choleras, dysentery, diarrhœa, rheumatic and gouty affections, etc., require medicines of this class. Cinnamon is also carminative, and will relieve colic and pain in the stomach and bowels generally. It is valuable as an adjuvant to other stimulants, and which are less pleasant to the taste. The dose of the powder is gr. x.—gr. xxx.

Pharmaceutic Preparations.—**OLEUM CINNAMOMI**: *Oil of Cinnamon*.—The oil of Cinnamon, like the bark, consists of different varieties; the chief of these, however, are those of the Ceylon cinnamon and the cassia, or Chinese cinnamon. Some writers have treated these under different heads (which

applies also to the bark), but as their properties are so very nearly alike, the author will here consider them together.

Oil of cinnamon is prepared from the inferior sorts of the bark—such as will not pay exportation, and such as has been damaged in curing. It is obtained by distillation with water. The bark, in the first place, is coarsely ground, and then macerated for a few days in sea-water, before distillation. The product is a light, and heavy oil, the former of which separates on the top of the water; the latter gradually precipitates, for ten or twelve days, to the bottom of the receiver. The water, however, still retains a little of the oil, and makes a saving to use it in subsequent distillations. Eighty pounds of the bark, when fresh, yield about two and a half ounces of the lighter oil, and five or six of the heavy. When the bark is old it yields less, by about one-eighth or tenth.

Fresh oil of cinnamon is of a light-yellow color, but becomes deeper or reddish as it gets older. It has all the flavor, odor, and taste of the bark, and possesses all its medical virtues, except its slight astringent property. It is exceedingly pungent and acrid to the taste—more so than capsicum.

Oil of Cassia, or Chinese cinnamon, is still more pungent than that of the Ceylon cinnamon, and its taste is also more lasting; but it, like the bark, is less spicy and aromatic, or fragrant. It is isomeric with the true cinnamon oil.

Cinnamon oil is composed of C^{18} H^{7} O^{2} + H, and is regarded by chemists as a Hyduret of Cinnamyle. When exposed to the air, it absorbs oxygen, and thus some cinnamic acid is formed, as well as some resin.

Use.—It is a very powerful and active stimulant, serviceable in all cases in which the bark is indicated. The dose is from min. iij.—min.vj. It is one of the most valuable rubefacients, and makes an ingredient in many liniments.

AQUA CINNAMOMI: *Cinnamon Water.* ℞ Bruised Cinnamon, ℔jss. (℥xviij. *Ed.* ℔j. *Dub.*) or Oil of Cinnamon, ʒij. *Lond.* (ʒiij. *Dub.*) Proof-spirit, f℥vij. *Lond.* (Rectified, f℥iij. *Ed.* Aq. Cong., ij. q. s. to prevent empyreuma); macerate for one day, and distil off Cong. j.

℞ Oil Cinnamon, f℥ss.; Carbonate of Magnesia, ʒss.; Distilled Water, Oij. U. S.

Action—Use.—Cinnamon Water is chiefly used as a vehicle for other less pleasant medicines. It is, however, carminative, and somewhat stimulant. That prepared by means of sugar or magnesia will sometimes spoil by keeping.

SPIRITUS CINNAMOMI: *Spirit of Cinnamon.* ℞ Oil of Cinnamon, ʒij.; Proof-spirit Cong., j.; Water, Oj. Mix and distil with a slow fire, one gallon.

Action—Use.—A stimulant. Dose, fʒj. to fʒiv.

TINCTURÆ CINNAMOMI: *Tincture of Cinnamon.* ℞ Cinnamon, in coarse powder, ℥iijss.; Proof-spirit, Oij.; Macerate twelve or fourteen days, and filter, or proceed by percolation.

Action—Use.—A stimulant more powerful than the spirit. Dose, fʒj. to fʒiij.

TINCTURA CINNAMOMI COMPOSITA: *Compound Tincture of Cinnamon.* ℞ Bruised Cinnamon (in fine powder, if percolation be followed), ℥j.; Cardamom in coarse powder, ℥ss.; Long Pepper (black will do) powdered, ℥ijss.; Ginger, ʒijss.; Proof-spirit, Oij.; Macerate for fourteen days, and strain. Percolation affords the best means of preparing this tincture.

Use.—An excellent aromatic cordial. Dose, from fʒj. to fʒiij.

ESSENTIA CINNAMOMI: *Essence of Cinnamon.* ℞ Dissolve ʒij. Oil of Cinnamon in Oj. Alcohol.

PULVIS CINNAMOMI AROMATICUS: *Aromatic Cinnamon Powder.* ℞ Cinnamon, ʒii.; Cardamom, ℥jss.; Ginger, ℥j.; Long Pepper (black will do) ʒss.; Pulverize separately and mix.

Action—Use.—Carminative, and aromatic. Dose, gr. x. to gr. xxx.

CONFECTIO AROMATICA: *Aromatic Confection.* ℞ Cinnamon, Nutmegs, āā ℥ij.; Cloves, ℥j.; Cardamom Seeds, ℥ss.; Saffron, ℥ij.; Prepared Chalk, ℥xvi.; White Sugar, ℔ij. Pulverize and mix. This mixture may either be kept in powder and made into a pulp as it is used, or it may at once be made by working in ℔j. of Aqua. The advantage of making it into a pulp, as it is wanted, is, that in this way fermentation is avoided, which sometimes takes place when it it is all made up at a time. The Edinburgh College orders the *Aromatic powder* to be made up with Syrup of Orange Peel, and leaves out the Chalk. The U. S. Pharmacopœia orders the powder to be made up with Syrup of Orange Peel and Clarified Honey.

Action—Use.—Aromatic confection is slightly stimulant, carminative, and antacid, when not containing acids. Dose, gr. x. to ʒj.

ELPLASTRUM AROMATICUM: *Aromatic Plaster.* ℞ Cinnamon Bark, powdered, ʒvj.; Frankincense (*Thuss.*), ℥iij.; Essential Oils of Alspice and Lemons, of each, ʒij.; Yellow Wax, ℥ss.; melt the Frankincense and Wax together, and strain; when they are beginning to thicken by cooling, mix in the Powder of Cinnamon, rubbed up with the oils, and keep close. When spread, it should be exposed to heat as little as possible, to prevent the evaporation of the essential oils.

Action — Use. — This forms an excellent application to the epigastrium in dyspepsia and gastric irritability. It allays pain and nausea, and expels flatus.

CARDAMOMUM.—The Seed.

Synonyms.—Kardemomen, *Ger.;* Cardameme, *Fr.;* Cardamomo, *Ital., Span.;* Kakelah seghar, *Persh.;* Ebil, or Kakúlé Kibbar, *Arab.;* Burrie, or Gujaratii elāichi, *Hind.;* Kapulaga, *Mula. Jav.* and *Bali;* Cardamongoo, *Port.;* Cardamom, *Eng.*

History.—Cardamoms were probably the *καρδαμωμον* of the Greeks, though it is difficult to prove the point. A great variety are known, and have been ably examined by Dr. Pereira in his Elements. It is difficult, however, to refer them all to their respective plants. There is no doubt but that the officinal Cardamom is produced in Wynaad and Coorg, on the coast of Malabar, and by the plant so fully described and figured by Mr. White, and communicated by the Directors of the East India Company to the Linnean Society (v. Trans. x. p. 229), as well as by Dr. Roxburgh. (Fl. Indica, ed. Wall. i. p. 68). By Dr. Maton it was formed into a new genus, *Elettaria*, where it is best retained until a reëxamination of the family is made by a competent botanist.

Botany.—*Sex. Syst.*—Monandria Monogynia. *Nat. Ord.*—Scitimineæ.—*Brown.* Zingiberaceæ.—*Lindley.*

Gen. Char. Elettaria.—*Corolla* with inferior border unilabiate. *Anther* double, naked. *Capsule* berried, three-celled. *Seeds* a few, or numerous, arilled.—*Roxburgh, Asiat. Research.*, vol. xi. p. 350.

Spec. Char. There are various species that contribute in furnishing the Cardamoms of commerce. The following is the description of the *Elettaria cardamomum*, which is supposed to

produce the true, or officinal drug: "*Rhizoma* with numerous fleshy fibers. *Stems* from six to nine feet high. *Leaves* lanceolate, acuminate, pubescent above, silky beneath. *Scapes* or flowering racemes, from the base of the stem compoundly flexuose, procumbent. Outer rim of the *corolla* in three oblong lobes, inner a single lip. *Anther* of two distinct lobes. *Filament* with two transverse lobes at the base, emarginate, and simple at the summit. *Capsule* of three cells and three valves, with a central receptacle. *Seeds* rough, tunicated."

It has a tuberous horizontal *root*, beset with numerous fibers, and sending up from six to ten, or even sometimes twenty erect, simple, smooth, green, and shining, perennial *stems*, which rise from six to twelve feet in hight, and bear alternate and sheathing *leaves*. These are entire, elliptical, lanceolate, pointed, and from nine inches to two feet long, and from one to five inches broad, with short footstalks and strong midribs. The scape proceeds from the base of the stem, and rests upon the ground, with the flowers disposed in the form of a panicle.

DESCRIPTION.—A number of different varieties of cardamoms are found in market, among which the following are the most important:

α. ROUND CARDAMOM: (*Amomum cardamom*).—This is a product of Sumatra, Java, and other East India Islands. The fruit is roundish, about the size of a cherry, rather ovate, with three convex sides, somewhat striated longitudinally. They have an aromatic camphorous smell. This is supposed to be the *Αμωμον* of Dioscorides.

β. JAVA CARDAMOM: (*Amomum maximum*).—This variety of the fruit has received its name from the Island Java, but improperly, as it seems not to be produced by this alone. The capsules are oblong or oval-oblong, and sometimes ovate, from three-fourths of an inch to an inch and a half in length, and about eight lines broad, being usually flattish on one side, and convex on the other. They have a feeble, aromatic taste and smell.

γ. CEYLON CARDAMOM: (*Elettaria major.*)—This, which is variously called *wild cardamom*, *C. medium*, *C. majus*, *C. longum*, etc., is a lanceolate, oblong capsule, acutely triangular, more or less curved, with flat and ribbed sides, about an inch and a half in length, and, perhaps, four or five lines in breadth.

This variety has an aromatic, but peculiar odor, and somewhat spicy flavor.

δ. MADAGASCAR CARDAMOM: (*Amomum Angustifolium.*)—The species producing this variety is a native of Madagascar, growing in marshy ground. The capsule is larger than any of the rest, ovate, pointed, flattened on one side, striated longitudinally, with a broad, circular umbilicus or spot at the bottom, surrounded with an elevated, notched, and corrugated margin. It has an aromatic flavor analogous to that of the Malabar cardamom.

ε. GRAINS OF PARADISE: (*Amomum grana-paradisi.*) alias *malaguretta pepper, guinea grains.*—This consists of small seeds of a round or ovate form, angular, or cuneiform. They are minutely rough, white within, but brown without. When rubbed between the fingers, they emit a feebly aromatic odor, and to the taste they are exceedingly pungent and peppery.

ζ. LESSOR CARDAMOM: (*Elettaria Cardamomum*).—This is the officinal cardamom. It is divided into three sorts, called the *shorts, short-longs* and *long-longs.* The first of these is from three to six lines long, and from two to three broad, and somewhat more coarsely ribbed than the other sorts. This is the most esteemed. The second, or *short-longs* is from five to seven lines in length, and about the same breadth as the former. The *long-longs* has a seed from three-quarters of an inch to an inch in length, and of a width about equal to that of the other varieties. Both the latter varieties are sometimes somewhat acuminate and generally more pale in color than the shorts.

ANALYSIS.—In 1834 Trommsdorff analyzed the small cardamom, and obtained the following results: *Essential oil* 4·6, *fixed oil* 10·4, a *salt of potash* (malate? *Pereira*), combined *with a coloring matter* 2·5, *fecula* 3·0, *nitrogenous mucilage* with *phosphate of lime* 1.8, *yellow coloring matter* 04, and *woody fiber* 77.3.

MEDICAL PROPERTIES AND USE.—Cardamoms are among the most agreeable, non-acrid, pleasant tasted, and sweet-flavored aromatic stimulants. But they are most valuable, only as an adjunct to less pleasant and more powerful remedies. They are, hence, seldom used alone, but generally in combination with cathartics, stimulants and tonics, to modify their tastes and effects, as well as favor their operation. When taken in substance the dose is from gr. v. to gr. xx. They enter into not less than sixteen of the officinal formulas.

BENZOIN ODORIFERUM.—The Bark and Berries.

SYNONYMS.—LAURUS BENZOIN, *Linn.;* Spice Bush, *Eng.;* Fever Bush, *Vul.*

BOTANY.—*Sex. Syst.*—Icosandria; Enneandria, *Linn. Nat. Ord.*—Lauraceæ, *Linn.*

Gen. Char. BENZOIN.—*Calyx* four to six parted. *Corolla* none. *Nectaries* three. *Stamens* varying from three to fourteen, in two or three rows, inner series barren—often diœcious. *Fruit* succulent, seated on the permanent calyx.

Spec. Char. B. ODORIFERUM.—An indigenous shrub, growing from four to ten feet in hight, and delighting in moist, rich soil, or river-bottoms. *Leaves* cuneo-obovate, entire, subpubescent beneath. *Flowers* in clustered umbels, appear before the leaves. *Berries* oval, of a shining crimson color when ripe. All parts of the shrub have a spicy agreeable flavor, which is strongest in the bark and berries.

MEDICAL PROPERTIES AND USE.—A very pleasant spicy stimulant and tonic. Useful in decoction, as a drink in fevers. It has been considered a specific for intermittents. The berries have been highly recommended as a stimulant in rheumatism. By distillation, the branches, bark, and berries yield essential oil containing all the stimulant virtues, but not the tonic. The dose of the latter is min. x.; that of the infusion f℥iij.

MEZEREUM.—The Bark.

SYNONYMS.—DAPHNE MEZEREUM, *Dub.;* Kellerhals, *Ger.;* Bois gentil, *Fr.;* Mezereo, *Ital.;* Mecereon, *Span.;* Mezereon, *Eng.*

BOTANY.—*Sex. Syst.*—Octandria Monogynia. *Nat. Ord.*—Thymelaceæ.

Gen. Char. DAPHNE.—*Calyx* none. *Corolla* four-cleft, withering, inclosing the stamens. *Drupe* one-seeded.

Spec. Char. Various species are medicinal, but only two are officinal, the D. MEZEREUM and the D. GNIDIUM. Daphne Mezereum is a hardy shrub, common to England and the adjoining continent. It grows three or four feet in hight, with a branching stem, and smooth, dark gray bark. The leaves are deciduous, sessile, obovate, lanceolate, entire,

smooth, pale green, and about two inches in length. The flowers are highly fragrant, of a pale rose color, disposed in clusters, and appear early in the spring, in advance of the leaves. The fruit is an oval, fleshy, red berry, having a single round seed.

The *D. Gnidium* has narrow leaves white downy flowers, and black berries.

DAPHNE MEZEPEUM.

DESCRIPTION.—The bark of the root was first employed, and is still considered the best. But the bark of the stem is what supplies our market. This comes in long strips, about an inch in width, sometimes flat, and again it is rolled. It is also sometimes wrapped in the shape of balls. The inner bark which is the medical portion, is tough, fibrous, striated and whitish in color. It is covered with a reddish-brown, wrinkled epidermis. Its taste is at first mild and sweetish, but afterward becomes exceedingly acrid and even corrosive.

ANALYSIS.—Gmelin and Bär discovered in this bark a peculiar, brilliant, crystalline, colorless, bitter principle, which is called *Daphnin*, and which has been supposed to possess the medical powers of the bark, but is now proven to be of but little activity. The other constituents, according to these gentlemen, are: *Wax*, *acrid resin* (which probably is the active medical principle), *yellow coloring matter*, a *reddish-brown extractive matter*, an *uncrystallizable* and *fermentable sugar*, *azotized gummy matter*, *lignin* and *malic acid*.

THERAPEUTIC PROPERTIES AND USE.—Mezereon, as the bark is generally called, has been for many years in popular use in the regular profession as a stimulant, topical excitant and vesicant. It has been supposed to possess special antisyphilitic properties, and still holds a position as such, in the formula for the Comp. Syr. Sarsaparilla of the U. S. P.

Mezereon is also regarded as a valuable remedy in certain cutaneous diseases, and chr. rheumatism, scrofula and paralysis.

Its topical and endermic application, however, is now regarded as the most important. In this use it proves revulsive, sometimes vessicant, and has been serviceable when applied to surfaces in proximity to organs in high states of acute inflammation. In form of plaster (*irritating plaster*), it has been employed with benefit in chronic hepatitis, pleuritis, splenitis, nephritis and pneumonia.

On the whole, the internal employment of mezereon, can not be considered judicious, since the drug is certainly too acrid and irritant, as also narcotic. Other articles much more mild will entirely supply its place.

The dose of the bark in substance is gr. x. But it is seldom employed in this way, even in the old practice; its internal use being mostly limited to the employment of the Comp. Syr. of Sarsaparilla.

MYRISTICA.—The Fruit.

Synonyms.—Jādicāi, *Tam.;* Jáéphal, *Hind.;* Jātiphala, *Sans.;* Jayaphala, *Beng.;* Jatipullum, or Sādikka, *Cyng.;* Jāphul, *Duk.;* Jouz bewá, *Pers.;* Jowzalteib, *Arab.;* Jaiphul, *Hind.;* Buah-pala, *Mal.;* Woh-pala, *Jav.;* Buwah-pa, *Bali;* Jājikāia, *Tel.;* Gasori, *Ternat.;* Noz-moscada, *Port.;* Japhul, *Mah.;* Muskaatnoten, *Dutch;* Noix Muscade, *Fr.;* Muskatnuss, *Ger.;* Noee, Moscata, *Ital.;* Nuez Moscada, *Span.;* Nutmegs, *Eng.*

Botany.—*Sex. Syst.*—Dicœcia Monodelphia. *Nat. Order.*—Myristicaceæ.

Gen. Char. Myristica.—Male: *Calyx* none. *Corolla* bell-shaped, trifid. *Filament* columnar. *Anthers* six or ten, united.

Myrisfica muscata.

Female: *Calyx* none. *Corolla* bell-shaped, trifid, deciduous. *Style* none. *Stigmas* two. *Drupe* with a nut involved in an arillus, with one seed.—*Willdeno.*

Spec. Char. M. Muscata.—A tree 20 to 30 feet high, with erect branches. *Leaves* petiolate, aromatic, oblong, acuminate, smooth, simply nerved. *Flowers* small, pale-yellow, in axillary racemes. *Fruit* pyriform,

about the size of a peach, smooth, dehiscing by two nearly equal longitudinal valves, and exposing the fleshy, scarlet arillus (*mace*), closely embracing the shell, within which is contained the kernel (*the nutmeg*). This latter is about the size of a plum, or about eight or ten lines in diameter, rather oblong, or oval, in shape. Their taste is aromatic, spicy, and oily. *Mace*, or the investing membrane of the nutmeg, in shape is flat, membranous, irregularly split; is soft, or flexible, of a reddish or orange-yellow color, and has the taste and smell of nutmegs.

Nutmegs abound in a concrete oil, which may be obtained by heat and pressure. It is solid when cool. This oil is usually, though improperly, called *oil of mace.*

Mr. Bonastre, it is said, on analyzing nutmegs, obtained, from 800 parts, 120 parts of a *white, insoluble oily substance* (*stearine*); 38 of a *colored soluble oil* (*olein*); 30 of *volatile oil;* 4 of *acid;* 12 *of fecula;* 6 of *gum;* 270 of *lignin;* 20 parts *lost.* The volatile oil of nutmegs is, like most essential oils, obtained by distillation with water. Alcohol and ether take up the active, or medical properties, of either mace or nutmegs.

Medical Properties and Use.—The Mace is a favorite medicine with the Hindoo doctors, who prescribe it in fevers, consumption, humoral asthma, and chronic dysentery. But they say that it must be used cautiously, as it is a narcotic. The Arabians place *mace* among their *mafeshyat*, or carminatives.

Mace is much employed in Europe, as a culinary spice.

The Nutmeg or fruit proper is more agreeable in taste, being less pungent, and is more used at present, than the mace. The two substances are regarded by the profession and treated by authors, as being alike in their medical properties, both being spicy or aromatic stimulants. Yet it is evident that mace is eminently more excitant or stimulant than the nutmeg.

It is now well known, however, that both the nut and the shells (mace), are narcotic, as declared by the Arabian writers, and hence we have no further use for them in this con-

nection. We are by no means deficient in aromatic stimulants; we can supply the place of this agent by scores of others, that will act in complete harmony with all the vital functions.

This article receives its place here more with a view of the opportunity of making the present remarks, in regard to its unfitness for use, than from any thoughts of its worth.

Order II.---VOLATILE STIMULANTS.

There is much uniformity in the therapeutic effects of those stimulants whose virtues are dependent upon an essential oil. They all require, also, about the same menstrua, and are, therefore, fully entitled to the character of a separate order.

The articles comprised in this order, although very serviceable in many varieties of disease, are not generally much relied upon in violent attacks, which require very potent and permanent stimulants.

The volatile stimulants are peculiarly indicated in many affections, both chronic and acute, particularly those that implicate the functions only, as in cases of dyspepsia, colic, hysteria, amenorrhœa, and many nervous derangements. But their effects are very transient, and when given as substitutes *for*, or auxiliaries *to* the more powerful stimulants, they must be administered in frequent doses.

As has been remarked above, the virtues of these plants reside in an essential oil; this, therefore, is most commonly used alone instead of the entire substance, as in some other cases. This oil is obtained by distillation with water. Alcohol is the proper *menstruum* for tinctures. But, while combined with gummy and extractive matters, as they exist in the plants, they will be taken up, to a considerable extent, by water, particularly when at an elevated temperature. This is illustrated in the solution of the essential oils in water, by the interposition of sugar, etc.

CAMPHORA.

Synonyms.—Camphora Officinarum (Nees); Laures Camphora, *Linn.;* Dryobalanops Camphoræ, *Dub.;* Canfora, *Ital.;* Kampher, *Ger.;* Camphre, *Fr.;* Kampher, *Danish;* Kamfer, *Dutch;* Alcanfor, *Portuguese;* Kamfora, *Polish;* Kanfora, *Russian;* Kanfor, or Alcanfor, *Span.;* Kamfer, *Swedish;* Kaphoor, *Arab.;* Cárpooram, also Soodun, *Tam.;* Cápooroo, *Cyng.;* Kāfoor, *Pers.;* Kaafur, *Malay;* Kupoor, *Hind.;* Kāpur, *Bali;* Camphor, *Eng.*

Botany.—*Sex. Syst.*—Enneandria Monogynia. *Nat. Ord.*—Lauraceæ.—*Lindley.*

Gen. Char. Laurus. — *Flowers* hermaphrodite, panicled, naked. *Calyx* six-cleft, papery, with a deciduous limb. *Fertile stamens* nine, in three rows, the inner with two, stalked, compressed glands at the base; *anthers* four-celled, three outer turned inward, the inner outward. Three *sterile stamens*, shaped like the first, placed in a whorl alternating with the stamens of the second row; three others stalked, with an ovate, glandular head. *Fruit* placed on the obconical base of the calyx.—*Lindley.*

Spec. Char. L. Camphora; or C. Officinarum.—*Leaves* triple-nerved, shining above, glandular in the axils of the veins. *Panicles* axillary and terminal, corymbose, naked. *Flowers* smooth on the outside.—*Nees.*

Young *branches* yellow and smooth. *Leaves* ever-green, oval, acuminate, attenuate at the base, bright green and shining above, paler beneath. *Petioles* from one inch to one and a half inches long. *Panicles* axillary and terminal, corymbose. *Flowers* small, yellowish-white. *Berry* round, blackish-red, size of a black currant. *Seed* solitary.—*Pereira.*

The flowers and fruits of some of the species of the Laurus genus, present such striking differences in their structure, that botanists have been induced to make new arrangements of them; accordingly the camphor, cinnamon, and sassafras trees have been separated from the Laurels by Nees von Essenbeck, and made the examples of a distinct genus.

The camphor tree is an ever-green, grows to a considerable size, is straight below and branched. All parts emit a cam-

phorous odor when bruised. *Wood* white, fragrant; much used in China for making trunks, boxes, etc. *Branches* somewhat lax, smooth, with a greenish bark. *Leaves* alternate with long petioles, ovate-lanceolate, rather coriaceous, smooth, shining, and bright-green above, paler beneath, with a sunken gland opening by a pore beneath, at the axils of the principal lateral veins. *Leaf-buds* scaly. *Perianth* six-cleft, with a deciduous limb. *Stamens*, fertile ones, nine in three rows, the three inner supported at the base with two stipulate compressed glands. *Anthers* four-celled, opening by as many ascending valves, the three interior looking outward, the others opening inward. Three sterile stamens subalternate with those of the second row, the three others stipulate, each with an ovate head. *Drupe* situated in the truncate, cup-like base of the perianth.— *Royle.*

History and Preparation.—It is not certain when camphor was first known; we have no certain evidence that the ancient Greeks and Romans had a knowledge of it. Bauhin, Alston,* and others, however, state that Ætius speaks of it. Avicenna and Serapion mention it; and Simeon Seth, in the eleventh century, described it. The Arabians, perhaps, had the earliest knowledge of it.

The camphora officinarum is a native of Eastern Asia, and is found abundantly in China, Japan, and Cochin-China. It was introduced into Java from Japan, and is now cultivated there. Many of the Botanical Gardens of Europe contain specimens of it. The camphor is found in every part of the tree, even in the leaves and flowers. It exists in grains in the wood, and is obtained by chopping up the wood and heating the chips with water in iron boilers, to which an earthern head, containing straw is attached. The camphor sublimes and condenses on the straw. As thus obtained, it is brought to Europe, where it is further sublimed and purified.

Although the camphora officinarum yields all the camphor of commerce, yet it is not the only species of this genus that yields it. It is thought that every individual species of the entire

* Lect. on Mat. Med., vol. ii. p. 406.

laurus genus yields camphor. It sometimes oozes from the bark of the root of the cinnamon tree, in the form of oily drops, which gradually concrete into white grains. These are called *camphura baros Indorum;* when it exudes in this way from the bark of the camphor tree, it is named *camphora rudis* (Parr). Moreover, we find that the species of other genera produce it; as, for instance, the more tender vegetables, *thyme*, *peppermint*, *sage*, and many of the labiate plants. Camphor is not, therefore, considered a peculiar abstract constituent; but like *gum*, *resin*, extractive, etc., is an absolute organic principle or element.

Description.—The drug, as it appears in Europe in its *crude* or *unrefined* state, consists of two varieties, called *Dutch*, or *Japan Camphor*, and the ordinary *crude*, or *Chinese Camphor*, so named from the parts whence they are imported.

α. Dutch Camphor.—This is imported in tubs covered by matting, and each surrounded by a second tub, secured by twisted hoops of cane. The tubs contain about one cwt., or more, each. The camphor consists of grains of a pinkish color, which adhere in the formation of various-sized masses. The grains are larger than those of the Chinese camphor, and the drug sublimes easier, or at a lower temperature, and hence usually bears a better price.

β. China Camphor.—This comes in square boxes, lined with lead foil, holding from one and a quarter to one and a half cwt. each. This sort consists of dirty grayish grains, sometimes more or less wet, but at others in a better condition, and even equal to the Dutch camphor.

Purification.—When camphor is brought to Europe, it is further sublimed and purified by means of vessels called bomboloes, from *βομβυλιος*, *bombola*. They are made of glass, of an oblate spheroid shape, about twelve inches in diameter, furnished with a short open neck. The *bombolo* is filled with the crude camphor, and then placed in a sand-bath, and heated, so as to melt the camphor, when lime is added, and the heat raised so as to make the liquid boil. The vapor condenses on the upper part of the vessel, and as the process advances, the sand is gradually removed from the top downward, so as to favor the condensation of the vapor. In from forty to forty-eight hours, the process is usually completed,

when the vessels (they usually have a number in use at a time) are removed, their mouths closed with tow, and water sprinkled over them, by which the glass is cracked and disengaged, when each will present a large cake of beautiful camphor, weighing, perhaps, a dozen of pounds. The impurities, together with a small portion of camphor, are retained by the lime, from which the camphor is again obtained in a manner somewhat similar to that by which it is first procured from the wood.

Physical Properties.—Camphor, as it occurs in its refined state, is in large hemispherical cakes, perforated in the middle, or variously broken in pieces. It is translucent, solid at ordinary temperatures, very aromatic, of a crystalline, granular nature, and bitter, aromatic, pungent, and cooling taste. It is rather unctuous to the touch, and moderately tenacious, but still is somewhat friable, and with the addition of a little alcohol, may be readily pulverized. Its fracture is shining, and its texture crystalline. It is extremely volatile, and, in this respect, is very analogous to the essential oils—indeed, it is nothing less than an essential oil, that becomes solid at the ordinary temperature. At a little lower temperature the oil of anise also solidifies. Unlike most of the essential oils, when left to evaporate in the open air it disappears without leaving any residue. The vapor, when it condenses, as is evinced when kept in glass bottles, forms crystals of camphor, of a flat octohedron form, or, if the process is more slow, they may arrange themselves in hexagonal plates.

The specific gravity of camphor varies from 0·9857 to 0·996, being lighter than water. According to Turner, it melts at 288° F., and boils at 400°. It is inflammable, and burns with a brilliant flame, produces much smoke, showing that it abounds with carbon, and leaves no residue. Water dissolves it very sparingly: according to Berzelius, only one thousandth part of its weight is taken up. Alcohol takes up 75 per cent. of its weight, which is mostly precipitated in fine powder on the addition of water. It is also soluble in ether, the volatile and fixed oils, and strong acetic acid.

Analysis.—When camphor is confined, by admixture with

pure clay, so as to prevent volatilization, and then suddenly heated, a thin volatile oil is formed, possessing the common characteristics of the camphor, as to taste, smell, etc. This process leaves a remnant of a large proportion of uncombined carbon and camphoric acid, while an uncertain quantity of carbonic acid and carburetted hydrogen escapes. Dumas makes its formula 1 eq, of camphogen (C^{20} H^{14}) and 2 of water. Its ultimate constituents are, C^{10} H^{8} O, or 78-94 per cent. of carbon, 10-53 of hydrogen, and 10-53 of oxygen.

The formula of the *Borneo Camphor*[*] is C^{20} H^{18} O^{2}.

Chemical Peculiarities.—Camphor, different from most vegetable substances, suffers no sensible change from age, nor does it suffer decomposition in volatilization, or even when subject to the highest temperature to which it can be exposed in close vessels. It is not, like *most* of the essential oils, converted into resin by the oxygen of the atmosphere, or by the action of nitric acid. When nitric acid is repeatedly distilled from camphor, the latter is converted into *camphoric acid*, and various camphorates. When camphor is dissolved in nitric acid, a nitrate of camphor is formed, which is commonly called *camphor oil*. *Camphrone* (composed of C^{30} H O), is formed by passing the vapor of camphor over red hot lime.

Physiological Effects.—Much difference of opinion exists among those of the profession who have experimented with this article on the healthy subject, especially with regard to its influence over the functions of circulation and calorification. While some have considered it to promote these functions considerably, others have even asserted that it is sedative in its influence. The weight of evidence, however, is certainly in favor of the former views. Its influence over the nervous system is well marked—it is antispasmodic and nervine. When long continued, or taken in large doses, it excites the brain and exhilerates the spirits. It is considered injurious

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[*] This is produced by a very large forest tree (*Dryobalanops aromaticus*), found on the islands of Borneo and Sumatra. It is found in concrete masses, occupying longitudinal fissures in the hearts of the trees.

when taken in over-doses. The mischief is dependent on its effects on the brain.

THERAPEUTIC PROPERTIES.—Camphor is one of the most popular medical agents now known. It is employed not only by almost all physicians of every class, but is also a general domestic remedy for nearly every variety of ailments. A bottle of Spirits of Camphor appears in our country to be a real household necessity.

In the profession, camphor is regarded a first-class stimulant, and antispasmodic. It is also anodyne, diaphoretic, emmenagogue, carminative, etc.

In its applications, which are so very extensive, and of such notable variety, the following may be given as among the most important:

First, as a *stimulant* in cases of debility or deficient vital action, as in asphyxia, syncope, hæmorrhages—particularly uterine—cholera, sinking typhus, cerebral congestions, palsy, etc.

Second, as an *antispasmodic*, in hysteria, epilepsy, apoplexy, hypochondriasis, mania a potu, catalepsy, chorea, infantile convulsions, trismus, tenesmus, etc.

Third, as an *anodyne* and *nervine*, in neuralgia, gastralgia, cardialgia, cephalalgia, colic, dysmenorrhœa, puerperal pains, lumbago, hydrarthrus, pleuritis, peritonitis, tormina in dysentery and cholera, etc.

Fourth, as a *diaphoretic*, in febrile and various inflammatory diseases, particularly the eruptive.

Fifth, as an *endermic agent*, or *rubefacient*, and *counter poison*.

Dr. Pereira, of London, gives the following enumeration of maladies in which camphor has been found useful: 1, fever (typhoid); 2, inflammatory diseases (last stage); 3, exanthemata; 4, mania; 5, spasmodic affections; 6, irritation of the urinary and sexual organs; 7, poisoning; 8, chronic rheumatism and gout; 9, cholera.

The dose of camphor is from gr. v. to gr. x.; but is often successfully given in smaller doses, even gr. j., in some cases.

PHARMACEUTIC PREPARATION.—TINCTURA CAMPHORA: *Spirit of Camphor.*—℞ Camphor, ℥iv.; Alcohol, Oij.; shave down and

dissolve. This corresponds very nearly with all the authorized formulæ. In the country it is very common, to dissolve the camphor simply in whisky, when it is called *camphire*.

Use.—This is commonly used as a liniment, for headache. It produces a grateful sense of coolness as it evaporates, and is anodyne and soothing in its effects. In domestic practice, it is usually the first remedy in many cases of emergency, as in syncope, contusions, hysteria, etc., when it is used either internally, or externally, applied to the nostrils, or rubbed over the parts affected, as the circumstances may require. The dose is f℥ss. to f℥j.

TEREBINTHINA.

Synonyms.—Τερμβινθος, *Greek;* Kota, *Nepaul.;* Ratinge roomie, *Arab.;* Zungbarie, *Pers.;* Terpentin, *Ger.;* Terebenthine, *Fr.;* Trementina, *Ital., Span.;* Turpentine, *Eng.*

History.—Turpentine was used by the ancients. Theophrastus and Dioscorides speak of it. It is an article of considerable importance, in the arts as well as in medicine, and, hence, has become a subject of extensive trade and commerce.

Botany.—*Sex. Syst.*—Monœcia Monadelphia. *Nat. Ord.*—Conifereæ or Pinaceæ.

Gen. Char. The Pinus genus of Linnæus contains all the different species that yield turpentine. But the genus has been thought far too comprehensive, and has, hence, been divided, by other botanists, into three distinctive genera, viz: *Pinus*, *Abies*, and *Larix*.

Gen. Pinus.—*Flowers* monœcious. *Catkins* racemose. *Filaments* short. *Anthers* crested, two-celled, bursting longitudinally (or *stamens* two; *anthers* one-celled). *Catkins* solitary, or from two to three. *Scales* imbricated, with membranous bractlets. *Ovules* two, at the base of the scales, collateral, inverted, their points lacerated and directed downward. *Scales* of the cone hard, woody, and truncated, hollowed at the base for the reception of the seeds. *Seeds* prolonged at the base into a membranous wing. *Leaves* evergreen, usually

avicular, in fascicles, surrounded at the base by a membranous tubular sheath.

Spec. Char. There are various species of pinus, both European and American, that contribute largely in furnishing the turpentines of commerce.

1. PINUS SYLVESTRIS (*Linn*, L. D.). Scotch Fir. Red deal.—*Leaves* in pairs. Young *cones* stalked, recurved, ovate-conical. *Wing* thrice as long as the seed. (Lamb, Pin. t. 1. Nees von E. t. 79.) Native of Scotland, Norway, woods of Europe, north of the Alps.—This species yields much Turpentine, Pitch, and Tar.

2. P. MARITIMA, *Dec.* (P. Pinaster of Lambert), (Nees von E. t. 76, 77).—Is abundant on the southern coasts of Europe, as well as of England, and in the south of France in the department of the Landes. It yields Bourdeaux Turpentine, Galipot, Pitch, and Tar.

3. P. PALUSTRIS (*Lambert*).—The Swamp Pine and Long-leaved Pine. A large tree, spreading from the State of Virginia to the Gulf of Mexico. This tree furnishes by far the greater proportion of Turpentine, Tar, etc., consumed in the United States, or sent hence to other countries.

4. P. PINEA (*Lamb*), and P. *Cembra*.—The Siberian Stone Pine, are interesting, as the seeds of both, sometimes called *Pine-nuts*, are eaten, as are those of P. *Geradiana*, in Affghanistan and Thibet. P. *longifolia* (Lamb) is an Himalayan species, which yields a very fine Turpentine, resembling pure white granular honey; much used by the natives of India in medicine, and called *bireeja*, etc.—*Royle*.

5. P. TÆDA (*Willd.*).—*Leaves* in threes, elongated, with long sheaths; *strobiles* oblong, conical, deflexed, shorter than the leaf; *spines* inflexed. The variety called *Old-field pine*, or *loblolly* of the Southern States, grows abundantly in Virginia and the southern parts of Pennsylvania. It is a large tree with a spreading top, and leaves about six inches long. It yields turpentine in abundance.

GEN. ABIES.—*Flowers* monœcious. MALES.—*Catkins* solitary. *Anthers* bursting transversely. FEMALES.—*Catkins* simple. *Scales* (or carpels) imbricated, thin at the apex, rounded, flat instead of being hollowed for the seeds; when ripe, falling from the axis. *Leaves* solitary in each sheath, never fascicled. In other respects agreeing with pinus.

Spec. Char. Of this genus there are also a number of species that yield medical products of the turpentine character.

1. ABIES EXCELSA, *Dec.* E. (*Pinus Abies*, Linn), L. D.—Norway Spruce Fir. *Leaves* scattered, tetragonal. *Cones* cylindrical, pendulous; the *scales* rhomboidal, flattened, jagged, and bent backward at the margin. Northern parts

of eastern Europe, Alps, northern parts of Asia. [Nees von E. t. 80.) Yields Abietis Resina by spontaneous exudation.—*Royle.*

2. A. PICEA (Lindl.).—The Silver Fir, with distichous leaves, and erect cones. A native of the mountains of central Europe. Yields Strasburgh Turpentine.

3. A. BALSAMEA (*Marsh*), E. (*Pinus balsamea*, Linn., L. D).—Canadian Balsam and Balm of Gilead Fir. *Leaves* solitary, flat, subpectinate, suberect above. Acuminate apex of the scales of the cone when in flower reflexed. Northern parts of America.—Lamb. Pin. t. 41. Nees von E. t. 82.

4. A. CANADENSIS (Lindl.).—Hemlock Spruce Fir. This is said to exude a Turpentine similar to that of the foregoing. A. *nigra*, the Black Spruce Fir, is interesting as yielding the Essence of Spruce.

GEN. LARIX (*Tourn.*), *Larch.*—*Flowers* monœcious. *Catkins* and *cones* lateral. MALES.—*Catkins* simple, ovate. *Anthers* numerous, with their filaments united into a thick column, crested, bursting longitudinally. *Leaves*, when first expanding, in tufted fascicles, becoming somewhat solitary by the elongation of the new branch.

Spec. Char. Some few medical turpentines are yielded by some of the species of this genus. The two following are among the most important species.

1. LARIX EUROPÆA, *Dec.* (*Abies Larix*, Lam. E., *Pinus Larix*, Linn. D.).—The Larch is a lofty tree, with wide-spreading branches; when well grown the extremities droop gracefully. The *leaves* deciduous. *Flowers* reddish. *Cones* ovate-oblong. Edges of *scales* reflexed, lacerated. *Bracts* panduriform. (*Lambert.*—Nees von E. 83. St. and Ch. 75.) A native of the Alps, much cultivated in this country. Yields Venice Turpentine, and a kind of manna called Manna de Briançon.

2. LARIX (or Cedrus) DENDARA (Deodar and Kelon).—Himalayan Cedar is an elegant and lofty tree, hardy, and yielding valuable timber. It has been largely introduced into England by the East India Company, and is interesting as having been long employed in medicine by the Hindoos, and known even to Avicenna. (*Hindoo Med.* 36.) "Its Turpentine, known by the name of *kelon-ke-tel*, is in great repute in the north-west of India, from its stimulant properties, and power of healing deep-seated ulcers, as in elephants and camels."

DESCRIPTION.—The turpentines of commerce are various, and require separate descriptions. Some of them are the simple products of the trees, others are the subjects of various pharmaceutic manipulations. Some, also, constitute a regular trade in their manufacture.

This is the most convenient place, perhaps, also to consider various other preparations and products of the trees that constitute these genera. They all properly belong to the class, stimulants, although some of them would be more judiciously arranged in different orders of this class.

VIRGIN TURPENTINE: *Terebinthina Virginiana.*—This is chiefly the product of the *P. Palustris* and *P. Tæda.* It consists of the collections of the first tappings, and is clear of dirt and other impurities. Its color is white, tinged with yellow; it is translucent or semi-transparent, of an agreeable aromatic odor, and a pungent, bitterish taste, and a semi-fluid, or in cold weather, soft, solid consistence. It is collected by cutting hollows in the trunks of the trees, which excavations receive the turpentine as it exudes from the wounded surface. The common *white turpentine* is of this same kind, but is collected later in the season, and with less care. It is of a yellowish-white color, and a taste and smell like the above. It commonly contains more or less impurities, as bits of bark, sand and dirt. Its consistence is about the same as that of the virgin turpentine.

Action—Use.—Turpentine is an active stimulant, diaphoretic and diuretic, and promotes, more or less, all the secretions. Its power as an anthelmintic and diuretic has already been spoken of.

The medicine is not much used as a general stimulant, and its internal exhibition is chiefly in view of a local influence over some particular parts that may be the subjects of chronic disease. Thus its application is mainly in affections of the urinary organs and intestines, as cystirrhœa, gleet, gonorrhœa, leucorrhœa, mucous diarrhœa, colic, etc. The dose is gr. x.—gr. xxx.; taken in pills; or f℥j.—f℥ij. of the tincture.

Its topical applications are much more important. It serves as a base of many plasters, ointments and salves. It is an important constituent of various *irritating*, *strengthening*, *adhesive*, *detergent*, *digestive*, and *healing plasters*, *discutient* and *healing ointments*, and *salves*, available in the treatment of chronic inflammatory affections of parts, simple tumors, cancers, scrofula, carbuncles, cuts, burns, etc.

EUROPEAN TURPENTINE: (*Terebinthina Vulgaris*).—This article either exudes spontaneously, or from incisions, from most of the pine tribe, as also from *Pistacia Terebinthus.* It consists of

resin intimately mixed with a volatile oil, known in its separated or distilled state as Oil of Turpentine. In time, all turpentines become converted into resins, from the evaporation of the oil and by its oxidation. They soften by heat, burn readily, are soluble in alcohol and ether, unite with the fixed oils, and resemble each other very closely in taste and smell; but differ in being more or less white or dark-colored, and vary in odor and taste, being more or less agreeable. Only a little of their properties are taken up by water, but they may be made into an emulsion with eggs or vegetable mucilage.

In Europe, this turpentine is prepared chiefly from the *P. Sylvestris* and *P. Maritima*, in the maritime districts of the south-west of France. But at the present time, most of the drug consumed under this name in Europe, is imported there from this country, and is the product, chiefly, of the *P. Palustris* and *P. Tæda*. This article is viscid, semifluid, of a dull, light-yellowish color, with a warm, acrid, bitterish taste, and a slight terebinthinate odor. While fresh, it yields about seventeen per cent. of oil of turpentine. That variety of the drug prepared in Europe, now more frequently called *Bourdeaux Turpentine*, from the place whence it is exported, is rather more white, turbid, and separates, on standing, into a transparent liquid and a granular, honey-like semifluid. It is acrid and nauseous in taste, and of a disagreeable smell; it yields about twenty per cent. of oil. It may, like our own turpentine, be solidified by means of magnesia. Its composition is *volatile oil* (oil of turpentine), *pinic acid*, *sylvic acid*, *resin*, and *bitter extractive*. The Bourdeaux Turpentine is not imported into this country.

Action.—Use.—Same as the foregoing.

CANADIAN TURPENTINE: *Terebinthina Canadensis.*—This article, which is commonly called *Balsam of Fir*, is obtained from the *Abies Balsamea* in Canada and the State of Maine, by puncturing the small vesicles which exist between the bark and wood of the trunks of the *fir tree*. As the turpentine runs out of the broken blisters, it is collected in bottles. While fresh, and close kept, this turpentine is of a tenacious fluid consistence resembling honey; is transparent and slightly tinged with yellow. When exposed to the air, it gradually becomes hard and solid by the evaporation of its volatile oil, and the absorption of oxygen. Its taste is somewhat acrid, slightly bitter, and strongly terebinthinate; its odor is peculiar, agreeable, and much like the turpentines generally.

The composition of the Canadian turpentine, according to the analysis of Bonastre, is *Volatile Oil* 18·6, *Resin*, easily soluble in alcohol, 40·0, *Subresin*, difficultly soluble, 33·4, *Fibrous caoutchouc*, like Subresin, 4·0, *Acetic acid* traces, *Bitter extractive*, and *Salts*, 4·0.

Action—Use.—This article possesses the common properties of the other turpentines, and being rather more active, and, while in a fluid state, more conveniently taken, is more exhibited internally. It is used in the treatment of affections of the urinary organs, particularly those characterized by mucous discharges, as gonorrhœa, cystirrhœa, leucorrhœa, gleet, syphilis, etc. It is also considered available in pectoral diseases, as pains in the breast, and incipient phthisis. In plasters and salves, it is also much used. The dose is from a half a teaspoonful to a teaspoonful.

VENICE TURPENTINE: (*Terebinthina Veneta*).—The genuine Venice Turpentine is the product of the *Larix Europæa*. It is procured by boring into the trunks of the trees, and adapting to each hole a wooden gutter, which conveys the turpentine into vessels.

The *Larch* or *Venice* turpentine is a thick and consistent fluid, transparent, but more commonly slightly cloudy, and of a yellowish-green tint, and an odor which is peculiar, not very agreeable, terebinthinate. Its taste is acrid and bitter. It has little or no tendency to concrete, and hence is always rather thin, and is kept in bottles.

This turpentine is procured in Switzerland and the French province of Dauphiny. The *larch* grows abundantly upon the Alps and the Jura Mountains. The drug has received its name from the circumstance that it was formerly an extensive article of Venician commerce.

Very little Venice turpentine is brought to this country, and what is commonly sold in the drug shops under this name, is a spurious article, made by dissolving rosin in oil of turpentine. Its color is much darker than that of the genuine article.

Action—Use.—Properties much the same as those of the last spoken of. It is regarded by some to be more detergent, and is used more in view of this property, in cutaneous affections. The dose is from ʒss. to ʒj.

The virtues of the factitious drug may be inferred from its ingredients, *resin* and *oil of turpentine*.

Besides these turpentines here mentioned, there are others that are spoken of in some works on Materia Medica; but as they do not occur in our market, or at least very seldom, it is perhaps unnecessary to take up more room on the subject. Among the most important of those unnoticed, are, 1, the CHIAN TURPENTINE, the produce of the *Pistacia Terebinthus*,

growing on the island of Chio; 2, STRASBURG TURPENTINE, which is the produce of the *Abies Picæ*, growing on the mountains of Switzerland and Germany; 3, DAMARRA TURPENTINE, derived from the *Pinus Damarra*, growing in the East Indies; 4, DOMBAYA TURPENTINE, produced by the *Dombeya Excelsa*, an inhabitant of Chili.

OLEUM TEREBINTHINA: *Oil of Turpentine.*—This article, which, in commerce, is called *Spirits* or *Spirit of Turpentine*, is prepared from the common, or any other varieties of turpentine, by distillation. Our American turpentine will generally yield about sixteen per cent. of the oil. It is usually distilled with water, in a common copper still, over an open fire, but may be distilled alone with a higher heat. The latter way, however, renders the product liable to be empyreumatic. The distilled product is found to consist of the oil of turpentine floating on water, while the residue in the still is resin.

To obtain oil of turpentine absolutely pure, it should be redistilled from a solution of caustic potassa. The following process embraces the particulars of the courses recommended by the Edinburg and Dublin schools:

Prep.—Cautiously distil *Oil of Turpentine*, Oj. (Ibij. by measure D.) with *Aqua* Oiv. (as long as oil comes over with the water, E., till Ojss. of oil is obtained, D.), or agitate it with one-eighth of Alcohol. Mr. Flocton redistils from a solution of caustic Potash, to get rid of all traces of resinous and acid matters—*Pereira.*

Purified Oil is limpid, colorless, with a powerful penetrating odor, and pungent fiery taste. Sp. gr. 0·865; boils at about 312°, but, as volatilization proceeds, at 350°, Sp. Gr. of its vapor, 4·764. It is exceedingly inflammable, and in burning produces much black smoke. It is slightly soluble in water, more readily in Ether and in Alcohol; miscible in all proportions in the fixed oils, dissolves resins and fats, and is one of the few solvents of Caoutchouc. It deposits crystals when moist and exposed to cold, in considerable degree, which are a Hydrate of the Oil. Sulphuric acid chars it, and it is set on fire by nitric acid and chlorine. It absorbs hydrochloric acid gas, and a substance called *artificial camphor* ($C^{20} H^{16} H Cl$) is thus produced. The composition of oil of turpentine is $C^5 H^4$. When exposed to the air, it absorbs oxygen; oil, therefore, which has been long kept, usually contains some. Oil of turpentine is now considered to be composed of two different, but isomeric *oils*, as is indicated by the changes in the boiling point. One of these, or that which combines with the hydrochloric acid gas, has been called *Radical Oil of Turpentine*, and also *Camphene.*

Action—Use.—The oil contains most of the active medical

properties of turpentine. It is not so much used for its stimulant effects internally, as externally. Applied to the skin, it proves powerfully rubefacient, and is very extensively used as an agent of this kind. It serves as an ingredient in a great many different liniments. It is rather too severe, however, to be applied to delicate parts in its pure state, and should always be compounded with other articles, according as the circumstances controling its application may indicate. Its anthelmintic and diuretic powers have been spoken of in the proper places. The dose of oil of turpentine is from half a teaspoonful to a teaspoonful, as a stimulant and diuretic; but when used as an anthelmintic, a tablespoonful or more is given, especially when the expulsion of the tapeworm is the object of its use.

RESINA: *Resin.* — When any of the Pinic Turpentines are subjected to distillation, with or without water, the Volatile Oil rising when heated, leaves behind it a solid resin, which is often called Colophony (Fr. *Colophane*), from the Greek *χαλοφονια*, but more usually black rosin, though it is only of a brownish-yellow color, semi-transparent, and a little empyreumatic. When the distillation is not carried quite so far, or if more water be added during the process, and agitated with it while in fusion, some of it becomes incorporated with the Resin, which latter, in consequence, becomes opaque, or of a whitish color. This is the *Resina flava* of Pharmacy, or *Yellow*, sometimes called *White Resin*. The incorporated water escapes by evaporation, or it may be expelled; the Resin then becomes of a pale-yellow color, and transparent.

The consistence of Resin is solid, and it is rather transparent, very brittle, with a glassy fracture; is a little heavier than water, differs in color according to its purity, possesses a weak terebinthinate odor and taste, melts at a moderate heat, becomes decomposed at a *higher*, producing both an oil and a gas, and burns with a smoky flame. It unites, when in fusion, with wax, fats, and fatty oils, also spermaceti; is readily dissolved by alcohol, ether, and many volatile oils, and is insoluble in water. The strong acids decompose it; the alkalies unite with it, and form soaps. Instead of being simple, it is found to be a compound of two acid bodies, one called *Sylvic*, the other *Pinic acid*, and of a neutral resinous principle. The Sylvic acid is more soluble in cold and diluted alcohol, and may thus be separated from the other. It crystallizes in small, quadrangular, rhombic prisms; is colorless, insoluble in water, soluble in ether, strong hot alcohol, and in volatile oils. Pinic acid (C^{20} H^{15} O^{2}) is considered isomeric with the *Sylvic*, and

has many of the same properties. A third acid, the *Pimaric*, has been detected in the Bourdeaux turpentine. The acid of Colophony, called the *Colophonic acid*, is considered somewhat different, being of a brown color, and is sparingly soluble in alcohol.

Action — Use. — Mild stimulant; mostly used externally; chiefly, however, on account of its adhesive properties, in various cerates, unguents, and emplastra.

PIX ABIETIS: *Burgundy Pitch.*—This article is obtained from the *Abies excelsa*, or Norway spruce, and the *Abies picea*, or European silver fir. It is obtained by removing portions of the bark, so as to lay bare the wood, and the flakes of concrete resinous matter, which form upon the surface of the wound, having been detached, are melted in hot water, by means of large boilers, and then strained through coarse cloths, while hot. The pitch receives its vulgar name from the province of Burgundy, in the east of France.

Pure Burgundy pitch is hard, brittle, quite opaque, of a yellowish, or brownish-yellow color, and a feeble terebinthinate taste and odor. As brought into this country, it is generally mixed with impurities, which require it to be melted and strained before using.

Action — Use. — A slight stimulant, and rubefacient when applied to the skin, in the shape of a plaster. It is chiefly used in making stimulating and strengthening plasters, and healing cerates. It has been remarked, that Burgundy pitch plasters have produced inflammation and sores. This may be accounted for from its *mechanical* effects, it being impervious, and thus confining all the impure matters that collect under them.

ABIES RESINA: L. *Thus*, D. Resin of ABIES EXCELSA, E. (*Pinus abies*, Linn.) L. D.—The Resin of the Norway Spruce Fir may be arranged with the Turpentines, as being a spontaneous exudation, and with the Resins as having lost by evaporation most of its Volatile Oil. It was formerly called *Thus*, or "Frankincense," as it still is in the D. P. It is collected in the form of concrete tears, which are hard and brittle, but soften readily at the temperature of the body. It is of a light yellowish or brownish-yellow color externally, lighter within, slight terebinthinate odor and acrid peculiar taste. The substance which the French called *galipot* or *barras* is the concretion produced on the Pine of the Landes, late in autumn or winter, when the collection of Bourdeaux Turpentine has ceased. A fine variety of resin is spontaneously yielded by the Himalayan *Pinus Marinda*.

Action—Use.—Slightly stimulant. Used mostly in making plasters.

PIX CANADENSIS: *Canada Pitch.*—Canada Pitch is procured from the *Abies* or *Pinus Canadensis*, or hemlock spruce of the United States and Canada. The hemlock does not abound so much in turpentine as most other species of the pinaceæ. The process for procuring the pitch is somewhat different from that adopted in collecting it from other trees. The tree, while thrifty, or young, seldom yields much of this product, and it is only when it is beginning to decay that it will justify any efforts at the collection of the pitch. The latter is now exuded spontaneously through the cracks of the bark, which, when thus well encrusted, is stripped off, broken into fragments, and boiled with water. The melted pitch rises to the surface, and is skimmed off. It consists of dark-colored, brittle masses, which, on being broken, present fragments of bark and some other impurities interspersed through their substance. From these the pitch is purified, in the shops, by melting and straining through canvas. Thus prepared, it is hard, brittle, opaque, of a dark, yellowish-brown color, of a slight peculiar odor, and slight taste.

PIX LIQUIDA: *Tar.*—This article has been employed in medicine from very early times. It is prepared by submitting the roots and branches of different pine trees to a smothered combustion. The resinous matter is melted, and also somewhat altered by the heat, and the tar flows out as a viscid and tenacious semi-fluid, of a brownish-black color, having a bitter, resinous, and a slightly acrid taste, and an empyreumatic odor. It is a very complex mixture of resin and oil of turpentine, both somewhat modified, and some empyreumatic oil, charcoal, and pyroligneous acid, with various products of the destructive distillation of the wood. By subjecting it to distillation, oil of tar and pyroligneous acid are obtained, and the tar water, by agitating it with aqua. Tar is soluble in ether, alcohol, and the fixed and volatile oils. Several kinds of it yield creosote, paraffin, eupion, etc. When the whole of it is evaporated, black pitch is left.

Action—Use.—Tar, taken internally, is alterative and stimulant; applied externally, it promotes a healthy action in indolent ulcers, and in some cutaneous diseases; is also an excellent application to burns, whether recent or not. The vapor is sometimes inhaled in chronic bronchial affections.

AQUA PICIS LIQUIDÆ: *Tar Water.*—℞ Tar by measure, ℔ij., Aq. Cj. Mix; agitate with a wooden stick for a quarter of an hour. When the pitch has subsided, filter, and keep in well stoppered vessels.

Action—Use.—Medical properties same as the above. Much esteemed by some in bronchial affections and phthisis.

LINIMENTUM (TEREBINTHINATUM, E.) TEREBINTHINÆ, L. D.; (U. S.) *Turpentine Liniment.*—Shake together till mixed *Oil of Turpentine*, f℥xvj., (f℥v. E. ℔ss. D.,) *Camphor*, ℥j. L. (℥ss. E.,) *Soft Soap*, ℥ij. L. (Resin Ointment, ℥iv. E. ℔j. D.) (Melt the Ointment, and mix with it gradually the (Camphor, E.) Oil of Turpentine, E. D.) (till a uniform Liniment be obtained, E.)

℞. *Oil of Turpentine*, Oss., *Resin Cerate*, ℔j. Add the Oil to the melted Cerate and mix them, U. S.

Action—Use.—Stimulant Liniment; but chiefly used by applying lint soaked in it, to burns and scalds.

ENEMA TEREBINTHINÆ, L. E. D. *Turpentine Enema.*—℞ *Oil of Turpentine*, f℥j. (℥ss. D.) *Yolk of Egg* q. s. Mix; and gradually add *Barley Water*, f℥xix. L. (*Water* (not higher than 100° F.) ℥x. D. f℥xix. E.)

Action—Use.—Antispasmodic; Anthelmintic in cases of Ascarides.

UNGUENTUM PICIS LIQUIDÆ, L. E. D., U. S. *Tar Ointment.*—℞ *Tar*, ℔j. (℥v. E. ℔ss. D.,) *Suet*, ℔j. L. (℔ss. D. Beeswax, ℥ij. E.) Melt together and express through linen, L. (a sieve, D. Stir briskly while it concretes in cooling, E.)

Action—Use.—Stimulant. Useful in Ringworm and some Ulcers.

PIX (ARIDA, E.) NIGRA: *Pitch.*—Pitch is left after the distillation of the liquid parts of the Tar. It is well known from its black color and firm texture, and consists of many of the same constituents as Tar.

Action—Use.—Stimulant and Alterative. Used in Ichthyosis in doses of gr. x.—℥j. in pills.

UNGUENTUM PICIS NIGRÆ, L.: *Pitch or Black Basilicon Ointment.*—℞ *Blach Pitch*, *Wax*, *Resin*, āā. ℥ix., *Olive Oil*, f℥xvj. Melt together and express through linen.

Action—Use.—Stimulant application to Porrigo or to indolent ulcers.

EMPLASTRUM PICIS, L. E.: *Burgundy Pitch Plaster.*—℞ *Burgundy Pitch*, ℔ij. (℔jss. E.), *Resin*, ℔j. (℥ij. E.) and *Bees' Wax*, ℥iv. (℥ij. E.); melt them together with a gentle heat, then

add *Resin of Spruce Fir*, ℔j. L., *Expressed Oil of Nutmegs*, ℥j L. (Oil of Mace, ℥ss. E.), *Olive Oil*, f℥ij. (f℥j. E.), *Aq.* f℥j. (f℥ij. E.); mix well, and boil till the mixture acquires the proper consistence.

Action — Use. — Warm Rubefacient Plaster to the chest, joints, etc.

CERATUM RESINÆ, L. (U. S.) UNG. (RESINOS E.) RESINÆ ALBÆ, D.: *Resin Cerate, or Basilicon Ointment.* ℞ *Resin*, ℔j. (℥v. E. (U. S.), white Resin, ℔ij. D.), *Wax*, ℔j. (℥ij. E. (U. S.), Lard, ℥viij. E. (U. S.) ℔iv. D. Melt together with a gentle heat; then add *Olive Oil*, f℥xvj., and press the Cerate while hot through linen, L. D. (Stir the mixture briskly while it cools and concretes, E.)

Action—Use.—A mild stimulant, applied to foul or indolent ulcers.

SASSAFRAS.—The Bark of the Root.

Synonyms.—Lauras Sassafras; Sassafras Officinale. — Cay-vang-dee, *Coch. Chin.;* Sassafras, *Ger., Arab., Fr., Ital., Span.*

Botany.—*Sex. Syst.*—Enneandria Monogynia. *Nat. Ord.*—Lauraceæ.

Gen. Char. Sassafras.—Diœcious. *Calyx* six-parted, membranous; segments equal, permanent at the base. Males *fertile stamens* nine, in three rows, the inner with double-stalked, distinct glands at the base. *Anthers* linear, four-celled, all looking inward. Females with as many sterile stamens as the males, or fewer, the inner often confluent. *Fruit* succulent, placed on the thick, fleshy apex of the peduncle, and seated in the torn unchanged calyx.—*Lindley.*

Spec. Char. S. Officinarum.—A forest tree, supposed by some to be peculiar to North America, but is stated by Dr. Ainslie to be found also in Cochin-China. In the north of the United States, the tree is rather small; but in the Middle and Southern States, it grows from thirty to sixty feet in hight, and from one to two feet in diameter. The bark is rough, or deeply furrowed, and of a whitish gray, or light ash color, on the trunk and branches; but that on the twigs is smooth, and of a deep green color. The leaves vary much in

their shape and size; on young shrubs, they are mostly entire, elliptical or oval, but some have a lobe on one side. On the bushes or trees, they are generally three-lobed. Their mean length is about four or five inches, and their breadth from two to three. They are pubescent, and prominently veined. The flowers, which are often diœcious, and appear before the leaves, are small, of a pale yellow color, and disposed in racemes, arising from the branches below the leaves, and having linear bracts at their base. The corolla is divided into six oblong segments. The male flowers have nine stamens; the hermaphrodite, which are on a separate tree, have only six, with a simple style. The fruit is an oval drupe, about half an inch or more in length, when mature of a deep blue color, and is supported on a red pedicel, whose base is next to the berry.

The bark of the root is the medicinal portion. This is separated at peeling time, divested of its epidermis, and carefully dried. Among the most prominent of its *constituents*, are *volatile oil* and *camphor*.

Medical Properties and Use.—Sassafras is a stimulant, diaphoretic, antiseptic, anodyne, and by some it is considered detergent. In domestic economy, it is used as a tea by many, and is much esteemed in this way by some. In London it is carried about in the streets, at day-break, under the name of *saloop*. In practice, it is not much used alone, but is sometimes employed as an ingredient in stimulating and diaphoretic powders, and sometimes in syrups. It is used in eruptive fevers, from an idea that it has a power of determining the humors to the surface. But it is applicable in all cases in which articles of this class are indicated. Dr. Forskahl states that the sassafras is used in Arabia for syphilis. (*Mat. Med. Khairina*, p. 148). As an external application, the powdered bark is esteemed in the form of a cataplasm to gangrenous parts, old sores, bruises, and fresh wounds. The dose of the powdered bark is from gr. xv. to gr. xxx. The decoction is drank freely.

Pharmaceutic Preparations.—OLEUM SASSAFRAS: *Oil of Sas-*

safras. This is procured by distilling the bark with water. It is at first colorless, but by age it becomes yellowish. It is milky when fresh, if the water is not well separated. Water seems to act more on it than it does generally on essential oils. It seems to divide it into two oils, one lighter, and the other heavier than water. By keeping, it deposits crystals of *stearoptene* (or, as commonly considered, *camphor*). Oil of sassafras is used as a stimulant and anodyne, and may be taken, dropped on sugar, or in the form of pills with crumb of bread, in doses of from min. v. to min. x. It will afford relief in the distressing pain attending menstrual obstructions, and that following parturition. It is much used as a rubefacient, and for this purpose it is of great value, when applied to painful swellings, sprains, rheumatism, etc., as it is not only rubefacient but anodyne. It is also applied over gangrenous parts, to check the progress of mortification. In most of the stimulating and rubefacient liniments, as well as some balsamic compounds, it is a prominent ingredient.

ROSMARINUS.—The Flowering Tops.

SYNONYMS.—ROSEMARINUS OFFICINALIS; Tay-duong-choi, *Coch. Chin.;* Hásalban achsir, *Arab.:* Δενδρολι βαχο, *Mod. Gr.:* Rosmarin, *Ger.;* Romarin, *Fr.;* Rosemarino, *Ital.;* Ronero, *Span.;* Rosemary, *Eng.*

BOTANY.—*Sex. Syst.*—Diandria Monogynia. *Nat. Order.*—Lamiaceæ, or Labiateæ.

Gen. Char. ROSMARINUS.—*Corolla* unequal, with the upper lip two-parted. *Filaments* long, curved, simple, with a tooth.—*Willd.*

Spec. Char. R. OFFICINALIS.—An ever-green shrub, about 3 or 4 feet high, with an erect stem, divided into many greyish colored, long, slender branches. *Leaves* numerous, sessile, opposite, linear, something more than an inch long, entire, obtuse at the summit, revolute at the margins, of a firm texture, smooth and green on the upper surface, whitish and hoary beneath. *Flowers* pale-blue or white, rather large, few, in short axilary, sub-sessile, opposite racemes, arising in the axils of the leaves. *Filaments* shortly toothed near the base; *anthers* linear, with two divaricating, confluent cells. *Seeds* four in number, of an oblong shape, and lie naked in the calyx.

The rosemary bush is a spontaneous production of the countries bordering on the Mediterranean, and is cultivated in gar-

dens, in Europe and this country. The flowering summits, which are the officinal portion, have a very strong balsamic odor, and were used by the ancients in making garlands, because of their beauty and agreeable flavor. For medical purposes, they must be collected when in full bloom, and carefully dried.

MEDICAL PROPERTIES AND USE. — The tops of rosemary are stimulant, anodyne, and carminative, and may be used as a substitute for other articles of this class. By some, the rosemary is regarded as an emmenagogue. In China, it is used as a nervine, and is appreciated in cephalalgia. On the Continent of Europe, it is considered to be useful in glandular enlargements. The German physicians prescribe the infusion for baldness, and say that it will promote the growth of the hair, and that it will give gloss and a healthy appearance to it. It is prepared by infusion, and drank freely. Its active properties are chiefly dependent on a volatile oil that is given off in large quantities by distillation with water.

PHARMACEUTIC PREPARATIONS. — **OLEUM ROSEMARINI**: *Oil of Rosemary.*—When pure, it should be void of color, and possess in a high degree the peculiar flavor of the flowering tops of the tree. It is often adulterated with oil of turpentine, which may be detected by its odor when dropped on a hot stove, or by its not being completely soluble in alcohol.

Use.—Oil of rosemary is very pungent and stimulating, but is not much employed alone for internal use, being chiefly compounded with other articles, the flavor of which it improves. Its chief use is as a rubefacient, being commonly formed into liniments and bathing-drops, with other articles. When taken internally, the dose is from gtt. v. to gtt. viii.

TINCTURA ROSMARINUS: *Tincture of Rosemary.*—Prepared, either by digesting the tops of the rosemary in spirits, or by dissolving ʒij. of the Oil in Oj. of alcohol.

SPIRITUS ROSMARINUS: *Spirits of Rosemary.*—Mix ʒij. of the Oil of Rosemary with Cong. j. of Rectified Spirits, and Oj. of Aq., and then distil over one gallon by means of a gentle heat.

These preparations are chiefly used to give flavor to less agreeable articles of this class.

LAVANDULA.—The Flowers.

SYNONYMS.—LAVANDULA VERA: Karpoorawullie, *Tam. Tel.;* Sitaké pungérie, *Duk.;* Vurdefrasioon, *Arab.;* Waluka, *Sans.;* Galkappra-Walli, *Cyng.;* Lavandel, *Ger.;* Lavande, *Fr.;* Lavandola, *Ital.;* Espilego alhucema, *Span.;* Lavender, *Eng.*

BOTANY.—*Sex. Syst.*—Didynamia Gymnospermia. *Nat. Ord.*—Lamiaceæ.

Gen. Char. LAVANDULA.—*Calyx* ovate, somewhat toothed, supported by a bract. *Corolla* resupine. *Stamens* within the tube.—*Wildenow.*

Spec. Char. The L. VERA is the species that is supposed to afford the officinal *Lavender Oil.* This is a small shrub, seldom attaining a hight of more than two or three feet, but has been seen six feet high. It has a woody stem, which is covered with a brown bark. The branches are herbaceous, quadrangular, pubescent, and are furnished with opposite, sessile, linear, entire, green or glaucous leaves. The flowers are small, blue, and arranged in interrupted whorls around the young shoots, thus forming terminal cylindrical spikes.

Lavender is a native of the south of Europe, growing on the dry barrens of Spain, Italy, and the South of France, but is cultivated in most of our gardens and yards. In this country it flowers in August. The flowers have a peculiar aromatic and very agreeable flavor. By distillation with water, they yield the officinal essential oil of lavender. The formula of the oil, which possesses all the virtues of the flowers, and which is the only part used as medicine, is $C^{15} H^{14} O^2$ or $3C^5 H^4 + 2 H O$.

MEDICAL PROPERTIES AND USE.—The flowering tops of Lavender are stimulant, anti-emetic, stomachic, carminative, and aromatic, but are seldom used in their crude state. The physicians of the East Indies bruise the leaves with sugar, and give the juice in croup; and they also apply the bruised leaves to the head in cephalalgia. The oil, or spirits are the most common preparations in which it is used. The dose of the oil is gtt. ij. to gtt. v.; of the spirit, f℥ss.—f℥ij. The oil is a fine perfume.

HYSSOPUS.—Flowering Tops.

Synonyms.—Hyssopus Officinalis: Zufaiy Yeabus, *Arab.*; Υσωπος, *Gr.*; Esof, *Hebr.*; Hyssop, *Eng.*

Botany.—*Sex. Syst.*—Didynamia Gymnospermia. *Nat. Ord.*—Labiateæ.

Gen. Char. Hyssopus.—*Calyx* five-cleft, nearly equal. *Corolla* upper lip roundish and notched at the apex, the lower three-petaled, middle lobe sub-crenate. *Stamens* straight and distant.

Spec. Char. H. Officinalis.—*Stems* numerous, erect, quadrangular, woody below, somewhat branched above, about two feet high. *Leaves* opposite, sessile, lanceolate, linear, pointed, punctate. *Flowers* violet colored, or blue, but sometimes white, turned chiefly to one side, and disposed in half verticillated, terminal, leafy spikes. Hyssop is a native of Europe, where, as well as in our country, it is cultivated in gardens.

Medical Properties and Use.—The flowering summits and leaves of the hyssop plant are gently stimulant, aromatic, carminative, tonic, nervine, anthelmintic, antispasmodic, and diuretic. Pliny considered it useful in diseases of the chest. The virtues of the plant are chiefly dependent on a volatile oil, that may be obtained by distillation with water or spirits. The medicine may be taken in the form of infusion, or that of the essential oil. The dose of the latter is from gtt. iij. to gtt. v. It is not very much used in regular practice.

HEDEOMA.—The Herb.

Synonyms.—Hedeoma Pulegioides, U. S.: Grotten-balsam, *Ger.*; Hedome Pouliot, *Fr.*; Pennyroyal, *Eng.*

Botany.—*Sex. Syst.*—Diandria Monogynia. *Nat. Ord.*—Lamiaceæ, or Labiateæ.

Gen. Char. Hedeoma.—*Calyx* bilabiate, gibbous at the base, upper lip three-toothed, lower two; dentures all subulate. *Corolla* ringent. *Stamens* two, sterile; the two fertile stamens about the length of the corolla.

H. PULEGIOIDES.

Spec. Char. H. PULEGIOIDES.—This is a very common plant in this country, and scarcely needs any description. It has an annual, small, fibrous, yellowish-white *root*. The *stem* is from nine to fifteen inches in hight, obscurely angular, terete, pubescent, and much branched. *Leaves* small, opposite, lanceolate-oblong, attenuated at the base, sparsely dentated, prominently veined, especially below, pubescent. *Flowers* small, pale blue, verticillate, on short peduncles. *Calyx* striated, pubescent, labiate, upper lip divided into two ciliated segments, the lower into three rounded lobes.

Its flowering time is from July to September. It is found in every part of the United States, growing on dry ground, on the roadsides, in uncultivated fields and open woods.

This plant has been confounded, by authors, with the *mentha pulegium*, or English pennyroyal, which belongs to a different genus. But as the medical properties of the two plants do not differ very much, the mistake can do no harm.

Hedeoma has a peculiar and fragrant smell, and a pungent, warming taste, which is possessed by the entire plant. It readily imparts its virtues to boiling water, and alcohol.

MEDICAL PROPERTIES AND USE.—The medical properties of this plant are stimulant, carminative, diaphoretic, and emmenagogue. The infusion, commonly called *pennyroyal tea*, is a very popular domestic remedy, and is drunk freely in colds, pleurisies, fevers, eruptive diseases, such as rubeola and scarlatina, as well as in menstrual obstructions. The *constituents* of this plant are principally the same as those of the most of the labiate plants.

PHARMACEUTIC PREPARATION.—OLEUM HEDEOMA: *Oil of Pennyroyal.*—This is obtained by distillation with water. It is of a pale yellow color, and a specific gravity of 0·948. Its taste and smell resembles those of the mint tribes generally. Those that know the smell of the plant will readily distinguish it.

Use.—This oil is much used, in the new practice, as a rube-

facient. It is an ingredient of most of the liniments, and other preparations that are designed to act as excitants and counter-irritants on the surface. By many, it is also used internally as a stimulant diaphoretic, and carminative. It may either be taken alone dropped on sugar, or it may be worked into pills. In colic pains, pain in the stomach, rheumatism, amenorrhœa, etc., it is of great value.

MENTHA PIPERITA.—The Herb.

SYNONYMS.—Menta Piperita, *Ital.;* Pfefferminze, *Ger.;* Menthe poivree, *Fr.;* Pimenta piperita, *Span.;* Peppermint, *Eng.*

HISTORY.—It is supposed that this species of the mint genus was not introduced into the Materia Medica until the latter part of the last century. It is a native of Europe, but is cultivated for its oil in various parts of this country. The plant is also set out in gardens, about springs and sides of brooks, and other wet places, for domestic use, and as a medical herb. When thus set out, in favorable places, it will spread spontaneously from the seed and roots, and thus spread in marshes and other wet places. The genus received its name from *Minthe*, the concubine of Pluto, who, according to the Heathen Mythology, was changed by Proserpine into a plant belonging to the genus now bearing her name.

BOTANY.—*Sex. Syst.*—Didynamia Gymnospermia. *Nat. Ord.*—Lamiaceæ.

Gen. Char. MENTHA.—*Calyx* campanulate or tubular, five-toothed, equal, or somewhat two-lipped, with the throat naked inside, or villous. *Corolla* with the tube inclosed, the limb campanulate, nearly equal, four-cleft; the upper segment broader, nearly entire, or emarginate. *Stamens*, four, equal, erect, distant; *filaments* smooth, naked *anthers*, with two parallel cells. *Style*, shortly bifid, with the lobes bearing stigmas at the points. *Achenia*, dry, smooth.—*Bentham.*

Spec. Char. M. PIPERITA.—*Stem* smooth, branched, angular. *Leaves* petiolate, ovate-oblong, acute, serrate, entire, smooth. *Spikes* lax, short, obtuse, interrupted at the base. *Calyx* five-cleft, slender, smooth at the base; teeth hispid.

The *root* is creeping; the *stem* from one to two feet high,

nearly erect, quadrangular, and generally purplish at the top. The Corolla is funnel-shaped, and of a white or purplish color.

DESCRIPTION.—As kept in the drug-stores, peppermint consists of the dried herb, put up in packages by the Shakers. The leaves are usually more or less broken up in packing. The herb is of a moderately green color, and of an agreeable flavor, peculiar to the mints.

ANALYSIS.—The principle constituents of peppermint are, *volatile oil*, *resin*, *camphor*, a *bitter principle*, *tannic acid*, and *woody fiber*.

PHYSIOLOGICAL EFFECTS.—When taken into the stomach, peppermint acts as a stimulant, the pulse quickens a little, and becomes fuller, and is accompanied with a pleasant warmth of the system. In the mouth, it produces a sense of coolness on respiring. This is in part dependent on the camphor it possesses. If the portion is repeated, or increased, perspiration will ensue.

THERAPEUTIC PROPERTIES AND USE.—Peppermint is a valuable stimulant, diaphoretic, stomachic, carminative, and anodyne. In fevers, when nausea prevails, and other stimulants disagree, peppermint will generally be useful. Its anodyne, carminative, and stimulating properties combined, render it of great service in pains in the stomach, and colic, which are dependent on the confinement of wind. It is much employed in combination with other medicines to improve their properties, and their acceptability to the stomach. It is one of the ingredients of Beach's Antibilious Powders; and also enters into many other cathartics. The dose is from gr. x.—gr. xxx., of the powder; but it is best taken in a liquid form.

PHARMACEUTIC PREPARATIONS AND USE.—INFUSUM MENTHÆ PIPERITÆ: *Infusion of Peppermint.* ℞ Dried peppermint herb, ℥j., boiling Water, Oj.; infuse for thirty minutes in a covered vessel; strain and sweeten. This is the most common way in which peppermint is taken, and is a very popular diluent, stimulant, and diaphoretic drink, under the name of *peppermint tea*, which is used in most cases of sickness. It is drank ad libitum, or according to the object of its use.

OLEUM MENTHÆ PIPERITÆ: *Oil of Peppermint.* This is prepared by distilling the recently dried herb with water. It yields about one per cent., but varies much; in warm and dry

MENTHA PIPERITA.

seasons it yields more than in cold and wet. The oil, when fresh, is nearly colorless, but as it acquires age it becomes deeply tinged with yellow. It has the mint odor much stronger than the herb. Held under the eyes, its evaporation produces a sense of coolness, like that experienced on tasting it. Its specific gravity is about 0·902, and its boiling point about 365° F.

Oil of peppermint is composed of C^{21} H^{20} O^{2}. On long standing, it deposits *stearoptene*, or camphor, the formula of which seems to be C^{10} H^{10} O.

The oil possesses the same virtues as the plant, but more concentrated. It is taken in doses of from gtt. ii.—gtt. x., on sugar. It is rubefacient, and, from the cooling sensation it produces, is well adapted to relieve headache, by applying it to the temples and forehead.

ESSENTIA MENTHÆ PIPERITÆ: *Essence of Peppermint.* ℞ Oil of peppermint, f℥ij.; Alcohol, Oj.; shake together until the oil is dissolved.* This may be used in all cases in which the oil would be prescribed, as in flatulency, pain in the stomach, colic, etc.

AQUA MENTHÆ PIPERITÆ: *Peppermint Water.* ℞ Oil of Peppermint, ʒiij.: Proof-spirit, ℥vij.; Water Cong. ij. Mix and distil one gallon. Dose, fʒj.—fʒiij.

Use.—The same as the essence.

Commonly, peppermint water is made by dissolving a drachm of the oil in four pints of distilled water, by means of a little white sugar, spirit, or carbonate of magnesia.

ELÆOSACCHARUM MENTHÆ: *Mint Sugar.* Mix gtt. xxx. or gtt. xl. of the Oil of either of the mints with ℥j. of the powder of the whitest sugar.

ROTULÆ MENTHÆ: *Mint Drops.* These are plano-convex, or button-like masses, made of white or fancy-colored sugar and the oil of peppermint.

MENTHA VERIDIS.—The Herb.

Synonyms.—Widdatilam, *Tam.;* Poodina, *Pers., Duk.;* Nana, *Arab.;* Μινθη, *Gr.;* Grune Munze, *Ger.;* Menthe a epi, *Fr.;* Menta Romana, *Ital.;* Yerba Buena Puntiaguda, *Span.;* Spearmint, *Eng.*

Botany.—*Sex. Syst.*—Didynamia Gymnospermia. *Nat. Order.*—Labiateæ.

Gen. Char. Mentha.—Vide M. Piperita.

Spec. Char. M. Veridis.—*Root* perennial, creeping. *Stem*

* This is the officinal formula, but is much stronger than usually made, and it requires the highest proof alcohol to dissolve this quantity of the oil.

inclining, or upright, angular, branched. *Leaves* subsessile, ovate-lanceolate, entire, unequally serrated, smooth; those under the flowers are all bract-like, pubescent, rather longer than the whorls. *Spikes* cylindrical, loose. Its flowering season is in August; the stamens are long, and the corolla purple. It is a native of Europe, but is cultivated in gardens, or grows wild in our pastures, meadows, marshes, and the sides of streams. It should be cut in dry weather when in full bloom, and carefully dried. The smell and taste of spearmint somewhat resemble peppermint. It yields an essential oil by distillation with water, possessing the virtues of the plant. Its composition is the same as that of peppermint. The entire plant is officinal.

Medical Properties and Use.—Spearmint is a valuable stimulant, carminative, diuretic, diaphoretic, anti-emetic, antispasmodic, and anthelmintic. The herb or oil may be used in the same way, and for the same purposes as peppermint. The dose of the powder is from gr. xx. to gr. xxx. But it is generally taken in the form of an infusion or tea. The dose of the oil is from gtt. iij. to gtt. x.

MONARDA.—The Herb.

Synonyms.—Monarda Punctata: Monarde ecarlatte, *Fr.*; Horsemint, *Eng.*

Botany.—*Sex. Syst.*—Diandria Monogynia. *Nat. Ord.*—Lamiaceæ.

Gen. Char. Monarda.—*Calyx* five-toothed, cylindric, striate. *Corolla* ringent, with a long cylindric tube, *upper lip* linear, nearly straight and entire, involving the filaments; *lower lip* reflected, broader, three-lobed, the middle lobe longer.—*Nuttall.*

Spec. Char. M. Punctata.—*Root* perennial. *Stem* upright, about two feet high, branched, obtusely angled, downy, whitish. *Leaves* oblong, lanceolate, entire, remotely serrate, punctate, pubescent. *Flowers* yellow, spotted with red or brown, disposed in whorls, provided with lanceolate colored bracts, longer than the whorl.

This is an indigenous plant, growing wild in light sandy or gravelly soils, in open woods and new grounds, in most of the States. It yields a pungent essential oil, possessing the smell,

taste, and virtues of the plant. The leaves and flowering heads are officinal. Its composition is about the same as that of peppermint.

MEDICAL PROPERTIES AND USE.—Monarda is an agreeable stimulant and carminative, useful in all cases in which the other mints are applicable. It is much esteemed by many practitioners as a remedy in fevers, especially in typhus. The oil is a good rubefacient, and is found of great benefit, applied to the scalp and temples in periodic headache. The *dose* of the oil is from gtt. iij. to gtt. x. The herb is usually taken, prepared by infusion in boiling water, and drank freely *ad libitum*.

ORIGANUM.—The Herb.

SYNONYMS.—ORIGANUM VULGARE: Origan, *Fr.;* Gemeiner Dosten, Wohlgemuth, *Ger.;* Origano, *Ital.;* Oregano, *Span.;* Origanum, *Eng.;* Marjoram, *Vul.*

BOTANY.—*Sex. Syst.*—Didynamia Gymnospermia. *Nat. Ord.*—Labiateæ, *Jussieu.* Lamiaceæ, *Lindley.*

Gen. Char. ORIGANUM.—*Strobile* four-cornered, spiked, collecting the calyces. *Corolla* with the upper lip erect and flat, the lower three-parted, with the segments equal.—*Willd.*

Spec. Char. O. VULGARE.—An indigenous, perennial plant, with erect, purplish, downy, four-sided, trichotomous stems, which grow usually about eighteen inches high, with opposite, ovate, entire leaves, which are slightly pubescent below, and of a deep yellowish-green color. *Flowers* numerous, rose-colored, disposed in round panicled spikes, having ovate reddish bracts. *Calyx* tubular, five-toothed. *Corolla* funnel-shaped; upper lip erect, bifid, obtuse; lower one trifid, blunt, spreading. *Anthers* double. *Stigma* bifid and reflexed.

The plant grows on roadsides, in uncultivated fields, and thin woods, throughout most parts of the Middle States. It flowers from June to October.

MEDICAL PROPERTIES AND USE.—A mild stimulant, diaphoretic, aromatic, and tonic. This is a very good article for a change, when it is wished to substitute a milder article for the more active and powerful stimulants. It is very pleasant to the taste, and agrees well with the stomach, and may hence

be long continued without causing a repugnance to its taste. As an ingredient in stimulating compounds, it serves a good purpose in improving the flavor and taste of the medicines. It is applicable in all cases in which an aromatic or stomachic stimulant is required. The dose is from gr. xx. to gr. xxx., taken by infusion in boiling water. Its principal *constituents* are *volatile oil*, *resin*, *tannic acid*, *a bitter principle*, and *woody fiber;* but its active properties are chiefly dependent on the volatile oil.

PHARMACEUTIC PREPARATION.—**OLEUM ORIGANI**; *Oil of Common Marjoram.* This is obtained by distillation of the herb with water. As it appears in the drug stores, it has commonly a reddish-brown color, but this mostly disappears on redistillation. Its taste is pungent, and its odor the same as that of the plant. A hundred pounds of the herb will usually yield about eight ounces, but the proceeds are much dependent on the character of the season and culture of the plant.

Use.—Oil of Origanum is an active stimulant and rubefacient. Its principal use is as an ingredient in rubefacient liniments, and bathing mixtures, but is sometimes used internally as a stimulant, stomachic, and carminative. The dose is from gtt. v. to gtt. x., on sugar. Its composition, according to Kane, is C^{50} H^{40} O. Most of our oil of origanum is imported.

ORIGANUM MAJORANA.—The Herb.

SYNONYMS.—MAJORINUM HORTANSIS: Mirzúnjoosh, *Arab.;* Márroo, *Tam.;* Mûrwa, *Duk.;* Αμαραχον, *Gr.;* Marjoline, *Fr.;* Marjoran, Wurstkraut, *Ger.;* Maggiorana, *Ital.;* Mejorana, *Span.;* Sweet Marjoram, *Eng.;* Pot Marjoram, *Vul.*

BOTANY. — *Sex. Syst.* — Didynamia Gymnospermia. *Nat. Ord.*—Labiateæ, *Jussieu.* Lamiaceæ, *Lindley.*

Gen. Char. Vide Origanum.

Spec. Char. O. MARJORINUM.—*Root* perennial. *Stems* numerous, woody, branching, four-sided, a foot and a half high. *Leaves* sessile, in pairs, ovate, obtuse, entire, downy, of a pale green color. *Flowers* small, white, and appear successively between the bracteal leaves, which are numerous, and form round, compact spikes, of which three or four are placed at the extremity of each peduncle. *Corolla* funnel-shaped, with

the upper lip erect, and roundish, the under divided into three pointed segments.

The plant is a native of Southern Europe (Portugal), Asia (Palestine), and Africa, and is much cultivated in Europe and America as a garden herb.

Its active properties depend on a volatile oil, which it yields to distillation with water. The other *constituents*, like those of *O. vulgare*, are *tannic acid*, *resin*, *bitter matter*, and *woody fiber*.

MEDICAL PROPERTIES AND USE.—This is a very agreeable aromatic stimulant and carminative, and, like the other species, may be used in all cases in which the milder stimulants and aromatics are indicated. It is taken without much reference to quantity, being prepared by infusing in boiling water, and then drank freely. It is much employed in cookery.

OLEUM ORIGANI MAJORANÆ: *Oil of Sweet Marjoram.*—This oil in appearance, taste and smell, much resembles that of the *O. vulgare* when redistilled, but is finer or more agreeable than it. It is used in the same way, and for the same purposes as that.

MELISSA.—The Herb.

SYNONYMS.—MELISSA OFFICINALIS: Bucklitulfaristum, *Arab.;* Parsee cunjamkoray, *Tam.;* Badrunjbuyeh, *Pers.;* Melisse, *Ger., Fr.;* Melissa, *Ital.;* Torongil, *Span.;* Balm, *Eng.*

BOTANY.—*Sex. Syst.*—Didynamia Gymnospermia. *Nat. Ord.* — Lamiaceæ, or Labiateæ.

Gen. Char. MELISSA. — *Calyx* dry, nearly flat above, with the upper lip sub-fastigiate. *Corolla*, upper lip somewhat arched, bifid; lower lip with the middle lobe cordate.— *Willd.*

M. OFFICINALIS.

Spec. Char. M. OFFICINALIS.—*Root* perennial. *Stem* branched, from one to two feet high. *Leaves* ovate, acute, cordate at the base, crenate. *Flowers* white, in axillary unilateral racemes. *Calyx* thirteen-nerved, sub-campanulate, slightly ventricose in front, two-lipped, upper lip flat, truncate, with three short, broad teeth, lower with two lanceolate teeth. *Corolla*, upper lip concave, lower spreading, trifid, with apices of stamens connivant under the upper lip of the corol; *anther-cells* divergent.

Balm is a native of France, or the South of Europe, but is cultivated in gardens in this country. Its *constituents* are about the same as those of the *Origanum*.

MEDICAL PROPERTIES AND USE.—Balm is a mild stimulant, and aromatic, possessing, also, diaphoretic properties. Its medical properties are almost entirely dependent on its volatile oil, which it yields only in small quantities by distillation with water. The watery infusion is its most common preparation, which is drunk freely as a stimulant and diaphoretic.

THYMUS.—The Herb.

SYNONYM.—THYMUS VULGARE: Thyme, *Eng.*

BOTANY.—*Sex. Syst.*—Didynamia Gymnospermia. *Nat. Ord.*—Labiateæ.

Gen. Char. THYMUS.—*Calyx* sub-campanulate, throat closed with hairs. *Corolla*, upper lip flat, emarginate, lower lip longer.

Spec. Char. T. VULGARE.—*Leaves* numerous, erect, linear, ovate, revolute. *Flowers* small, in a whorled spike. A native of Europe, but is cultivated in gardens in this country. The *thymus serpillum*, or wild thyme of Europe, has similar properties to this. Both have a peculiar, grateful odor, which is dependent on its volatile oil. The herbaceous portion is cut when in bloom, and dried for use, as a domestic remedy.

MEDICAL PROPERTIES AND USE.—*Thyme* is mildly stimulant and aromatic, but is seldom used in general practice. In domestic practice, it is given in the form of a warm infusion

to promote perspiration, relieve headache, etc. By some, it is employed as tea at table.

SALVIA.—The Herb.

SYNONYMS.—SALVIA OFFICINALIS: Ελελισφαχος, *Gr.*; Sayselley, *Tam.*; Saoohal, *Cyng.*; Veĺāitié Capoor ka pāāt, *Duk.*; Shing-jin, *Chin.*; Salbiah, *Persh.*; Séfakuss, *Arab.*; Salva. *Port.*; Sauge, *Fr.*; Salbey, *Ger.*; Salvia, *Ital.*, *Span.*; Sage, *Eng.*

BOTANY.—*Sex. Syst.*—Diandria Monogynia. *Nat. Ord.*—Lamiaceæ, or Labiateæ.

Gen. Char. SALVIA.—*Calyx* tubular, striated, two-lipped, upper lip two to three toothed, lower lip two-cleft. *Corolla* ringent. *Filaments* affixed transversely to a pedicel.

Spec. Char. There are several species that possess about the same medical properties. The *Salvia Officinalis*, or common garden sage is a perennial plant, about two feet in hight, and has a branching shrubby stem, furnished with numerous opposite, petiolate, ovate, lanceolate, crenulate, wrinkled, grayish-colored leaves; which, as well as the flowers, have a peculiar fragrant odor, and warming aromatic, bitterish, and slightly astringent taste. The flowers are blue, variegated with white and purple, and are disposed on long terminal spikes. Sage is a native of Europe, but is cultivated in most of our gardens. The several varieties differ chiefly in the size and color of their flower.

MEDICAL PROPERTIES AND USE.—Sage has mildly stimulant properties united with tonic, and slightly astringent. The infusion is used with other preparations as a gargle in aphtha, etc.; and is also used as a common drink during convalescence from fevers, and in various other affections. Sage was highly esteemed by the ancients, but is not very extensively used in general practice, except in the form of a gargle and wash for sore mouth, relaxation of the uvula. For this purpose it is usually prepared with some more powerful astringent, as geranium maculatum, or myrica cerifera, and sweetened with honey; sometimes vinegar is added.

CALAMUS.—The Rhizomæ.

SYNONYMS.—ACORUS CALAMUS: CALAMUS AROMATICUS: Vassamboo, *Tam.;* Butch, *Duk.;* Vudge, *Persh.;* Bach, *Hind.;* Vachā, *Sans.;* Shwet Buch, *Beng.;* Vudza, *Tel.;* Wadda Kaha, *Cyng.;* Bagy, *Can.;* Kawa Sob., *Jap.;* Dringo, *Port.;* Vaymboo, *Malay;* Kusset alderireh, *Egyp., Arab.;* Thach-xuog-bo, *Coch. Chin.;* Acorus vrai, Acorus odorant, *Fr.;* Kalmuswurzel, *Ger.;* Calamo aromatico, *Ital., Span.;* Sweet Flag, *English.*

BOTANY.—*Sex. Syst.*—Hexandria Monogynia. *Nat. Ord.*—Acoraceæ.

Gen. Char. CALAMUS.—*Receptacle* spadix-like, cylindric, covered with florets. *Corolla* six-parted. *Style* none. *Stigma* insignificant. *Capsule* three-celled, three-seeded.

Spec. Char. C. AROMATICUS.—*Rhizome* horizontal, fleshy, jointed, with a layer of bristly fibers at the joints, beset with numerous fibers below, white within, externally whitish, and tinged on the planes with yellow or green. It has a peculiar odor, and spicy aromatic and pungent taste. *Leaves* radical, sheathing at the base, long, sword-shaped, smooth, green above, reddish, variegated with red, green, and white, at their base, or junction with the rhizome. The *scape* resembles the leaves, but is something longer, and sends out from one side, near the middle of its length, the *spadix*, which is crowded spirally with small flowers.

Calamus is an indigenous plant, growing in wet, swampy places, in most parts of the United States. Its flowering time is in May or June. According to Trommsdorff, its composition is as follows: 0.1 per cent. of *volatile oil*, 2.3 *soft resin*, 3.3 *extractive*, with a little *chloride of potassium*, 5.5 *gum*, with some *phosphate of potassa*, 1.6 *starch*, analogous to inulin, 21.5 *lignin*, and 65.7 *water*.

MEDICAL PROPERTIES AND USE.—Calamus is a stimulant tonic, possessing in some degree the virtues of the aromatics. It is also carminative, and has been used with success in flatulency, pain in the stomach, and in colicy affections, especially among children. As an adjuvant to tonic and laxative medicines, it is of considerable benefit in dyspepsia, dysentery, and other affections of the alimentary canal. In domestic practice,

it is often boiled in milk, and taken freely. The root is also chewed by some. The watery infusion is prepared by scalding an ounce of the root in a pint of water. The dose of this is a wineglassful, or more.

There are in addition those already treated of, quite a variety of useful medical plants that would have their place in this order of stimulants, if the limits of the work would admit them. Some of the more important of these may be briefly noticed here in a secondary list.

TANACETUM VULGARE: *Tansey.*—This is a well-known perennial herbaceous plant, introduced from Europe, and now almost every where cultivated in gardens for its medical use. It is a bitter aromatic stimulant, diaphoretic, nervine, emmenagogue, antispasmodic and anthelmintic. Its virtues are in an essential oil, which is obtained by distillation with water. The plant is commonly used in domestic practice, tinctured in weak spirits (whisky), and is thus called "*Bitters.*" It is chiefly taken in this way as a stomachic and tonic, *ad libitum*,—a bad practice, as it promotes an appetite for spirituous liquors.

As an emmenagogue and parturient it is taken in hot infusion or decoction, drunk freely. The top leaves or flowers is the part used.

ACHILLEA MILLEFOLIUM: *Yarrow.*—A wild perennial herbaceous plant, common in Europe and America. In appearance it resembles somewhat the *Tansey*, and is not unlike it in its medical properties. It may be employed in the same manner and use as that, and in similar doses. The entire plant is medicinal.

COLINSONIA CANADENSIS: *Richweed.*—A perennial, herbaceous, wild plant, with a hard, knotty root, upright, smooth, annual stem, large, broad, cordate, serrate, petiolate, opposite leaves, and a terminal fructification. The entire plant has a very strong, peculiar, somewhat balsamic odor, which is dependent upon an essential oil that may be obtained by distillation.

The herbaceous part of the *Colinsonia* is an aromatic stimulant, anodyne, carminative, emmenagogue and diuretic, and was much employed by the aboriginese in this country at an early date. They used it as a vulnerary, applying the bruised leaves upon wounds and contusions. They called it a *heal-all*, and the plant has also been called *wound-wort*, in allusion to its soothing and healing properties in this application. Internally, it is taken in form of infusion for headache, colic, cramp, etc. There are many species of it, all nearly alike in medical properties. Grows in woodlands throughout the western States.

SOLIDAGO ODORA; *Sweet Golden-rod.*—This is one of the most prominent of the wild perennial plants which adorn our western open woodlands and prairies. It grows from three to five feet in hight, and is divided at the top into flower-bearing branches, of a magnificent golden color, whence the name *golden-rod.*

The odor of the plant is found in an essential oil, that may be obtained by distillation.

This species of solidago is medicinal in all its parts. It is stimulant, aromatic, diaphoretic, carminative and diuretic. It has been mostly employed in dropsical and nephritic affections. But has also been found serviceable in cramp of the stomach, flatulency, and in asthma. It is given freely in strong infusion.

BETULA: *Birch-tree.*—The bark of the black or sweet birch (*Betula Lenta*), has long been used as an aromatic stimulant, pectoral, astringent, etc., and has given much satisfaction in dysentery, diarrhœa, typhoid fever, diabetes, consumption, and in all cases of tedious convalescence from fevers. It may be given in powder, in doses of gr. xx., or in tincture in quantities of f℥ij.—f℥ss. The oil, obtained by distillation from the bark, is a fine flavoring agent for syrups, tinctures, confections, etc.

AMBROSIA ELATIOR: *Rag-weed.*—This common annual weed, found in pasture grounds and roadsides of our entire country, has been employed with benefit as a topical stimulant. It has an aromatic essential oil upon which its flavor and stimulant

properties depend. But it is also very bitter, and this property is more persistent than is common with most other bitter vegetable substances. When cows eat it, their milk is rendered bitter and unfit for use. The use made of this plant, as yet, has been mostly in a domestic way. The fresh herb has been applied in a bruised state to painful parts, as in bruises, sprains, and lacerations, and its effects in these applications are much praised.

Our indigenous vegetable resources are exceedingly abundant, and hence we have had no necessity to press our inquiries in this regard, otherwise, there would be little question but that many among our common plants, our *weeds*, would be found highly efficient as medical agents. The *classical* name AMBROSIA might, in such a case, not be dishonored in its medical connections, and would perhaps obtain a more eligible English name than that above given, and which sounds so rudely after its latin name, *ambrosia*, which literally means *Angels' food*.

Order III.—FRAGRANT VOLATILE STIMULANTS: CARMINATIVES.

The order of stimulants called *fragrant volatile*, embraces the umbelliferous tribe, which are very agreeable to the taste, and acceptable to the stomach. They are valuable on account of their carminative virtues. These are dependent upon their peculiar power to excite the muscular contractions of the stomach and intestines, which, owing to atony, occasioned by their being a long time in a state of over distension, are incapable of contracting readily, and hence remain in a tympanitic state. The peculiar stimulating virtues of *carminatives*, seem to overcome this atony of the muscles, or, at least, they so influence the nerves of these organs, as to excite the latter to contract, and thus they expel the wind that is pent up within them.

The active properties of the fragrant volatile stimulants reside in an essential oil, and hence alcohol and ether are their proper menstrua. Experience proves, however, that all

essential oils, as already stated, while combined with gum and extractive matter, will be taken up by water, to a considerable extent, especially when the latter is at the boiling temperature; thus *infusions* or *teas* are very common forms in which our stimulant and carminative herbs are taken. But all officinal preparations besides the oils and the dry preparations, are made with alcohol. The essential oils of the fragrant stimulants are all obtained by distillation with water.

FŒNICULUM.—The Seed.

SYNONYMS.—*Μαραθρον, Gr.;* Razeeanuj, *Arab.;* Mādhūrikā, *Sans.;* Mayuri, *Hind.;* Bādeeyan, *Pers.;* Adas, *Jav.;* Sonf, *Duk.;* Pedda-gillakāra, *Tel.;* Dewadooroo, *Cyng.;* Pērun Siragum, *Tam.;* Fenchel, *Ger.;* Fenouil, *Fr.;* Finocchio, *Ital.;* Xinojo, *Span.;* Fennel, *Eng.*

BOTANY.—*Sex. Syst.*—Pentandria Digynia. *Nat. Ord.*—Umbelliferæ.

Gen. Char. FŒNICULUM.—*Calyx*, a tumid, obsolete rim. *Petals*, roundish, entire, involute, with a squarish, blunt lobe. *Fruit*, tapering. *Half-Fruits* with five prominent bluntly-keeled ridges, of which the lateral are on the edge, and rather broadest. *Vittæ*, single in the channels, two on the commissure. *Involucre* none.—*Lindley.*

Spec. Char. There are several species of fennel that are possessed of analogous properties.

1. FŒNICULUM DULCE: *Sweet Fennel.—Stem* somewhat compressed at the base. *Radical leaves* somewhat distichious. *Segments* capillary, elongated. *Umbels* of 6 to 8 rays. *Dec.* This is a smaller plant than the following, and is an annual; but its fruit is much larger, some nearly five lines in length, less compressed, somewhat curved and paler, with a greenish tinge. A native of the south of Europe, cultivated in our gardens as a pot-herb, and for garnishing "*finnochio dulce*, turionibus edulibus."

2. FŒNICULUM VULGARE: *Wild Fennel.—Root* biennial, or perennial, tapering. *Stem* annual, three to four feet high, roundish at the base, filled with pith. *Leaves* decompound. *Segments* capillary and elongated. *Flowers* umbelliferous, yellow, small. *Umbels* large, from thirteen to twenty rays. *Fruit* oblong, small, dark colored, odoriferous. A European plant, growing wild on sandy and chalky soil.

MEDICAL PROPERTIES AND USE.—The fennel-seed is one of the most popular and useful of the carminatives or aromatic stimulants. It is very useful in flatulency, colic, gastralgia,

nausea arising from wind in the stomach (which is a more common cause of nausea than is usually supposed), indigestion arising from atony of the stomach, etc. Fennel-seed is also extensively used in combination with other agents, with a view to the modification or improvement of their taste or operation.

The Romans used the fennel-seed tinctured in wine, as a remedy against the poisoning from the bite of the *scorpion*. Boerhaave thought that the root of the sweet fennel plant, is equal to that of ginseng. *Dose;* the powdered seed is taken in the quantity of ʒss.—ʒj.

Pharmaceutic Preparations.—**OLEUM FŒNICULUM DULCIS**: *Oil of Sweet Fennel.* This is prepared simply by distilling the bruised seed with water.

Action—Use.—Same as the seed.

AQUA FŒNICULI: *Fennel Water.*—℞ Bruised seeds of *Fœniculum Dulce*, ℔j. Aq. q. s. to prevent empyreuma. Distil Cj.

Action—Use.—A mild carminative and aromatic, useful as a vehicle.

ANISUM.—The Seed.

Synonyms.—Pimpinella Anisum: U. S. E., Somboo, *Tam.;* Sompoo, *Tel.;* Jera manis, *Malay;* Anisu, *Guz.;* Sataphusphā, *Sans.;* Sonf, *Duk.;* Rāzyaneh roomie, *Per.;* Mungfi, or adis manis, *Jav.;* Kadis Manis, *Bali;* Anys, *Dut.;* Anissame, *Ger.;* Graines d'anis, *Fr.;* Semi d'aniso, *Ital.;* Semiente de anis, *Span.;* Anison, *Arab.;* Anise Seed, *Eng.*

Botany.—*Sex. Syst*—Pentandria Digynia. *Nat. Ord.*—Umbelliferæ.

Gen. Char. Pimpernella.—*Fruit* ovate-oblong. *Petals* inferior.. *Stigma* nearly globular—*Willd.*

Spec. Char. P. Anisum.—*Stem* about a foot high, smooth. *Radical leaves* heart-shaped, rather roundish, lobed, incised; *stem leaf* biternate. *Segments* linear, lanceolate, rather wedge-shaped, acuminate. *Umbels* on long stalks, many-rayed without involucres. *Flowers* small, white. *Calyx* obsolete. *Petals* obcordate, with an inflexed point. *Fruit* ovate, one line and a half long, covered with a few scattered hairs. *Carpels* with five filiform, equal ridges. *Interstices* with three or more vittæ.

Stylopodium tumid. *Styles* of the fruit recurved.—*Nees and Eberm.*, 275.

DESCRIPTION.—The fruit commonly called *aniseed*, is ovoid, of a greenish-gray color, and slightly downy; the taste is warm, sweetish, and aromatic; the odor penetrating but agreeable, resembling the star-anise. It is cultivated in Malta and the south of Spain, and also in Germany, and in our gardens. The kernel contains three and five tenths per cent. of *fixed oil*, and the inner firmly-adhering seed-coat about three per cent. of *volatile oil* of *anise*, on which its properties chiefly depend.

THERAPEUTIC PROPERTIES.—Agreeable and superior carminative and anodyne; much used also for flavoring syrups, conserves, etc.

OLEUM ANISI: *Oil of Anise.*—This is obtained by distillation, with water from Aniseed. It is of a bright yellow color, and has the strong odor and taste of Anise. Much is imported from abroad; but that which is said to come from the East Indies is probably produced by some other plant. It solidifies very readily at 50°, from containing a large portion of Stearoptene.

Action—Uses.—Stimulant aromatic, stomachic, useful in flatulent colic, in doses of min. v.—min. xv.

SPIRITUS ANISI, L. (COMPOSITUS) D: *Spirit of Anise.*—Mix bruised Anise, ℥x. (and bruised seeds of Angelica, āā. ℔ss. D.), Proof-spirit, Cj.; and Aqua, Oij. (q. s. to prevent empyreuma—macerate for twenty-four hours, D.); with gentle heat, L. Distil Cj.

CARUM.—The Seed.

SYNONYMS.—CARUI, L. E., CARUM CARUI: Carvi, *Fr., Ital.*; Gemeiner Kummel, *Ger.*; Alcaravea, *Span.*; Caraway Seed, *Eng.*

BOTANY.—*Sex. Syst.*—Pentandria Digynia. *Nat. Ord.*—Umbelliferæ.

Gen. Char. CARUM.—*Fruit*, ovate-oblong, striated. *Involucre* one-leaved. *Petals* keeled, inflexed-emarginate.—*Willd.*

Spec. Char. C. CARUI.—A biennial, about two feet high. *Root* fusiform. *Leaves* bipinnate. *Leaflets* cut into linear segments. *Involucre* wanting, or of one leaf. *Involucel* none. *Calyx* obsolete. *Petals* obcordate, with a narrow, acute, inflexed

point. *Fruit* aromatic, oblong, a little curved, brownish colored. *Carpels* with five filiform ridges. *Interstices* with single vittæ. *Stylopodium* depressed. Grows in meadows and pastures: cultivated in gardens.

DESCRIPTION.—The fruit, or officinal portion, is about two lines in length, slightly curved, with five longitudinal ridges, which are of a light-yellowish color, while the interstices are of a dark-brown.

Caraway seeds have a pleasant odor, and a warm, aromatic taste, owing to the presence of about five per cent. of volatile oil, which may be dissolved by alcohol, or distilled off with water.

THERAPEUTIC PROPERTIES AND USE.—Stimulant carminative, much used in confectionary. Its oil and spirit as corrective adjuncts, the water as a vehicle.

OLEUM CARUI, L. E. D.: *Oil of Caraway.*—Obtained by distilling with Aq. the (bruised, E.) fruit of *Carum Carui.*

SPIRITUS CARUI, L. E. D.: *Spirit of Caraway.*—Take bruised Caraways, ℥xxij. (℔ss. E. ℔j. D.); Proof-spirit, Cj. (Ovij. E.) Aq., Oij. L. (q. s. to prevent empyreuma, D.) Mix. (Macerate for two days (twenty-four hours D.) in a covered vessel, add Aq. (Ojss. E.) with gentle heat, L. Distil Cj. (Oviij. E.)

AQUA CARUI, L. E. D.: *Caraway Water.*—Take bruised Caraway Seeds, ℔j., pour on Aq. q. s. to prevent empyreuma. Distil Cj. Same as Aq. Anethi, L.

ANETHUM.—The Seeds.

SYNONYMS.—ANETHUM GRAVEOLENS; Saddacooppéi, *Tam.*; Sattacooppa, *Cyng.*; Ανηθον, *Gr.*; Soie, *Duk.*; Sowa, *Hind.*; Mīsrēyā, Sītāsīvā, Sālēyā, *Sans.* Suddapa, *Tel.*; Suva, *Guz.*; Moongsi, *Java*; Aneth a odeur forte, *Fr.*; Dill, *Ger.*; Aneto, *Ital.*; Aneldo, *Span.*; Dill, *Eng.*

HISTORY.—Dill (*ανηθον*), a native of the south of Europe, and of the Oriental region, was well known to the ancients.

BOTANY.—*Sex. Syst.*—Pentandria Digynia. *Nat. Ord.*—Umbelliferæ.

Gen. Char. ANETHUM.—*Fruit* nearly ovate, compressed, striated. *Petals* involuted, entire.—*Willd.*

Spec. Char. A. GRAVEOLENS.—An annual plant, one to two feet high, every part smooth and glaucous, stem finely stri-

ated. *Leaves* tripinnated, with fine capillary segments like those of the Fennel, petioles broad and sheathing at the base. *Umbels* long-stalked, without general or partial involucres. *Calyx* margin obsolete. *Petals* varnished, yellow, roundish, entire, involute. "*Fruit* lenticular, flat, of a bright-brown color on the rather convex back, surrounded by a pale membranous margin. *Carpels* or half-fruits with equi-distant filiform ridges, the three dorsal acutely keeled, the three lateral more obsolete, and passing into the margin. *Vittæ* broad, solitary, filling the whole channels, two on the circumference." Much cultivated in the East, but also in the United States as a domestic remedy and condiment.

Description.—The flattened elliptical fruits, commonly called dill seeds, with their brown and slightly convex backs and pale membranous margin, are easily distinguished from the other officinal fruits. Both the plant and the fruit are much used in the East as condiments and articles of diet. The plant is mentioned in the New Testament among the things tithed; but is there translated *Anise*. The carpels have a bitter but aromatic taste, owing to the presence of volatile oil which is stored up in the vittæ, and this is what makes them useful as a carminative stimulant.

Therapeutic Properties and Use.—Dill is an aromatic and carminative, very agreeable to some persons. It is used in the same way as the other carminatives generally.

Pharmaceutic Preparations.—OLEUM ANETHI: *Oil of Dill.*—Distil with *Aq.* bruised fruit of *Anethum graveolens.*

Action—Use.—Odor and taste aromatic. Used for making Aqua Anethi. Carminative in doses of gtt. v.

AQUA ANETHI, L. E.: *Dill Water.*—℞ Bruised *Dill seeds*, ℔jss. (℥xviij, E.) *Aq.* Cij. *Proof-spirit*, f℥vij. (rectified, E. f℥iij. E.) Distil Cj.

Action—Use.—Aromatic, and much given to infants to relieve flatulence, and used as a vehicle for active medicines.

ANGELICA.—The Root, Herb, and Seed.

Synonyms.—Engelwurzel, *Ger.;* Angelique, *Fr.;* Arcangelica, *Ital.;* Angelica, *Span.;* Archangel, *Eng.*

BOTANY.—*Sex. Syst.*—Pentandria Digynia. *Nat. Ord.*—Umbelliferæ.

Gen. Char. ANGELICA.—*Fruit* elliptic, compressed, somewhat solid and corticate; ridges three, dorsal acute, intervals grooved, margin alated. *General involucre* none.—*Sprengel. Umbel* large, many-rayed, spreading; *umbellet* dense, subhemispheric; *involucel* about eight-leaved. *Calyx* five-toothed. *Petals* inflected.—*Nuttall.*

Spec. Char. There are two officinal species of angelica:

1. A. ATROPURPUREA: *Masterwort.*—This is a thrifty indigenous, herbaceous plant, growing from three to ten feet in hight. *Root* perennial, large, purplish. *Stem* smooth, herbaceous, large, hollow, and often as thick as the wrist. *Leaves* very large, triternate, and supported on long hollow petioles. *Flowers* umbelliferous, greenish-white. Grows wild, in meadows and other open places, in a rich soil, in various parts of the United States. Flowering time in June and July. The entire plant has a strong and peculiar, but not unpleasant odor.

A. ATROPURPUREA.

2. ANGELICA ARCHANGELICA: *Garden Angelica.*—This is a biennial plant, native of Europe, but cultivated in our gardens.

Root large, pungently aromatic. *Stem* three to five feet high, hollow, striated, rather glaucous. *Foliage*, stalks and even flowers of a bright green. *Leaves* two or three feet wide, bipinnated or biternate. *Leaflets* ovate, lanceolate, sharply and closely serrated, all sessile, partly decurrent, terminal one trifid. *Petioles* much dilated at the base. *Umbels* terminal, globular, with dense secondary umbels. *Involucre* of two or three linear bracts, secondary one of about eight linear lanceolate bracts. *Calyx* minutely five-toothed. *Petals* ovate, entire, acuminate, incurved. *Fruit* nucleated. *Carpels* or half-fruits with three dorsal thick-keeled ridges and two marginal ridges dilated into broad wings. *Interstices* without vittæ. *Seed* free, with numerous vitæ.—*Nees and Eberm.*

Description.—In its recent state, the root of the first-named species of angelica is acrid, and is, by some, said to be poisonous. But in the dried state its acrid properties are dissipated. As it occurs in market, it is either split up into longitudinal sections, or is cut transversely. Its odor is not as strong as that of the recent root. The seed is flat, about two or three lines in diameter, swelled in the center, and has an aromatic taste and peculiar odor.

Medical Properties and Use.—The root and seed of both species of angelica are used for medicinal purposes, and likewise the herb of the species last described. The virtues they possess are those of an elegant stimulating aromatic and carminative, applicable in most cases in which articles of this class are indicated.

CUMINUM.—The Seed.

Synonyms.—Cyminum, L., U. S.: Sirágum, *Tam.;* Dooroo, *Cyng.;* Jeera, *Beng.;* Zira, *Duk., Hind.;* Kemun, *Arab.;* Zéréh, *Pers.;* Jintan, *Malay;* Gilakara, *Tel.;* Jirăkă, Ajāji, *Sans.;* Jeerágá, *Can.;* Komyn, *Dut.;* Cuminho, *Port.;* Cumin, *Fr.;* Römischer Kümmel, *Ger.;* Kummer, *Dan.;* Cumin, *Eng.*

Botany.—*Sex. Syst.*—Pentandria Digynia. *Nat. Ord.*—Umbelliferæ.

Gen. Char. Cuminum.—*Fruit* ovate, striated. *Partial umbels* four. *Involucres* four-cleft.—*Wood.*

Spec. Char. C. Cyminum.—An annual plant, about six or eight inches high, with a round slender stem; numerous narrow, linear, pointed, smooth *leaves*, which are of a deep green color. *Flowers* white, or purple, disposed in umbels of few rays. *Involucres* with three or four linear leaflets. *Fruit* or *seed* oblong, plano-convex, or flat on one side, and convex, furrowed, or rough on the other, about one-sixth of an inch in length, and of a bright brown color. Each has seven longitudinal ridges. The odor of the seed is peculiar, strong, and durable; the taste warm, bitterish, aromatic, and somewhat disagreeable.

Medical Properties and Use.—Cumin seed possesses about the same medical virtues as the umbellifera generally, being stimulant, aromatic, and carminative. As a stimulant it is

rather more powerful than most of those yet described in this order. It abounds in essential oil, which possesses all its active properties. The dose of the oil is from min. v. to min. xx.; that of the powdered seed is from gr. xv. to ʒss.

CORIANDRUM.—The Seed.

Synonyms.—Cóttamillie, *Tam.*, *Tel.*; Mety, *Malay*; Cotumbāroo, *Cyng.*; Dunya, *Hind.*, *Ben.*; Dhunnian, *Duk.*; Dhānyākă, *San.*; Kezereh, *Arab.*; Kishneez, *Persh.*; Dhāna, *Guz.*; Cottimbiry, *Can.*; Koriander, *Ger.*; Coriandro, *Ital.*; Cilantro, *Span.*; Coriandre, *Fr.*; Coriander, *Eng.*

Botany.—*Sex. Syst.*—Pentandria Digynia. *Nat. Ord.*—Umbelliferæ.

Gen. Char. Coriandrum.—*Corolla* radiate. *Petals* inflex, emarginate. *Universal involucre* one-leafed. *Partial involucres* halved. *Fruit* spherical.—*Willd.*

Spec. Char. C. Sativum.—An annual plant, with an erect, round, smooth, branched stem, about two feet high. *Leaves* compound; upper ones thrice ternate, with linear pointed leaflets; the lower ones are pinnate, with the pinnæ cut into irregular serrated lobes, resembling A. Petroselinum. *Flowers* white, or of a crimson lake, small, and arranged in terminal umbels. *Fruit* globular, small, and possessing a peculiar aromatic taste and flavor.

Medical Properties and Use.—Coriander may be regarded as among the mildest of our aromatic stimulants and carminatives. Its chief use is as an adjunct to other remedies, to cover their unpleasant taste or smell. When taken alone, the dose is from ʒj. to ʒj. of the powdered seeds. It yields an essential oil, by distillation, which possesses its virtues.

OSMORHIZA.—The Root.

Synonyms.—Myrrhis Clatoni, *Mich.*; Osmorhiza Dulcis, *Praf.*; Osmorhiza Longistylis *Eat.*; Uraspermum; Myrrhis; Chaerophyllum; Scandix.: Cicily, Sweet Cicily, Sweet Anise, *Eng.*

Botany.—*Sex. Syst.*—Pentandria Digynia. *Nat. Ord.*—Umbelliferæ.

Gen. Char. Osmorhiza. *Calyx* with the margin obsolete. *Petals* ovate, emarginate, inflexed. *Fruit* elongated, alternate

at the base, acute-angled, in the transverse section roundish. *Involucre*—general—two or three leaved; partial ones—five-leaved. *Flowers* all white, with the central ones barren, and the outer ones fertile.—*Eaton.*

Spec. Char. O. DULCINUM, or LONGISTYLIS. *Root* perennial, fusiform, branched. *Stems* upright, pubescent. *Leaves* compound, leaflets gashtoothed, pubescent. *Umbels* axillary, terminal, about five-rayed. *Style* as long as the villose germ, filiform, erect, deflected.

A sweet-scented perennial, herbaceous plant, growing in rich soil, in slightly shaded places, in the Middle and Western States. It is much sought for by children in rural districts, for its root, which is very sweet and aromatic; more agreeable than panax, has much of its taste, and also somewhat that of anise, whence one of its English names.

Many instances of poisoning have occurred, by the mistaking of another species of the plant, the *O. Brevistilus*, which is somewhat narcotic, but no serious consequences have been known from its poisoning effects. This species may be known by the root being less sweet or aromatic, and by its style, as the specific name indicates, being shorter. This plant is also more hairy, and its leaves are more deeply cleft than those of the former.

MEDICAL PROPERTIES AND USE.—The root of the Sweet Cicily is a fine aromatic carminative, stimulant, expectorant, anodyne, and demulcent. The seeds are also possessed, in some degree, of the same properties. The root, in the dried state, may be employed in substance or in tincture, as a carminative, and in combination with some of the more efficient agents, as an expectorant in pneumonia, asthma, bronchitis, and coughs generally. The dose of the powdered root is ʒj., that of the tincture is fʒij.

DAUCI FRUCTUS.

The seed of the common carrot is a good carminative, sometimes used in domestic practice. The root makes a good cataplasm.

Order IV. GUM-RESINOUS STIMULANTS.

This order is well distinguished by the physical character of its articles, which are concrete productions of various species of plants. They are called *gum-resins*, because of their partaking of the nature of both *gums* and *resins* in their essential properties. They are more permanent in their effects than any other order of stimulants, and also combine with their stimulant properties the virtues of a tonic. This circumstance explains, in part, the cause of their more permanent stimulant powers.

The gum-resinous stimulants are quite available in the treatment of many varieties of disease. Their solvents are alcohol and water. Alcohol dissolves the resin, and water the gum. The alcoholic solutions, called *tinctures*, are the most valuable, being generally the most active, as the stimulant virtues of this order of medicaments abound most in the resinous portions.

MYRRHA.

Synonyms.—Balsamodendron Myrrha: Μυρρα, Σμυρνα, *Gr.*; Mur, *Hebr.*; Bowl, *Hindoo*; Válátipōlum, Páléndra bōlum, Villey bolum, *Tam.*; Balintra bolum, *Tel.*; Vola, *Sans.*; Heera bol, *Duk.*; Manisan lebah, *Malay*; Madu, *Java, Bali*; Mirra, *Ital., Pol., Portuguese, Span.*; Myrrha, *Ger.*; Myrrhe, *Fr.*; Mirrhe, *Dutch*; Myrre, *Danish*; Myrha, *Swedish*; Murr, *Arab.*; Myrrh, *Eng.*

History.—The earliest notice of Myrrh occurs in the Old Testament (Gen, xxxvii. 25). It appears thus that this article was an object of trade with the Eastern nations more than three thousand five hundred years ago. In the Hebrew language it is termed *Mur*, in allusion to its bitterness. The Greeks, who were well acquainted with it, called it *Σμυρνα*, or in the Æolic dialect, *Μυρρα*. It appears that Hippocrates (*See Dierbach, Arzneim des Hippok., p.* 224), employed it in several diseases; and Dioscorides (lib. i., cap. 77), describes several kinds of it, the most esteemed being the *Troglodytica*. Some of the ancient poets would have us believe that the name of this gum-resin was derived from Myrrha, the daughter of Cinyras, *king of Cyprus*, who fell in love with her own father, and

after having criminal intercourse with him, fled to Arabia, where she was changed into a tree which still bears her name.

The ancients seem, however, not to have had a knowledge of the tree which yields the *gum-myrrh*, although the drug was so extremely popular with them. Nor were the moderns better informed, until about the year 1825, when Ehrenberg returned from his travels in various parts of Asia and Africa, with Hemprich; and who brought with him a specimen of the tree which has been described and figured by Nees von Essenbeck in his *Beschriebung Officin Planzen*, where he observes that his friend, Dr. Erenberg, collected from off this tree "*sehr shœne Myrrh*," (very pretty Myrrh). He describes the tree to belong to the Balsamodendron genus.

The tree according to accounts, is found in Arabia Felix, near Gison, growing in thickets, among the acaciæ and euphorbia. A species of Balsamodendron, said to yield myrrh, is reported to grow in Africa. Johnson says, that during his travels in Africa, he found two varieties in Adel. Other statements, also, go to show that myrrh is collected for exportation on the borders of the Red Sea. Dr. Malcolmson, in a communication from Aden to Dr. Royle, states that it is exported in native boats from different ports on the Red Sea, but chiefly from Berbera, Zela, and Massowah, and adds that there is no myrrh produced in Arabia. The East Indies now furnish the most myrrh.

The gum exudes spontaneously from cracks in the bark on the trunk of the tree, near the ground, and flows freely on the ground and stones below. The natives also bruise the bark with stones, to promote its exudation.

Botany.—*Sex. Syst.*—Octandria Monogynia. *Nat. Ord.*—Terebenthinaceæ.

Gen. Char. Balsamodendron.—*Flowers* irregular. *Calyx* four-toothed, persistent. *Petals* four, linear-oblong; æstivation induplicate-valvate. *Stamens* eight, inserted under the annular disk; elevated warts between the stamens. *Ovary* one. *Style* one, short, obtuse. *Berry* or *drupe* ovate, acute, with four sutures, one or two-celled; *cells* one-seeded. *Leaves* pinnated;

leaflets three to five, sessile, without dots. Oriental trees giving out balsam.—*De Cand.*

Spec. Char. B. MYRRHA.—*Stem* shrubby, arborescent; *branches* squarrose, spinescent. *Leaves* ternate; *leaflets* obovate, obtuse, obtusely tooth-letted at the apex, the lateral smooth. *Fruit* acuminate.—*Nees.*

P. MYRRH.

A small shrubby tree, with whitish gray bark, and yellowish white wood, both of which have a peculiar odor. The branches are rough, beset thinly with thorns, and terminate with spines. The leaves are ternate, consisting of three ovate lobes, the two lateral of which are smaller. The fruit is oval, pointed, longitudinally furrowed, of a brown color, somewhat longer than a pea, and surrounded, at the base, by the four-toothed persistent calyx.

DESCRIPTION.—Myrrh is a gum-resin that occurs in various-sized, irregular pieces. Some varieties consist of tears, either separate or agglutinated. It is usually of a reddish-brown, and semi-transparent appearance. Some impure and bad specimens are dark, or blackish. Others, again, are almost transparent. When fractured, it presents a shining and fresh appearance. When it is well dried out, and is cold, it will pulverize pretty easily; but when warm, it becomes tenacious. It is inflammable, but not actively so, and is not fusible by heat. Its specific gravity is about 1·36. The taste is bitter, and peculiarly aromatic. Its odor is strong and durable.

Few drugs present more of a variety in quality, as it is not only liable to contain dirt, and sand, and bark, but is often very much adulterated with pieces of bdellium and various other gums of the sort. Bdellium is more soft and waxy, and will soften more by the application of heat; even the heat of the hand will soften it. It is bitter and somewhat acrid.

Myrrh is only partially soluble in water, alcohol, or ether. Water takes up its gummy and extractive matters. Alcohol and ether dissolve, to some considerable extent, the resin and oleaginous principles in which the virtues of the drug chiefly reside. If nitric acid be added to the watery solution, the latter is turned red. Potash increases the solvent power of water, causing it to decompose the resin.

The drug is usually imported in chests, containing from one to two hundred weight. That brought from Turkey has generally been considered the best, and an inferior article was brought from India. But at the present time nearly all the myrrh is imported from the East Indies, so that the names *Turkey Myrrh* and *India Myrrh*, as designating quality, are not any longer appropriate. As may be supposed, from the manner in which it is collected, a difference of quality in the myrrh itself obtains; thus we find that the chests in which it is imported sometimes contain the article of two or three qualities, when it is termed *myrrh in sorts*. But these are sometimes sorted out, and thus we have myrrh of the *first*, *second*, and *third* quality. The first quality alone should be used as medicine; it is of a uniform reddish-brown color, semi-transparent, has a very strong odor, and is clear from impurities.

Analysis.—Myrrh contains a *volatile oil*, *resin*, *gum*, and *various* kinds of *salts*.

Volatile Oil.—This is a peculiar production, having the common characteristics of essential oils, with the peculiar aroma and taste of the myrrh. When fresh, it is clear, but becomes yellowish by keeping. It is heavier than water, and is soluble in alcohol, ether, and the fixed oils. Exposed to the air, it partially evaporates, leaving a thick, varnish-like residuum. It may be procured by distillation with water, but not with alcohol.

2. Resin.—This is hard, without odor, insoluble in ether, soluble in caustic alkali. The resin and oil unite with facility, forming a soft resin, which is supposed by some (Pereira, Royle), to be an elementary principle, like the hard resin. This *soft resin* is odorous, and partially soluble in ether, and alcohol.

3. Gum.—This is composed of *bassorin*, and *arabin;* the former insoluble in water, the other soluble. The latter

forms a precipitate when alcohol is added to the watery solution.

Myrrh was analyzed by Pelletier, in 1816,* by Braconnot, in 1819,† and by Brande (Dic. Mat. Med. Lon. Ed. 1839, p. 366). The following tables exhibit their results:

PELLETIER.

Volatile Oil, Resin,	34
Gum, soluble and insoluble,	66
	100

BRACONNOT.

Volatile Oil,	2·5
Resin,	23·0
Gum, soluble,	46·0
Gum, insoluble,	12·0
Loss,	16·5
	100·0

BRANDE.

Volatile Oil,	2·60
Resin, soft,	22·24
Resin, hard,	5·56
Gum, soluble,	54·38
Gum, insoluble (*Bassorin*),	9·30
Salts (benzoates, malates, phosphates, sulphates, and acetates of potash and lime,	1·36
Impurities and Loss,	4·55
	100·00

Physiological Effects. — The most prominent effects of myrrh on the healthy system, when taken into the stomach, in moderate doses, are at first an agreeable warmth, which, if the dose is repeated, is gradually extended to the whole body; the pulse is quickened and rendered stronger. It increases muscular activity (Pereira), and gives firmness to

* Ann. de Chein, ixxx. 45.

† Ibid ixvii. 52.

the solids. Its occasional use promotes assimilation, and expectoration. It seems also to exert a specific action on the uterine system, and is hence, considered emmenagogue. In over-doses, it produces nausea and headache. Locally, it acts mildly, as an astringent and stimulant.

THERAPEUTIC PROPERTIES.—This article has been variously regarded by therapeutists, with respect to its most prominent effects as a medical agent. Some have considered it most active as an expectorant (Murray); some as an emmenagogue and antispasmodic, and others as a stimulant, tonic, and antiseptic. Parr considered it a narcotic bitter, and moderate sedative.

Its most obvious effects, however, without doubt, are those of a stimulating tonic, as is well evinced in the popular use of its tincture.

The medicine is particularly indicated in all cases of feeble vital reaction, as in malignant, putrid, and pestilential disorders. It is very serviceable in the epidemic cholera, and cholera morbus; also in dysentery, typhus, and in malignant scarlatina. In phthisis pulmonalis, chronic catarrh, and in humoral asthma, it is highly esteemed by many practitioners.

Its popularity as a medicine in amenorrhœa and chlorosis, is of considerable antiquity, and, without doubt, will still continue, as must necessarily be expected from such an active stimulating tonic.

It is a common remedy in rheumatism, and is often indiscriminately administered in unsettled pains of the chest, side and abdomen. The dose of the powdered myrrh is gr. x.—ʒj.

As a local application, it is of great service in apthea, malignant anginosæ, ulcerated and spongy gums, and mercurial sore mouth. In various ill-conditioned sores, ulcers, fistulas, cancers, chancres, etc., it proves itself a remedy of great value; the tincture, of a proper strength, should frequently be applied in these cases by means of a sponge, cloth, or syringe, as the case may require. It cleanses the sore, corrects the fetor, and stimulates the parts to a healthy action.

PHARMACEUTIC PREPARATIONS.—TINCTURA MYRRHÆ: *Tincture of Myrrh.*—℞ Myrrh in coarse powder, ʒiij.: Rectified spirit,

Oij.: Macerate eight or ten days and filter. The U. S. Dispensatory directs Myrrh, bruised, ʒiv.; Alcohol, Oij.: Macerate fourteen days and filter through paper. This is a common form in which Myrrh is used. The dose is fʒj.

TINCTURA MYRRHÆ COMPOSITUM: *Compound Tincture of Myrrh.*—℞ Myrrh in coarse powder, ʒiij.; Alcohol, or fourth-proof Brandy, Oij.; Capsicum, ʒss.: Macerate ten days, or boil in a water-bath ten minutes, and when clear, decant.

Use.—The compound tincture of Myrrh is applicable in all cases in which the myrrh itself is indicated, but will be found much more stimulating, prompt, and permanent in its effects. Besides its internal use, it is also much employed in the form of a liniment, for various painful swellings, bruises, rheumatism, etc. The dose is ʒss. to ʒj.

PILULÆ MYRRHÆ: *Myrrh Pills.*—℞ Myrrh, ʒiv.; Carbonate of Potassa, ʒij.; good Rye Whisky, Oij.: bruise the Myrrh, add the whole together, boil in a water-bath fifteen minutes, and filter; evaporate to the consistence of an extract, and form into pills. Dose from one to three. Useful as a tonic in amenorrhœa, chlorosis, dyspepsia, and general muscular debility. The U. S. Dispensatory gives a formula for a *Tonic Myrrh Pill* that contains Ferrium, and is regarded by the old-school practitioners, as one of their most active and valuable tonics in all cases of amenorrhœa and chlorosis. Aloes is also combined with Myrrh, to form tonic and emmenagogue pills.

AMMONIACUM.—The Gum-Resin.

SYNONYMS.—DOVEMA AMMONIACUM. Féshook, *Duk.;* Ammoniak, *Ger.;* Ammoniaque, *Fr.;* Ammoniaco, *Ital.;* Amoniaco, *Span.;* Ushek, *Arab.;* Semugh belshereen, *Persian;* Ammoniac, *Eng.*

HISTORY.—Much uncertainty is involved in the history of this drug. Prof. Royle has collected the following facts, which will, no doubt, be interesting to many readers: "Ammoniacum is described by Dioscorides, 3 c. 88 (or 98), as the product of a plant called *Agasyllis*, *Metopium* of Pliny, which grows in Cyrenaic Africa, near the temple of Jupiter Ammon, whence it derives its name. Mr. Don supposed this to be a corruption of Armoniacum; it is so written in some old books. Jackson, in his account of Morocco, states that the Ammoniacum plant, which he calls *Feshook*, grows in Morocco, near Al-Araish. The Hon. Fox Strangways favored Dr. Lindley, as well as the author, with the fruit of a *Ferula*, which was

marked as that of *Fusogh*, or Gum Ammoniac, obtained by him from Tangier. Some of these were sent to Dr. Falconer, by whom they were grown in the Saharunpore Botanic Garden, and the plant found to be identical with *Ferula Tingitana*. Dr. Lindley had previously determined the fruit to be that of the same plant. In his Flora Medica, he refers the *Feshook* of Jackson, t. 7, to *F. orientalis*, with a query. But the ammoniacum of commerce of the present day is a product of Persia, and obtained from Bombay, having been previously imported there from the Persian Gulf, whence probably a portion is also carried up the Red Sea, and thus reaches Europe by the Levant. Capt. Hart (Trans. Med. Soc. of Calcutta, i. p. 369), found the plant in the plains between Zezed-khast and Kumisha, on the road from Shiraz to Ispahan, or on the border of the provinces of Fars and of Irak Ajemi. Lt. Col. Johnston saw the plants growing at Mayer and Yezed-khast, and collected specimens of the plant, with its fruit and gum. Lt. Col. Wright obtained specimens at the same place, which he gave to the Linnean Society, and which Mr. Don described. M. Fontanier (Merat and De Lens, i. p. 25), also obtained it at Yezd-Cast in Faristan, which appears to be the same place. Maj. Willock informs the author that the *ooshak* plant is only to be met with in the province of Irak, in dry, gravelly plains, where it is exposed to an ardent sun. Sir John M'Niel found it on the low hills near Herat, and Dr. Grant at Syghan, to the north of Bamean, where the same dry climate prevails. In the same kind of country, but more to the eastward, many other Umbelliferæ were found by Dr. Falconer, together with *Narthex Asafœtida* and *Prangos pabularia*. M. Fontanier says Gum Ammoniac exudes naturally at the axils of the umbel and upon the tumid apices of the peduncles. Willdenow concluded erroneously, that ammoniac was produced by *Heracleum gummiferum*."

Botany.—*Sex. Syst.*—Pentandria Digynia. *Nat. Ord.*—Umbelliferæ.

Gen. Char. Dormera.—*Epigynous disk* cup-shaped. *Fruit* slightly compressed from the back, edged with three distinct, filiform, primary ridges, near the middle, and, alternating

with them, four obtuse secondary ridges, the whole enveloped in wool. *Vittæ* one to each secondary ridge, one to each primary marginal ridge, and four to the commissure, of which two are very small.—*Lindley.*

Spec. Char. D. AMMONIACUM.—*Root* large, perennial. *Stems* seven to nine feet high, about four inches in circumference at the base, clothed with glandular down (*Don*), smooth (*Fontanier*), glaucous, with the habit of Opopanax Chironium. *Leaves* large, petiolate, somewhat bipinnate, two feet long; pinnæ usually three pairs, each pair rather remote; lower leaflets distinct, superior ones confluent, deeply pinnatifid; segments oblong, mucronate, quite entire, or rarely a little lobed, coriaceous, veined beneath, one to five inches long, and one-half to two inches broad. *Petiole* ribbed, pubescent, much dilated, and sheathing at the base. *Umbels* proliferous, racemose, partial umbels globose, on short peduncles, usually disposed in a spicate manner. Neither general nor partial involucre. *Peduncles* terete, wooly. *Flowers* sessile, immersed in wool. (*Lindley*). Margin of calyx five-toothed, teeth acute, membraneous. *Petals* white, ovate, with an inflexed point. *Disk* large, fleshy, cup-shaped, with a plicate, rather lobulate margin. *Stamens* and styles yellow, the latter complanate, recurved at the apex. *Stigmas* truncate. *Ovary* densely woolly. *Fruit* elliptic, compressed from the back, surrounded by a broad flat edging. *Mericarps*, with three distinct filiform ridges near the middle, and alternating with them (four obtuse secondary ridges) two of the primary ridges confluent with the margin. *Vittæ*, one to each secondary ridge, one to each primary marginal ridge, and four to the commissure, of which two (the exterior ones) are very small.—(*Don*, *Lindley* and *Royle*). The only species.

DESCRIPTION.—The ammoniac is the concrete juice of the plant, which exudes from the latter, when mature, in consequence of the wounds inflicted by an insect that attacks it in great numbers, piercing it in every direction. The juice soon dries and is picked off and sent *via* Bushire, to India, and other parts of the world.

The drug comes either in tears or in aggregate masses, and

in both cases is mixed with impurities. The variety in tears preferable, as it may be picked, and thus the impurities can be removed. The tears are of an irregular shape, commonly more or less globular, yellowish without, and whitish within, compact, homogenous, and brittle when cold. Its fracture is shining and conchoidal. The masses are rather of darker color and less uniform consistence, appearing, when broken, as if composed of whitish tears embedded in a darker substance, which also contains foreign substances, as above-mentioned, consisting of dirt, sand, various seeds, and other vegetable matters.

Ammoniac has a peculiar odor, and a slightly acrid, bitter, and sweetish taste. When heated it softens, but does not melt. It burns with a light flame, and a resinous and slightly alliaceous odor. When triturated with water, it forms a milky emulsion, which, however, becomes clear on standing.

Medical Properties and Use. — Ammoniac is stimulant, expectorant, diaphoretic, and in large doses, cathartic, sometimes diuretic and emmenagogue. Its stimulant properties, however, predominate. Its chief application, according to the history of its medical character, is in chronic catarrh, asthma, and "other pectoral affections, attended with deficient expectoration." It is also applied externally, in the shape of a plaster, and in this way has been thought to be useful as a discutient or resolvent, in white swellings, and other indolent tumors. It may be given in the form of emulsion, tincture, or pills. The dose of the substance is from ten to thirty grains.

GUAIACUM.

Guaiacum, although regarded as belonging more properly to the class *alteratives*, very justly merits a notice of its stimulant virtues here. The author has been much pleased with its effects in rheumatism. In some instances, he has found the most difficult cases of the chronic variety of this painful complaint, yield to the effects of this article, with astonishing promptness. A rheumatic case of particular interest occurred in his practice, in the fall of 1839, in which the usual means of treatment seemed not to afford any relief, although the patient

was the subject of very thorough treatment, applied under the directions of several eminent physicians, for a number of weeks. The author, presuming that the patient had a pretty good knowledge of the course pursued, as is generally the case with persons long the subjects of medical attention, was induced, from the critical character of the case, to inquire as to what had been the principal remedies used. On finding that guaiacum had not been tried, he was induced to test its virtues in this peculiar case. The effect was of the most striking character. The same day very considerable relief was obtained, and in four days, the subject of so much suffering was completely restored, excepting a sense of stiffness and debility, which could not but have been expected after so long a prostration.

As a stimulant, the medicine is very diffusive and permanent in its effects, and may be used with confidence in rheumatism, gout, syphilis, gonorrhœa, amenorrhœa, and various visceral obstructions. The dose is from gr. x. to gr. xxx. When employed in rheumatism, gout, and amenorrhœa, it is well to give it in combination with the botrophin.

There are other resinous substances that may be arranged into this order of stimulants, all of which, however, have found a place, as the article just spoken of in other classes. Among those made officinal are the following:

1. Asafœtida.
2. Galbanum.
3. Sagapenum.
4. Opopanax.

Order V.---ALCOHOLIC AND ETHERIAL STIMULANTS.

The various spiritous stimulants form a very distinct order. They are chiefly characterized by their peculiar essential properties, and their exhilerating and intoxicating effects. They are the results of the vinous fermentation, and mostly procured by distillation.

Spirituous stimulants although more used than any other kind, by the old-school practitioners, are not so favorably

regarded by medical reformers. They are considered rather pernicious in some of their effects, and hence, have been altogether rejected, as medicines, by some. They are very quick and diffusive, but transient in their stimulant effects.

The wines, which are less inebriating than the distilled liquors, and which unite a tonic power with their stimulant virtues, are the most valuable of this order. They are much esteemed by a large portion of our profession.

But, while these agents (alcohol, etc.) are comparatively little esteemed in a *medical* point of view, they are of incalculable importance in pharmacy. This is clearly apparent in almost every part of the work.

ALCOHOL.

Synonyms.—Arak, *Hindoo;* Alcoole, Acquavite rettificata, *Ital.;* Alcohol, Espiritu rectificato de vino, *Span.;* Rectificirter Weingeist, *Ger.;* Esprit de vin, *Fr.*

History.—It is uncertain when distilled liquors were first known. By some (Morewood) it is supposed that the Chinese had a knowledge of the process of distillation long before the rest of Asia, Africa, and Europe. Albucasis, who is supposed to have lived in the twelfth century, is stated to have taught the mode of procuring spirit from wine.* Yet it is certain that the art was known long before his day. Raymond Lully, in the thirteenth century, was also acquainted with the *spirits of wine*, which he called *aqua ardens*, and understood the mode of depriving it of water by means of carbonate of potash. Alcohol is now extensively manufactured in every part of the world, and is procured from all substances that contain sugar.

Preparations.—The formation of alcohol occurs when ether and water meet in the nascent state, as when some of the acid salts of ethyle are heated, or otherwise decomposed. But, practically, it is produced entirely from sugar (or the elements forming it) by the fermentative process. Thus any of the vegetable juices containing sugar, as the juice of the grape, currant, peach, etc., as well as that of all the grains, will soon

* Gmelin, *Handbuch d. Chimie*, Bd. ii. p. 274.

enter into fermentation, if kept in a temperature ranging between 40° and 85°, and will give off a large quantity of carbonic acid, while the sugar totally disappears, and alcohol is found in its place. The alcohol is then separated, by means of distillation, and is afterward rectified. Hence, the preparation of alcohol may properly be considered as consisting of three stages: 1, That which is characterized by the production of a fermented vinous liquor; 2, That which consists, in the preparation from this, of an ardent spirit; 3, That in which the spirit is rectified or separated from foreign matters.

1. *Production of Vinous Liquor.*—The fermentative process evinces various peculiarities, that are marked by its several stages; thus starchy liquids, under proper circumstances, become saccharine (process termed *saccharine fermentation*), and then sugar, in turn, when mixed with water and nitrogenous matter (*ferment*) as yeast, is converted into carbonic acid and alcohol, the process being termed *vinous fermentation.** The conditions necessary to the production of a vinous liquid, are the presence of *sugar* (or some substance capable of forming sugar, as *starch*), a certain quantity of *water*, and a *ferment* (generally yeast), together with a proper temperature.†

Turner thinks that cane-sugar is converted into grape sugar before it is changed into vinous spirit: he says that "grape sugar, C^{12} H^{14} O^{14}, contains the elements of 2 eq. alcohol, 4 eq. carbonic acid, and 2 eq. water, 2 (C^4 H^6 O^2) + 4 CO^2 + 2 HO; and, by very exact experiments, it has been proved that 100 parts of grape sugar yield only 47·12 of alcohol, 44·84 of carbonic acid, together 91·96 parts; the loss 8·04 parts being the two eq. of water separated. On the other hand, cane-

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* Under certain circumstances, mannite, lactic acid, and a peculiar mucilage, are formed by the action of the nitrogenous or albuminous principles of vegetable juices on the sugar. This change has been called the *vinous* or *mucilaginous* fermentation.—*Liebig.*

† Vinous liquids are capable of generating acetic acid, when the process is denominated *acetoas fermentation.* Moreover, most vegetable substances are gradually converted into gasses, and a substance called vegetable mold, constituting the process called *putrefactive fermentation.*

sugar, C^{12} H^{11} O^{11}, requires the addition of one eq. of water to yield two eq. of alcohol, and four eq. carbonic acid=2 (C^4 H^6 O^2)+4CO^2; and here, also, experiment has demonstrated, that 100 parts of cane sugar yield 53·727 parts of alcohol, and 51·298 of carbonic acid, together 105·025; the increase, or 5·025 parts, being due to the one eq. of water taken up to form dry grape sugar, C^{12} H^{12} O^{12}, into which cane sugar is converted before it undergoes fermentation. These facts prove that the ferment takes no direct part in the reaction, but only acts by inducing a state of change.

2. *Production of Ardent Spirits.*—It has been supposed that vinous liquors do not contain alcohol, but are merely capable of furnishing it by a new arrangement of their ultimate constituents, which were thought to take place on the application of heat. Brande, Gay-Lussac and Donovan have, however, proven that alcohol may be extracted from those liquors without the application of heat, and by such means as will not admit of its generation during the process. It is effected by precipitating their acid and coloring matter by means of subacetate of lead, and then separating the water by carbonate of potassa.

In vinous liquors, the alcohol, as already hinted, is combined with acids, coloring matter, considerable water, and, in addition, a volatile oil. In its separation from these, we, in the first place, take advantage of its volatility, and hence, we adopt the process of distillation, which deprives it of all matters except those which are capable of volatilization. The spirits thus obtained are variously called, according to the materials from which they are distilled: *e. g.*, that obtained from the expressed and fermented juices of the fruits, as grapes, currants, goosberries, etc., or from wine, is called *Brandy* (from Brandy-wine); that from fermented molasses, *Rum;* from cider, malted barley, rye, etc., *Whisky;* from malted barley and rye-meal, with hops, and then rectified from juniper-berries, *Holland-Gin;* from malted barley, rye, or potatoes, rectified with turpentine, *common Gin;* from fermented rice, *Arrack;* from a decoction of malt and hops, *Ale* (*Beer*); and from a mixture of honey and water, *Mead.* Each

of these liquors has an aroma peculiar to itself, or the substance from which it is obtained; this is dependent upon the volatile oil they possess.

Ardent spirit, from whatever source it may be obtained, is composed of *water*, *alcohol*, *volatile oil*, and sometimes *coloring matter*. The average amount of alcohol of a sp. grav. of 0·825 at 60°F., in some of the most important ardent spirits, according to Brande, is expressed in the following table:

(*By Measure.*)	*Alcohol (by measure).*
100 parts of Brandy contain	55·39
" " Rum, "	53·68
" " Gin, "	51·60
" " Whisky (Scotch),	54·32
" " " (Irish),	53·90

3. *Rectification.*—The object now is to separate the pure spirit or alcohol from all other substances, and to procure what is called *oxyhydrocarbons* or *absolute alcohol*. This is done by repeated distillations, and by the use of carbonate of potash, or, what is better, chloride of calcicum, which, by their powerful affinity for water, keep it back while the alcohol distils over. The amount of potash or lime that is usually taken, is from ℔j. to ℔iv., to the gallon, or one part of chloride of lime, made perfectly dry by exposure to a red heat, to three parts of spirit. The lime should first be pulverized, and when the spirit is thrown upon it, should be intimately mixed; when, after it becomes perfectly cold, it is ready to be put into the still.

In this country, alcohol is usually prepared from whisky. One hundred gallons of the latter will yield between fifty-seven and fifty-eight gallons of *rectified spirit* of a specific gravity of 0·835. The Edinburgh College directs a course by which anhydrous alcohol is at once obtained from rectified spirit. The process is as follows: Take of rectified spirit *one pint* [Imperial measure]; lime, *eighteen ounces*. Break down the lime into small fragments: expose the spirit and lime together, to a gentle heat in a glass mattress, till the lime begins to slake; withdraw the heat till the slaking is finished, preserving the upper part of the mattress cool with

damp cloths. Then attach a proper refrigeratory, and with a gradually increasing heat distil off seventeen fluid ounces. The density of this alcohol should not exceed 796: If higher, the distillation must have been begun before the slaking of the lime was finished. Dr. Christison gives assurance that if pure quicklime is used with the precautions mentioned in the Edinburgh formula, rectified spirit of the density of 0·838, seventeen-twentieths of its volume of alcohol, of a density of 0·796, and if the first tenth be kept apart, the rest may be obtained as low as 0·7942.

100 parts.		sp. gr.	100 parts.		sp. gr.	100 parts.		sp. gr.	100 parts.		sp. gr.
Alco.	Wat.	at 60°	Alco.	Wat.	at 60°	Alco.	Wat.	at 60°	Alco.	Wat.	at 60°
100	0	.797α	76	24	.857	52	48	.912θ	28	72	.962
99	1	.798	75	25	.860	51	49	.915	27	73	.963
98	2	.801	74	26	.863	50	50	.917	26	74	.965
97	3	.804	73	27	.865	49	51	.920ι	25	75	.967
96	4	.807	72	28	.867	48	52	.922	24	76	.968
95	5	.809β	71	29	.870	47	53	.924	23	77	.970
94	6	.812	70	30	.871	46	54	.926	22	78	.972
93	7	.815γ	69	31	.874	45	55	.928	21	79	.973
92	8	.817	68	32	.875	44	56	.930	20	80	.974
91	9	.820	67	33	.879	43	57	.933	19	81	.975
90	10	.822	66	34	.880	42	58	.935χ	18	82	.977
89	11	.825δ	65	35	.883	41	59	.937	17	83	.978
88	12	.827	64	36	.886	40	60	.939	16	84	.979
87	13	.830	63	37	.889	39	61	.941	15	85	.981
86	14	.832	62	38	.891	38	62	.943	14	86	.982
85	15	.835	61	39	.893	37	63	.945	13	87	.984
84	16	.838ζ	60	40	.896	36	64	.947	12	88	.986
83	17	.840ν	59	41	.898	35	65	.949	11	89	.987
82	18	.843	58	42	.900	34	66	.951	10	90	.988
81	19	.846	57	43	.903	33	67	.953	9	91	.989
80	20	.848	56	44	.904	32	68	.955	8	92	.990
79	21	.851	55	45	.906	31	69	.957	7	93	.991
78	22	.853	54	46	.908	30	70	.958	6	94	.992
77	23	.855	53	47	.910	29	71	.960			

α. Alcohol of the *Ed.* p.
β. Alcohol of the *Dub.* p. nearly.
γ. Alcohol of the *Lond.* p.
δ. Lightest spirit obtained by ordinary distillation.
ι. Alcohol of the *U. S.* p.
ζ. Spiritus Rectificatus, *Lon. Ed.*
ν. Spiritus Rectificatus, *Dub.*
θ. Spiritus Tenuior, *Ed.*
ι. Spiritus Tenuior, *London;* Proof-spirit.
χ. Alcohol Dilutum, *U. S.*

In estimating the specific gravity of alcohol, any hydrometer may be used, as their scale will always correspond with some particular specific gravity, and by reference to some

appropriate tables, the per centage of absolute alcohol indicated in each case immediately appears. For this purpose, the table constructed by Lowitz, as improved by Thomson, will answer well. This is given on the preceding page, with notes marking the specific gravities of a number of officinal spirits.

The following is a table in which the admixtures of Water and Alcohol are made with the spirit, taken at a *Specific Gravity* of 0.825 at 60° Fahr., which is the highest proof obtained by ordinary distillation. This table will be perhaps found more convenient to many persons than the above, since the spirit to be added to underproof liquors in bringing them to proof, is that of the specific gravity of 0.825.

Spirit 0.825 *Temp.* 60° *F.*	Water *Temp.* 60° *F.*	*Sp. Grav.*	Water *Temp.* 60° *F.*	Spirit 0.825 *Temp.* 60° *F.*	*Sp. Grav.*
100	plus 0	0.82500	100	plus 95	0.93247
100	" 5	0.83599	100	" 90	0.93493
100	" 10	0.84568	100	" 85	0.93749
100	" 15	0.85430	100	" 80	0.94018
100	" 20	0.86208	100	" 75	0.94296
100	" 25	0.86918	100	" 70	0.94579
100	" 30	0.87568	100	" 65	0.94876
100	" 35	0.88169	100	" 60	0.95181
100	" 40	0.88720	100	" 55	0.95493
100	" 45	0.89322	100	" 50	0.95804
100	" 50	0.89707	100	" 45	0.96122
100	" 55	0.90144	100	" 40	0.96437
100	" 60	0.90549	100	" 35	0.96752
100	" 65	0.90927	100	" 30	0.97074
100	" 70	0.91287	100	" 25	0.97409
100	" 75	0.91622	100	" 20	0.97771
100	" 80	0.91933	100	" 15	0.98176
100	" 85	0.92225	100	" 10	0.98654
100	" 90	0.92499	100	" 5	0.99244
100	" 95	0.92758	100	" 0	1.00000
100	" 100	0.93002			

The practitioner, but more particularly the pharmaceutist, should acquaint himself well with this subject, as it is a matter of the greatest importance in the preparation of many of our compounds. This applies not only to the general appearance and physical characters of the preparations, but may very materially effect the therapeutic properties, or virtues of the articles prepared.

Purity.—It is unfortunate that the alcohols of the several pharmacopœias differ so very materially in their strength, as some confusion is liable to arise on the part of those inexperienced in pharmacy. The alcohol of the U. S. Pharmacopœia, at a temperature of 60°, is of a specific gravity of 0·835; that of the London P., 0·815; that of the Dublin P., 0·810; while that of the Edinburg P. is 0·794–6: all being thus a great deal stronger than that of the United States. When liquors, at a temperature of 60°, have the specific gravity of 0·920, they are denominated in commerce *proof-spirit*. If they are lighter than this, they are said to be above proof; if heavier, below proof; and whatever percentage of pure water, or of spirit of 0·825, is necessary to bring the sample to the standard of proof-spirit, shows the number of degrees it is above or below proof.

Besides its specific gravity, there are other means of adjudging pure alcohol; it should be colorless, transparent, and not rendered turbid on the addition of water. Its taste and smell are peculiar, and somewhat resembling wine. It should not possess either an acid or alkaline reaction, and should admit of complete volatilization. If any of the *oil of corn-spirit* be present, which is often the case, the addition of a little colorless sulphuric acid will indicate its presence, by showing a red tinge. Nitrate of silver, according to Vogel, is a more delicate test for the oil. If it be mixed with spirit, and exposed to solar light, it becomes red if any oil be present, but undergoes no change of color if the spirit be pure.

Immense frauds are now practiced in this and other countries, in mixing, adulterating, and manufacturing fictitious liquors. It is hence almost impossible to get at this time, in the market, a genuine article of any of the standard liquors. Some very base and poisonous substances are often detected in them. Strychnine is said now, to be put into them, with a view of promoting their strength.

Properties.—Alcohol is a limpid, colorless, volatile, inflammable liquid, having a penetrating, or pungent, but agreeable odor, and strong, burning taste. When free from water, its specific gravity, at a temperature of 60°, is 0·795. Its boiling point is 172°, and it has never yet been made to freeze. It is

inflammable, and burns without smoke or residue. The products are carbonic acid and water. Its flame, when weak, is of a yellowish color, but when strong, is bluish. The color of the flame, however, may be variously tinted: as yellow, by chloride of sodium; whitish violet, by chloride of potassium; green, by salts of copper, or boracic acid; carmine-red, by chloride of lithium; and crimson, by chloride of strontium.

Alcohol combines readily, and in all proportions, with water and ether, and is one of the most general solvents that we possess.

Analysis.—The primary constituents of alcohol are C^4 H^6 O^2. Its proximate principles being etherine and water $= C^4$ $H^4 + 2$ H O.

Physiological Effects. — *α. On Vegetables.* When freely applied, in its full strength, to vegetables, it proves injurious, and if continued, is destructive to many. Pereira considers its effects on plants analogous to those of hydrocyanic acid.

β. On Animals generally. In a diluted condition, it at first produces the usual signs of a stimulant or excitant, which is soon followed with a marked impression on the brain, which is characterized by an exhilaration of the spirits — intoxication—and, if the dose is repeated, stupor and insensibility. Alcohol, in a pure state, acts as a corrosive on tender parts; and, like all other excessively acrid, and corrosive articles, will produce inflammation, convulsions, and death, when injected into the veins, or thrown into the stomach in considerable quantities. Pereira collects the following statements in regard to various experiments with alcohol of full strength. "Leeches, immersed in spirit, die in two or three minutes. Their bodies are shrivelled or contracted, and before death, they make but few movements; the head and tail of the animal are drawn together. Fontana (*Treatise* on the Venom of the Viper, translated by J. Skinner, vol. ii. p. 371, *et seq.*) found, that when half the body of a leech was plunged in spirit, this part lost all motion, while the other half continued in action. The same experimentalist observed, that spirit killed frogs, when administered by the stomach in doses of forty drops, or when injected beneath the skin, or applied to the brain or

spinal marrow. Plunging the heart of this animal in spirit, caused its motion to cease in twenty seconds. Applied to the right crural nerve of a frog, it destroys the power of moving in the right foot, on the application of stimulus. Munro (*Essays and Observations*, Physical and Literary, vol. iii. p. 340) observed, that alcohol, applied to the hind legs of a frog, rendered the pulsations of the heart less frequent, and diminished sensibility and mobility. Fontana (*Op. cit.*, p. 336, *et seq.*) states, that turtles were killed by spirits administered by the stomach or by the anus, or injected beneath the skin; before death, the animal is motionless; applied to the heart of these animals, it destroys the contractility of this viscus. Some very interesting experiments were made, with spirit, on birds, by Flourens. This distinguished physiologist administered six drops of alcohol to a sparrow, whose skull he laid bare. In a few minutes the animal began to be unsteady, both in walking and flying. After some time a dark red spot appeared upon the skull, in the region of the cerebellum, and became larger and deeper colored; in proportion as the alcohol more powerfully affected the animal. * * * The effect of alcohol on fishes is analogous to that on other animals. If a little spirit be added to water, in which are contained some minnows (*Cyprinus phoxinus*, Linn.), the little animals make a few (spasmodic?) leaps, and become incapable of regaining their proper position in the water, but float on their sides or back. If removed into pure water, they soon recover.

"The mammals on which the effects of alcohol have been tried, are—dogs, cats, horses, rabbits, and guinea-pigs. The principal experimentalists are—Courtan (*Philosophical Transactions for* 1712); Fontana (*Op. supra cit.*); Viborg (*Abhandl. fur Thierarzta*, Thiel II, quoted by Wibmer, Die Wirkung, etc.); Brodie, *Philosophical Transactions for* 1811); and Orfila, (*Toxicologie Generale*). The results of their experiments may be thus briefly expressed:—Four drachms of alcohol injected into the jugular vein of a dog, coagulated the blood, and caused instant death (*Orfila*). Introduced into the stomach of cats, dogs, or rabbits, it produces an apoplectic condition (*Brodie* and *Orfila*); this state is preceded, according to Orfila, by a strong

excitement of the brain. The same experimentalist found that alcohol acts with less energy when injected into the cellular texture than when introduced into the stomach; from which he infers, that its first effects are the result of the action which it exerts on the extremities of the nerves; though he admits that ultimately it becomes absorbed. On examining the bodies killed by introducing alcohol into the stomach, this viscus has been found in a state of inflammation."

Although it is certain that pure alcohol in *considerable doses*, or when long continued in *small doses*, either pure or diluted, must necessarily prove very injurious; yet, every one, it is presumed, certainly discovers that most of these experiments come far short of doing justice to this important subject; as they not only fail elucidating all the facts that ought to have been obtained by the same trouble, but are eminently calculated to lead to unjustifiable or false inferences. In the first place, the complete immersion of a leech in alcohol is an improper and unfair experiment, as the animal is not only totally deprived of the necessary elements of its existence; which circumstance, though alone insufficient to produce death so soon, may nevertheless contribute to the destructive effects of a spirit so much concentrated, and applied as with an intent to kill. Who does not know how vastly the circumstances of the application of the article of experiment will affect the result. No surprise is evinced on the death of *other* animals who may be subjected to a change of elements, however congenial the instrument of mischief may be when properly applied! These remarks, apply equally, in some respects, to some of the rest of these experiments; as, for instance, *plunging the excised heart of a frog into alcohol.* Moreover, the injection of alcohol or any other substance, into the jugular vein of any animal affords no fair opportunity of judging its true physiological effects, as the injection of pure water, in the same way, has been known, in numerous instances, to produce death, while it would not, for a moment, be supposed that the water is really poisonous to the subject of experiment.*

* No experiment is of any value, unless all the circumstances which can in any way affect the results, are carefully taken into account. It is easy to

γ. *On Man.*—The effects of alcohol on the human body, depend very much upon its state of purity, the substance with which it is combined, the quantity taken, and the constitution and habits of the individual taking it.

When the spirit is much diluted, as when yet in combination with the vegetable juices, as the wines, porter, etc.; or even when diluted with water, in the character of whisky, it is sometimes taken for years, without any indications of immediate mischief. When combined with other materials, as medical substances, it has, as is well known by daily observation, in innumerable instances, not only been a safe potation, but has been even of the greatest benefit to the system. If taken in very small quantity, little more than a transient stimulating impression will be observed; and if the constitution and habits of the individual taking it are good, its effects are still more modified.

A large quantity of pure alcohol, when taken into the stomach, will produce the most *violent symptoms*, which often end in death, in a very few minutes. Inflammation of the stomach, paralysis, apoplexy, and delirium, are among the common symptoms of an over-dose. Besides its dynamic effects, which may be more intimately associated with the nervous system and brain, it evinces a chemical agency. Alcohol possesses a powerful affinity for water, and by combining with it, will thus disturb the relation existing between the elements of the tissues. It coagulates liquid albumen, and fibrine, and converts the parts which contain these principles in a solid or less elastic, and flexible state. In this way its mischievous effects not only implicate the constituents of the blood, but many of those in every part of the system.

The remote effects of ardent spirits are marked first by an excitement of the vascular and nervous systems. The pulse is increased in frequency, the face becomes flushed, the eyes

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perceive that *minor* circumstances may elude our observation, but the most *important* contingencies often unobservedly control the results. The author has known an individual, who, to save a sheep from the *struggles of death*, poured down a decoction of *Lobelia Inflata*, and afterward declared it a *poison*, because the sheep died in an instant after the draught was forced down.

animated, the general spirits exhilarated, and the intellectual functions excited. The individual, according to his disposition, or temperament, becomes talkative, joyful, enthusiastic, boisterous;—care disappears, engagements change, and whatever notions may now be entertained, will be enthusiastically acted out. Sometimes the most emphatic protestations of love and friendship are frequently made, and the most prodigious liberality is practiced, while a remarkably independent spirit rules throughout. The ideas now revolve with the greatest rapidity, and are sometimes lofty and sublime, but again not unfrequently lead to various indiscretions. These exhilarating and buoyant feelings are what all drinking men are in quest of; the unfortunate drinks to drown his grief; the coward to attain courage; "the *bon vivant* for the sake of enjoying the society of his friends;" the drunkard to gratify his appetite; and while none would wish to transcend these bounds, a fearful fate, alas! too often, will ensue.

When still more liquor is taken, intoxication or drunkenness will ensue. This condition is characterized by a disordered state of the intellectual functions with very obvious physical derangements. A delirium now sets in, varying in its characteristics with different individuals, depending on the temperament, etc. Thus Macknish, in his *Anatomy of Drunkenness*, has the following classification of drunkards:

1, The *sanguinous drunkard*, with whom every thing is full of life and prospect; 2, The *melancholy drunkard*, with his portentous mien, and wretched despondency; 3, The *surly drunkard*, that quarrels with every one; 4, The *phlegmatic drunkard*, who sleeps and wallows continually; 5, The *nervous drunkard*, who is controlled by passion; 6, The *choleric drunkard*, who is ever burning with fury.

In excessive drunkenness, there is usually more or less coma, often apoplexy, and not unfrequently distressing delirium, or *delirium tremens*.

One of the most marked characteristics attending the continued use of ardent spirits, is, that the drinker contracts a growing appetite for them, which has destroyed some of the

most brilliant talents, and ruined many of the best men in the world.

Much inquiry has been made in reference to the modus operandi of spirituous liquor; and although many have supposed that the specific effects are produced through nervous action alone, yet it is now demonstrated that absorption into the circulation takes place, and it is probable that much of the effect upon the brain is dependent on its direct action upon this organ. "Tiedmann and Gmelin (*Uber die Wege auf welchen Substanzen aus den Magen ins Blut gelangen:* Heidelberg, 1820), recognized the odor of it in the blood of the splenic vein, though they were unable to detect it in the chyle. A similar observation is reported by Magendie. (*Element. Compend. of Physiology*, by Dr. Milligan, p. 248—1823.) Dr. Percy also found it in the blood of animals to whom he had administered it. He likewise detected it in the urine and the bile. Moreover, the recognition of the odor of alcoholic liquors in the breath of individuals who have swallowed them, as well as their detection by their smell in the fluid contained in the ventricles of the brain, in the pericardium, etc., proves indisputably that alcohol becomes absorbed. Dr. Cooke (*Treatise on Nervous Diseases*, i., 222: Lond., 1820), states, on authority of Sir A. Carlisle, that, in one case, the fluid of the ventricles of the brain had the smell, taste, and *inflammability* of gin. Dr. Christison (*Treatise on Poisons*, p. 853, 3d ed.), has questioned the correctness of this observation, on the ground that gin, of sufficient strength to take fire, could not enter the blood-vessels without coagulating the blood. But the objection appears to me to be groundless; for I find that a small quantity of undiluted commercial gin may be added to white of egg without causing either coagulation or the slightest opacity. Dr. Ogston (*Edinburg Medical and Surgical Journal*, vol. xl.) has confirmed the testimony of Carlisle, and states that, in one case, he found about four ounces of fluid in the ventricles, having all the physical properties of alcohol. Dr. Parcy (*Op. supra cit.*) has recently set the question at rest, and satisfactorily proved the accuracy of the above statements, by his

experiments on animals. He appears to think that some peculiar affinity exists between the substance of the brain and the spirit; more especially as, after analyzing a much larger quantity of blood than can possibly exist in the cranium, he could generally obtain much more alcohol from the brain than from this quantity of blood. He was unable to determine whether or not the fluid of the ventricles contained any alcohol."*

MEDICAL PROPERTIES.—Alcohol is a very active and powerful stimulant, but is very little used alone as a medicine. It is not permanent in its effects, and, withal, the benefits of its use in this way are obtained at too great a sacrifice, as at best, it can not be said to be an absolutely harmless remedy. Nevertheless, there are a number of spirituous liquors which, while they contain only from ten to sixty per cent. of alcohol, as the wines, etc., possess other valuable properties that cause them to be esteemed as remedies; these will be considered under their appropriate heads. As an external application, diluted alcohol is sometimes used as an evaporating lotion.

PHARMACEUTIC USE.—In pharmacy and pharmaceutic chemistry, alcohol is a very important article. In the preparation of medicines, however, alcohol is seldom used in its full strength. Proof-spirit (sp. grav. 920) and rectified spirit (sp. grav. 838) are generally used instead of absolute alcohol. It would be difficult to get along in pharmacy without alcoholic liquors, as the various *Tinctures*, *Spirits*, *Ethers*, *Ethereal Oils*, and *Resinous Extracts*, are all prepared with this menstruum. Vegetable juices and extracts are often preserved by simple admixture with alcohol.

The chemical use of this article, as well as the various pharmaceutic preparations embracing its agency, are noticed in their respective places throughout the work.

SPIRITUS VINI GALICI: *Brandy*.—This, as already stated, is obtained by distillation from wine. Its qualities are somewhat dependent on the varieties of the fruits that are used in its preparation. Ure states that an experienced dealer may recognize, individually, the brandies of Languedoc, Bordeaux,

* Pereira *Mat. Med. and Therap.*

Armagnac, Cognac, Aunis, Saintoage, Rochelle, Orleans, Barcelona, Naples, etc. Among the most celebrated of the French brandies, are those of Cognac and Armagnac. Pure and genuine brandy has a peculiar, rich, vinous, aromatic flavor. The brandy of commerce is usually of a rich reddish-brown color, which is produced artificially with burnt sugar (caramel), and, according to some, saunders' wood, by the dealers in the article. As usually sold, it is, perhaps, about ten per cent. under proof. Much of the brandy sold in this country for foreign brandy, is manufactured here. Ure, in his Dic. of Arts and Manufac., gives the following formula for the manufacture of this kind of brandy: Dilute the pure alcohol to the proof pitch; add to every hundred pounds weight of it, from half a pound of argol [crude winestone] dissolved in water, a little acetic ether and French-wine vinegar, some bruised French plums and flavor-stuff from Cognac, then distil the mixture, with a gentle fire, in an alembic furnished with an agitator. The spirit which comes over may be colored with nicely-burned sugar [caramel] to the desired tint, and roughened in taste with a few drops of tincture of catechu, or oak bark.

Brandies are often mixed with diluted alcohol, and then colored and flavored so as to bring them as near in resemblance to the genuine as possible. *Grains of Paradise*, and other substances, are also sometimes added to improve the strength of those varieties that are diluted simply with water or whisky. It is asserted, that strychnine is put into the brandies now made to give them strength.

Physiological Effects.—Idem et Alcohol.

Medical Properties, Use, etc.—The medical properties and use of Brandy are much the same as those of Alcohol. It is more tonic than simple alcohol. As a menstruum it is not so much employed as that article, yet it is most commonly used in making the tinctures of myrrh.

SPIRITUS SACCHARI: *Rum.*—This spirit is obtained from the skimmings and drainings (molasses) of sugar, as well as the washings of pots in sugar manufactories. A good article of rum is transparent, and of a slightly brown, or yellowish tint. It has a peculiar, and somewhat agreeable flavor, depending on its volatile oil. Its specific gravity is usually 0·930, or from six to ten per cent. under proof. Some of the West India rum has a very superior flavor, depending on pineapples, slices of which are put into the puncheons that contain the spirit. The *Jamaica Rum* is usually the most esteemed.

The physiological effects and use of *rum* are much the same

as those of *proof-spirit* and *brandy*. Owing to its flavor and mild taste, it is preferred for some purposes, especially in making syrups that are intended for pulmonary diseases. Rum is considered rather more sudorific than most other ardent spirits.

SPIRITUS FRUMENTI COMPOSITUS: *Compound Grain Spirit.*—To this class of liquors belong *Gin*, *Whisky*, etc., the products of the fermented infusions of the various grains. Vide alcohol.

Their effects on the system are about the same as those of alcohol. *Gin* is rather more diuretic than the other spirituous liquors, owing to the oil of juniper that it contains, and is, hence, preferred, when preparations requiring spirits are made, and which are intended for *nephritic* affections or dropsical complaints. *Whisky* is the most common and the cheapest of these liquors, being manufactured in every part of the country, by simple distillation from the fermented infusion of any of the grains, without any addition or rectification. Gin and Whisky have a specific gravity that will average about 0·941 to 0·943, and containing from fifty to sixty per cent. of water. Good rye whisky will answer for many purposes in place of diluted alcohol; and, by country practitioners, is used very much to the exclusion of alcohol.

VINUM.

SYNONYMS....Οἶνος, *Greek;* Shérab unghoorie, *Duk.;* Khumar, *Arab.;* Drakh ka mud, *Hind.;* Mey, *Pers.;* Mada, Madira, *Sans.;* Vino, *Ital., Span.;* Wein, *Ger.;* Vin, *Fr.;* Wine, *English.*

HISTORY.—Wine has been known from the earliest periods of antiquity. The sacred historian (Gen. ix., 20) informs us that Noah planted a vineyard and drank wine, which was some four thousand years ago. Hippocrates used it in practice. It was one of his remedies on the memorable occasion of his staying the *plague* at Athens. Galen also employed it extensively in practice, and Homer, Herodotus, and other historians, speak of it. "The ancients," says Parr, "had a considerable variety of wines, and were peculiarly attentive to the management of the fermenting process." Pliny, Athenæus, and Varro, give details of their preparation by the

ancients. The wines of the ancients, however, were so variable, from the method of management pursued with them, that it is difficult to ascertain their real character and qualities. Among the ancient wines, the *Falernian* (*vinum massicum*) was the more austere and strong; this was equivalent to the hock, probably, of the moderns; the *cæcubum*, the lighter nectar wine of warmer districts, though Galen speaks of a lighter, weak kind of *Falernia*, and in one place, the *cœcubum* as a more generous beverage than any old wine. The *vinum sentinum*, which was the favorite wine of Augustus, was light and grateful; this was probably of a weaker quality. The *Sabine wine*, "vile Sabinum," was light and generous, or it would not have been styled by Galen *ευγενη Σαβινος*. Horace mentions it as estimable at four years, and Galen remarks, that it was probably matured only in six.

Among the Greek wines, the *Pramnian* and the *Maronean* were distinguished for their strength. Homer informs us that the Maronean required twenty parts of water to dilute it; and Hippocrates, unless the copies err, orders an equal dilution of the Thasian wine. Pliny informs us that, at a later era, it was usual to mix eight parts of water to reduce it to the strength of common wine. The wines of Crete, Chios, and Lesbos, were rich and generous; the latter pleasant, and not heady.

The Persians, Armenians, Arabs, and Jews, ascribe their introduction to Nahusha, or Noah. The Greeks considered that *Bacchus* carried them from Asia to Greece and India, *Saturn* to Crete, *Orestes*, son of *Deucalion*, to Sicily, *Osiris* to Egypt, *Janus* to Italy, *Geryon* to Spain, etc.

Wine is now manufactured in most countries; but Italy, France, and Spain, produce the most. The sorts now made from the many different species and varieties of grapes (which are much modified in their qualities by the climate, soil, and skill in cultivation) and the mixture of the juice, are almost innumerable. Rafinesque states that France produces five hundred different kinds; Italy seven hundred; Spain and Portugal six hundred: Germany and Hungary one hundred; Greece and Turkey three hundred; Persia one hundred;

Thibet and China two hundred, Egypt and Barbary one hundred and fifty; South Africa thirty; Atlantic Islands fifty; North America sixty; and South America thirty.

The grape culture in the United States was not on first trial very encouraging, as the attempt was made with foreign plants, which are not suited to our climate and soil. But on the failure of these, attention was given to our native vines, first by Major Adlum, N. Longworth, Esq., the Swiss at Vevay, and some gentlemen in North Carolina—Mr. G. Pflieger, and others: and it is now ascertained that several of the varieties of our native vines produce some of the finest fruits of the kind to be found in any country.

In our country, and particularly in Ohio, and about Cincinnati, the grape culture has now become a very considerable portion of industry, and is rapidly increasing. There are, within twenty miles around this city, over twelve hundred acres planted in vineyards.* At Maysville and Ripley, on the river, above, are one hundred acres more; and down the Ohio, at Vevay, Charleston, and Louisville, there are at least two hundred and fifty; thus making in the Ohio valley alone one thousand five hundred and fifty acres in grape culture, which yield, taking the moderate average of two hundred gallons per acre, three hundred and ten thousand gallons of wine per season. In good seasons, perhaps double this quantity, or six hundred and twenty thousand gallons are produced. It has been supposed, that in a good season, the wine made in the vineyards immediately around Cincinnati amounts to the value of a quarter million of dollars.

Wine is now made in every State in the Union, and to show how rapidly the enterprise is carried on in the West, it may be observed that three years since, the number of acres reported to have been set in Missouri, was less than one hundred, whereas now, according to the preface to the fourth edition of Mr. R. Buchanan's valuable Treatise on the Culture of

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*N. Longworth, Esq., who perhaps has done more than any other person for American grape culture, has himself one hundred and twenty acres or more in grapes, and an investment in the business of over $100,000.

the Grape, and Wine-making, there are five hundred acres set at Hermann, Missouri, alone.

BOTANY.—*Sex. Syst.*—Pentandria Monogynia. *Nat. Ord.*—Vitis.

Gen. Char. VITIS.—*Calyx* somewhat five-toothed. *Petals* five, cohering at the point, separating at the base, and dropping off like a calyptra. *Stamens* five. *Style* none. *Berry* two-celled, four-seeded; the cells or seeds often abortive (*De Cand*). The species vary, and present us innumerable varieties. The following description will serve for that of the oriental grape: "A hardy, exceedingly variable *shrub*. *Leaves* more or less lobed, smooth, pubescent or downy, flat or crisp, pale or intensely green. [Tendrils opposite to each foot-stalk, solitary, spiral]. *Branches* prostrate, climbing or erect, tender or hard. *Racemes* loose or compact, ovate or cylindrical. *Fruit*, red, pale, or white, watery or fleshy, globose, ovate or oblong, sweet, musky or austere. *Seeds* variable in number, or sometimes the whole of them abortive." (*De Cand*). It is said that not less than fourteen hundred varieties are cultivated at the Luxembourg gardens.

Spec. Char. The species of the grape are exceedingly numerous, and if an attempt were here made to treat even in the briefest way upon those species that are mostly *cultivated*, an inadmissible amount of space would be required. Besides this fact there is still another that would be in the way of an attempt of a thorough and satisfactory specific description, and that is the species have never been well defined, and much confusion and uncertainty, even with the most experienced, has existed in regard to many species.

All our American plants agree in being humble, trailing vines in their youth, but susceptible of living from one hundred to three hundred years, and of becoming very large, and as tall as the tallest trees that support them; the *bark* is fibrous, the *wood* hard, *branches* knotty, *leaves* very variable, but always more or less cordate or reniform at the base, and toothed on the margin, with five-branched nerves and deciduous stipules. *Flowers* in bunches, thyrsoidal or paniculate, small, more or less fragrant, greenish-yellow, complete, pistil-

liferous or staminiferous, on three different individuals, blossoming in May and June. *Fruit* from the size of a pea to that of a plum (*Rafinesque*), disposed in racemes. The berry has a more or less tough skin, of a black, purple, brown, green, yellow, or straw color; and a more or less fleshy or pulpy, and juicy interior, with hard seeds.

The following twelve varieties are those among the native North American, now most cultivated in the United States:

1. CATAWBA.—This is the finest and best of all the varieties now known in this country, for making wine. Some have given this vine the rank of a distinct species, yet it is only a highly improved variety of the native Fox Grape. It is a sub-variety of Rafinesque's *Prolifera*. It was perhaps first known in North Carolina, and was introduced to general attention by Major Adlum. It has, however, been found in the native state elsewhere in the same latitude.

2. CAPE. This is supposed by Rafinesque, to be of the same species as the Catawba. It is the variety also called *Alexander*, *Schuylkill* and *Muscadel*. It was first discovered in Pennsylvania, on the Schuylkill near Philadelphia. It makes a good wine.

3. ISABELLA. This variety was first known in South Carolina, but is hardy enough for successful cultivation in Ohio, Pennsylvania, and New York. Rafinesque places this also, in his species *Prolifera*, with the Catawba. It is a fine table grape, and makes good wine.

4. BLAND'S MADEIRA. A delicious table grape, but not very hardy.

5. OHIO. A fine table grape; bunches large, berries small and black.

6. LENOIR. Sweet and palatable; bunches large, berries small and black.

7. MISSOURI. Sweet and agreeable; bunches medium, berries black without pulp, makes good wine.

8. NORTON'S SEEDLING. Sweet, pulpy, small.

9. HERBEMONT'S MADEIRA. Makes good wine; berries small, black, without pulp.

10. MINOR'S SEEDLING. A good hardy variety, berries large, musky, rich flavored; makes good wine.

11. WHITE CATAWBA. A seedling from, but inferior to Catawba; berries white, large.

12. MAMMOTH CATAWBA. Seedling from the Catawba, very large, round, pulpy.

In North and South Carolina, the Scuppernong variety is most common, and produces much good wine. This is the *Muscadine* of the lower Mississippi Valley.

Raisins (*Uvæ, passæ, majores; Passulæ majores*) are the dried berries of the grape. The best—the Granada *Muscatels* and

Blooms—are simply sun-dried; while the *Lexias* (so called from the liquor in which they are dipped), according to accounts, are immersed in a mixture of water, oil, and ashes, and afterward sun-dried. By this treatment, their skins are rendered so fragile, that the juice readily exudes and candies on the fruit. Dillon, in his "*Travels through Spain*," states that the sun-dried raisins have their stalks half cut through, while the bunch remains on the vine, and is thus dried. Some raisins are also said to be dried by heated ovens. Raisins are imported in casks, barrels, boxes, and jars; the best come in jars and boxes of about twenty-five pounds weight. The varieties of the grape from which they are prepared, are the *Sultanas*, *Blooms* and *Muscatels*. The *Corinthian Raisins*, or *Currants*, are obtained from a very small grape called *Black Corinth*.

Preparation of Wine.—There is much variety in the methods pursued for the making of wine from the grape, but all involve about the same principles.

The process consists mainly of two parts: first, that of obtaining the *must* (juice of the grape), and, second, its fermentation. In obtaining the must, the grapes should be first fully ripe, before they are taken from the vine. They are then to be divested of all the decayed or any immatured berries that may be in the bunches: after which they are mashed by any means that will not crush the seeds or stems. It has been a practice from time immemorial to mash the grapes by treading with the feet in tubs. The must is then expressed by means of the press (*wine-press*), and placed in casks, loosely stopped, for some weeks, for the purpose of fermentation. The casks are not quite filled at this time, with a view to give room for the working of the must without running over. When this first process of fermentation has passed, the wine is partly formed, and the casks are then filled, stopped tightly, and left to rest during the winter. In the spring the wine is racked off into other clean casks. A slight additional fermentation now takes place that will complete this part, except what may be done in the way of *fining* the wine. This process consists

in the use of albumen (white of eggs) or gelatin, for clarifying, or of the employment of precipitants.

Some skill is required in fermenting wine. Some grapes lack in sugar or in the fermentive principle, and hence the wine will not keep. These are usually supplied when necessary.

When the proportion of fermentive principle is less than that of the sugar, the wine, when formed, remains sweet; and in the reverse state the wine will be sour unless sugar is supplied.

The author having solicited from N. Longworth, Esq., some information concerning the native wines, received a private letter, from which he takes the liberty to give here an extract, although it was not intended for print. Sometimes we may be thus permitted to presume on the generosity of the philanthropist when important public good is thereby accomplished.

The information communicated in this extract, is exactly in point here, and our profession will doubtless well appreciate it:

"The only grape at present cultivated extensively for wine, is the CATAWBA. Still wine is made from the must of the grape fully fermented without any addition. In pressing out the must, the last pressing $\frac{1}{4}$, or $\frac{1}{5}$, is put into a separate cask. This is deficient in sugar, and makes an inferior wine. By putting from 18 to 24 ounces of pulverized loaf sugar to the gallon of must, after undergoing a full fermentation, it makes a fine sweet wine. The sugar exhausts the leaven and the wine continues sweet. The still Catawba, pure, is of the character of hock,—a dry, hard wine, and from its aroma and flavor, I deem it superior to hock.

"The ISABELLA is not much cultivated for wine; it makes a still wine inferior to the Catawba. For sparkling wine, the Isabella is valuable, as several persons prefer it to the Catawba.

"The HERBEMONT also makes a superior still wine. The plant is a native of North Carolina, from which State our best grapes are procured. Its flavor is the same as the Spanish Manzanilla wine, and will pass for it with all acquainted with the Spanish wine. I deem it will also be valuable for sparkling wine. This vine outgrows all others. I have had a shoot grow 40 feet in a season. I believe it could be made to grow 50 feet or more.

"The *Sparkling Catawba* and *Isabella* have no addition to the pure wine, except some of the best rock candy, to increase the sparkling and give it more sweetness.

"No pure wine will bear transportion a distance in casks.

Nor will it keep in the cellar, unless the cellar is cool, the cask kept full and air-tight. When bottled, it will keep for any number of years, and is not injured by transportation in hot weather.

"European writers say that there is no grape that produces a dark-colored must; that the coloring matter is always in the skin, and must be brought out by fermentation. I have native grapes the must of which, as pressed from the fresh bunch, is of the color of ink."

DESCRIPTION.—Professor Rafinesque gives the following comprehensive description of the various wines:

1. RED WINES owe their color to the coloring matter; they are most common, often called table wines, or claret. They vary from pale purple to black, and from the thinness of water to the thickness of syrup. When new, or less than three months old, they are less agreeable, difficult to digest, flatulent, liable to irritate and inflame the bowels. When from three to eighteen months old, they are palatable and perfect. When older, they become better still, lighter, milder, and healthier, very stomachic, and reviving.

2. WHITE WINES are made from white grapes, or red grapes without husks. They are commonly limpid, thin, and dry, whence they are called dry wines, or sack. The color is white, pale, yellow, or brownish. They are milder and less acid than the red wines, very diuretic and useful in dropsies. Such are Hock and Sherry.

3. SPARKLING WINES contain an excess of carbonic acid; commonly called Champagne; white and frothy, very mild and healthy, but liable to affect nervous persons.

4. ACID WINES have too much malic acid; they are thin and sourish, but very cooling. The northern and mountainous countries afford hardly any other, the grapes being deficient there in sugar. Several American grapes can produce no other, unless sugar is added. The colors are white, or pale red.

5. ASTRINGENT WINES contain more tannin. They are commonly red, rough, and austere. Such are Port, or Oporto, Catalonia, Roussillon, etc. Useful for persons of lax fibers, or who have undue evacuations; but liable to bring on gout.

6. STRONG WINES have an excess of alcohol, which makes them affect the head. They are commonly white, or brown. Such are Madeira, Teneriffe, Lisbon, etc. Unless drank very moderately, they produce intoxication, dyspepsia, inflammation, and chronic diseases.

7. SWEET WINES contain much sugar, some strength, and perfume. They are commonly white, or pale, but some are red; also, commonly thick, luscious, delightful, acting as mild cordials, and very nourishing. Such are Cyprus, Malaga, Lacrima, Muscat, Malmsey, Constantia, etc. Used mode-

rately, they are reviving, tonic, stimulant, and useful in all diseases of debility.

8. Exquisite Wines abound in delicious and fragrant aroma, are sweet, but not strong. Such are Tokay and Nectar, the best of all wines or cordials, the best kinds of which sell on the spot at fifteen dollars per bottle, or sixty dollars the gallon; while common table wines often sell in Europe at five cents the gallon. The finest perfumed sweet wines may be concentrated by frost into exquisite Essence of Wine.

Some of the most famous or valuable wines are the following kinds. Each has its particular flavor:

French Wines.—1, Sillery; amber color, dry, fine perfume, stomachic. 2, Rose-colored Champagne. 3, Moselle; white, light, agreeable. 4, Straw Wine—similar to Tokay; made from grapes kept on straw till spring. 5, Rangen; white, very strong, bad for the nerves, may cause palsy. 6, Pineau; sweet, light, fragrant. 7, Vouvray; sweet, soft, strong, white. 8, Grosnoir; black, thick, rough, loses color and taste by age. 9, Burgundy; red, brisk, delicate. 10, Cote d'or; red, strong, brisk, high flavor. 11, Auxerre; red, fine, delicate, fine boquet. 12, Leclos; white, quite limpid, fine. 13, Chambertin; red, fine, sweet perfume. 14, Volnay; red, very fine, delightful smell. 15, Grillet; white, brisk, perfumed, sweet when young, dry when old. 16, Hermitage; red, fine, perfumed. 17, Golden Hermitage; golden color, delicious perfume and flavor. 18, Medoc, or best perfumed Claret. 19, Graves; white Claret. 20, Roussillon; red, rough. 21, Muscat; white, sweet, delicious. 22, Ciotat; similar, but thin. Most of these best wines are drunk as luxuries or medical tonics, and the very best are seldom exported, costing from one dollar to five dollars per bottle.

Spanish Wines.—1, Tinto; black, thick, strong. 2, Tintillo; ditto, red. 3, Seco; white, dry, bitterish. 4, Xeres, or Sherry; white, dry, nutty, strong. 5, Paxaret, white, sweet, high flavor. 6, Granada; amber color, very sweet when young, losing the sweetness by age. 7, Albaflora; like Hock, white, not so dry. 8, Sweet Malaga: brown, sweet, strong, a fine cordial when old. 9, Dry Malaga; whiter, thinner, and dry. 10, Alicant; red, strong, very tonic. 11, Catalonia; red, and rough, like Port. 12, Malmsey; sweet, reddish, fine flavor. 13, Red Malaga; fine, strong. 14, Salamanca; pale, red, fine.

Wines of Portugal are commonly called *Port* when red, and *Lisbon* when white: both are strong and rough, but improve by age, unless adulterated, as usual, with brandy. 1, Carcavelos; is the Sweet Lisbon. 2, Bucellas; the Dry Lisbon. 3, Setubal, like Muscat. 4, Minho; best Pale Port. 5, Douro; very rough.

Italian Wines.—1, Chiaretto; pale, red, fine. 2, Pennino;

white, thin like water, acid—made in the Alps and Appenines. 3, Florence, or Tuscany; similar to Burgundy, thinner, can not keep. 4, Lombard, Modena, and Montserrat; red, thin, acid. 5, Montepulciano; red, strong, hot. 6, Vicentino; red, strong. 7, Falerno, and Salerno; red, delicate. 8, Calabrese; black, thick, sweet. 9, Tarento; red, rough. 10, Malvagia; sweet, strong, delicate. 11, Lacrima; red, sweet, strong, perfumed. 12, Moscatello; yellow, sweet, luscious. 13, Nobile, and Vergine; exquisite, similar to Tokay. 14, Rosolio, or Fiascone; white, sweet, thick like a cordial. 15, Paglino; straw color, fine. 16, Agrodolce; sweet and acid, white. 17, Nenacio, black and thick. 18, Puglia; pale, red, brisk. 19, Viterbo; red and rough. 20, Trappola; sweet and bitter. 21, Amaro; red, bitterish. 22, Zafferano; saffron color. 23, Doro; golden, sweet. 24, Albano, and Sanguinello; bright and pleasant. 25, Greco; yellow, pungent, sweet. 26, Morello; black, strong. 27, Vesuvio; red, strong. 28, Ischia; pale, strong. 29, Pergola; pale, thin, flat. 30, Passola; fine, made with shriveled grapes. 31, Meile; yellow, as sweet as honey. 32, Corsican; similar to Catalonia. 33, Sardinian; similar to Burgundy, many kinds. The Italian wines are hardly known out of Italy, being seldom exported; those of South Italy alone will keep well.

Sicilian Wines.—1, Di Pasto; pale, strong. 2, Catania; similar, with the pitch taste. 3, Mascali; red, strong. 4, Etna; white, fiery. 5, Palermo; pale, red, strong, but thin. 6, Castelvetrano; yellow, strong, limpid. The Marsala, or Sicily Madeira, is made with this Castelvetrano, brandy, bitter almonds, etc., well fined, and kept two years. 7, Tusa; sweet, brown, flavor of Cyprus. 8, Syracusa; sweet, strong, yellow, like Muscat. 9, Noto and Lipari; strong, pale, rough. 10, Modica; pale, red, flavor of Malaga.

Swiss Wines.—1, De Vaud; dry, like Rhenish. 2, Neufchatel; red, like Burgundy. 3, Baudry; red, good flavor. 4, Montagnard; thin and acid.

German Wines.—Commonly dry and acid. 1, Treves; a specific for gravel [?]. 2, Hock; white, very dry. 3, Rhenish; white, delicate. 4, Berg; strong, and perfumed. 5, Heidelberg; fine, red. 6, Bohemia; like Burgundy. 7, Danube; delicate, do not keep. 8, Austrian; greenish, strong. 9, Styrian; pale, strong. 10, Spitz; fine. 11, Tyrol; red, weak.

Hungarian Wines.—1, Anspruch Tokay; white, luscious, soft, mild, oily, exquisite. 2, Marlas, and Common Tokay; inferior, thinner. 3, Szeghi; white, aromatic perfume. 4. Moda; nearly similar to Mazlas. 5, Zombor; strong, pale red. 6, Matra, and Arad; red, sweet, strong wines.

Russian Wines.—Only produced in the South. 1. Zimlansk; red, fine. 2, Don; white, fine. 3, Tangarog; disagreeable taste. 4, Kaffa; or Champagne of Crimea. 5, Sudagh; white,

sweet, similar to Hungarian. 6, Cutner, or Moldavian; green, very strong.

Grecian Wines.—1, Carlovitz; red, fine, brisk. 2, Posega; white, fine flavor. 3, Dalmatian; red, strong, fine. 4, Lissa; dark red, very strong, the strongest of all wines. 5, Morea; red, perfumed. 6, Napoli; Malmsey. 7, Malmsey of Mount Ida, in Candia. 8, Nectar of Candia; exquisite, delicate, sweet. 9, Samos; sweet and acid, white. 10, Nectar of Scio; sweet, astringent. 11, Scio; pale, red, fine. 12, Tenedos; like Medoc. 13, Tenedos; red Muscat. 14, Santorin; very sweet and agreeable, but sulphurous. 15, Pitch Wine; brown, with the taste of tar. 16, Holy Wine; very fine. 17, Cyprus; sweet perfumed, red when young, yellow when old, similar to Malaga, a very fine cordial and stomachic.

Asiatic Wines.—1, Smyrna; red, strong, fine. 2, Astracan; red, similar to Lacrima. 3, Caspian; like Moselle. 4, Caspian Champagne. 5, Kuma; red, light, thin. 6, Tartary; strong, made very intoxicating by poppies. 7, Tiflis; fine wine, made from wild grapes! 8, Arminian; red and white, fine, strong. 9, Syrian claret. 10, Damascus; golden, dry. 11, Lebanon; thick, perfumed, red. 12, Golden Wine; yellow, from Syria. 13, Jerusalem; white, good. 14, Sana; in Arabia, good. 15, Shiraz; red, harsh, high flavor. 16, Nectar of Shiraz; white, sweet, strong, perfumed. 17, Ispahan; white, fine. 18, Tabriz; red and white, many kinds. 19, Shirvan; red, like best Claret. 20, Affghan; similar. 21, Many wines in Bucharia, Thibet, and China, hardly known.

African Wines.—1, Jew's Wine; red, good. 2, Berber; white, fine. 3, Madeira or Vidonia; dry, strong, yellow, flavor of bitter almonds. 4, Bagoal of Madeira; sweeter. 5, Pingo; Malmsey of Madeira, exquisite. 6, Tinto of Madeira; red, perfumed, austere, useful in dysentery. 7, Canary; white, similar to Lisbon. 8, Vidonia of Teneriffe; similar to Madeira when old. 9, Gomer; white, sharp, limpid like water, flavor of Madeira. 10, Palma; yellow, light, dry. 11, Palma Malmsey; flavor of pine-apple. 12, Fayal; white, thin, strong. 13, Azorian; pale red, like light Port. 14, Constantia; red, highly perfumed, sweet. 15, Cape or Henapop; less perfumed. 16, Stony; dry like Graves. 17, Rota; red, strong. These four last from the Cape of Good Hope.

South American Wines.—Only made in Chili, Cuyo, Tucuman, etc., little known, similar to Catalonia, pale red. In the Andes of Peru, wine is also made, but weak and bad tasted. The wine made in the West Indies, with V. glomerata and V. maritima, is red, harsh, acid.

North American Wines.—These are made from Canada to Mexico, chiefly from native grapes. In the United States, seventeen species can make good wine, either alone or with a little sugar. The principal wines, already made, are, 1,

Vincennes; pale red, light. 2, Vevay; red, acid. 3, Vevay prime; brown and sweetish, fine. 4, Alexander; pale red, flavor of raspberries, and similar to best Burgundy, made from V. prolifera. 5, Bland; acid, strong, yellow, made from V. blanda. 6, Lufborough; red, rich, fine musky flavor. 7, Catawba; yellow, fine body and perfume. 8, Scuppernong; yellow, limpid, very strong, fiery when brandy is added. 9, Muscadine; yellow, sweet, perfumed. 10, Cattskill; strong, between Madeira and Port in taste and color. 11, Cooper's; brown, similar to Lisbon, but acidule. 12, Elsinburg; fine flavor. 13, Orwisburg; very fine, white. 14, Isabella; pale and fine. 15, Worthington; similar to Port. 16, Winter Wine; dark red, acid and harsh. 17, York; red, harsh. 18, Harmony; red, acid, good. 19, Alabama; brown, fine, etc. The European vines thrive in our gardens, and produce good eatable grapes with some care; but are often injured in the fields by late frosts, and do not ripen well, or give a thin acid juice, unsuitable for good wine. We must, therefore, rely on our native hardy grapes, some of which are equal to the best exotic.

The Mexican wines, made from Spanish vines, produce wines similar to Spanish, but are little known as yet.

This comprehensive list and description of wines, though truthful and satisfactory, in reference to the old standard wines, is yet deficient in regard to some of the late wines. This, however, may be said more particularly in its application to our Native Wines. There are several of these that require further notice.

1. Still Catawba.—This is a light or straw-colored wine, of fine fruity aroma. It is dry, hard, and very much resembles the German Hock. It contains in 100 parts, 11·5 of alcohol, and 88·5 of water. It is a fine tonic.

2. Sparkling Catawba.—This is also a light-colored wine, has the same fine flavor as the *still*, but is sweeter, and much more palatable to the present American taste. It resembles the finest French Champagne. It is a "*Ladies Wine*." It costs $12 per dozen.

3. Cape.—Cape is a red wine, resembling the French Claret, and is usually made with the addition of sugar. It contains in 100 parts, 9·12 of alcohol, and 90·88 of water. It is a pleasant tasting, and good tonic wine.

4. Isabella.—This is of the color of light Madeira. When made of the pure juice it is sour, and tastes much like the Rhine wines; but it is commonly made with sugar, and is thus adapted to the common taste.

5. Herbemont's Madeira.—This is of a pink or light red color, and of a fine flavor, resembling, in taste, that of the finest Spanish Manzanilla.

6. Ohio.—A dark red wine, not of a good flavor when fresh, but improved by age.

7. Missouri.—An excellent wine, resembles Madeira.

There are also more varieties of wine made in this country, from other vegetable juices besides that of the grape. Among these, are those made from the Gooseberry, Currant, Elderberry, Blackberry, Apple, etc. A fine tasted wine is made of the rhubarb plant. Mr. J. Eshelby, of this city, has commenced manufacturing this within the last few years, and it is surprising to see to what perfection he has brought his product. He calls his wine Champagne. He proceeds upon a formula which he has obtained from England, where it has been made for some years.

Composition of Wine.—The juice of both ripe and unripe grapes, has been analyzed by several chemists; the following tables, given by Pereira, embraces the most important results:

JUICE OF THE UNRIPE GRAPE.

Proust.		*Gèiger.*
Extractive.	1. Deposit from the juice.	Wax.
Malic acid, a little.		Chlorophylle.
Citric acid, much.		Tannin.
Bitartrate of potash.		Glutinous matter.
Sulphate of potash.	2. Filtered juice.	Tannin.
Sulphate of lime.		Extractive.
		Sugar (uncrystallizable).
		Gallic Acid.
		Tartaric acid (free) about 1·12 per cent.
		Malic acid (free) about 2·19 per cent.
		Bitartrate of potash.
		Malate, phosphate, sulph., and muriate lime.
Unripe grape juice.		Juice of White Grape of good quality.

JUICE OF THE RIPE GRAPE.

Proust.	*Bèrard.*
Extractive.	Odorous matter.
Sugar (granular and uncrystallizable).	Sugar.
Gum.	Gum.
Glutinous matter.	Glutinous matter.
Malic acid, a little.	Malic acid.
Citric acid, a little (Tartaric, *Braconnot*).	Malate of lime.
Bitartrate of Potash.	Bitartrate of Potash.
	Supertartrate of lime.
Ripe Grape Juice.	Ripe Grape Juice.

PURITY.—The preceding table, exhibits the results of the examination of the pure juice of the grape, but the wines of commerce are, many of them, very far from being pure. All contain more or less alcohol, many of them astringent and stimulating substances, sugar, coloring matter, etc. The following table exhibits the proportion of Alcohol (*sp. gr.* 0.825 at 60° F.), by measure, contained in one hundred parts of wine:

Brande.		*Prout.*	*Brande.*		*Others.*
1. Lissa, *average*	25·41	15.90	24. Alba Flora,	17.26	
2. Raisin, "	25·12		25. Malaga,	17·26	
3. Marsala, "	25·09	18·40	26. Zante,	17·05	
4. Port, "	22·96	20·64	27. Mam. Madeira,	16·40	*Fontenelle*
5. Madeira "	22·27	21.20	28. Lunel,	15·52	18.01
6. Currant, "	20·55		29. Sheraaz,	15.52	*Prout.*
7. C. Madeira, *average*,	20·51		30. Syracuse,	15.22	30·00
8. R. Madeira, "	20·35		31. Claret, *av.*	15·10	
9. Teneriffe,	19·79		32. Nice,	14·63	*Prout.*
10. Colares,	19·75		33. Burgundy, *av.*	14·57	12·16
11. Constantia, white,	19·75	14·50	34. Sauterne,	14·82	
12. Lacrima Cristi,	19·70		35. Vin de Grave,	13·94	
13. Vidonia,	19·25		36. Barsac,	13·86	
14. Sherry, *average*,	19·17	23·80	37. Tent,	13·30	
15. Lisbon,	18·94		38. Frontignac, (R)	12·79	*Fontenelle*
16. Malaga,	18·94		39. Champagne, *av.*	12·61	12·20
17. Constantia, red,	18·92	14·50	40. R. Hermitage,	12·32	
18. Calcavella, *average*,	18·65		41. Côtie Rôtie,	12·32	
19. Bucellas,	18·49		42. Hock, *av.*	12·08	
20. Cape Muscat,	18·25		43. Gooseberry,	11·84	
21. Rousillon, *average*,	18·13		44. Orange, *av.*	11·26	
22. Grape Wine,	18·11		45. Tokay,	9·88	
23. W. Hermitage,	17.43		46. Elder,	8·79	

Christison, however, thinks that the proportion of alcohol in wine has been overrated. He makes the mean of seven Port wines about 16·20; that of thirteen Sherrys, excluding those long kept in casks, about 15·37, and that of Madeira, long kept in casks, 15·49. Wine kept in casks, according to this gentleman's views, will, for a few years, increase their proportion of alcohol by the mutual action of their elements, and it is supposed that they will improve their flavor during this time. In a few years, however, a reverse action will gradually take place, during which time the proportion of alcohol will decrease, and likewise some of the flavor.

Adulteration of wines is very extensively practiced, but it consists chiefly of the admixture of wines of inferior quality

with those of superior; and if we except brandy and other spirits, little else will be found, unless it be the coloring, astringent, flavoring, and sweetening matters already spoken of. It may be remarked, however, in reference to mixing wines, that *poorer* wines are not always the result of this practice. Wines are also much falsified, that is, other, and sometimes very base compounds, are put up and sold under the names of certain popular wines.

Physiological Effects. — Taken in moderate quantities, wine acts as a stimulant and tonic. It increases the action of the heart and arteries, diffuses an agreeable warmth over the whole body, promotes the various secretions, sustains muscular force, promotes nervous action, excites the mental faculties, and causes gayety and agreeableness of feeling. Nevertheless, in a perfect state of health, while the *grape* may be nutritive, *wine* can not be said to be necessary to the constitution, although it promotes digestion in most persons.

Wines taken in large portions, especially the strongest kinds, will produce intoxication, like the ardent spirits; but a singular peculiarity obtains in its power to produce this effect: for although the alcohol that it possesses is the cause of the intoxication arising from its use, there is no correspondence between the effects of wine and a quantity of alcohol equal to that which is taken in the wine. A mixture of alcohol and water, corresponding to the strength of wine, will produce intoxication in a much smaller quantity than is necessary of wine. Four fluid ounces of alcohol are contained in eighteen and a half fluid ounces of port-wine, or twenty-six and a half of claret. It takes eight of brandy, to furnish the same quantity; yet every one knows that individuals can not take more than a third as much brandy as they can of port-wine.

The intoxication produced by wine comes on slower than that by ardent spirits, and is much more lasting in its duration. The attending headache, nausea, and general derangement of the digestive apparatus, when produced by it, is also much more considerable.

Therapeutic Properties and Use.—Wine is regarded as

a valuable stimulant, tonic, and cordial, and is one of the most common articles prescribed in general practice, to patients that are weak, and much relaxed, or that are convalescing tediously. It supports the vital power, equalizes the circulation, regulates the nervous action, obviates delirium, especially that caused by an exanguinous, or extremely relaxed condition of the system.

"As a medicine," says Parr, "wine is a most valuable cordial in languor and debility, particularly useful in the low stage of typhus, raising the pulse, supporting the strength, promoting a diaphoresis, and *resisting putrefaction more quickly and certainly than any other medicine.* Delirium, from excessive irritability, and a defect of nervous energy, is often more relieved by the judicious use of wine; during the prevalence of an intermittent epidemic, or putrid sore-throat, a moderate use of wine has proved a salutary prophylactic. In malignant angina; in the small-pox, verging to putrescency, with great debility; in gangrenes and the plague; wine is considered an important remedy, and in almost every case of great prostration of strength, is a most grateful and efficacious cordial."

In cases of irritability of the stomach, wine will sometimes set peculiarly grateful, when no other stimulant could possibly be taken. This property, as well as its remarkably salutary effects, when applied to fresh wounds and bruises, according to sacred history, was well known to the ancients. As a remedy *for*, and corrector *of* old sores, ulcers, and cancers, it is also important.

But the special *adaptations* and the *varieties* of wines have already been spoken of in their description, and need not here be treated upon. The quantity to be taken varies exceedingly in different cases: some patients can bear but little, perhaps scarcely a spoonful, while others require large quantities, frequently repeated. A pint, or more, has been given in the course of a few hours, with the happiest effect.

In pharmacy, it is used as a menstruum for various medicines, and thus *Medicated Wines*, *Wine Bitters*, *Cordials*, etc., are often prepared, and extensively used. One of the most common and valuable domestic preparations of wine, is *Wine-whey*,

which is made by adding from a gill to half a pint of good wine, to a pint of boiling milk, straining out the curd, without pressing, and sweetening the whey. It forms a very excellent drink, in nearly all varieties of disease.

ÆTHER SULPHURICUS.

Synonyms.—Sulphuric Ether, Ether, *Eng.*

History. — It is not known whether Ether was known to the ancients. Raymond Lully, who lived in the thirteenth century, is the first whom we know to have been acquainted with it. V. Cordus, in 1540, described the method of preparing it. He called it *Oleum Vitrioli dulce.*

Preparation. — "Take of Alcohol, four pints; Sulphuric acid, a pint; Potassa, six drachms; Distilled Water, three fluid ounces. To two pints of alcohol, in an open vessel, add gradually fourteen fluid ounces of the Acid, stirring them frequently. Pour the mixture, while stil hot, into a tubulated glass retort, placed upon a sand-bath, and connected by a long adapter with a receiver kept cold by ice or water; then raise the heat quickly until the liquid begins to boil. When about half a pint of ethereal liquid shall have passed over, introduce gradually into the retort the remainder of the Alcohol, previously mixed with two fluid ounces of the Acid, taking care that the mixture shall enter in a continuous stream, and in such a quantity as shall supply the place, as nearly as possible, of the liquid which distils over. This may be accomplished by connecting a vessel containing the alcoholic liquid with the retort, by means of a tube provided with a stop-cock to regulate the discharge, and passing nearly to the bottom of the retort, through a cork accurately fitted into the tubulure. When all the Alcohol has been thus added, continue the distillation until about three pints shall have passed over, or until white vapors shall appear in the retort.

"To the product thus obtained, add the potassa previously dissolved in the Distilled Water, and shake them frequently. At the end of twenty-four hours, pour off from the alkaline solution the supernatant ether, introduce it into a retort, and, with a gentle heat, distil until two pints have passed over, or until the distilled liquid shall have the specific gravity of 0·750." U. S.

"Take of Rectified Spirit, fifty fluid ounces; Sulphuric Acid, ten fluid ounces. Pour twelve fluid ounces of the Spirit gently over the Acid, contained in an open vessel, and then stir them together briskly and thoroughly. Transfer the mixture immediately into a glass matrass connected with a refrigeratory, and raise the heat quickly to about 280°. As soon as the

ethereal fluid begins to distil over, supply fresh spirit through a tube into the matrass in a continuous stream, and in such quantity as to equal that of the fluid which distils over. This is best accomplished by connecting one end of the tube with a graduated vessel containing the spirit—passing the other end through a cork fitted into the matrass—and having a stop-cock on the tube to regulate the discharge. When forty-two [fluid] ounces have distilled over, and the whole spirit has been added, the process may be stopped. Agitate the impure ether with sixteen fluid ounces of a saturated solution of muriate of lime, containing about half an ounce of lime recently slacked. When all odor of sulphurous acid has been thus removed, pour off the supernatant liquor, and distil it with a gentle heat so long as the liquid which passes over has a density not above 0.735. More ether of the same strength is then to be obtained from the solution of muriate of lime. From the residuum of both distillations, a weaker ether may be obtained in small quantity, which must be rectified by distilling it gently again." *Ed.*

"Take of Rectified Spirit, three pounds; Sulphuric Acid, two pounds; Carbonate of Potassa, previously ignited, an ounce. Pour two pounds of the spirit into a glass retort, add the acid to it, and mix. Afterward place it on sand, and raise the heat so as that the liquor may quickly boil, and the ether pass into a receiver cooled with ice or water. Let the liquor distil until some heavier portion begins to pass over. To the liquor which remains in the retort, after the heat has subsided, add the remainder of the spirit, that ether may distil in the same manner. Mix the distilled liquors, then pour off the supernatant portion, and add to it Carbonate of Potassa, shaking them frequently during an hour. Lastly, distil the ether from a large retort, and keep it in a stopped vessel." *Lond.*

The Dublin College orders it made from the Sulphuric Ethereal Liquor, by distilling it from a mixture of this with Potassa.

Properties. — Sulphuric Ether is a very limpid, colorless liquid, of a strong, agreeable, sweet odor, and hot, pungent taste. When pure, it will not redden litmus; but if imperfectly prepared, or long kept, it will to some extent. Its specific gravity is 0·713; its boiling point 95°. It is not susceptible of freezing at even 166° below zero. The officinal strength, according to the U. S. and Lond. Pharmacopœias, is 0·750. Its inflammability is very great, and hence it should be handled carefully about the flame or fire. The products of its combustion are water and carbonic acid.

Composition.—Chemically speaking, this liquid is an *oxide of ethyle*, while alcohol is a *hydrated oxide of ethyle*. The formula of ether then is $C^4 H^5 + O$. It thus appears that ether contains no sulphur, and can have no claim on its common name further than the fact of the agency of sulphuric acid in its production.

Therapeutic Properties and Use.—Ether is not very extensively used in the new practice simply as a therapeutic agent, but in pharmacy it is, like alcohol, very important. As a medicine, it is stimulant, and antispasmodic; but its effects, though diffusive, are very transient. It is serviceable sometimes when it is desired to produce a sudden reaction, as in syncope, asphyxia, and in all cases of rapid depression of the vital powers. As an antispasmodic, in cases of hysteria and hypocondriasis, it is often of very considerable service.

As a letheon, or anæsthetic, it has of late attracted much attention. When inhaled into the lungs, it will produce a species of insensibility and intoxication that will admit of the severest surgical operations without the least sensation of pain. But these effects of ether are not altogether safe, as they prevent the proper decarbonization of the blood, and will, hence, in some instances, produce no small amount of mischief. Its inhalation will prove antispasmodic.

Externally applied, it serves as a refrigerant, by its rapid evaporation; and thus it will sometimes relieve headache.

Ether is by far the most available in pharmacy, for, excepting water and alcohol, there is no better general solvent. Its extreme volatility places it before alcohol as a menstruum in the preparation of many of the vegetable oils and resins. The virtues of lobelia, capsicum, podophyllum, etc., are taken up by the ether in the form of a tincture, when, by evaporating the ether, the desired product is left behind. By means of a retort and refrigeratory, the ether may be saved for succeeding processes.

The use of ether as a pharmaceutic agent, being so well illustrated in treating of articles prepared with it, it is unnecessary to protract this subject any more.

The dose of sulphuric ether is from f℥ss. to f℥jj., or from 30 min. to a teaspoonful.

SPIRITUS ÆTHERIS NITRICI.

Synonyms.—Spiritus Æthereis Nitrosus, *Lond. Ed. U. S. Dub*; Spiritus Nitri Dulcis; *Spirit of Nitric Ether, Sweet Spirits of Nitre, Eng.*; Alcohol nitrique, *Fr.*; Entere nitrico alcoolizzato, *Ital.*; Saltpeter naptha-waengeist, *Ger.*

Preparation.—The preparation of this article involves only the action of Nitric Acid upon Alcohol and the distillation of the resulting ether. All the spirituous ethers are produced in the action of acids on alcohol.

But the process of manufacture requires certain precautions, as there is danger of explosion, from the contact or rapid union of the strong acids with alcohol.

The London College gives only the elementary process for the manufacture of the spirits of nitre thus: ℞ Rectified Spirit, ℔iij.; Nitric Acid, ℥iv. Add the acid gradually to the spirit and mix them. Distil off f℥xxxij., Imperial.

The Edinburg College gives a process in detail by which all risk of explosion is obviated; this is, perhaps, the best when the ether is intended to be directly prepared from alcohol by the action of the acid; it is as follows:

℞ Rectified Spirit, two pints and six fluid ounces; Pure Nitric Acid, seven fluid ounces. Put fifteen fluid ounces of the spirit, with a little clean sand, into a two-pint matrass, fitted with a cork, through which are passed a safety-tube, terminating an inch above the spirit, and another tube leading to a refrigeratory. The safety-tube being filled with pure nitric acid, add through it gradually three fluid ounces and a half of acid. When the ebullition, which slowly rises, is nearly over, add the rest of the acid gradually, half a fluid ounce at a time, waiting till the ebullition caused by each portion is nearly over, before adding more, and cooling the refrigeratory with a stream of water, iced in summer. The ether thus distilled over being received in a bottle, is to be agitated first with a little milk of lime, till it ceases to redden litmus paper, and then with half its volume of concentrated solution of muriate of lime. The pure hyponitrous ether thus obtained, which should have a density of 0·899, is then to be mixed with the remainder of the rectified spirit, or exactly four times its volume.

The U. S. Pharmacopœia directs this ether to be made out of the Nitrate of Potash, ℔ij.; Sulphuric Acid, ℔iss.; Alcohol, Oixss.; Carbonate of Potash, ℥iss.; and Dilute Alcohol, Oj. The alcohol and powdered nitrate of potash are to be mixed in a large glass retort, and the acid gradually poured in; digestion is to take place over a gentle fire for two hours, when the heat is to be raised, and one gallon distilled over. To this the diluted alcohol and carbonate of potash is to be added, and then again one gallon is to be distilled from it.

Description.—Sweet Spirits of Nitre is a volatile, aromatic, colorless fluid, sometimes slightly tinged with yellow. Its taste is sweet and peculiar, although somewhat like that of sulphuric ether. Its specific gravity is about 0·840. The U. S. formula produces the highest proof, being 0·834. It is very inflammable, and burns with a whitish flame. Its chemical formula is $C^4\ H^3\ O + N\ O^3$.

Medical Properties and Use.—Sweets spirits of nitre is stimulant, diaphoretic, diuretic, and antispasmodic. It has been long employed in the old practice in fever as a diaphoretic and diuretic. In the Eclectic practice it has also had a prominent place in the same use; also in gonorrhœa. In this application it is combined with balsam of copaiva. It proves serviceable in nephritis, cystitis, peritonitis, gastritis, hysteritis, etc. It often obviates nausea, and pain in the stomach. The dose is a teaspoonful repeated, as occasion may require.

Order VI.—AMMONIACAL STIMULANTS.

The different preparations of *Ammonia*, are alone comprised in this order. They are not very numerous, especially those of them that are used by practitioners of the New School; nor are they as extensively useful, in this connection, as most other orders of stimulants. A few, however, as the *carbonate*, *muriate*, and *aqua* of *ammonia*, are of some importance.

Ammoniacal stimulants in their action, are very diffusive, and volatile; but, from their *acrid* properties, some of them, which are more caustic, excite the parts with which they come in contact, much more than those more remote from the sphere of their immediate influence. Their power, as *topical stimu-*

lants, make them eminently useful as rubefacients; and, indeed, this is the chief purpose for which they are employed in the new practice.

AMMONIA MURIAS.

SYNONYMS.—AMMONIA HYDROCHLORAS: Salmiac, *Ger.*; Sel Ammoniac, *Fr.*; Sale Ammoniaco, *Ital.*; Sal Ammoniaco, *Span.*; Hydrochlorate of Ammonia, Sal Ammoniac, *Eng.*

PREPARATION.—The Egyptians, many years ago, prepared the Sal Ammoniac from the soot formed in the combustion of camel's dung, which they used as fuel. It is now obtained in this country, from two principle sources:—1, The *gas-liquor*, collected in the condensing vessels of coal-gas works; 2, The *bone-spirit*, which is a secondary product, arising from the destructive distillation of bones, in the manufacture of animal charcoal for sugar refiners.

The ammonia in the *gas-liquor* is found in several different combinations with other elements, but principally with sulphur, and carbon. To these, sulphuric acid is added, when the affinity for sulphur prevails. When this liquor is duly evaporated, brown crystals of sulphate of ammonia are obtained. This salt is then sublimed with chloride of sodium, in pots of iron, lined with clay, and furnished with a dome or head of lead. The affinities of the different elements, contained in the mixture, give rise to several decompositions and recompositions during the process of sublimation. Thus, the chlorine combined with the soda, disengages from the latter, and unites with the ammonia, forming muriate of ammonia, which is found sublimed in the head of the still, while the sulphur and soda constitute a new salt that remains behind.

Sometimes a different process is adopted, and the ammonia, instead of being first all converted into a sulphate, is directly changed into a muriate by the addition of muriatic acid, or chloride of calcium; from this, after due evaporation, the muriate is sublimed.

Muriate of ammonia may be obtained from *bone-spirit* in the manner above described; but, it is also prepared by a different process. The *bone-spirit* is digested with sulphate of lime.

Thus by double decomposition and re-composition, sulphate of ammonia, and carbonate of lime, are formed. Then the muriate is prepared from the sulphate of ammonia, by sublimation, as in the other process. Ammonia is not manufactured for market in this country, but is chiefly imported from England and Hindostan. That brought from the latter place, is an impure article, and is not used as medicine, but is consumed in the arts.

The English sal ammoniac occurs, in commerce, in large white cakes, some two inches thick, which are convex on one side and concave on the other. When broken, it presents a striated texture, somewhat tough and ductile; semi-transparent; nearly permanent in the air; without smell, and of a saline taste. It is not so soluble in alcohol as in water. It will dissolve in its own weight of boiling water; but requires three times as much when of the temperature of 60°. When dissolved, it diminishes the temperature of the menstruum, and is hence used for the purpose of making freezing mixtures.

Composition.—Hydrochlorate of ammonia is composed of 1 eq. of ammonia, and 1 eq. of hydrochloric acid. Its ultimate constituents are, 4 eq. of hydrogen, 1 eq. of nitrogen, and 1 eq. of chlorine. Pereira gives the following analytic tables of sal ammoniac:

	Atoms.	Eq. wt.	Per ct.	Kirwan.	Bucholtz.	Berzel.
Ammonia.....	1	17	31·48	25	31	31·05
Hydrochloric Acid...	1	37	68·51	75	69	68·05
Hydrochlorate Amm.	1	54	100·00	100	100	100·00

	Vol.	Spec. Gr.
Ammoniacal Gas,.....	2	0·59027
Hydrochloric Acid Gas,.....	2	1·28478

Physiological Effects.—*α. On Vegetables.*—A watery solution containing 1·300 of its weight of hydrochlorate of ammonia, according to Sir Humphrey Davy, promotes vegetation; but if it contains 1·30 of its weight will act injuriously.

β. On Man.—When taken in doses of from gr. x. to xx., it

at first, produces a sensation of warmth at the stomach, followed by nausea, with slight oppression, which is attended by headache and increased nausea, if the dose is repeated. After it is absorbed, it produces a manifest stimulating effect on the glandular and lymphatic systems.

THERAPEUTIC PROPERTIES AND USE.—Hydrochlorate of ammonia is stimulant alterative, strongly antacid, diaphoretic, and somewhat diuretic. The Germans esteem it highly as an alterative and resolvent; they use it instead of mercury, in glandular diseases, and general cachectic habits.

In the new practice the muriate of ammonia, as an internal remedy, has not yet been well tested, and we are therefore left to the records of the old for any reliable information concerning it. Its stimulant and alterative power however is generally conceded. It has been found serviceable in chronic inflammation, or induration of the glandular structures, as splenitis (ague-cake), parotitis (mumps), bronchocele (goiter), and indeed in many other local affections arising from a depraved habit of the constitution. It is given in doses of from gr. v. to gr. xxx.

As an external application, the solution of sal ammoniac has been found useful as a resolvent, lotion and embrocation. Various solutions, in water, vinegar, and spirits, have been made, and in many cases very beneficially used in glandular swellings, contusions, and echymosis, when there is no wound of the skin. A watery solution is used as a wash for ulcers, cancers, and scrofulous sores.

AMMONIA CARBONAS.

SYNONYMS.—AMMONIÆ SESQUICARBONATIS; (L.) Carbonate of Ammonia, Volatile Salts, *Eng.*

The elements constituting Carbonate of Ammonia are found variously combined, under different circumstances, and thus several substances are known under the name of *Carbonate of Ammonia.* An impure article is formed during the decomposition of most organic substances that contain nitrogen, and hence the atmosphere always contains more or less of it. According to Liebig, rain water contains it; and it is well

known that the urine and excrements of most animals, and especially of the human species, when in a putrid state, give off ammonia in the state of a carbonate. An anhydrous neutral carbonate of ammonia is formed by the union of dry carbonic acid and ammoniacal gasses.

The medical carbonate is prepared by subliming together one part of hydrochlorate of ammonia and one and a half of chalk, well pulverized separately and mixed together; or it may be prepared in the same way from equal parts of Sal Ammoniac and Carbonate of Soda. The phenomena of the process are as follows: 1, A mutual decomposition takes place between the elements of the ingredients employed: 2, A new combination takes place between the nitrogen and hydrogen of the sal ammoniac and the oxygen contained in the chalk (oxide of calcium), or of the carbonate of soda; while, in the third place, the chlorine that is set free, combines with the calcium, and forms a chloride of lime which remains behind, while the carbonate of ammonia sublimes over into the receiver.

Physical Properties.—When recently prepared, Carbonate of Ammonia is in white, rather hard, translucent masses, of a fibrous texture, crystalline appearance, an extremely pungent, ammoniacal odor, and a sharp taste. It is completely soluble in about four times its weight of water; also in diluted alcohol. When pure, it will totally evaporate when heated. It has an alkaline reaction; and when held under a piece of tumeric paper it turns it to a brown color. When exposed to the air, it is converted into a bicarbonate of ammonia, and losing its translucency, falls into powder. This is caused by the loss of a portion of its ammoniacal gas, which is equivalent to an addition of half an atom of carbonic acid.

Composition.—The officinal article of the *Lon.* Pharmacopœia, is a *sesquicarbonate of ammonia*, whose formula is NH^3, $1\frac{1}{2}\ CO^2$, HO=59, or $2NH^3$, $3CO^2$, $H^2\ O^2$=118; and that made officinal in the *U. S.*, *Ed.*, and *Dub.* Pharmacopœias, is a carbonate, whose formula is given as NH^3, CO^2; while Dalton, Scanlan, and Pereira, would make it appear that the article is neither a carbonate or sesquicarbonate of ammonia, but a

compound of the carbonate and bicarbonate. "For," it is argued, "if treated with a small quantity of cold water, a solution of carbonate of ammonia is obtained, while a mass of bicarbonate, having the form and dimensions of the sesquicarbonate employed, and of which it is a mere skeleton, is left." Dr. Pereira, from the uniformity of its composition and its crystaline structure, considers it to be a chemical combination of the two salts. Dr. Bache, in defense of his position in the U. S. Dispensatory, in reference to this matter, makes the following remarks: "When converted into bicarbonate by exposure to the air, each eq. of the medical salt loses one eq. of monocarbonate, a change which leaves the acid and base in the proper proportion to form the bisalt. The mutual decomposition of the salts employed in its preparation, would generate, if no loss occurred, the monocarbonate, and not the sesquicarbonate. The way in which the latter salt is formed, may be thus explained. By the mutual decomposition of the three eqs. of muriate of ammonia and of chalk respectively, three eqs. of monocarbonate of ammonia, three of water, and three of chloride of calcium are generated. During the operation, however, one eq. of ammonia and one of water, forming together oxide of ammonium, are lost; so that there remains to be sublimed, three eqs. of carbonic acid, two of ammonia, and two of water [=118]; or, in other words, the exact constituents of the hydrated sesquicarbonate. When this is resublimed in the process of refining, two eqs. of the salt lose one eq. of carbonic acid, and become one eq. of 5–4 carbonate of ammonia."

Therapeutic Properties and Use.—Carbonate of ammonia is powerfully antacid, stimulant, diaphoretic, and antispasmodic; but is less used as an internal remedy, than some other articles. It is employed as an antacid in some cases of dyspepsia, in which there is a disposition to acidity of the stomach, together with nervous inactivity. It has also been used as a lithontriptic. In view of its antispasmodic properties, it is sometimes used in cases of hysteria, hypocondria, and epilepsia. In some cases of typhus, it is employed as a stimulant and antiseptic. It is an antidote to the poisons commu-

nicated by the bites and stings of reptiles and insects, which consist of some peculiar acids, and which become neutralized by the remedy.

One of the common uses that are made of this article, is that of a volatile smelling-salt. It is in this way eminently adapted to all cases of syncope, hysteria, and asphyxia. Applied to the nostrils, it stimulates the mucous membrane, and thus excites the arteries and nerves, and produces a reaction. It must, however, be applied with care to the nostrils of persons in an insensible state, as great mischief may be done from its acrid and powerfully irritating effects. When prepared for a smelling salt, it is put into a bottle with a ground stopper, and a little oil of bergamot or lavender added. The dose for internal use, is from gr. v. to ʒj., exhibited in a pill or in solution.

As a topical remedy, it has been used in aqueous solution, or mixed with oil, in cases where a rubefacient is required.

AQUA AMMONIA.

Synonyms.—Liquor Ammonia, U. S., L.: Water of Ammonia, *Eng.*

Preparation.—"Take of Muriate of Ammonia, in fine powder; Lime, each, *a pound;* Distilled Water, *a pint;* Water *nine fluid ounces.* Break the lime into pieces, and pour the water upon it in an earthen or iron vessel; then cover the vessel, and set it aside till the lime falls into powder and becomes cold. Mix this thoroughly with the muriate of ammonia in a mortar, and immediately introduce the mixture into a glass retort. Place the retort upon a sand-bath, and adapt to it a receiver, previously connected, by means of a glass tube, with a quart bottle, containing the distilled water. Then apply heat, to be gradually increased till the bottom of the iron vessel containing the sand becomes red hot, and continue the process so long as ammonia comes over. Remove the liquid contained in the quart bottle, and for every fluid ounce of it, add three and a half drachms of distilled water, or so much as may be necessary to raise the sp. gr. to 0.96. Keep the solution in small bottles well stopped."—*U. S.*

℞ "Take of Hydrochloride of Ammonia, *ten ounces;* Lime, *eight ounces;* Water, *two pints* [Imperial measure]. Put the lime, slaked with water, into a retort; then add the hydrochlorate of ammonia, broken into small pieces, and the remainder of the water. Distill fifteen fluid ounces [Imperial measure] of solution of ammonia."—*Lond.* The specific gravity of this is 0·960.

The several Pharmacopœias have formulæ for a solution called *Liq. Ammo. Fortior*, U. S., Lond.; *Aqua Ammo. Fortior*, Ed.; *Aq. Ammo. Causticæ*, Dub.; *Stronger Solution of Ammonia*, which has a specific gravity of 0·882. When this is diluted with two measures of distilled water, is of about equal strength with the common aqua of ammonia.

Physical Properties.—The aqua of ammonia is a colorless liquid, having a very pungent ammoniacal odor, and caustic, alkaline taste. It gives no precipitate with limewater, or with chloride of calcium, proving the absence of carbonic acid; nor will it effervesce with dilute acids. This, like the carbonate of ammonia, will not give any precipitate with nitric acid, to show that it contains any earthy matters or chlorine. But oxalic acid will indicate the presence of calcium. It has a very strong alkaline reaction, and, like the carbonate, transiently browns tumeric paper.

Composition.—Pereira gives the following table, to show the composition of the liquid of several Pharmacopœias, with their different specific gravities:

	LOND., ED. Sp. Gr. 0·960	DUB. Sp. Gr. 0·950	LIQ. AM. FORT. Sp. Gr. 0·880
Ammoniacal Gas, ...	10	12·5	30·5
Water, ...	90	87·5	69·5
Liquor Ammonia, ...	100	100·0	100·0

Impurities.—Aqua of ammonia sometimes contains traces of carbonate of ammonia, hydrochloric acid, chlorine, etc.; which may be detected as follows: The carbonate may be detected by means of lime-water, which produces a precipitate of carbonate of lime. When neutralized by a portion of nitric acid, nitrate of silver will detect the presence of *hydrochloric acid* or *chlorine;* oxalic acid, that of *lime;* and sesquicarbonate of ammonia, *lime* or *other earthy matters*, by producing precipitates.

Therapeutic Properties and Use.—The therapeutic properties of this article are very analogous to those of the carbonate of ammonia, and need not be here described. When administered internally, it is given to fulfill the same indications for which the carbonate is used. It is, however, more

commonly prescribed as an antidote for poisoning by hydrochloric acid, oil of bitter almonds, and other substances containing this peculiar poison. It is also recommended against poisoning by cicuta, belladonna, tobacco, and other poisons of the kind. As a diaphoretic, it seems not to be dependent entirely on its mere stimulating or general exciting power; but, from its alkaline properties, it derives an additional faculty of exciting the functions of the skin. It is more convenient than the carbonate, in its application as an antidote to the poison inflicted by bites and stings, and is equally active as an application to the nostrils in cases of syncope, hysteria, epilepsy, etc. It may, like it, be kept in bottles prepared for the purpose. When thus put up, it may be scented with any of the pleasant-flavored essential oils.

Externally, it is especially valued as a rubefacient, and counter-irritant, in pains of neuralgic and rheumatic character, as well as in inflammations and phlegmasia dolens. The dose is from min. x. to min. xxx., properly diluted. A strong solution of ammonia will answer as a caustic.

Spirit of Ammonia is another preparation of ammonia, which is much valued by some as a stimulant and antispasmodic. This is prepared in the following way:

"Take of Sal Ammoniac, ten ounces; Carbonate of Potassa, sixteen ounces; Rectified Spirit, Water, each three pints [Imperial measure]. Mix them, and distil three pints Imperial measure." (Lond.) The *aromatic spirits of ammonia* is prepared by dissolving in the common *spirits of ammonia* some of the aromatic essential oils, such as the *lemon*, *rosemary*, *cinnamon*, *cloves*, etc. It is also used as a stimulant and diaphoretic, and likewise as a carminative. The dose of these is from thirty drops to a teaspoonful, properly diluted.

Order VII.---ELECTRICAL AND CALORIFIC STIMULANTS.

The terms *Materia Medica*, if too strictly defined, might, in their literal sense, be made to exclude the agencies above indicated. But *Therapeutics* certainly comprises not only these

but all others that may be successfully employed for the cure of diseases.

There is no question but that they, in many more cases than commonly apprehended, are the real cause of cure, while other means have the credit.

The various *liniments*, *plasters*, *embrocations*, and *baths*, which require much friction and manipulations, developing electric phenomena and heat, doubtless owe their effects, in part, to the office of these agencies.

Beside the immediate results of friction and traction employed in the use of these preparations, the materials applied also change the electric state of the surface. There is much difference in the electric and caloric conducting power of a dry surface and a *wet*, or one oiled over and one *not*. The hygrometric states of the atmosphere will affect the body much less when this is oiled over well, and these phenomena (the calorific and electrical) are always dependent upon this state of the air, and will correspond to it in their effects upon the body.

The nurse with her "*goose-grease*" is often more successful than the Æsculapian, who does not know the power of friction and of the benefits of changing the conducting power of the skin in croup or asthma, and bronchial inflammation, occuring in small children.

In treating thus of the medical employment of electricity and caloric, the reader will not be detained with a discussion of the nature or general phenomena of these agents, since that would too much extend the intended limits of this article. Works on Natural Philosophy and Chemistry, will afford information on that point.

Electricity however evinces some peculiarities, dependent upon the manner of its development, which require special consideration, because they are distinct in their effects upon the economy.

For medical purposes five different methods of development may be successfully practiced: 1, by *Traction;* 2, by *Machine Friction;* 3, by *Chemical Action;* 4, by *Magnetic Induction;* 5, by *Magneto-Galvanic Induction.*

ELECTRIC TRACTION.

This method of developing electricity is commonly called *Mesmerism*, from its having been first practiced by a man named Mesmer. This, as all other things are liable to be, has been carried to extremes in the credence demanded for it of community, and a reaction has taken place, which has precipitated this appliance for the present into neglect.

This method involves a process of delicate manipulation with the hands of an operator over the surface of the subject, performed in passes with the extended hands, over the parts more particularly intended to be relieved. Pressure or close friction in this case is not necessary, although the latter is often more effectual.

The philosophy of the process is the freeing or extraction of any excess of the electric or magnetic element that may exist. The electric and magnetic elements are excited by the transformations of the organic elements of the animal structure, and so far as we have yet discovered there are no tissues which do not evince electric or magnetic phenomena in their transformation. When parts are in excessive motion, their electric states would always be more apparent, but for the general conducting power of the body, which equalizes it in the entire body, and gives off the electricity to any conducting medium that may be in contact.

Persons in an insulated condition, as they often are when in bed, especially when on feathers, become positively electric when in a febrile, inflammatory, or otherwise highly excited state, since the feeble conducting power of the surrounding mediums are not equal to the development of the electricity. In all such cases, therefore, one person (any one) may relieve another simply by placing the hand in contact with the body of the other. Manipulation does it more effectually. This is all that is intended here to be indicated in this connection. The effects of manipulation upon the mind do not in their discussion belong here, except in so far as the quieting of excitement thereby, simply, is concerned. In delirium, delirium tremens, and even in temporary insanity, much benefit may

be thus secured. Indeed there is no other means in the entire range of medical appliances equal to it.

In insanity, when the mind is entirely incoherent, the subject is moved only by his physical sensations. A soft pleasurable touch, and tender manipulation will produce amazing effects in such cases.

No experienced physician has failed to realize what this means will do in cases of high mental agitation, delirium, cerebral congestion, etc.

ELECTRICITY BY FRICTION.

The idea of a *static* state of electricity naturally occurs, when we speak of electric friction, and indeed this form of electric evolution is called the *static*, in contradistinction to the *galvanic* which is denominated *dynamic*.

Static electricity is commonly developed for practical purposes, by means of the ordinary electric machine, of cylinder or plate, rubber and conductor, in proper state of insulation. But the simple evolution of static electricity requires only the friction itself, between an electric and a conductor, or non-electric, the machinery serving thus, simply for the purpose of its collection.

Leyden Jar.—When electricity is evolved by means of the electric machine, the *Leyden Jar* is commonly employed as a reservoir for the electricity, and for its conveyance and discharge to the objects designed. In the use of this, the condition of its escape with a *shock*, depends upon the presence of a negative body, which is supplied in the outer coat of foil on the jar. The subject to be shocked therefore is to be interposed in the connection between the inner coating of the jar, and the outer. The Leyden Jar has a projecting knob on the top, designed for convenience of contact with the inner or positively charged coat, and when the subject takes hold of the jar upon its outer coating, or is in contact with any conductor with it, as a chain or wire, he needs only to touch the knob to receive the full charge of what is in the reservoir or jar, passing through or over the surface of what is intermedi-

ate with the two poles, or between the parts in contact with the outer and inner surface of the jar.

The force of the shock will depend upon the capacity of the coated jar, and its charge. By means of the arrangement of several jars in contact with their outer, and with their inner surfaces, an electric battery is thus constructed, which will hold a much higher charge than any person can receive with safety.

For practical purposes the charge is to be regulated to the objects of its use, but generally it is made as strong as the subject is able or disposed to bear. In applying the electricity, some attention must be given so as to compel the current to traverse the parts designed to be submitted to it. The surface should always be dry on such parts, lest the wet, being a better conductor, will convey it over, without its passing *through* the parts. The operator can, by a little attention, or modification of conduction, cause the electricity to pass through almost any particular part of the body, by interposing it between the poles, or coating of the jar or battery. An insulated chain or wire from the outer coating, may be held in contact, upon one point, on the part to be acted upon, and another, having connection with the inner coating, or the knob of the jar or jars, may be brought into contact with a point opposite the other, so as to force the electricity to pass as is desired. When a shock is not desired, the electricity is to be passed directly from the prime conductor of the machine, through the subject or any part, by a continuous current, without any connection with the jar, the electricity going off into the earth or other conducting media to find its equilibrium. A stronger silent current may be sustained, by conducting the charge from a jar or battery, by means of small conducting points, directed in proximity to the knob of a jar or battery. In this case the connection with the outer surface or coating, must be avoided, or the entire charge will pass in a shock.

Electric Aura.—When the electricity is conducted gradually from the prime conductor, by means of an insulated wire, and this is directed in proximity, toward any part of the sub-

ject, so as to let the fluid pass through an intermedium of air (somewhat as spoken of above), it is called the *electric aura*. If this is performed in the dark, the passage of the fluid from the point of the wire will be observed in a light cone-like figure, with the apex to the wire, and the base spreading broadly upon the surface in proximity.

Electric Sparks.—When a charge, from a jar or battery, is made to pass through an intermedium of air between its two surfaces, the electricity is visible in this intermedium, in the appearance of bluish sparks of fire. These sparks, indeed, are almost always visible in the discharge of the jar, for the electricity will pass, in bringing the points together, before the contact occurs. The distance through which the electricity thus passes, is entirely dependent upon the amount of the charge, and the character of the conductor and its connections. Among the clouds, the passage thus is many rods, and between the clouds and earth, it is sometimes still greater; this passage thus, from a body positively charged to a *negative*, constitutes lightning. But a charge, small enough to be borne safely, will not pass over more than half or three-fourths of an inch. By means of an insulated wire, continuous from the prime conductor of the machine, and terminating with a knob or director, a continuous stream of electricity may be passed, in successive sparks. The director can be moved about over the surface intended to be acted upon, and thus the objects of its use secured.

Electric Bath.—Static electricity may also be displayed upon the body, in what is called the *electric bath*, or *insulation*. In this process, the subject is to be put in an insulated state. The most common way is, to place him upon a stool or chair, with glass legs, and then putting him into connection with the prime conductor of the machine, by means of a wire. In this situation he becomes, like the prime conductor, a reservoir or treasury of electricity, and becomes charged so that his hair will become extended, and sparks may be drawn from him in any part.

If the position is reversed, and the body, in the insulated

state, is put in connection with the negatively-excited electric, instead of the positive, or prime conductor, nearly the same apparent phenomena occur. Sparks will also appear in bringing conducting objects into the range of electric attraction; but the sparks go in the opposite direction, *i. e.*, from the conductors to the insulated subject.

By continuing the action of the machine, this electric bath may be prolonged any desired length of time, according as the objects of its use may demand.

Static electricity is not now generally considered quite as efficient for medical purposes as the galvanic current; yet it is still considerably employed. In dry weather it is very convenient, but in wet or damp atmospheres it will not work well, and must give place to the other.

The effect of the electric shock is considered to be more mechanical than that of the galvanic current, and this is sometimes thought an additional advantage to that of the stimulation it affords. In the shock there is a violent contraction of all the muscles subjected to its influence, and this usually excites a reaction, sometimes shown in the circulation.

So far as yet discovered, the *silent conduction* of the current, as from the prime conductor, seems to be the feeblest of all the simple electric appliances. This is shown by the fact that no perceptible difference is experienced in the modification of the volume of the current, passing in any stream within the conducting power of the body; that is, a *large* stream and a *small* one make, severally, no difference in the sensation.

The electric bath is, perhaps, of but little more effect. But the electric shock and sparks have been regarded to have considerable remedial power. When these shocks and sparks are communicated by means of a vibrating machine, in which the succession of shocks is of a force equal to the power of endurance, we may have the best application of the static form of electricity. On the whole, however, there are as yet no proofs of the equality of this method of electric appliance with that of the galvanic form, yet to be described.

For therapeutic application of all the forms of electricity, the reader is referred to the end of this general article.

ELECTRICITY BY CHEMICAL ACTION.

Chemical action, as a means of evolving the electric phenomena is by far the most available for medical purposes. The difference between the static and dynamic forms of electricity, as proven in the *arts*, might be taken as something of a proximate indication of their comparative merits in their *medical* use. Still, perhaps, this is too strong a position to be taken, while we of the profession are compelled to own our *backwardness*, as compared with the advancement of artizans in the investigation of this agency in our respective pursuits.

It is unnecessary to give here any account of the construction of the galvanic battery, further than to state that it contemplates the evolution of a peculiar form of electricity arising from the oxydation of metals. The metal commonly employed as the subject of chemical action is zinc, and another metal, commonly copper, silver, or platina, is conjoined to it for the purpose of collecting and establishing a current of the evolved fluid, with a view to its uses.

Conducting wires interposed between the two metals, or the polar extremities of a battery of a series of plates or cylinders of these metals, serve for the *application* of the galvanic electricity, on the same general principles as noted for the static electricity. There is also a positive and a negative conducting wire, but the display of the passing current is somewhat different. There is less volume, less spark and less sensation, but, on the other hand, incomparably more stimulation and tendency to promote organic changes in the structures of the body. Perhaps the literal meaning of the respective terms, *static* and *dynamic* electricity, may as well here be taken to represent, for the present, the distinctive effects of the two forms, since it is not designed, at this part of the discussion, to go into details.

MAGNETIC INDUCTION.

Much noise was made a few years since, about the new method of developing electricity by magnetic induction. It was known that when a magnet is placed within a coil of wire,

isolated by being covered or wrapped with a silk thread, the wire assumes a polar character, the reverse of that of the magnet and that if the magnetic circuit, and that of the coil be closed at the same time, a current in the latter takes place in a direction the reverse of that of the former. The knowledge of this fact gave rise to the construction of machines on the magnetic principle, and a great variety have been produced.

Some are constructed with armatures, vibrating so as to produce a tremulous motion in the passage of the current, and thus, with powerful magnets, a very sensible impression is produced.

Experience, however, seems not to sustain the claims of the magnetic machines; at least it is by no means probable that they will supersede galvanism, in some of its forms of application.

MAGNETO-GALVANIC INDUCTION.

Machines are now so constructed as to conduct the electric current from the galvanic battery through an insulated coiled wire over a magnet, around a bundle of soft iron, and so regulated by an armature, with vibrating motion, as to produce the same tremulous and disagreeable sensation as that caused by the simple magneto-electric machine.

This apparatus has been much praised, and indeed it is a good and effective machinery, one that may long maintain a reputation. But so far as the author knows, there have as yet been no proofs that all the additional expense of this machine, and all the disagreeableness added by its vibrating action, has in any thing like a corresponding measure, advanced its utility over that of the simple galvanic battery. What is here said, however, is not intended as a disparagement to the galvano-magnetic machines, for they are indeed not only very pretty in their construction, but fine-acting, certain, and *useful;* at least *equal* to any other machines yet made.

The author understands that Profs. R. S. Newton and Saunders, of this city, have in course of construction a new galvanic battery, which will have advantages over others, in convenience in its use,—that it is constructed on principles

which will develop the true galvanic current from chemical action; but not having seen any of the machines, or witnessed their use, he can not speak much of it.

Galvanic Chains.—These consist of a series of small hexagonal plates of silver and zinc fastened to each other at one of their surfaces, that is, a silver and a zinc plate together, and then joined by wires so as to be flexible or to move freely. A chain thus of any desired length—the longer the better—may be constructed, which is to be worn next to the skin; galvanic power of considerable effect may thus be developed.

Galvanic Rings may be constructed on this same principle and worn around the limbs, under the cloths, without any inconvenience.

Therapeutic Effects and Application.—In some respects, all the different forms in which electricity may be developed and applied to the body, are alike. They are all stimulant to the general system, and tend to promote most, if not all the functions. There are many proofs that could be here detailed with satisfaction, in favor of this fact. But there are also some other proofs bearing upon the special uses of *certain forms* of electricity that are not to escape an early notice. Simple galvanism has been ever noted for the intensity and penetrating character of its stimulant power upon the animal economy: and there is but little question but that its range of influence far transcends that of both *static* and *magnetic* electricity. It has been found to promote the growth of *plants* in a most remarkable way. With *animals*, special tests have been made to discover its influence over the respective organs and their functions. Thus digestion, chylific and lymphatic absorption, circulation, secretion, and assimilation, among the functions of organic life, have all been found to be highly promoted by its influence. The voluntary muscles, and the nervous system in particular, always participate very largely in the reception of its stimulant impression.

In General Palsy.—Among the diseases in which galvanism has been found useful, *palsy*, perhaps, is one that may be first named. In its employment in paralytic affections, it requires application either to the paralyzed part, or upon the

tract of the nerves supplying it, or else to the nervous center.

It must be obvious, however, that when a paralytic affection is dependent upon some morbid growth, or some other physical obstruction in the course of the nerves leading to the palsied part, no immediate good can arise from the office of electricity.

It has been stated that when the lesion is dependent upon an inflammatory condition of the nervous center, or the trunk of the nerve, that not only must electricity here *fail*, but it will *aggravate* the difficulty by enhancing the inflammation. In so far as the failure of an effort for an immediate good effect from galvanism, in this case, is concerned, the experience of the author well attests the fact, but he has not observed any aggravation of the symptoms. Even in the delirium tremens, when the limbs are paralyzed by the effects of liquor upon the brain and nerves, the power of electricity for good has often been apparent.

There are several forms of palsy, i. e., palsy arising from a variety of different causes, as, 1, palsy from cerebral extravasation of blood; 2, traumatic palsy; 3, rheumatic palsy; 4, palsy from accidental mechanical pressure; 5, lead palsy (P. Metallica). All these demand the power of this remedy, perhaps less from the real prospects of success, than from the fact that they are so generally beyond the reach of other agents.

In Hemiplegia.—In this form of palsy, and in *paraplegia*, the operator must observe, that he makes the application of his curative agent to the source of the lesion; for unless this is done, no beneficial effect can be expected. Galvanism has maintained a good reputation in this application, in the hands of discriminating physicians, who knew how to employ it.

In Paralysis Agitans.—In the *shaking palsy* of aged persons, it would seem presumptuous to attempt to arrest the natural "*wear and tear*" of time; but even here, in a few instances, galvanism has done a good office. In its application here, it is well to have the patient sit with his feet in water, which is put in connection with one of the poles of the battery, and

then changing about the connection of the other wire from hand to hand, to the neck, head, etc, so as to make the fluid traverse the body in as many directions as possible. The skin also must be kept dry.

In Paralysis of the bladder.—In cases of this kind, where there is *incontinence of urine*, or *disurea*, galvanism may often be successfully invoked. It is not always sufficient, however, to attempt to force the current through the bladder by external applications. One of the conducting wires, insulated in a proper way for the purpose—that is, having the wire insulated in its entire course, except an inch of its extremity where a small enlargement may give off or receive the current to or from the bladder, as the relative position of the poles may be. The wire may be passed through a gum elastic catheter. The opposite conductor, having a clean moistened plate terminus, can be shifted about the hypogastric and lumbar regions, but particularly the former, since the proximity of the bladder is more direct there.

In Impotency.—If the current is applied skillfully to the organs externally, and also internally by the passage of one of the conductors into the urethra, or the rectum, to the neighborhood of the vesiculæ seminales, much benefit may sometimes be thus obtained.

In Paralysis of the Rectum and Sphincter Ani.—In applying the electric current through the parts here, a suitable sized bulb terminus of a director is to be introduced and shifted about as the judgment of the operator may suggest, while the opposite conductor may have a plate terminus, and be shifted about the external neigboring parts. The process is often successful.

Prolapsus ani, and such forms of constipation as depend on an insensible state of the rectum, may thus be relieved.

In Amaurosis.—When dimness of vision is dependent upon paralysis of the optic nerve, the battery has proved its greatest and almost only remedy.

Old-school authorities are very discriminating, in this case, in regard to its diagnosis, so as to avoid the use of galvanism where there is any sign of, or tendency to inflammation. But

while it would be folly to apply this means in well-marked or high states of inflammation of any parts of the eye, still it would seem that prejudice, rather than observation, must have done its part in the indorsement of this sentiment, in the use of electricity.

The principle bearing in point here, has been discussed already where stimulants in general were treated of—to which remarks the reader is referred for the philosophy or rationale of general incitant action.

In attempting to relieve amaurosis, by means of the galvanic battery, no vibrating machine should be employed, as such will prove very disagreeable, and will not offer any additional benefit. One conductor with a plate terminus, moistened, may be applied to the back of the neck; and the other, with a small bulb terminus, may be passed over and about the closed eyelids, so as to bring the current over the track of the optic nerve as much as possible. Sometimes, by the passage of the director over the face upon the ramifications of the facial branch of the fifth pair, the use of this means may be further promoted.

In Deafness.—In paralysis of the auditory nerve, we may sometimes avail ourselves of the galvanic stimulus with success. Its external application may not, however, promise much, in most cases. It then becomes desirable to be more special and direct, in the use of our agent. The subject must lie on his side, when the meatus auditorius is to be half-filled with water. One of the conductors is then to be suspended in this water, without coming in contact with the parts in the bare part of the wire or its terminus. The other wire may now, either with a moistened sponge or bulb terminus, be applied to the nape of the neck and around under the occiput toward the opposite ear.

The current should be let on gradually, and the entire process conducted with care and discretion.

In Asphyxia.—In suspended animation, arising from strangulation, drowning, noxious gasses, etc., the battery has been in many instances, found of great service. The current in these

cases, is to be forced through the nervous centers, as much as may be.

As the function of respiration is of the most importance in our first attempt at resuscitation, it is advisable to direct the magnetic current into the phrenic nerve, so as to excite the action of the diaphragm. A vigorous impression upon this nerve where it passes the anterior scalenus muscle, so conducted as to force the current into the ramifications of the phrenic in the diaphragm, would in its theoretical aspect at least, be suggestive of good; and it is gratifying to know also, that experience has proven the plan practically successful. M. Duchenne sustains this position, and authorizes its confident practice.

To secure a practical proximity to the phrenic nerve at the point above indicated, may be a little difficult to an operator who is not familiar with such manipulations. But a pressure with two fingers placed upon the outer border of the clavicular fasciculus of the sterno-mastoid muscle, directed inward, and the fingers then spread so as to admit the passage of the director, an access may be had to the inner surface of the scalenus without the interference of the sterno-mastoid or the platisma-myoid muscles. From this point the phrenic nerve may thus be reached with the electric current. The other wire is then to be placed in a corresponding position on the opposite side, that the diaphragm may thus be brought into action through this nerve.

It is said that in this application of the magnetic current, the lower ribs will expand, the abdominal walls raise, and the air rush with sound into the lungs as soon as the current is established. The current is broken in a second or two, to admit the escape of the air, while the latter is promoted by an assistant, in mechanical pressure upon the chest and abdomen. When the expiration is completed—that is, in a few seconds—the current is again closed, that the lungs may fill with air as before: and the process is thus repeated until natural respiration is reëstablished.

In Glandular Swellings. — Perhaps no disease will so

clearly show the available stimulant action of electricity or galvanism, as the indolent swellings of the glands. Where the medical resources are so often at fault, and where we find a remedy affording only middling success we hail it with pleasure. The effect of the silent current from the plain battery, is in this case equal to any reasonable expectation. Enlargements of the parotid, the submaxillaries, and in several cases the thyroid (*Bronchocele*) have yielded to this agency. The author has a knowledge of a case in a physician, who had a very great enlargement of the thyroid gland that came on in advanced life, and had been treated and prescribed for by many of his profession — old-school — without any apparent effect, as the tumor continued to enlarge rapidly, until he gave galvanism a thorough trial, and was rewarded happily for his perseverance in search of an effectual remedy; the tumor was entirely removed by absorption excited by the use of the battery. This disease is exceedingly rare in males, still more so as occurring first in advanced age, and perhaps correspondingly difficult of successful management.

In Indurations.—Those indolent swellings of parts that have been the subjects of chronic inflammations, following injuries, more particularly of the articulations, and which are often attended with anchylosis, have ever been considered to be among the most difficult cases to be remedied. These are among the cases that fall into the electric treatment, and it is gratifying to know that they are not unfrequently much benefited by this appliance.

In Chronic Local Diseases Generally.—There are many other chronic local diseases, which are dependent for their persistence at least, upon a want of proper vital stimulus, and which are likely, many times, to be successfully treated with the galvanic battery. Among these the following may be enumerated: Rheumatism, Gout, Sciatica, Neuralgia, Angina pectoris, Atrophy, Cutaneous Anæsthesia, Dyspepsia, Torpor of the Liver, Constipation, Amenorrhœa, Tubercles, etc.

Extraction of Metals.—The polarizing power of the galvanic current has been long known, and the decomposition of salts has been practiced by all chemists, who have ever

expected as much to find the acid and its basic companion in opposite polar positions as they have looked for the decomposition of the salt. It would seem strange, therefore, that the law of induction has not, ere this, led to many more valuable therapeutic appliances than appears; or that the discovery of the important office of galvanism, in extracting, by polar or electric affinity, foreign metallic substances from the human body, should be made by accident. Yet this appears to be the fact, at least so far as the profession is concerned. In April, 1852, M. Vergnés, who being engaged in the business of galvanic silvering and gilding, had received into his body a sufficient quantity of these metals to cause obstinate ulceration on his hands, which after an unsuccessful resort to the usual means of relief, was cured by the exposure of his hands to an electro-chemical bath, positively excited. A metallic plate, in connection with the negative pole, became covered in fifteen minutes, with a coating of gold and silver, which was extracted from his flesh. He was entirely relieved by a few applications of the galvanic bath. This case, and others equally successful, have been reported to the Academy, at Paris, by M. Dumas.

In our own city, Profs. R. S. Newton and Saunders reported to the E. Nat. Med. Association, in June, 1857, various successful experiments in the extraction of mercury from the bodies of individuals who had suffered from its effects before. If the author remembers correctly, their method was to place the subject into a tub of acidulated water, with his feet resting upon a large plate of bright copper attached to the negative pole of the battery, while he held the other, or positive connection in his hands.

The method pursued, according to a memoir presented by MM. Vergnés and A. Poey, to the French Academy of Sciences, is to place the subject, up to his neck, in an isolated iron bathing tub, supplied with water slightly acidulated with nitric, or muriatic acid, for the extraction of mercury, silver, and gold, or sulphuric acid for that of lead. The individual rests in the tub in a sitting posture, on a bench, with his legs extended horizontally on his seat. The tub is connected with the negative

pole of a galvanic battery, and the subject has hence only to hold the positive conductor in the hand; though to prevent the hand from being burnt by the powerful current of the fluid, the conductor is to have an enlarged metallic terminus, covered with linen cloth.

The metals extracted go toward the negative pole, and adhere to the surface of the iron tub, in specks or patches of variable size, according to the extent to which the subject has been saturated, or the force of the battery.

It is to be hoped that future trials of this agency, in ridding the body of those foreign and uncongenial elements, may continue as flattering.

HEAT AS A STIMULANT.

In order that the application of heat to the body shall prove stimulant, it must be of higher degree than that of the latter, otherwise an abstraction, instead of an addition will occur. This arises from the free or unfixed nature of the matter of heat.

It may be well here to define also the meaning of the phrase "*taking cold.*" The philosophical meaning of this is *losing heat*, and there is no doubt but that a change in the temperature of the body does take place, when we *take cold*, as it is called, but the physical condition of the body in this state involves much more; and we find, that an elevation simply of the temperature of the body, does not obviate the symptoms, as would be expected, were the entire difficulty in the mere change of temperature.

The state of the secretions, and particularly those of the air-passages, and the skin, is most involved when persons labor under the "*effects of colds.*" These secretions are obstructed and thickened, or rather the perspiration is checked by a constricted state of the skin, and in consequence thereof the mucous membranes become oppressed. They evince a state of inflammation and congestion, as is known by the heat, fulness and oppression of the nares and bronchia.

The impression of heat upon the nervous system is specific and distinct from the common phenomena of heat; for in

physics generally, heat evinces its motive power by its property of effecting expansion in the position of particles. But the nerves are impressed by heat in their own property of sensation, which relates directly to the excitability. These latter endowments have in their office, the control of the circulation, secretion, excretion, and indeed all the physiological functions, and the incitant power of heat is thus coëxtensive.

Heat applied to a part will give rise, first, to sensation, which is dependent upon its relative degree of development. Thus when the surface of the body is cold, or below its common temperature, it requires a lower degree of heat for the same measure of sensation; and as to the *quality* of the sensation, it also depends upon the relative state of bodily temperature: for so it follows, that a given and moderate degree of heat, say 95°, will be agreeable and warm to the sense of touch when the surface is chilled, or cold; while, when applied in a heated, or feverish state of the part, the sensation will also be agreeable, but will be cool and refreshing.

Application of Heat.—Heat may be therapeutically applied in various ways: 1, *negatively*, as by the prevention of the radiation of the heat of the body itself; 2, by the application of *dry heat by contact;* 3, by the application of *moist heat.*

1. *Negative application of Heat.*—This implies the confinement of the heat of the body. This is effected by the interposition of substances of inferior conducting power, as clothing, or the covering of beds. Furs, feathers or down, wool, and silk, are such: they rate in their conducting power, in the inverse order as here given. Cotton and linen are better conductors than the above; and of these the latter superior to the former. Linen being thus the most ready conductor of all the materials commonly worn in clothing, it is hence the poorest to protect against the radiation of the heat of the body. The prevention of radiation is equivalent to the artificial supply.

2. *Supply of dry heat.*—The methods of supplying dry heat to the body are various, besides dry heated air—as by means of a stove or open fire in a close room; by the application of heated substances, as jugs or bottles containing hot fluids or

sand; or by heated rocks or other similar materials placed in contact with the body. But the most natural means, when the state of the person admits it, is by insolation, or exposure to the hot rays of the sun.

3. *Moist heat.*—This is usually applied to the body either in form of hot vapor or hot water, in what are called *water* or *vapor baths.*

Moist heat is the most *effectual* method of elevating the temperature of the body, although the natural provisions afford the heat mostly in a dry state, *i. e.*, the dry air; yet when we wish to make a decided impression in the application of heat from without, we commonly employ some of the hot baths. It is known that moisture and heat conjointly have the advantage of two principles of action. Water is a very superior conductor of heat, and will eminently facilitate its passage into the body when this is of a lower temperature. Water or moisture is also relaxant, and will tend to obviate the tension of the skin. Vapor shares in this power, and when heat is thus applied—that is, by means of water or vapor—the application can be made more forcibly with the same impunity. While dry heat may subject the softer or less-resisting tissues—as the brain and lungs—to a disproportionate pressure, moist heat will be less apt to do it, since the water or vapor proves so prominently relaxant to the outer surface, particularly the skin, and in this way tends to bring the blood to the exterior parts.

As to the mode of applying moist heat, not much will here be said. The bathing-tub, in general, is very much preferable to the hot sponging, since the evaporation that always goes on in the latter will very much modify the results.

Wet sheets, when applied hot next to the body — the patient being in bed, and then well enveloped with other covers, dry—will in a short time, secure a good office in the supply of moist heat. This is indeed the most practicable as well as the easiest means for feeble persons, who can not well endure the fatigue of a tub-bath.

The methods for applying the vapor-bath are equally well known, and the present remarks need not be further extended.

On page 346, et. seq., the vapor-bath and some methods for its employment, are spoken of.

Use and Therapeutic Effects.—The use of heat to the body, when the latter suffers from a low temperature, is too obvious to require discussion here, in so far as the general phenomena of life and health are concerned. But the more special facts may be of some interest to be dwelt upon in a brief way.

It is obvious, from the nature of the organic elements, that a given temperature of the body is necessary to life. Many of these are of a character that admits of life only at a certain range of temperature. Such are *albumen*, *gelatin*, etc., which thicken when they are brought to a reduced temperature, and will be absolutely incapable of their uses in the economy. Mobility and circulation, in a common way, afford the clearest indices to the state of the temperature.

Sensibility in the structures, or that endowment of the parts by which they have their impressibility, and by which they develop their physiological offices, is also very much dependent upon the temperature.

Digestion, assimilation, nutrition, secretion, excretion, and, indeed, all the functions of organic life are dependent upon the state of the temperature. Hence the wonderful provisions of Nature for the maintenance of the standard animal heat, which, in man and all the superior animals, is 98°. Among the conditions of the body, or the states of disease, which require the application of heat, or in which its artificial supply is particularly useful, are the following: 1, In the *cold stages of fever*; 2, *Retrocession of cutaneous eruptions*; 3, *Spasms or collapse*; 4, *Internal inflammation*; 5, *Obstructed perspiration*; 6, *Internal congestions*, etc.

Class II.---TONICS.

Tonics are medical substances, which have the power to exalt the tone of the organs of the body, or in other words, which give strength and vigor to the system.

A certain state of permanent tension of the fibers of the

body is necessary to the physiological state. Sir Gilbert Blane observes, that no muscle, whether voluntary or involuntary, can act, unless its fibers are previously in such a state, that if divided, they would shrink by their own resiliency, leaving an interval between the cut extremities. This will apply equally to all parts possessing a fibrous structure. The arteries, veins, lacteals, and lymphatics, require a certain tonicity, to enable them to "grasp" and propel the fluids they contain. A want of this tonic power, is equivalent to *debility* or a state of disease.

Now, the doctrine which contemplates disease to be dependent upon a want of proper vital resistance to morbific influences, must most obviously place tonics among the most important medical agents that we possess.

Modus Operandi.—Various theories have been proposed, in the way of explaining the operation of tonics. It has been contended that these substances exert a mechanical influence over the matter of which the muscular fiber is composed. But this would not explain the operation of those tonics which are not necessarily carried into the circulation.

It has also been supposed that tonics produce their legitimate effects by their action upon the stomach, in promoting digestion. But, although this principle, without any doubt, obtains to a very considerable extent, yet it is difficult to account in this way, for the comparatively quick effects that some tonics produce. Liebig was of opinion, that vegetable tonics were peculiar nitrogenized substances, which effect their legitimate ends by the supply of special nutriment to the brain and nervous tissue, and thus qualify the tonic principle in this case to be to the nerves especially what the chyle is to the body generally. See Animal Chem., p. 173, et seq. 1842.

With regard to the idea that the power of tonics is proportioned to the bitterness of the agents employed, it may be said that it does not hold good, for we find that although most of our vegetable bitters are more or less tonic, yet there are some powerful tonics that are not in the least bitter; and, on the

other hand, there are some substances intolerably bitter, that are almost entirely void of tonic virtues.

It is unfortunate for science, that men in their investigations should be prone to be engrossed with isolated facts, or to be satisfied with discoveries already made, as much as indeed they are. A truth may be found,—*nay*, an entire system of *new truths!* they may be extremely entertaining, and yet afford no argument that there may not be many others, *even but one single step in advance*, which may be still infinitely more important and interesting. Had the ardor for exploring been quenched, when Columbus first discovered the West Indies, or even when the eastern coast of the Continent had been explored, our beautiful *West* would still be the theater of the wild sports of the Indian and the rude objects of his chase. Had investigation ceased, when the notions of positive and negative electric phenomena were among the visionary speculations of Franklin, we should have no use for telegraphic wires. If inquiry had stopped on the simple discovery of the motive power of caloric, there would have been no use for steam-engines. If the discovery that has secured immortality to Harvey, had not been improved upon, it would have been of no practical advantage to the medical profession; and finally, if the apprehension of the vital principle, or *vis conservatrix*, by Hippocrates, had not led to its further investigation, or had the more modern investigations of nervous phenomena, forever ceased with the improvements of Van Helmont, the modus operandi of tonics would never be fully understood.

We find that the vital force, as well as the tension or tonicity of the system may be very much modified by direct action upon them,—that they may be entirely destroyed as in poisoning, by hydrocyanic acid, without leaving the least traces of organic disturbance. In this case, the extinction of life is no more remarkable than the total loss of muscular tension, and which, indeed, may perhaps justly be regarded as being identical with the cause of death from the effect of this singular poison.

Now may not these vital endowments here contemplated be

influenced on the opposite scale, without necessarily involving new principles of action? The answer is apparent, and it may be illustrated in the use of *tonics*. These agents produce their effects upon the vital principles, mostly through the nervous system. They exalt the vital integrity of the living fiber, and thus the normal tension of the system is maintained. They are thus among the truest examples of vito-dynamical agent.

That this is the sole principle of the action of tonics is not for a moment supposed, it is only contended that it is the chief one, and that this may *obtain* independently of any other. That tonics effect much indirectly, by promoting digestion, is very readily admitted; and this principle may often be successfully invoked in the explanation of various facts that mark the gradual increase of strength that is so regularly proportioned to the state of the functions of assimilation.

The gradual and more permanently *stimulating* virtues of tonics, as explained by Drs. Murray, Paris, and others, are not among the least efficient that are possessed by this class of remedies.

APPLICATION.—It has been very correctly remarked that a certain state of tension of the animal fiber, is necessary to the physiological state. According to some, this fact might be still more strongly expressed. Dr. Paris states, "It has been justly admitted, that a state of permanent tension in the fibers of the body is necessary for the *existence of life*, and that any undue departure from such a condition is followed by debility."

These views evidently place tonics in a different light from that in which they have been generally considered. Instead of being regarded as mere *secondary restoratives*, applicable only when the force of disease is broken up by other means, they should be considered rather as among the most efficient means we have to *subvert* disease in its first as well as its most *violent* stages. It is true they are not indicated, as such, in *every* case, nor are *other* agents! But that the indications for their use are as frequent and as well-marked throughout the entire treatment of disease, as are those for the employment of either

of the *evacuents*, or for the *special stimulants*, is very certain, and is a conclusion which every attentive therapeutist must arrive at, who devotes himself to a careful and philosophical investigation of the subject.

If disease is regarded as absolutely the result of debility, it is folly to attempt a cure without obviating this, its direct or indirect *cause*. It is admitted that there are many mechanical or chemical influences which may obtain either as primary or collateral causes, or as effects which demand early, and, sometimes paramount attention. But still it is a fact that, until this debility is obviated, convalescence can not take place.

The position here taken in reference to the application of tonics, it is thought, is not only in accordance with sound theory, as already hinted, but is most strongly corroborated by numerous facts that are furnished by practical observation.

The entire course pursued by the old-school physicians, contributes to illustrate what has just been stated. Their course in febrile disease, is first to *deplete* and *reduce* the system, then to apply tonics. The principles here involved are simply these: first, by the use of depletives they diminish febrile action, *not by exalting vital resistance against it*, but by obviating the mechanical and chemical conditions necessary to its existence—they remove combustible matter by blood-letting and the use of purges, and modify the access of oxygen by diminishing the excitement of the vascular system.* Secondly, when they have thus obviated the febrile movement, they apply tonics and stimulants to recover the tone of the organs and the normal vital force of the system. Now the latter process effects the cure. The first simply obviates, *for the time being*, some of the mechanical and chemical conditions that supervene on the occurrence of debility, or that follow as consequences of external influences which the normal living powers are incapable of resisting, and which circumstance is equivalent to a diminution of the vital force. If the tonics were *not* given, the fever would return; sometimes it sets in again with equal, if not

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* It is well known that the activity of respiration always corresponds with that of the circulation.

redoubled violence, the cause not being yet removed. This fact is clearly stated by Dunglison, and admitted by all. "Antiphlogistics simply," says the author just named, "have been found to have no effect in breaking in upon them [intermittents]. However useful they may have proved in lessening the duration of one of the stages of the paroxysm, they do not prevent the occurrence of the attack."*

Were the tonics given in the onset, in a proper condition of the system, and the vital power thus exalted above the force of the *morbific influence*, the same effect might have been accomplished at once.

Numerous instances of the casual use of tonics in the active stage of fever, have occurred in the practice of different old-school physicians, and their effects have generally been so contrary to what their principles would lead them to expect, that they have been astonished beyond measure. We have many reports of this kind in the various medical journals of our day. The London Fever Hospital has reported much in favor of tonics in every stage of fever.

Although *tonics* are *stimulant* in their action, and their administration, hence, is somewhat governed by the mechanical condition of the organs, yet there is a marked difference between the stimulant effects of tonics and those of the *excitants* proper. The stimulant power of tonics is very gradual in its inception, and is not so likely to favor congestion, or to do mischief from its tendency to excite the circulation. The author has been particular in investigating this subject, as it has long appeared to him that the prejudice against tonics in fever has arisen as a simple abstract deduction or speculation from the doctrine that fever and inflammation, in essence, are but the exalted action of the vital force. This doctrine being *false*, he concluded that all the indications founded upon such pathological basis, must also be incorrect, and by consequence, others that stand in opposition might be at least *approximations* to the true indications of cure. Theory alone, however, could

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* Thera. and Mat. Med., vol. II. p. 22.

not be trusted, especially while its delusions were so apparent. *Observation* corroborative of philosophical deductions, could alone suffice in a matter so important. He found that so far as tonics served to supply combustible matter, or to promote vascular action, they did, indeed, contribute to the febrile movement, and that when given in very large quantities while the skin is very close and dry, and there is already a tendency to congestion, they will augment the latter in their *primary* impression; as the immediate effect of a very large dose must, of necessity, give rise to some additional excitement to the circulation, which can not as yet be counteracted by the aid that the medicine is calculated to afford the vital energies, since this latter is accomplished more slowly. But how insignificant is this, their effect, when compared to their ultimate results, or the absolute aid they afford to the vital force.

In all that has here been discussed, the principles are the same as those that relate to the physiological effects and therapeutic power of stimulants *proper*, except that tonics are much less exciting in their influence over the circulation, and at the same time, eminently more permanent in the aid they afford the *vis conservatrix*. They may, therefore, be given in conditions of febrile excitement that would not admit of the use of the former.

The success that follows the exhibition of cinchona and its alkaloids in intermittents, is not only illustrative of this fact, but it goes far to prove the real *adaptation* of tonics to *febrile* disease.

It is unnecessary to descend to particulars here in reference to the application of these agents. Having discussed the *general principles*, it is thought that the intelligent reader will be fully able, with what he will find written in the contemplation of the several orders and different agents contained in this class, to form just ideas, not only in reference to the importance of tonics, but also of their general and special application.

It may not be improper, however, to remark here, that tonics are indicated in all cases of disease where the natural

defenses are insufficient to repel the invasion, but especially when there is much debility or want of action, as in typhus, the secondary stage of remittents, jail fever, etc.

Our list of tonics is comprised mostly of vegetable bitters. It seems that the bitter properties and tonic virtues of plants are very intimately associated together. But, as has already been hinted, the tonic power is not absolutely identical with the bitter principle; for although the best tonics are mostly intensely bitter, yet instances are not wanting to show that the bitterness of substances is no sure indication of the character of their tonic virtues. Aloes and opium, for instance, are both intensely bitter, but are by no means proportionately tonic in their effects. On the other hand, some other articles are powerfully tonic, and yet possess no bitterness at all; such is ferrium, etc.

The virtues of vegetable tonic remedies are readily taken up by water, as they reside in the extractive principles of plants. They are also imparted to alcohol, acetic acid, and ether.

It is important to bear in mind, that when the use of tonics requires to be long continued, as in some chronic complaints, it is necessary to change the agents employed, so as not to use the same article too long at a time. The system becomes accustomed to their influence, so that after a week or two their power will be apparently exhausted, while other articles of the same order will have their full power. After any article is discontinued for a time corresponding to that in which it had exhausted its power, and is then again resumed, it will act as a new agent.

Order I.---ANTI-INTERMITTENT TONICS.

Experience has long since proven a marked dissimilarity in the quality and power of the impression that the different articles of this class are capable of producing upon the system. The most remarkable of these, is the peculiar anti-intermittent power that characterizes a few of our tonics, and which is made the basis of the present order.

The principle upon which this singular impression is pro-

duced, and by which is broken up the chain of morbid association, and thus every variety of periodic disease at once arrested, is something more than can justly be attributed to tonics in general. It is supposed that, in the intervals between the paroxysms of these complaints, there is an unobservable train of morbid associations going on within the "recesses" of the nervous system; and that, in like manner, the remedies here to be considered, may display their influences upon these tissues. One thing is very probable, at least: the periodicity of action that characterizes the former, is very intimately associated with the *condition* of the nervous system, for besides the fact that many of the physiological movements are essentially *periodic*, it must follow also as a consequence, that the resistance opposed by nature will be thus periodically exerted likewise. It is *further* evident, that the functions of the nerves are much implicated in the morbid phenomenon, from the fact that by a sudden excitement of them the character of the symptoms may be materially modified, and, indeed, a paroxysm may thus sometimes be completely broken up. We have instances of this kind in the effects of *anger*, sudden *joy*, or, indeed, any other passion suddenly excited.

The articles of this order seem to exert a peculiar tonic power over the nerves, by which they effect their specific influence. This power is by no means dependent upon the bitterness of the agents employed, as we find other substances which possess no bitterness whatever, are nevertheless actively anti-intermittent. Still, however, we find that bitter and astringent vegetable substances abound *most* with these virtues. It is often the case, when the ordinary agents of this order, as quinine, etc., fail to produce their usual effects, that the latter are fully developed on combining with them an active astringent principle; and hence it has been a common practice with some physicians, to combine their bitter tonics with active astringent tonics, when they were exhibiting them against ague.

It may be proper to remark here, that the articles of this order are not confined in their application merely to intermittent fever, but are almost equally serviceable in all forms of

disease which are characterized by periodicity of action, or which come on in regular paroxysms! Thus, antiperiodics have been successfully exhibited against some cases of *remittent fever*, *epilepsy*, *chorea*, *hemicrania*, *periodic pains of the eyes*, *face*, and other parts of the body, as *neuralgia*, etc. Still the nearer any form of disease approaches to the character of a regular *periodic*, the more certain will be this order of tonics to effect their cure. Moreover, in addition to this extension of their application, we find that they are fully equal to the common tonics in all other cases in which this class of remedies is indicated.

CINCHONA.—The Bark.

Synonyms.—China, *Ital.*; Quina, *Span.*; China, Peruvianische Rinde, *Ger.*; Quinquina, *Fr.*; Peruvian Bark, *Eng.*

History.—The exact time when the virtues of Cinchona were discovered, is unknown. Various fabulous accounts, however, are on record concerning the circumstances which lead to a knowledge of them. It is stated that, in the year 1500, an Indian impelled by his thirst, during a paroxysm of an intermittent, repaired to a pool near a town in Peru, and which was surrounded by a grove of the Cinchona trees (many of which had been torn up by an earthquake, and fallen into the water, rendering it bitter), drank freely of the bitter water, and was cured of his malady. Others, learning the fact, tried the experiment, and with like results, until the matter was investigated, when it was found that the water owed its virtues to the trees, and finally, that the bark was the true source. Geoffroy (Mat. Med. ii. 181) asserts that the Indians had a knowledge of the virtues of the bark, long before the arrival of Columbus on this continent; and remarks that they, from their hatred against the Spaniards, kept it a secret for many years, until, finally, an Indian, grateful for some favors received from the Governor of Loxa, revealed to him the secret.* Humboldt, however, in opposition to this opinion, asserts that

* A fable was popular many years since, that the virtues of Cinchona were discovered, by observing lions eat the bark when attacked with intermittent fever.

in Loxa, and other parts far around, he found that the natives ranked Cinchona among poisons, and had no knowledge of its anti-intermittent power. Still he admits, that in Malacatis, "where many bark-peelers live," they begin to esteem its virtues.

He speaks further of a tradition, current in Loxa, that the Jesuits, having accidentally discovered the bitterness of the bark, tried an infusion of it in tertian ague, and thus discovered its specific effects.

In 1737, La Condamine, a French Academician, who, with others of his fellows, was sent to South America to make some geometrical observations in reference to the figure of the earth, on his journey to Lima, through the province of Loxa, had an opportunity of examining the tree. On his return he published a description of it in the Memoirs of the Academy. Linnæus, soon after, gave it the name of Cinchona, in honor of the Countess of Cinchon, wife of the Viceroy of Peru, who brought some of the bark to Europe, on her return from South America, in 1639. It is said that this lady gained her knowledge of the virtues of the bark from a Spanish soldier, who, on being cured of an intermittent by it, recommended it to the Countess, who was also cured of an attack by its use. On her recovery she distributed a large quantity of the bark among the Jesuits, with whom it soon acquired popularity. The Jesuits carried it to Rome and distributed it to their brethren. Hence the name *Jesuit's-Bark*, and *Cortex Cardinalis de Lugo*, from Father Lugo, who was the principal man in taking it to Rome, and who was at very great expense and trouble in the enterprise. But the faithfulness of this account, few are now willing to vouch for, although it is contended that the general knowledge of the medicine was derived from Rome.

BOTANY.—*Sex. Syst.*—Pentandria Monogynia. *Nat. Ord.*—Cinconaceæ.

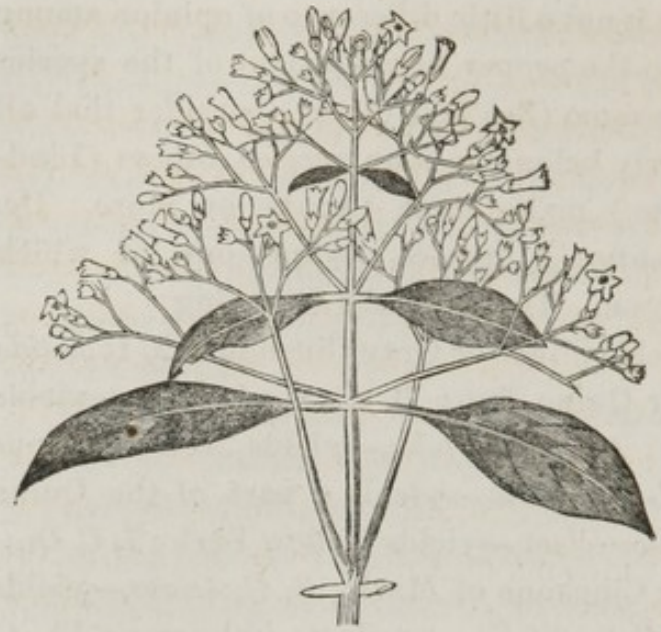
Gen. Char. CINCHONA.—*Calyx* five-toothed. *Corolla* hypocrateriform, with a five-parted limb, valvate in æstivation. *Anthers* linear, inserted within the tube, not projecting, unless in a very slight degree. *Capsules* splitting through dissepiment into cocci, open at the commissure, and crowned by the calyx. *Seeds* girted by a membranous lacerated wing.—*Lindley.*

Spec. Char. There is not a little difference of opinion among botanists in regard to the proper arrangement of the species of this genus. While some (Zea and others) consider that all the Cinchonas properly belong to four species, others (Lindley, Von Martius, etc.) make some twenty or more. Dr. Lindley reports twenty-six species, twenty-one of which appear to be well known. These are the following:

1, *C. Micrantha*—yields Silver or Gray Cinchona; 2, *C. Nitida*—yields Cascarillo or Quino fino; 3, *C. Condaminea*,—yields Crown or Loxa Bark; 4, *C. Lancifolia*,—yields New Spurious Yellow Bark; 5, *C. Lucumæfolia*,—yields a part of the Quina fina de Loxa; 6, *C. Lanceolata*,—yields Yellow Bark; 7, *C. Ovalifolia*,—yields White Cinchona of Mutis; 8, *C. Ovata*,—yields Ash Cinchona; 9, *C. Rotundifolia*,—products unknown; 10, *C. Cordifolia*,—yields Hard Carthagena Bark; 11, *C. Pubescens*,—yields Huamalies Bark; 12, *C. Hirsuta*,—yields a kind of Cascarilla fina; 13, *C. Glandulifera*.—yields Cascarilla negrilla; 14, *C. Villosa*,—bark unknown; 15, *C. Oblongifolia*,—bark unknown; 16, *C. Acutifolia*,—yields poor bark; 17, *C. Magnifolia*,—yields Red Bark; 18, *C. Caduciflora*,—bark not used; 19, *C. Stenocarpa*,—bark unknown; 20, *C. Macrocarpa*,—bark unknown; 21, *C. Cava*,—bark unknown, species imperfectly known; 22, *C. Dichotoma*,—said to yield Quinas finas; 23, *C. Macrocalyx*; 24, *C. Crassifolia*; 25, *C. Pelalba*; and, 26, *C. Muzonensis*.

The various species of this genus are generally described as being trees or shrubs, growing from ten to forty, or perhaps fifty feet high, with a trunk from a few inches to some three or four feet in diameter. Some of the species furnish very beautiful forest trees, being well proportioned and handsome in appearance. The leaves are opposite, upon short petioles, with flat margins, and have ovate or oblong, foliaceous, free, deciduous stipules. The flowers are terminal, in corymbose panicles, and of a white, pale red, or purplish-rose color.

The following cut represents a panicle or cluster of flowers with the bracts or flower-leaves, of the species called by Humboldt. *C. Condaminea*. This is the species that yields the Crown or Loxa Bark, the finest or genuine Yellow Bark. It



CINCHONA CONDAMINEA.

rows near Loxa, in the Cajanuma-Urituccinga and other neighboring mountains in Peru. It is said that it always grows on micaceous schist, in high situations, sometimes 7500 feet, and never less than 5700, above the level of the ocean.

HABITATION.—The Cinchonas are found in various parts of South America. Their range extends, according to Pereira, from 11° N. lat. to 20° S. lat., being more than thirty degrees extent in latitude. They are confined chiefly to mountainous situations, being found to range at an elevation of from 1200 to 10,000 feet above the level of the sea.

The bark is peeled by the Indians in May, either by cutting the trees or peeling them as they stand. As soon as it is taken from the tree, it is carried to open places and quickly dried, as it otherwise deteriorates. As soon as dried, it is carried to the coasts and packed in chests or hides, in packages usually containing only one kind of bark.

COMMERCE.—Loxa and the neighboring provinces, for more than a century after the use of the bark, was almost its exclusive source. In the first part of the last century, it began to be exported from Payta to Spain, and from thence to other parts of Europe; and from the middle to the latter part of the century, many other ports shared in the trade. The tree was found to grow plentifully in New Granada, and the bark was shipped from the ports of Carthagena and Santa Martha. Subsequently, Cinchona was discovered in the more southern portion of the continent, and it began to be exported from Buenos Ayres, as well as the various ports on the west or Pacific side. It is now shipped from numerous ports on the Pacific coasts,

the principal of which, however, are Payta, Lima, Callao. Arica and Valparaiso.

The amount of this bark annually exported from the various ports of South America, is truly enormous; and when it is considered that the *Cascarilloes*, or bark-peelers, give but little attention to the probable destiny of the production, and that the most wasteful practices are followed, when they are likely to save present inconvenience or labor, or promote the profitableness of their business, it is not astonishing that the government of Bolivia should put restrictions on the exportation of the drug, from an apprehension that the trees yielding it might become extinct.* Many who are acquainted with the commerce of this drug, and the circumstances of its collection, are of opinion, that unless the government will provide for the preservation of the trees, they will all be destroyed before the wood-lands will be taken up and become personal property. An English author states that some dealers in Europe are now laying up large stocks of the drug on the speculation that the forests containing the Yellow or Calisaya bark, are already about exhausted of this tree.

Description.—Cinchona, like other barks, consists of three different parts, or structures,—the *epidermis*,† or most external portion, *rete mucosum*, or cellular layer, *cutis vera*, or cortical layers. Sometimes the bark is brought to us divested of its outer layers, when it is called *uncoated bark*. These outer layers are of a whitish or grayish color, but vary according to the varieties of the bark; they are smooth, wrinkled, furrowed, or cracked.

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* The cutting of Cinchona Trees was prohibited in Bolivia, by that government, for five years, commencing January 1, 1838.

† The term *epidermis*, as applied to this bark, has been differently understood by medical men; but is generally defined to mean the external or lifeless portion of the bark, which consists of an uncertain number of layers, which increase one in number *annually* by the outer layer of the cortical portion losing its life, while a new layer, or *liber*, is formed next to the wood. This increase of layers, after the bark has attained a certain age, is modified by the decay from without; so that the epidermis of a given species is usually of nearly a uniform thickness after the bark has commenced to decay or wear away from without.

The cutis vera, which is the second, and, indeed, the principal portion of the bark consists of a series of layers which are formed at the rate of one a year, but after some years, lose their life gradually from without, so that this portion keeps about the same thickness. The innermost layer, termed the *liber*, which is the product of the last year's growth, is generally the most valuable; but all these layers, except the outer, are possessed of the medical virtues, and are used together.

The bark is usually more or less quilled, but is sometimes flat. The absence of the curl depends upon one or two circumstances—the age of the stem from which the bark is taken, or the want of flexibility of the bark even in the fresh state. When the bark is rolled cylindrically in a quilled form, it is termed *quilled bark* (*cinchona tubulata*). Writers speak of several kinds of quilling, namely: the *partially quilled* (*cinchona sub-convoluta*), when the edges of the quill approximate; the *closely-quilled* (*cinchona convoluta*), when the edges of the quill overlap each other, forming a more or less closely-rolled-up tube; and the *doubly quilled* (*cinchona involuta*), when both edges of the quill are rolled together so as to form two cylinders, but which on the back appear as one.

The transverse fracture of the bark is either smooth, resinous, or fibrous; that producing the resinous fracture is usually preferred.

The color, taste, and smell of the different varieties differ so much, that no definite account of them can be given.

Classification.—It has already appeared that the bark is divided into very many different varieties. These are in part founded on botanical characteristics; partly on the physical properties and medical qualities of the bark itself; partly in reference to the ports from whence the bark is brought; and, finally, some are arranged according to their chemical characteristics.

It is obvious, however, that in the present state of things, no classifications of the barks can be successfully adopted, except that founded on the physical characteristics of the bark itself. As there are are no other parts of the tree accompanying the bark, the latter can not be traced to the species

from which it was derived: and the ever varying aspects of the bark will not admit of the discrimination necessary for practical use, were the relations between the species and their products once even well determined. On the other hand, a chemical classification can not consistently be adopted for general practice, while so many of the profession lack that extent of chemical knowledge necessary to the chemical investigation of vegetables; and it is unnecessary to remark that the varieties, being produced in promiscuous groups, and thus carried indiscriminately to the different ports, can not possibly be distinguished by the *ports* whence they are shipped.

Guibourt, who describes some thirty-seven varieties of cinchona barks, arranges them according to their physical properties (color, etc.), into five classes, as follows: 1, *Grey Cinchonas;* 2, *Yellow Cinchonas;* 3, *Red Cinchonas;* 4, *White Cinchonas;* 5, *False Cinchonas.*

Von Bergen, who has perhaps given the most reliable description of these barks ever yet published, gives nine species,* viz.:

1. China Rubra, or *Red Bark.*
2. China Loxa, or *Crown Bark.*
3. China Huanuco, or *Gray* or *Silver Bark.*
4. China Regia, or *Yellow Bark* of English Commerce.
5. China Flava Dura, or *Hard Carthagenia Bark.*
6. China Flava Fibrosa, or *Woody Carthagenia Bark.*
7. China Humalis, or *Rusty Bark.*
8. China Jean, or *Ash-colored Bark.*
9. China Pseudo-Loxa, or *Bastard Crown-Bark.*

Dr. Pereira has made an arrangement embracing the elements of other classifications, in such a way as, with some valuable improvements he himself has added, is calculated to elucidate this subject in a very happy manner. Dr. Royle remarks that—"his synonyms are particularly valuable, in consequence of his having exchanged specimens both with Bergen and with Guibourt, and thus identified the German, French, and English names, by a comparison of the several kinds of barks."

* Versuch einer Monographie der China. Hamburgh, 1826.

As this is a subject of much interest and practical importance, not only to the pharmaceutist and apothecary, but also to the practitioner, the author has arranged in a tabular view the important synonyms of Pereira, accompanied with a description of the barks by various authors, and a reference of them to their species, as far as practicable, so that by a glance of the eye, the descriptions of the different varieties of the bark may be compared with each other.

§ I. GENUINE CINCHONA WITH EPIDERMIS NORMALLY BROWN.

α. Cinchona Palladi; Pale Barks; Quinquinas Gris.—Guibourt.

1. C. Coronæ, Ed. Crown or Loxa Bark.—ESSEN. CHAR. *Coat* moderately thin, hard; *cracks* numerous, annular, transverse; *under surface* smooth; *color* cinnamon-brown.—Bergen.
2. C. Huanuco; Gray or Silvery Cinchona, Ed.—ESSEN. CHAR. *Coat* moderately thin, hard; *wrinkles* longitudinal, predominating; *under surface* splintery; *color* rusty brown.—Bergen.
3. C. Jean; Ash Cinchona.—ESSEN. CHAR. *Coat* thin, light, readily pulverized; *cracks* few; *quills* mostly crooked; *color* dark cinnamon-brown.—Bergen.—*Species.* C. Ovata.—Fl. Peruv.
4. C. Huamalies; Rusty Barks.—ESSEN. CHAR. *Coat* thin and spongy; longitudinal *wrinkles* and *warts* which penetrate to the *cortical layers; under surface* even; *color* rust-brown.—Bergen.—*Species.* C. Purpura.

β. Cinchona Flavæ or Yellow Barks.

5. C. Calisaya Sue Regia; C. Flava, U. S. Ed., Dub., Royal Yellow Bark.—ESSEN. CHAR. *Coat* very thick, brittle; *furrows* longitudinal; *cracks* predominating, transverse; *under surface* uneven; *color* deep cinnamon-brown.—Bergen.—*Species.* Unascertained; supposed by some to be the C. Cordifolia.

γ. Cinchona Rubra or Red Barks.

6. C. Rubra, U. S., Ed., Dub., Red Cinchona.—ESSEN. CHAR. *Coat* thick, with *wrinkles* longitudinal; *furrows* and *warts*, but without any important impressions on the *cortical layers; inner surface* uneven; *color* brownish-red.—Bergen.—*Species.* Unknown.

§ II. GENUINE CINCHONAS WITH WHITISH AND MICACEOUS EPIDERMIS.

α. Pale Bark, with a Whitish Epidermis.

7. C. Loxa Alba; White Loxa Bark. Found with the Crown or Loxa Cinchona, and from which it can only be distinguished by the whiteness of its epidermis.—Mutis.—

White Cinchona is different from this, being flat and yellowish.

β. *Yellow Barks, with White Epidermis.*

8. C. de Carthagena Dura; Carthagena Hard Cinchona.—Essen. Char. *Coat* thin and soft or wanting; longitudinal *furrows* irregular; *under surface* uneven or splintery; *color* dull ochre-yellow.—*Species.* C. Cordifolia.—Mutis.
9. C. de Carthagena Fibrosa; Carthagena Fibrosa Cinchona.—Essen. Char. *Coat* thin, soft, of moderate thickness, or entirely rubbed off; *under surface* even, but rough to the touch; *color* pure yellow-ochre.—Bergen.—*Species.* Unknown.
10. C. de Cusco; Cusco Cinchona.—Essen. Char. Hard to distinguish from Calisaya or true yellow; it has a whitish uncracked *epidermis* on the smaller pieces or quills; *rete mucosum* orange-red and corky; *inner surface* yellowish, or of a cinnamon-brown. This variety may be distinguished by sulphate of soda not producing a precipitate in its infusion.
11. C. Aurantiacea de Santa Fe; Orange Cinchona of Santa Fe.—Essen. Char. *Cortical layers* excessively fibrous, insipid, and of an orange color.—*Species.* C. Lancifolia. Mutis.

γ. *Red Barks with a Whitish Epidermis.*

12. C. Nova;—Mutis,—Red Cinchona of Santa Fe. This is dissimilar to most other barks, is not much wrinkled or cracked; its taste is astringent and unpleasant, and its epidermis with scarcely any lichen.—*Species.* C. Magnifolia.
13. Red Cinchona, with a white micaceous epidermis. This is a variety commonly found with the common red bark of commerce.

§ III. Barks falsely called Cinchonas, and which do not yield the Cinchona Alkaloids.

1. C. de Santa Lucia; St. Lucia Bark. The bark of Exostema Floribundum, a native of the West India Islands. Its bitter principle is called Montama.
2. C. Caribæa; Carribæan or Jamaica Bark. The Bark of Exostema Caribæum, a native of most of the West India Islands and Mexico.
3. C. Peruviana; Peruvian Cinchona; Ecorce de Exostema du Perou.—Guibourt. The bark of Exostema Peruvianum, a native of the colder parts of Peru, between the river Chota and the village of Querocotillo.
4. C. Brasiliana; Brazilian Cinchona; Ecorce d'Exostema du Brazil.—Guibourt. The Bark of Exostema Souzanum, a native of Brazil. It yields an alkaloid called Esenbeckina.

5. C. Pitaya; Pitaya Cinchona; Quinquina bicolore.—Guibourt. The bark of an unascertained tree.
6. C. de Rio Janeiro; Rio Janeiro Bark. The bark of Buena Hexandras.

In the United States Dispensatory, and most other American works, the barks are all classed under four heads: the *Pale*, *Yellow*, *Red*, and *Carthagena Barks*. This is a good classification for most practical purposes.

Under the title of *Pale Barks* (which is derived from the color of the powder), is comprised the *Loxa* and *Lima*, or *Huanuco Bark*, among the most important, and the *Jaen* and *Huamilies*, among those less so. The finest kinds are about the size of a quill, rough exteriorly, marked with circular, and occasionally with longitudinal fissures, and of a grayish color, owing to the lichens which envelop the epidermis. The shade, however, differs; being sometimes of a light gray, or nearly white; while at others, it is of a dull brown, and is often spotted by patches of lichen. The inner surface is smooth, but, in the coarser kinds, it is often rough and ligneous. Its natural color is of a brownish-orange, varying to red or yellow. The fracture is usually clear, sometimes somewhat fibrous on the inner surface. The taste is moderately bitter and somewhat astringent, but not disagreeable or nauseous. The superior kinds are said to have a feeble odor, which is aromatic, and observable in the powder and decoction. The pale barks contain but comparatively little quinine, but yield a better proportion of cinchonia.

Yellow Bark is the epithet intended to be applied only to the best varieties of the bark of this color. In commerce it is commonly called *Calisaya*. Druggists arrange this variety of bark into two divisions, the *quilled*, and the *flat;* they sometimes come separate, but often mixed in the same seroon. It would seem, from their appearance, that they are produced from larger, or older branches, than the pale varieties. The quilled variety of the *Calisaya* occurs in pieces from a few inches to a foot or more in length, and from a quarter of an inch to some three inches in diameter, varying as much also in the thickness of the tissue. The epidermis is of a brownish

color, often covered, and generally spotted with white lichens. In larger kinds of the bark the epidermis is thicker, rough, traversed by deep fissures. It is easily separated from the true bark, makes a dark, insipid, and worthless powder, and should always be separated from the bark before the latter is pulverized. The *cutis vera*, or real bark, when divested of its epidermis, is of a brownish-yellow color, with an orange tinge. In thickness it is from one to two lines; its texture is fibrous, and when broken presents shining points, which seem to be the points of fibers running longitudinally. These spiculæ are of rather a firm consistence, yellow and transparent; they separate on pulverizing the bark, and floating in the air, they insinuate themselves into the skin, like cowitch, producing a disagreeable smarting and itching. It is said that the external part of the bark is more bitter and astringent than the other portions (perhaps the *liber* should be excepted). The bark is much more bitter, and less astringent, than the *pale bark*, by which it may be distinguished when the bark is small, in which case it, in color, much resembles the latter. The yellow bark is the most valuable of all.

Red Bark is readily distinguished by its color, being distinct both in the bark and its powder. It is of a lively brownish-red. The bark is larger and thicker than the yellow, and appears as if it were taken from the larger branches, or trunk, of the tree. The epidermis is rugged, wrinkled longitudinally, and in thicker pieces, marked with furrows, which occasionally penetrate to the cutis vera. Sometimes numerous small eminences, or warts, are observed on the outer surface. The outer layers of the cutis vera are darker colored, more brittle and compact, but less bitter and astringent, than those nearer the wood. The innermost layers are ligneous and fibrous, of a more lively brownish-red, but sometimes inclining to an orange, or even yellowish-brown color. The taste and smell much resemble those of the yellow bark. It ranks next in value to the *yellow*.

Carthagena Bark, though a regular commercial name, is not applied to a single variety of bark, but is a general name for

all the barks that are exported from Carthagena, or other northern ports of New Grenada, as Santa Martha, Rio Hacha, and Maracaybo. These barks are characterized by a soft, whitish, or yellowish-white, micaceous epidermis, which is easily disengaged, and is often almost completely removed; yet there is generally enough remaining to indicate its character. These barks are produced, likewise, in more remote parts of South America, but as they are of less value, they would not pay transportation from the western coast at present; and it is not probable that they will ever be imported into this country from the parts whence the yellow and red barks are derived, while the latter can be procured with equal convenience.

ANALYSIS.—The constituents of cinchona are *fatty matter*, *red coloring matter* (*cinchonic red*), *yellow coloring matter* (*cinchonic yellow*), *tannin*, *gum*, *starch*, *quinic*, *or kinic acid*, *volatile oil*, *kinovic acid*, *cinchonia*, *quinia*, *aricina*, *kinate of lime*, and *lignin*.

These constituents are possessed in different proportions by the different varieties of the bark. The pale bark of Loxa contains most of them, but some of them in small quantities. It contains much less quinia than either the yellow or red bark, but it possesses a large proportion of cinchonia.

The yellow, or Calisaya bark, contains the fatty matter, volatile oil, cinchonic red, yellow coloring matter, tannin, starch, lignin, kinate of lime, a large proportion of quinia, and comparatively small quantity of cinchonia.

Red bark contains the same constituents with the yellow, but a larger proportion of the red coloring matter, as well as both the quinia and cinchonia, in pretty large proportions.

The Carthagena barks contain the same elements as the red or yellow barks, but in different proportions.

The following table, embracing Goebel's classification of the barks, *according to their chemical characteristics*, will serve as well to illustrate that system of arrangement (as noticed under the head of *classification*) as to show the proportions of the more important constituents of each of the classes of the barks.

KINDS OF BARK.	Quantities of the Alkaloids to every pound of bark.	
	Cinch.	Quinia.
I. *Barks containing Cinchonia:*		
a. Huanuco, or gray bark, - - - - -	168 gr.	
II. *Barks containing Quinia:*		
1. Yellow, or regia bark, - - - - -		
a. Flat, uncoated pieces, - - - -		95 gr.
b. Coated thick quills, - - - - -		84 "
c. Thin quill, - - - - - -		60 "
2. Fibrous Carthagena bark (*China flava fibrosa*), -		54 "
3. Ash bark (*China Jaen*), - - - -		12 "
III. *Barks containing both Quinia and Cinchonia:*		
1. Red bark, - - - - - - - -	65 "	40 "
2. Hard Carthagena bark (*China flava dura*), - -	43 "	56 "
3. Brown, or Huamilies bark, - - - -	38 "	28 "
4. Loxa, or Crown bark, - - - - -	20 "	16 "
5. False Loxa bark, - - - - - -	12 "	9 "
IV. *False Cinchona barks.*	0 "	0 "

As the proportions of quinia and cinchonia, which are yielded by the several kinds of barks, is of so much importance, as well to the pharmaceutist as the practitioner, the author deems it proper to insert a table originally prepared by Dr. Christison, showing the results of the investigations of various experimentalists. It will, however, appear that these results vary considerably, which must be accounted for on the grounds that they perhaps did not use precisely the same varieties of the bark. Nevertheless, their results may well be considered as an approximation to the true proportions:

TABLE SHOWING THE PROPORTIONS OF CINCHONIA AND QUINIA IN EVERY 1000 PARTS.

	Cinc.	Qui.	
1. *Yellow bark:*			
" Stripped quills,....	0·0	15·0	*
" Stripped flat,.....	0·0	14·6	*
" Quilled,.....	0·0	17·2	†
" "	0·0	20·0	‡
" "	0·0	11·0	⁒
" Flat,.....	0·0	21·3	†
" "	0·0	37·0	‡
" "	0·0	12·3	⁒
2. *Red bark:*			
" Thick quills,.....	24·0	0·8	*
" Fine quality,.....	6·1	11·5	†
" "	4·2	8·3	‡
" "	8·4	5·2	⁒
" Pale red,.....	6·1	8·6	†
" Fine quills,.....	9·0	7·5	*
" Flat,.....	11·8	1·5	*
3. *Crown bark:*			
" Fine quills,.....	0·0	0·5	*
" Fine quality,.....	12·3	trace	†
" "	2·4	1·0	‡
" "	2·6	2·0	⁒
" Medium quills,....	0·0	2·1	*
" Low quality,.....	9·2	0·0	
4. *Gray bark:*			
" Fine quills,.....	24·33	0·0	*
" Medium quills,....	27·3	0·0	*
" Fine quality,.....	9·2	0·0	†
" "	10·0	3·6	
" "	21·3	0·0	⁒
" Inferior, ...	6·4	4·2	‡
5. *Ash bark:*			
"	0.0	trace	*
"	1·6	1·2	⁒
"	1·6	10·4	‡
6. *Rusty bark:*			
"	12·4	0·0	*
"	5·1	3·6	⁒
"	6·3	3·6	‡
" Thin quills,.....	0·0	1·0	‡
7. *Carthagena bark:*			
" Hard,.....	4·0	3·2	*
" "	5·5	7·3	⁒
" Woody,.....	4·4	3·0	*
" "	7·0	5·4	⁒

* Von Santen. † Soubeiran. ‡ Michaelis. ⁒ Goebel.

Physiological Effects.—Topically, the bark operates as a mild astringent, stimulant, and irritant. It appears to render the textures more firm and solid.

Its constitutional impression is chiefly manifested on the nervous and vascular systems, as well as the fibrous tissues. When the system is in perfect health, it will produce no considerable effect when taken in small doses. When the dose is increased or repeated, it will produce an increased action in the heart and arteries; the pulse is quickened, and rendered more full; and ultimately headache will ensue. Hahneman, the celebrated author of the Homœopathic system of medicine, contends that it will produce marked paroxysms of ague, which will recur at regular intervals. This is one of the principle hypotheses, i. e. *similia similibus curantur*, on which is founded his remarkable system. He contends that the barks will cure intermittents, because they will produce symptoms, on the healthy system, similar to those that characterize these affections, when brought on from other causes.

A temporary improvement of the appetite usually follows the use of Cinchona. But if long continued, it is said to disorder the stomach, and produce a furred tongue.

It must not be supposed that these barks, more than any other tonics, will evince their tonic powers on the healthy system as on the diseased. A state of debility alone is calculated to develop, to any marked extent, these virtues in remedies.

Accounts are given of pernicious effects which are said to follow the injection of solutions of bark into the veins. But the fallacy of such experiments has already been pointed out. These reports are eminently calculated to mislead such individuals as are unacquainted with the subject. It is to be hoped, therefore, that authors will be more careful on these points. The great object of medical writers should be, not only to deal in facts, but to invest facts with their *just claims only*.

Therapeutic Properties.—Cinchona, without doubt, is the best tonic known to the profession. There is no other article, in reference to the therapeutic value of which, there is such a

uniformity of opinion in the general profession. All accord to it the first place in the list of tonics.

What so eminently distinguishes the present article above the others of this class, are its remarkable antiperiodic virtues. These are so certain and uniform in their effects, that they have gained for the medicine the character of a *specific for ague.* Many articles have been proposed as substitutes, but none have proved successful competitors. The medicine has now sustained its high character for a full century in Europe and in the United States, and scarcely for one other—perhaps not one—can this be said. All have had their fluctuations.

Cinchona alone fully establishes the order of antiperiodic or anti-intermittent tonics; perhaps no other article now known, could have done it. The medicine will seldom fail of giving satisfaction, if properly used. But it is often given without due attention to the circumstances, which alone can insure success. The stomach should always be cleansed by means of an emetic, when the intermittent has been of long continuance, for if this precaution be neglected, it may not retain a sufficient amount of the medicine to develop its full influence. The intestines may also be so out of order as to require a cathartic. Indeed, many practitioners make it a point always to precede the use of cinchona, when it is prescribed against ague, with a cathartic possessing the power to excite the secretions.

Enough of the medicine should always be given to produce a decided impression upon the system in the outset. When the paroxysms are broken up, the doses may be modified, but must still be continued until the patient is restored to his usual strength. If this particular be unattended to, a relapse may take place; as it is very difficult in all periodic forms of disease, to break up completely the chain of morbid associations, which circumstance is evinced in *epilepsy*, etc., as well as in ague.

If from four to six drachms of the bark, or thirty grains of quinia are administered and retained in the system, for from three to six hours before the accession of the chill, the ensuing

paroxysm may be prevented, and thus the disease may be cut short at once. But it often happens that there is not sufficient time, after the commencement of the treatment, to admit of the development of the constitutional effects of the medicine before the chill or paroxysm comes on. In such cases, therefore, it is of little avail to attempt an effort to prevent its occurrence. The object, then, must be to take advantage of this start upon the next ensuing paroxysm, which may be obviated with an almost absolute certainty. The author does not recollect of a failure in his practice for many years, when he had so much of an advance upon the disease.

The medicine is best administered during the intervals between the paroxysms of the intermittent, as it will then agree better with the stomach, and is more likely to be effectual. It is certain, however, that the idea of its being dangerous when administered during the presence of a paroxysm of an intermittent, is not founded on deductions made from observation, but is rather to be referred to the speculative theory, that stimulants and tonics are always absolutely *inadmissible* in febrile affections. The bark has, in innumerable instances, been given in every stage of the paroxysm with decidedly beneficial results. Many practitioners, especially in the Western States, are in the general habit of giving large doses of quinine at given intervals, without any reference to the paroxysms, and they continue the use of the medicine until the disease is completely broken up.

Although the most extensive use of cinchona is appropriated to the treatment of intermittent fever, yet the medicine is of great avail in all other periodic forms of disease. Remittent fever, periodic neuralgia, some cases of epilepsy, hemicrania, periodic pains in the eyes, face, and other parts of the body, and even hectic fever, have all been successfully treated with the Peruvian tonic. Nor is it necessary that the intermissions should always be complete, for we find that in remittent fever, when there is but very indistinct apyrexia, the medicine is, nevertheless, generally quite available. Indeed the author is inclined to think that the profession have not given due attention to the applicability and power of this article in remittents.

Although it can not be expected that a remittent can be controlled with the same ease and certainty of success as an intermittent may, yet it is questionable whether the use of cinchona may not be available here in a much greater degree than is generally supposed.

It should not be forgotten that cinchona, and all its preparations, though chiefly valued for their antiperiodic virtues, are nevertheless, equally as good and available, when used as a common or simple tonic, as any other article of this class. Hence, the medicine is very extensively employed; and were it not for its being more expensive than most of our indigenous tonics, and that it is rather more unpleasant to take than many of the latter, it would be used still more to their exclusion.

The author has used some of its preparations topically, and endermically, especially the quinine and extract, to great advantage. He cured a case of palsy by the application of a liniment made of quinine and the alcoholic extracts of lobelia and capsicum, which had exhausted the skill of some six or eight eminent physicians.

It is not in place here to go into a lengthy detail of the particulars that relate to the application of this medicine. A few remarks more on this subject must suffice. When there is no objection to taking it, and the stomach bears the medicine in quantities sufficient, it generally answers well to give it in substance; its effects are rather more certain when exhibited in this way. But at the present time, its alkaloids and extracts—but particularly the *disulphate of quinia*—have almost entirely superseded the use of the bark in substance. The quantity of bark necessary to the cure of ague, is from one to two ounces, taken in doses of one drachm every two hours. Doses so large, however, are generally objectionable; and as several of the preparations are also very certain in their effects, they are generally preferable. The extract, when properly prepared, is rather better than the quinine, or any of the alkaloids or salts of cinchona.

In cases of irritability of the stomach, or other inconveniences in which the bark can not be taken by the mouth, it may

be exhibited by other means, as by enema; or the alkaloids may be employed on the iatroleptic plan. When given by injection, or when applied externally, it must be used in much larger quantities than what are necessary to be taken into the stomach. Numerous cases might here be reported of its success, when used in the ways just spoken of. The most obstinate intermittents have been known to yield to the external application of some of the alkaloids, particularly quinine.

PHARMACEUTIC PREPARATIONS. — PULVIS CINCHONÆ: *Cinchona Powder.*—This is the form in which Cinchona is usually found in the retail drug-stores. It consists in very fine powder, obtained by grinding and bolting the bark. It varies in color and quality, according to the bark from which it is prepared. The common kinds of cinchona powder are — the *pale*, *yellow*, and *red;* but the varieties throughout correspond with those of the bark, and are known by the same appellations. The yellow and red powders are the best.

The effects of cinchona are rather more certain, when the medicine is taken in substance; but, as already stated, the quantity requisite when taken in this form, is so considerable, that it often disagrees with the stomach, besides being very inconvenient to be taken. Of late therefore, the medicine is seldom taken in this form. The dose is from ℈ij. to ʒiv., or even more, if the stomach will bear it, often repeated.

INFUSUM CINCHONÆ: *Infusion of Cinchona.*—This is prepared by macerating one ounce of any of the barks, in coarse powder, in a pint of boiling water, for two hours, and straining.

Use.—This is a tonic but little superior to the common bitter tonics. As the water only takes up a small quantity of the kinates of cinchona, quinia, lime, gum, tannin, and coloring matters, leaving the greater parts of the alkaloids in the marc, it can not be expected, therefore, that the infusion possesses the activity of the bark itself, or that it can be depended on as a febrifuge. The dose is from fʒiv. to fʒvij., thrice a day.

DECOCTUM CINCHONÆ: *Decoction of Cinchona.*—℞ Bark in coarse powder, ʒj.; Sulphuric Acid, min. x.; Water, Oj. Put together in an earthen or glass vessel, and boil in a water-bath for twenty minutes, strain, and boil down to one-half.

Use.—This preparation contains considerable quantities of

the alkaloids, in the form of soluble sulphates, and is, hence, a pretty good tonic and febrifuge. The dose is f℥j. to f℥ij., three times a day.

TINCTURA CINCHONÆ: *Tincture of Cinchona.*—℞ Bark, coarsely powdered, ℥vj.; Diluted Alcohol, Oij.; Moisten the bark with a part of the diluted spirits, let it remain thus for two or three days, add the balance of the spirit; proceed by percolation, to prepare the tincture. Or it may be prepared in the ordinary way.

Use.—The tincture of the bark contains a considerable portion of its active properties, and is a valuable tonic, stomachic, and febrifuge. But it is less powerful and convenient than the more concentrated preparations. The dose is from f℥j. to f℥iij. It is commonly used as an adjuvant to the decoction or infusion, when the latter are prescribed in cases of intermittent fevers.

EXTRACTUM CINCHONÆ: *Extract of Cinchona.* ℞ Bark, in coarse powder, ℥xvi.; Alcohol, Oiv.; Water, a sufficient quantity. Macerate the bark in the alcohol for five days, and proceed by means of an instrument for displacement. When the liquor ceases to pass, pour on the water, by degrees, so as to keep the surface of the bark covered with the water until one gallon in all is obtained. The alcohol may now be distilled off, and the remainder evaporated down to the proper consistence.

The extract may be obtained by means of water alone, but it is much less valuable. By adding a small quantity of sulphuric acid to the water, and then conducting the process in proper vessels, a tolerably good extract may be obtained. By some, whisky alone, is used as a menstruum; and, after obtaining the tincture, as much of the spirit is distilled off as can be done without burning the remainder; after which the evaporation is conducted by means of a water or sand-bath.

Use.—This is one of the most valuable preparations of cinchona, as it not only possesses a good proportion of all its valuable alkaloids, but contains the tannin or tannic acid, which adds much to the permanency of the effects of the medicine. The extract is usually taken in the form of pills, in doses of from gr. xv. to gr. xxx. A small proportion of capsicum worked in with the pills, will be a valuable addition for many cases in which the medicine is used. The extract of cinchona is serviceable in all cases in which an active and

powerful tonic is indicated; but it is particularly applicable in obstinate and protracted intermittents.

EXTRACTUM CINCHONÆ ALCOHOLICUM: *Alcoholic Extract of Cinchona.*—℞ Cinchona, powdered, ℔v.; Alcohol, C. iij. Add of the alcohol to the cinchona sufficient to cover the powder, in a vessel, when mixed; let it stand several days; place in a percolator, and pass the remainder of the alcohol through it twice; filter and distill the alcohol down, until the residuum thickens; then finish the evaporation in the sun or air.

Action—Use.—This is the best of the preparations of the Peruvian bark, with the exception of the alkaloids. It will seldom fail to give satisfaction in all that is expected of the cinchona. The dose is gr. xv.—gr. xxx. Usually formed into pills with capsicum.

QUININE: QUINIA DISULPHAS.

PREPARATION.—The London College directs the preparation of Quinine as follows: "Take of Heart-leaved Cinchona (Calisaya), bruised, ℔vij.; Sulphuric Acid, ℥ix.; Purified Animal Charcoal, ℥ij.; Hydrated Oxide of Lead, Solution of Ammonia, Distilled Water, each as much as may be sufficient. Mix four ounces and two drachms of Sulphuric Acid with six gallons of Distilled water, and add the Cinchona to them. Boil for an hour and strain. In the same manner, again boil what remains, in acid and water, mixed in the same proportions, for an hour, and again strain. Finally, boil the cinchona, in eight gallons of distilled water, and strain. Wash what remains frequently with boiling distilled water. To the mixed liquors add oxide of lead, while moist, nearly to saturation. Pour off the supernatant liquor, and wash what is thrown down with distilled water. Boil down the liquors for a quarter of an hour and strain; then add gradually a solution of ammonia to precipitate the quinia. Wash this until nothing alkaline is perceptible. Let what remains be saturated with the rest of the sulphuric acid, diluted. Afterward digest with two ounces of animal charcoal, and strain. Lastly, the charcoal being thoroughly washed, evaporate the liquor cautiously, that crystals may be produced."

In this process, the quinia, which, as already shown, existing in the bark, in combination with kinic acid, in the character of kinate of quinia, is dissolved by the acidulated water. Now, when the oxide of lead is added, the acid combines with it, forming the sulphate of plumbium, which is precipitated.

The solution now contains only the kinic acid and quinia. As soon as the ammonia is added to this solution, the kinic acid disengages from the quinia and unites with the ammonia, thus forming kinate of ammonia, while the quinia is precipitated. The coloring matters having already been removed by the animal charcoal, nothing more is necessary than to add a little more sulphuric acid, when the disulphate of quinia will form beautiful crystals on evaporation.

The Edinburgh College adopts a plan by which the coloring and extractive matters, as well as the gum and acids, are first extracted by means of a solution of soda. For this purpose Stoltz uses lime, and others potash. The alkaloids are then dissolved by boiling the residuum in water acidulated with sulphuric acid, when, upon the addition of soda, the impure quinia is precipitated. The latter is then again dissolved in water acidulated with sulphuric acid; and, after filtering again, set aside for crystallization. The impure disulphate of quinia thus obtained, is redissolved in boiling water, and after clarifying with animal charcoal, is filtered and again left to crystallize.

The U. S. Pharmacopœia directs as follows: "Take of Yellow Bark, in coarse powder, *four pounds;* Muriatic Acid, *three fluid ounces;* Lime, in powder, *five ounces;* Water, *five gallons;* Sulphuric Acid, Alcohol, Animal Charcoal, each *a sufficient quantity.* Boil the Bark in one-third of the water, mixed with one-third of the Muriatic Acid, and strain through linen. Boil the residue twice successively with the same quantity of Water and Acid as before, and strain. Mix the decoction, and, while the liquor is hot, gradually add the Lime, previously mixed with two pints of water, stirring constantly until the quinia is completely precipitated. Wash the precipitate with distilled water, and, having pressed and dried it, digest it in boiling Alcohol. Pour off the liquor and repeat the digestion several times, until the Alcohol is no longer rendered bitter. Mix the liquors, and distill off the Alcohol until a brown viscid mass remains. Upon this substance, removed from the vessel, pour about half a gallon of distilled Water, and, having heated the mixture to the boiling point, add as much Sulphuric Acid as may be necessary to dissolve the impure alkali. Then add an ounce and a half of Animal Charcoal, boil for two minutes, filter the liquor while hot, and set it aside to crystallize. Should the liquor, before filtration, be entirely neutral, acidulate it very slightly with Sulphuric

Acid; should it, on the contrary, change the color of litmus paper to a bright red, add more Animal Charcoal. Separate the crystals from the liquor, dissolve them in boiling water slightly acidulated with Sulphuric Acid, add a little Animal Charcoal, filter, and set aside to crystallize. Wrap the crystals in bibulous paper, and dry them with a gentle heat. The mother-waters may be made to yield an additional quantity of Sulphate of Quinia, by precipitating the Quinia with solution of Ammonia, and treating the precipitated alkali with Water, Sulphuric Acid, and Animal Charcoal, as before."

Disulphate of Quinia consists in fine, silky, needle-shaped crystals, which are slightly flexible, about a line, or less, in length; and are matted, or grouped, in small star-like tufts, and hence make a spongy powder. Its color is white, and its taste intensely bitter. It is very slightly soluble in cold water, but will dissolve in thirty parts of boiling water. On adding only a very small quantity of sulphuric acid to water, it will dissolve it with facility. By this means the alkaloid, by taking up an additional proportion of sulphuric acid, is converted into a *sulphate*, whereas, before, it was a *disulphate*, or *subsulphate*, containing two equivalents of the vegetable base, and only one of the acid. The vegetable acids, as the solution of tartaric, citric, etc., dissolve it with facility. At a moderate heat, or when exposed to the air, it loses its crystalline form, which, however, may be again restored, by dissolving in alcohol, evaporating, and leaving it to crystallize.

Impurities.—This article, on account of its high price, is sometimes adulterated with foreign substances, of similar appearance. The articles most commonly used for this purpose are, salacin, sulphate of lime, white sugar, starch, etc. When a portion of the suspected article is dissolved in cold water, sulphate of lime, starch, and any fatty matters that it may contain, are not dissolved, but will settle to the bottom. Sugar can be detected by its taste. Gum, and alkaline earths, will remain undissolved by alcohol, and earthy impurities will, moreover, resist the action of heat. At a red heat, pure quinine is entirely consumed. This, therefore, will detect incombustible, or mineral substances.

Use.—Quinine is decidedly the most powerful tonic now known, operating with remarkable promptness and certainty.

From the smallness of the dose required, and consequent facility in taking it, this alkaloid now almost entirely supersedes the use of the bark in practice, especially in its employment as an antiperiodic. It is seldom the case, that the stomach will not bear a quantity, taken between the paroxyms, or within twelve hours, that will be sufficient to prevent the occurrence of even the first ensuing, or any subsequent paroxysm, of a simple intermittent. It seems, moreover, that intermittent fever is almost equally under the control of the medicine, whatever the form of the attack may be: *i. e.*, whether it assumes the type of a *quotidian*, *tertian*, or *quartan*. Nevertheless, the *tertian* type generally admits of cure most readily.

Although the chief use of quinine, like that of the bark, is in those forms of disease which are characterized by marked intermissions, or periodicity of action, yet the application of the medicine is very general; it becomes serviceable in all cases of debility, general or local, especially those that are attended with irregular vital reaction.

Many objections have been urged against quinine, as a general remedy, on the supposition that it is not safe in its action. But it is certain that these views can not have resulted from careful observation; they are rather the consequence of a want of proper discrimination between the effects of this article and those of others previously or collaterally used; or even between the effects of quinine and those of the disease itself, for the removal of which it may have been administered.

Arsenious acid, which indeed appears to be almost equally efficient in arresting periodic affections, has, from its comparatively low price, been very extensively prescribed for many years, by the practitioners of the old school. It is also known that mercury, in its various forms, has been the universal opening medicine in those varieties of disease in which quinine is indicated and administered. Indeed, "*a dose of calomel, followed with quinine*," has become the popular prescription for agues. Now, it needs no great effort to prove the effects commonly reckoned among the mischiefs of quinine, to be the legitimate results of those potent poisons, while quinine, though innocent, has got all the blame.

Moreover, observation fully proves that the mischievous effects commonly ascribed to quinine, in many instances, do not obtain at all in the premises, but must be referred, even for an ideal existence, to the theory which contemplates the tonics, and stimulants as phlogistic in character.

The author has given this subject considerable attention, but never, under any circumstances, has he found effects to follow the use of quinine, that are not common to the bark itself, in proportionate doses. It is hard to see the consistency of the practice of any individual who uses the bark while he rejects the alkaloid.

CINCHONIA DISULPHAS.

PREPARATION.—This alkaloid is prepared from *Cinchonia*, which is procured by submitting the powdered bark to the action of sulphuric acid, very much diluted, and then precipitating by an excess of lime. The precipitate thus formed is collected on a filter, washed with water, and treated with alcohol. The alcoholic solution must be filtered while hot, and on cooling the Cinchonia is deposited. This is then heated with a little water, adding dilute sulphuric acid gradually, until the Cinchonia is dissolved. The solution is now boiled with animal charcoal, previously washed with dilute muriatic acid, and after filtering, while hot it is set aside to crystallize. The solution will not, at first, yield all the salt it contains, but by alternate evaporation and crystallization, the whole of the sulphate may be obtained from it.

There are many other processes by which this alkaloid may be obtained, but this perhaps is the most simple.

Disulphate of Cinchonia is in short, oblique, prismatic crystals, terminated by bihedral summits. It is soluble in fifty-four parts of water at common temperatures, and in a much smaller quantity of hot. Six parts of alcohol of a sp. gr. 0·85, or eleven parts of absolute alcohol will dissolve it. When heated it becomes phosphorescent; at 212° F. it fuses, and at 248° F. it loses its water of crystallization. To the taste, it is not so bitter as quinine. Its composition is as shown in the following table:

	Atoms.	*Eq. Wt.*	*Per Cent.*
Sulphuric Acid, - - - - -	1	40	10·42
Cinchonia. - - - - -	2	308	80·20
Water, - - - - - - -	4	36	9·38
Crystallized Disulphate of Cinchonia,		384	100·00

Use.—This alkaloid, which is often called *Sulphate of Cinchonia*, is considered identical in its medical properties with the Disulphate of Quinia, but supposed to be a little less active. It is applicable in all cases in which quinine is indicated, and may be used in like doses.

Aricina, and various other alkaloids, besides those already treated of have been prepared, and some of them used for medical purposes, but they have not yet been considered as meriting a place in the *Materia Medica*.

PYRUS MALUS.—The Bark.

Synonyms.—Apfalbaum, *Ger.*; Pommier, *Fr.*

Botany.—*Sex. Syst.*—Icosandria Pentagynia. *Nat. Ord.*—Pomaceæ.

Gen. Char. Pyrus.—*Calyx* five-cleft, superior. *Corolla* five-petaled. *Poma* five-celled, two or many seeded.

Spec. Char. P. Malus.—A tree of variable size, short trunk when growing in open ground, very branched; branches horizontal. *Leaves* slightly variable, but mostly ovate, acuminate, entire, serrate, petiolate. *Flowers* white and pink colored, in sessile umbels. *Fruit* (the apple) orbicular, fleshy, luscious, aromatic, juicy, nutritious.

The apple-tree and fruit, certainly needs no further description.

Therapeutic Properties and Use.—The bark of the root, and also of the stem of the apple tree, has been discovered to be an anti-intermittent tonic, of very considerable power. Some in their enthusiasm, have compared its power in intermittent fever, to that of quinine, and have declared it even more certain than that potent article.

Experience in its use however, does not justify this high estimate; and yet the claims of this article are, nevertheless,

very important. Had we even no higher assurance in favor of any one of our innocent indigenous productions, than that they were only half as certain as quinine, in their anti-intermittent power, it would certainly still be a matter of rejoicing. Our dependence upon foreign sources for standard remedies is, to say the least, inconvenient.

The apple-tree bark is cheap, and yields its virtues to the resources of pharmacy, with incomparably greater facility than cinchona.

The quantity to be taken, to insure the specific effect of this bark, is too great to admit of its use in substance, and as a more concentrated form of it is so easily had, the use of the medicine is now altogether confined to that form. It will be treated of under the succeeding head of *Phloridzina*.

It may be remarked here, that the bark of all the species of *pyrus*, as far as yet investigated, is prominently marked by anti-intermittent properties. Thus the bark of the *Pear*, *Plum*, *Cherry* and *Quince* trees, has been proven to be efficient in this way.

PHLORIDZINA.

The name *phloridzina* or *phloridzin*, from φλοιος '*bark*,' and ριζα '*root*' was given to a crystalline principle, discovered in the root of the apple-tree, by M. de Konnick in 1834. It has since been proven that all the species of *pyrus*, or at least, many of them, yield this principle as well as the-apple tree. The bark of the *pear*, *quince*, *plum* and *cherry* trees in all their varieties, will thus yield *phloridzina*.

Preparation.—The medical principle sought, is free in the bark, and requires no other means for its elimination to water, than a moderate degree of heat, which is within the range of the boiling point of water. Another happy circumstance is that it is insoluble in cold water, and hence it may be obtained though not entirely pure, as a spontaneous precipitate from the simple decoction of the bark on cooling.

This precipitate needs only to be boiled with animal charcoal, in water, the solution filtered while hot, and then again set aside for precipitation, when the product will be freed from color mostly, and will be in granular crystalline form.

A very simple way to procure the phloridzina, is to take

coarsely powdered apple-tree-root bark ten parts, and coarsely powdered charcoal one part, mixing them, and boiling in a copper kettle for two hours, with a due proportion of rain water, filtering while hot, and then setting it aside for precipitation; when the precipitation is completed, the water may be drawn off by means of a syphon, or it may be carefully poured off, and the precipitate then collected and dried on plates in the open air.

If about five per cent. of alcohol be added to the water employed in the decoction, and then after filtration, it is either distilled off, or evaporated by boiling for a time, the product will be much more.

PROPERTIES.—Phloridzina when properly discolored by animal charcoal, is in beautiful white crystals, of a silky appearance. In mass it looks pure dead white, like well-prepared *lactin*. It is insoluble in cold water, but yields to it as it is heated about 70°, with notable facility. Water under 70° dissolves only one part in 1000 of its weight; but from 70° to 212°, it dissolves it in all proportions. Alcohol takes it up very readily, but ether much less so, even when boiling. It has no action on test papers, and may be thus called a neutral principle.

This article ought to be prepared by manufacturers generally. But the author knows of no house that has offered it to the trade, or the profession.

THERAPEUTIC EFFECTS—USE.—No article, which is the production of our own country, can claim more confidence than this, as an anti-intermittent tonic. It will arrest the chills in intermittents with considerable certainty, when given in full doses.

There have, however, been some doubts expressed as to its high merits, and several persons have even declared it to be devoid of specific anti-intermittent powers, and state that it is not superior as a general febrifuge to other simple vegetable tonics.

This discrepancy, most likely, arises from a want of proper testing of the power of the agent. As intimated before, the dose is necessarily large, as indeed it is with all other articles when designed to produce certainty in the anti-intermittent effect. Quinine itself requires three times the quantity in a

prescription against chills, that it does for a general tonic effect. Few physicians give this agent, as a common or general tonic, in larger doses than gr. iij.—gr. v. But when a prescription is made out that is intended to be certain against the chills, ten, twenty, and thirty grains are given. In Missouri, and in Northern Indiana, there are physicians who habitually prescribe 40 to 60 grains of quinine in a course for an intermittent, and they say that a less quantity is not only inefficient, but that this quantity is entirely safe and successful; that the unpleasant effects usually complained of are less apparent in their practice than is stated, of the old method of many repeated small doses.

Phloridzina is entirely safe in its use—is cheap, and need not be parsimoniously used. If this sentiment is acted upon, this remedy will make itself known. It may be remarked, however, that, as stated above, this agent is not classed with quinine as to certainty or reliability of effects; and if occasional failures occur, they must be anticipated. Combinations with the quinine, perhaps, offer quite the most advisable methods of its use. That article is found to be much improved in its anti-intermittent action by combination with simple astringents, and the Phloridzina that will be mostly prepared by persons not making a business of its manufacture, will not be likely to be divested thoroughly of the tannin or astringent principles of the bark: it will thus afford a duplicate auxiliary force to quinine.

Ten grains of quinine, conjoined with thirty of phloridzina, will be equally efficient to twenty grains alone, and will act with the same mildness or agreeableness to the patient. The thirty grains of the latter article will not cost more than a single grain of the other; i. e., quinine costs thirty times as much as phloridzina. In this, therefore, we have economy, which is not secured at the cost of any inconvenience or risk in the person taking it.

In the old practice, some physicians have been in the habit of combining the arsenious acid with quinine, from motives of economy. That was a *reprehensible* practice, for while the man who, under the old philosophy (?) contemplating the poisonous

quality of agents only in the *degree* of their action, might be comparatively excusable in the use of such an agent, that man who administers deadly poisons, from motives of economy simply, when they may answer his end, is not worthy of his profession.

In the present case, with an agency absolutely inefficient for evil, an economical object is not only justifiable, but creditable.

The dose of phloridzina is twenty grains, although less, or even ten grains has been found efficient. It should be given in powder or solution, and not in pills, unless the pills are soft and easily dissolved in water, and it ought to be combined with quinine, when it is prescribed as an anti-intermittent. A repetition of one or two doses of the medicine in six to nine days, in more obstinate cases of ague, may insure a defense against relapse. All intermittent forms of disease are liable to return.

CORNUS FLORIDA.—The Bark.

Synonyms.—Corniolo, *Ital*; Schonbluhender Hartriegel, *Ger.*; Huntsholtz, *Vul., Ger.*; Cornouiller Fleuri, *Fr.*; Mon-ha-can-ni-min-schi, or Hat-ta-wa-no-min-schi, *Del. Indians*; Dogwood, *Eng.*; Boxwood, *Vul.*

History.—It is not known at what period the medical virtues of Cornus Florida first became known. Shœpf had a knowledge of its tonic properties and its use in intermittent fever, as early as 1787. Other physicians, and in some sections of the country, private individuals had known something of its medical properties in the latter part of the last century. The tree grows wild in almost every part of the United States, but is most abundant in the Middle States. It is found on uplands or dry grounds in almost every variety of soil, and even on the poorest lands.

Botany.—*Sex. Syst.*—Tetrandria Monogynia. *Nat. Ord.*—Cornaceæ.

Gen. Char. Cornus. — *Calyx* symphogyne, four-toothed. *Corolla* small, and of a greenish-yellow color. *Stamina* four, epigyne alternating with petals. *Fruit* a drupe, inclosing a bilocular two-seeded nut.—*Rafinesque.*

Spec. Char. C. FLORIDA.—*Leaves* opposite, ovate, acute at the base, glaucous beneath. *Flowers* small, clustered, greenish-yellow, and surrounded by a large *involucre*, with four very large, broad, or obcordate petals, which are of a white or pale pink color, crisped and truncated at the outer end. These are usually mistaken, by common observers, for the corolla. *Fruit* oblong, of a beautiful red, and disposed in compact clusters.

This is a small tree, seldom growing over twenty-five feet in hight. The bark is rough, and of a dark color. Its liber is of a pinkish-brown, and is intensely bitter to the taste. The branches are spreading, often opposite, especially the smaller ones. The twigs are of a purplish color, and are marked by light-colored rings at the points, where the leaves of former years were attached. Its flowering time is in May.

ANALYSIS.—The composition of the bark of Cornus Florida is almost identical with that of the pale cinchonas. It perhaps contains a little more *gum* and *tannic acid*. Its alkaloid corresponding with *cinchonia*, is called *cornine*. The author, in one experiment obtained, *gum*, *soft resin*, *fatty matter* (*a considerable*), *extractive*, *coloring matters*, *tannin*, some *acids*, *a peculiar bitter principle* (*cornine*), and *lignin*.

PHYSIOLOGICAL EFFECTS.—The recent bark, when taken in large quantities, is apt to disagree with the stomach, and will occasionally cause vomiting and pain in the bowels. But, on drying, the principle producing these effects, seems to become dissipated. A small portion of the powder, or any of the preparations, will have but little or no effect. When taken in larger quantities, it will raise the pulse somewhat, produce a sensation of vascular fullness, and will transiently improve the appetite. It promotes muscular tone, and a firmness of the fibrous tissues.

On lifeless animal substances, it produces a firmness, strength, and insolubility of tissue, owing perhaps, mostly, to its tannic acid.

THERAPEUTIC PROPERTIES.—Barton remarks that the similarity between the dog-wood and Peruvian barks, in their sensible qualities, their chemical analysis, and their action on

the excised and dead fiber, as shown in the experiments of Dr. Walker, sufficiently proves an identity in their medical effects; and the result of actual experience with the bark of the Cornus Florida, by many physicians, entitles it to be ranked among the best tonics of our country.

Dr. Gregg says he used the dog-wood twenty-three years, during which time he found its virtues such as to convince him, that it was not inferior to the Peruvian bark, in curing intermittents, nor inferior as a corroborant, in all cases of debility.* He used the medicine in powder, and considered twenty-five grains of this, equal to *thirty* of cinchona. But it appears from most observations that these gentlemen had a higher opinion of the medicine than its merits really justify.

Our new-school practitioners are laboring with commendable zeal to perfect our Materia Medica, in its indigenous collections; and it is gratifying to find their labors so richly rewarded by the immense stores of the vegetable world. The bark of this tree has been extensively tested by them as an anti-intermittent, and although the general conclusion is, that it is inferior to cinchona, yet the character of its febrifuge virtues, is now very well established.

When properly prepared it seldom fails to fill every reasonable expectation, from its use, both as a general tonic and antiperiodic. But as the bark will not yield a very large proportion of its virtues to either cold or boiling water, it must be obvious that its infusion, decoction, and watery extract, when depended on for the cure of intermittents, must necessarily lead to disappointment. For this purpose, the cornine or the extract, prepared as directed, must be employed.

Besides its tonic power, which is available in all cases in which agents of this class are indicated, it also possesses others which make the medicine applicable in all conditions in which antiseptics, astringents and stimulants, are generally supposed to be indicated.

The dose of the powdered bark, as a general tonic or corroborant, is from gr. xx. to gr. xxx. As an antiperiodic,

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* Walker's Inaugural Diss., p. 40.

the powder or crude preparations are not applicable, as they can not be taken in doses large enough to be available. It has been stated that the variety bearing the red or pink involucres, is much more powerful than the other as an antiperiodic: as to this the author's observations do not serve him so as to know.

PHARMACEUTIC PREPARATIONS.—**INFUSUM CORNI:** *Infusion of Dogwood.*—℞ Dogwood Bark, bruised, ℥j.; Boiling Water, Oj. Macerate for two hours, and strain.

Use.—Useful as a corroborant, or general tonic, but not sufficiently powerful to be depended on in cases of intermittents. The *dose* is from f℥ij. to f℥v.

DECOCTUM CORNI: *Decoction of Dogwood.*—℞ Dogwood Bark, bruised, ℥j.; Water, Oj. Boil for ten or fifteen minutes in a covered vessel, and strain while hot.

Use.—This preparation is somewhat stronger than the infusion, and may be used to fulfill the same indications.

EXTRACTUM CORNI: *Extract of Dogwood.*—℞ Dogwood Bark, in coarse powder, ℥xvj.; Alcohol, Oiv.; Water, Ovi. Digest the bark in the alcohol for two days, decant and strain. Boil the dregs in the water three hours, and strain as before. Now place the spirituous decoction in a retort, and distil off the alcohol until one pint remains, which is done merely from motives of economy, and then evaporate both together in a suitable vessel, to the proper consistence. The extract may now be formed into pills, or it may be kept in jars.

Use.—This extract is possessed of good tonic power, and proves serviceable in all cases in which the simple tonics are indicated. Also useful in intermittent diseases, as an auxilliary to cinchona. It will serve thus to secure the specific effects of that agent, when taken in much smaller doses than required when given alone. It has also proved successful in its application for the cure of ague alone.

EXTRACTUM CORNI ALCOHOLICUM: *Alcoholic Extract of Dogwood.*—Obtain the Saturated Alcoholic Tincture of the Dogwood Bark, filter, place in a still, or retort, over a sand-bath; run over the spirit, until the residuum begins to thicken; take it up, and expose in shallow plates, in an airy place, or in the sun, until it acquires a proper consistence, being particular not to let it remain out so as to get wet, or receive the night dews.

Dose, gr. xx. A pretty certain anti-intermittent tonic; the best preparation of Dogwood, except the cornine.

CORNINE.

PREPARATION.—℞ Bark of the root of Cornus Florida, ℔x.; Water, C. x.; Sulphuric Acid, ℥iv.; Milk of Lime, q. s.; Alcohol, Oiij.; Animal Charcoal, ℔j. Place the sulphuric acid and water in an earthen pot, over a sand-bath; stir it, and add the powdered bark; boil for several hours; filter; add the milk of lime, for the precipitation of the active principle, and let it rest one day; throw off the supernatant liquor, dry the precipitate, digest in the alcohol for four hours, stirring it occasionally; when settled, pour off the spirit; boil with the animal charcoal for twenty minutes; filter; evaporate nearly to dryness, and wash thoroughly on a filter.

This process affords a light-colored, or pearly powder, of a semi-crystalline appearance, and very bitter taste. It is undoubtedly the active principle of the bark, and is well entitled to the name of Cornine.

MEDICAL PROPERTIES, USE.—This is one of the most reliable tonics, of the anti-intermittent order, ever prepared from any product of our own country. The dose required to cure an intermittent is but little more than that generally prescribed of quinine. It affords a very excellent adjunct to that article, one that will serve in all its applications.

The dose of the Cornine, for common use, is gr. x. But when prescribed against ague, it must be given in somewhat larger quantities.

CORNUS SERICEA.—The Root.

SYNONYMS.—Bloubarender Hartriegel, *Ger.*; Hat-ta-wa-no-min-schi, *Del. Ind.*; Swamp Dogwood, Red American Cornal, Red Willow, Rose Willow, Blue-Berries, Dogwood, etc., *Vul.*

HISTORY.—The Cornus Sericea is a native shrub, long known to the aborigines of this country, and particularly by the Delawares, who used to smoke the twigs with tobacco, in a compound that they called Kin-ni-ka-nick; and likewise used the bark of the root to dye their garments scarlet. It is thought that they also had a knowledge of its medicinal virtues.

It was cultivated in England by Bishop Compton, before 1683.

BOTANY.—*Sex. Syst.*—Tetrandria Monogynia. *Nat. Ord.*—Cornaceæ.

Gen. Char. Vide C. Florida.

Spec. Char. C. SERICEA.—An indigenous shrub, growing usually from six to eight feet in hight, with numerous erect *stems*, which are covered with a shining reddish bark. The *branches* are opposite, roundish, spreading, and of a dingy purple color. The *young shoots* are round, annulated, with a very few spots, and of a dark purple color; those very young are somewhat pubescent. The *leaves* are opposite, petiolated, ovate, pointed, entire on their margins, nerved, and somewhat veined; the midrib and nerves are depressed on the upper side of the leaf, and projecting below: the size of the leaf, when full grown, is about three inches long, and about half as broad. The *flowers* are small, white, and disposed in terminal cymes. The *calyx* is monophyllous, four-toothed, villous. The *corolla* consists of four linear, acute, spreading petals, larger than the calyx. The *fruit* consists of a cluster of berry-formed, globular, fleshy drupes, of a beautiful cerulean blue color, excavated at the base, and generally surmounted with the persistent style. In this country the shrub is in blossom in June and July, and the berries ripen in September. Grows in swamps, or wet thickets, banks of streams, and bottom-lands, generally.

ANALYSIS.—The constituents of the bark of the Cor. Sericea, differ little, in the main, from those of Cor. Florida, or even the Peruvian Bark, excepting in its essential oil, which is *peculiar*.

THERAPEUTIC PROPERTIES AND USE.—The C. Sericea is considered equal in value, as an antiperiodic, with the common dogwood, and may be used, in all cases, as a substitute for it. Its pharmaceutic preparations, application, and dose, are about the same as those of that article.

CORNUS CIRCINATA.—The Bark.

SYNONYM.—Round-leaved Dogwood, *Vul.*

BOTANY.—*Sex. Syst.*—Tetrandria Monogynia. *Nat. Ord.*—Cornaceæ.

Gen. Char. Vide C. Florida.

Spec. Char. A *shrub* from six to ten feet high, with warty *branches;* large roundish, pointed leaves, waved at their edges,

and downy beneath. Its *flowers* are white and disposed in depressed cymes. The *berries* are blue. Grows native in various parts of the United States, from Canada to Virginia; being found mostly on hillsides, and on the banks of streams. Its flowering season is in June and July.

THERAPEUTIC PROPERTIES AND USE.—An antiperiodic, and general astringent tonic, analogous, in its effects, to the C. Florida and C. Sericea. It is applicable, in febrile disease, generally, when the tonics are indicated; but especially in the treatment of intermittent and remittent forms. The dose is from a scruple to a drachm of the powder, or from five to fifteen grains of the extract, which is prepared from its alcoholic tincture.

PINKNEYA.—The Bark.

SYNONYMS.—Quinquina Pinkney, *Fr.;* Pinkney, *Eng.;* Fever-bark tree, Florida bark, *Vul.*

BOTANY.—*Sex. Syst.*—Pentandria Monogynia. *Nat. Ord.*—Rubiaceæ.—*Linn.*

Gen. Char. PINKNEYA.—*Calyx* superior five-parted. *Corolla* tubular, border five-cleft, recurved. *Stamens* five, exserted at the base of the tube. *Seeds* winged.—*Raf.*

Spec. Char. P. PUBENS.—*Leaves* opposite, petiolate, oval, acute at both ends, subtomentose beneath. *Flowers* terminal, cymose.

A shrub of large size, with many stems, sometimes twelve to twenty-four feet high. Grows in low, wet or swampy places, in the Southern States, near the Atlantic coast and Gulf of Mexico.

MEDICAL PROPERTIES AND USE.—The pinkney bark was once supposed to be a successful competitor with the cinchona. This expectation, however, has been sadly disappointed, for on more thorough trial it was found much less reliable than the South American febrifuge.

Nevertheless, it is even now much esteemed by many physicians as an anti-intermittent. Perhaps its proper rank as an agent of this kind is with the Carthagena, or false cin-

chonas. If this is correct, the pinkney will still be at the very head of all the indigenous vegetable anti-intermittents.

Drs. Barton and Law, maintained that six out of seven cases of intermittents, will yield to this agent.

Analysis.—Dr. Far investigated this article in view of testing its active principles, on the supposition that it might yield salts similar to those of the cinchona; and he succeeded in obtaining a basic principle capable of forming a salt with acids, and called it *cinchonin*. This was found in considerable quantity. But it is to be regretted that this able chemist was prevented by some cause from completing his investigations. No complete analysis of this bark has yet been published. It is known, however, that its virtues yield freely only to alcohol and acidulated water.

Pharmaceutic Preparations.—The Alcoholic Extract is the only preparation of the pinkney which has been much used, excepting the tincture. But the dose necessary, of the latter, is so large that quite an objection arises against this form of its use. The alcoholic extract however will give good satisfaction.

Therapeutic Properties and Use.—What is here to be said is so near what was said under the head of Cinchona, (except that this article is of feebler power), that it is deemed unnecessary to repeat the description of its application and effects. The dose is gr. xx. of the extract; that of the tincture is f℥ss.—f℥j., to be repeated three times a day in ague, until the chills are arrested. As a general tonic, ten grains of the extract, and f℥j.—f℥ij. will answer well.

SALIX.—The Bark.

Synonyms.—Ἰτέα, *Gr.;* Corteccia di salcio, *Ital.;* Corteza de sauce, *Span.;* Weider, *Ger.;* Ecorce de saule, *Fr.;* Willow, *Eng.*

History.—Dioscorides mentions Ἰτέα, which is our willow, as an astringent, employed by the ancients. We have no account, however, of its use as a medicine in more modern times, until 1763, when it was brought into notice as a remedy for *ague*, by the Rev. Mr. Stone, who published a paper on the subject (*Phil. Trans.* vol. liii., p. 195). Some of the

species of salix have been made officinal in all the Pharmacopœias.

BOTANY.—*Sex. Syst.*—Diœcia Dyandria. *Nat. Ord.*—Saliaceæ.

Gen. Char. SALIX.—MALE.—*Amentum* cylindrical. *Calyx* a scale. *Corolla* none. *Glands* of the base nectiferous. FEMALE.—*Amentum* cylindrical. *Calyx* a scale. *Corolla* none. *Style* two-cleft. *Capsule* two-celled, two-valved. *Seeds* downy. —*Willd.*

Spec. Char. The salix genus affords rising of a hundred species, most of which are medicinal, and possess analogous therapeutic virtues. Yet only three of them are officinal, the *S. Alba*, *S. Ceprea*, and *S. Fragilis*.

1. S. RUSSELLIANA: *Bedford Willow.*—*Leaves* glaubous, lanceolate, tapering at each end, serrate on whole margin, very pale beneath; petioles glandular or margined. *Stipules* semi-cordate, serrate, acuminate. *Ovaries* pedicelate, glabrous, longer than the scales. *Styles* as long as the bifid stigmas. *Scales* narrow, lanceolate, slightly ciliate. A large tree, native of Britain, but common with us. The tree is set as a shade and ornamental tree in yards and outlots. It has long and thrifty shoots, with bright green or yellow smooth bark. Grows rapidly.

2. S. ALBA: *White Willow.*—This is the common European or White Willow, a *tree* twenty-five or thirty feet in hight, with numerous round, spreading branches, the younger of which are silky. The *bark* of the trunk is cracked and brown, that of the smaller branches, smooth and greenish. The *leaves* are alternate, upon short petioles, lanceolate, pointed, acutely serrate, with the lower serratures glandular, pubescent on both sides, and silky beneath. There are no stipules. The *flowers* appear at the same time with the leaves. The *amenta* are terminal, cylindrical, and elongated, with elliptical, lanceolate, brown, pubescent scales. The *stamens* are two in number, yellow, and somewhat longer than the scales; the *style* is short; the *stigmas* two-parted and thick. The *capsule* is nearly sessile, ovate and smooth. Introduced and common in Massachusetts.

S. NIGRA.

3. S. NIGRA.—*Leaves* lanceolate, acute at both ends, serrulate, same color both sides, glabrous; *petioles* and *midribs* downy above; *stipules* contracted, toothed; *aments* flowering at leafing time, erect, cylindric,

villose; *scales* oblong, very villose, *filaments* three to five bearded at the base; *germs* pedicelled, ovate, glabrous; *stem* very short; *stigma* two-cleft.—*Eaton.*

Indigenous, grows on streams and wet places. The engraving on the preceding page represents a cut branchlet of it.

4. S. Fuscata: *Sooty Willow.*—*Leaves* lanceolate, glabrous. *Aments* precede leafing, nodding. *Scales* obtuse. *Germs* short, pedicelled, ovate, silky. *Stigma* sessile, two-lobed. Grows in Pennsylvania.

5. S. Babylonica: *Weeping Willow.*—A well-known ornamental willow. A large tree. *Branches* pendulous, very long and slender. *Leaves* lanceolate, acuminate, smooth, glaucous beneath. *Stipules* roundish, oblique, acuminate. *Ovaries* sessile.*

6. Salix Cordata: *Heart-leaved Willow.*—*Leaves* oblong, lanceolate, cordate at base. *Stipules* large. *Aments* woolly, black. Grows six to ten feet high; branches green and smooth; found in wet places in Middle and Western States.

7. S. Longifolia: *Long-leaved Willow.*—A dwarfish willow with long leaves. Grows on banks of streams in Ohio, Pennsylvania, and most of the Middle States.

8. S. Angustata: *Narrow-leaved Heart Willow.*—An osier, with long leaves, long slender twigs, and erect aments. Grows on streams in Middle and Western States.

9. S. Eriocephala: *Woolly-Headed Swamp Willow.*—A small tree. *Branchlets* very pubescent, brown or purplish. *Leaves* lanceo-elliptical. *Aments* large, very woolly, appear in April.

10. S. Discolor: *Two-colored Bog Willow.*—A small tree eight to ten feet high. *Leaves* oblong, glabrous above. *Aments* cotemporary with the leaves, oblong, downy, the scales white and glossy, contrasting with the brown or dark twigs. Grows in swamps. Its roots are red.

11. S. Virminalis: *Basket Willow.*—An introduced species, cultivated for the use of its long, slender, flexible shoots, in making baskets, etc.

12. S. Conifera: *Cone-gall Willow.*—An indigenous species, also called *Rose Willow.* *Leaves* lance-oblong, remotely serrate, acute, glabrous above, flat and downy beneath, the first year's growth glabrous. *Stipules* lunate, subdentate. *Aments* precede the leafing. *Scales* lanceolate, obtuse, villose. *Germs* pedicelled, lanceolate, silky. *Style* two-cleft. *Stigma* two-lobed. Known by its scaly, conical excrescences or *galls*, which are the consequence of injuries from the stings of insects.

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* Linnæus named this species in reference to the pathetic allusion to it by the Psalmist (Ps. 137).

"By the rivers of *Babylon* there we sat down;
Yea, we wept when we remembered Zion.
We hanged our harps upon the *Willows* in the midst thereof."

13. S. Fragilis: *Crack Willow.*—*Leaves* ovate-lanceolate, pointed, serrated throughout, very smooth. *Footstalks* glandular. *Germen* ovate, abrupt, nearly sessile, smooth. *Scales* oblong, about equal to the stamens and pistils. *Stigmas* cloven, longer than the style.—*Smith.* An European species, grows sixty to eighty feet high.

14. S. Caprea: *Great Round-leaved Willow.*—*Stem* erect. *Leaves* roundish-ovate, pointed, serrated, waved; pale and downy beneath. *Stipules* somewhat crescent-shaped. *Catkins* oval. *Germen* stalked, ovate, silky. *Stigmas* nearly sessile, undivided. *Capsules* swelling.—*Smith.* An European species.

There are many other European and American species that might here be described if there were space, all of which are possessed of analogous properties. It has not yet been satisfactorily determined which of all the different species of the salix is the most valuable in a medicinal point of view. But as the tonic power is that for which it is chiefly esteemed, the bitterness of the barks will be a good criterion to judge by. The *salix nigra*, or black willow, which is very common in this country, growing in wet places, and bottom-lands, along our rivers, is considered, if not the best, at least, not inferior to any other.

Therapeutic Properties and Use.—The willow-bark has long been of reputable character as a tonic and astringent. Several of the species have been made officinal. The bark of the *S. Caprea* was officinal in the Ed. Phar.; that of the *S. Alba* in the U. S., and that of *S. Alba*, *S. Fragalis* and *S. Caprea* in the Dub. Pharmacopœia. All the species, however, as already intimated, are supposed to be tonic, and have, perhaps, nearly equal merit. The bark is also antiseptic, as are most of the barks that have bitter and astringent properties.

The most important application of the bark of the willow is as a tonic in remittent and intermittent fever, where it has given good satisfaction. But the dose necessary to insure its good effects is too large to admit its use in substance. The alcoholic extract and the salicin, therefore, are the forms of its present employment.

Analysis.—Among the constituents of willow bark are *tannin*, *resin*, *a yellow bitter coloring matter*, *a green fatty matter*, *gum*,

wax, lignin, a peculiar crystalline principle (*salicin*), and *an acid* combined with magnesia.

PHARMACEUTIC PREPARATIONS.—EXTRACTUM SALICI ALCOHOLICUM: *Alcoholic Extract of Willow.*—This is made by simply evaporating the saturated tincture of the willow-bark to the proper consistence.

Use.—A very superior tonic and febrifuge. *Dose*, gr. v. —gr. xv.

SALICIN.

PREPARATION.—Various methods have been pursued for obtaining this principle both from the willow and the poplar barks. The plans have generally been to procure a strong decoction of the bark, and then adding solutions of acetate of lead, or sulphate of zinc, to precipitate the tannin, gum, and extractive; boiling in animal charcoal for discoloring; filtering, and then evaporating to a point where crystallization of the salicin takes place.

The process of Merck is to treat a boiling concentrated decoction of the bark with litharge, until it becomes nearly colorless. By this means gum, tannin, and extractive matter, which would impede the crystallization of the salicin, are removed from the solution; but a portion of the oxide is taken up, probably, in combination with the salicin. This he separates, by adding first sulphuric acid, and then sulphuret of barium, when, after filtering, the liquor is evaporated. The salicin is deposited, and may be purified by repeated solution and crystallization.

Another process is given by Erdmann: One pound of the bark is to be macerated for twenty-four hours in four quarts of water, mixed with two ounces of lime, and the whole is then to be boiled for half an hour. The process is to be repeated with the residue. The decoctions having been mixed, and allowed to become clear by subsidence, the liquor is poured off, concentrated to a quart, then digested with eight ounces of ivory-black, filtered, and evaporated to dryness. The extract is exhausted by spirit containing twenty-eight per cent. of alcohol, and the tincture evaporated so that the salicin may crystallize. This is purified by dissolving again, treating with ivory-black, and crystallizing. From two to three hundred grains of salicin may be obtained from a pound of the bark.

The dose of salicin is about the same as that of quinine, from gr. v.—gr. xx. That of the extract is from gr. x.—gr. xxx. The decoction is taken in portions of f℥j—f℥iij. It is not conveniently taken in substance, as the dose required is too great, being from ʒj—ʒiij.

Salicin is now becoming a popular tonic with the profession generally. It is much employed as a substitute for the salts of cinchona. It is, however, most certainly inferior to quinine, in its use as an anti-intermittent. But its combination with that article, affords a very effective agency in all periodic forms of disease.

EUONYMUS.—The Bark.

SYNONYMS. Wa-hoo, *Ind.*; Burning Bush, Spindle Tree, etc., *Vul.*

HISTORY.—The *Wa-hoo*, as it is generally called, in the country, is said to have been a popular remedy among the Indians, as well as among the whites of certain early settlements in the Mississippi valley. It has also been the subject of much quackery among some empirics, or *Indian Doctors*, as they call themselves. The Euonymus Atropurpureus was shown the author, as being the true Wa-hoo, by an Herbalist, in 1834, on one of the northern tributaries of the Ohio river. This gentleman said that he had obtained his knowledge of it from the Indians, who, he stated, used it as a certain remedy for ague.

The term *Wa-hoo* seems now to be applied indiscriminately to two different species of the Euonymus, by our country practitioners.

BOTANY.—*Sex Syst.*—Pentandria Monogynia. *Nat. Ord.*—Celastraceæ.

Gen. Char. EUONYMUS.—*Calyx* flat, from four to six, generally five, sepals united. *Corolla* flat, inserted on the outer margin of the glandular disk. *Stamens* five, short. *Capsule* colored, five-angled, five-celled, five-valved. *Seeds* ariled.

Spec. Char. There are three species of Euonymus, all of which are admired for their beauty. Two are wild American species, and one is European.

1. EUONYMUS ATROPURPUREUS.—A smooth *shrub*, about four to ten feet high, and considerably branched. *Branches* smooth. *Leaves* elliptic-lanceolate, acuminate, finely serrate, puberulant beneath, from two to three inches long. *Peduncles* divericate, many-flowered. *Flowers* usually in cymes of three to six. *Corolla* dark purple, about two and a half lines in diameter.

Capsule smooth, of a crimson color. *Seeds* covered with a bright red aril. *Spindle-tree.* Flowers in June. Seeds ripen late in the fall. Grows in woods and thickets, in river-bottoms, in the Western States.

2. EUONYMUS AMERICANUS. — A *shrub* of rather smaller size than the preceding. *Branches* smooth, four-angled. *Leaves* subsessile, lance-oval, acute at apex, serrate, smooth, from one to two inches long, one-third as wide. *Peduncles* long, round, two, three or four flowered. *Flowers* a little larger than those of the preceding species, yellow or pink colored. *Capsule* dark, red, warty. *Seeds* covered with a bright-red aril.—*Burning Bush.* Flowers in June. Berries ripen late in the fall. Grows in similar situations to those of the above.

MEDICAL PROPERTIES AND USE. — The bark of the root of either of the species just described, possesses a peculiar bitterness that is very permanently tonic, and somewhat anti-intermittent. The author has made some trials of it, in which the results were rather in favor of its character, as an anti-periodic. He has not been able, from his own observations, to judge of the comparative value of the two species here described, as the power of the latter has not been so much investigated by him. They are probably very nearly alike in their medical properties. They both possess, in addition to their tonic virtues, a laxative power, which makes them very valuable in the treatment of constipation in dyspeptic complaints.

The euonymus, under its Indian name, *Wa-hoo*, was much employed by the natives, and some of the earlier white settlers, who obtained a knowledge of its virtues from them. They prepared it in strong decoction, and sometimes in whisky tincture, and took it for the cure of ague, and for general debility and loss of appetite.

The medicine is useful in the cases indicated by its employment by the natives; but taken alone, requires too large a dose for the cure of ague, even in the concentrated forms of its preparation, and ought therefore to have combined or prescribed with it a small proportion of quinine.

Dropsies and chronic hepatitis are diseases in which the medicine has been found useful.

The dose of the powder is gr. xx.—ʒj., often repeated.

PHARMACEUTIC PREPARATIONS.—TINCTURA EUONYMI: *Tincture of Euonymus.* ℞ Cort. Euonymus, in coarse powder, ℥iv.; Alcohol, Oij. Digest seven days, and filter.

Action — Use.—Tonic and antiperiodic, useful in intermittent and remittent fever, dyspepsia, and general debility. Dose, fʒij.—fʒiv.

EXTRACTUM EUONYMI: *Extract of Euonymus.*—℞ Euonymus, ℔iv.; Alcohol, Cijss.; Aq., Ciij. Digest in the alcohol, at a temperature a little below the boiling point, for four hours; or keep in a warm place for a week; strain through calico, and distil to one pint. Boil the bark in water for four hours over a slow fire; strain and evaporate to one pint. Mix the liquors, and evaporate by means of a water-bath, to the proper consistence.

Action—Use.—Same as the bark or tincture. Dose, gr. x., as a common tonic.

EXTRACTUM EUONYMI ALCOHOLICUM: *Alcoholic Extract of Euonymus.*—This extract is obtained by simply evaporating the alcoholic tincture of the root-bark to the proper, or desired consistence. Some practitioners prefer it in a fluid, and others in a more solid state. The alcohol can be saved for the same use again, if it is distilled instead of being simply evaporated.

When the extract, or any other form of the use of the euonymus is employed as an anti-intermittent, it is best combined with a small proportion of quinine, as it is not sufficiently certain to be relied upon alone in its prescription against intermittents.

Dose.—The dose of the alcoholic extract, as a common tonic, is gr. v. In its prescription for ague, however, it is to be given in larger quantities, as gr. x.—gr. xx., combined with gr. iij.—gr. v. of quinine, given three times a day. It is of about twice the power of the extract above.

EUONYMIN.—When the alcoholic extract of euonymus is thoroughly washed with cold water, a resinous principle will remain when the extractive and other principles of the extract, soluble in water, are thus removed. This is a dry substance, not, however, easily kept in the powdered form. It is intensely bitter, of a light-brown or greyish color, and pos-

sesses the peculiar taste of the bark of the root. It requires much less of this to the dose than of any of the extracts.

Keith & Co. advertise an alkaloid principle, obtained from the euonymus, under this name; and the author is informed that they now combine their alkaloid principle with the resinoid, and say that it very much improves it. The dose is gr. iij.

LUPULIN.

Lupulin is a secretion produced by the scales of the strobil of the hop-vine. To obtain it, the *hops* (strobiles) are to be rubbed or threshed, when the dust may be sifted out; this consists of the lupulin, and also small fragments of the scales of the strobiles, which can not well be separated from the lupulin. This latter principle is produced in quite a large proportion with the hop, being from one-sixth to one-tenth of their aggregate weight. The lupulin may be obtained more pure by shaking it out of the hops, instead of rubbing or threshing.

Physical Properties.—Lupulin is a coarse yellow powder, and as found in market, is mixed with fragments of the scales of the hops, and presents thus the appearance of a mixture of two substances of different shades of colors. It has the peculiar aroma of the hops, and their bitter taste. When moderately heated, it becomes adhesive, and is inflammable. It consists of *volatile oil*, *tannin*, *extractive*, *a peculiar principle* (*lupulite*), *resin*, *wax*, and *lignin*. Boiling water, and alcohol take into solution the medical properties. By distillation with water, the volatile oil is obtained. It is tonic, nervine, and narcotic.

Medical Properties and Use.—The lupulin is now conceded to be a tonic of the anti-intermittent order. It is proven, in practice, to have the power to arrest ague, and has also been found of considerable utility in remittent, typhoid, and even yellow fever. It is also sedative, nervine, and somewhat narcotic.

Within a few years, it has acquired no small reputation for certain special uses. Its sedative powers have been found to be of very special effect in cases of morbid genital irritation.

In 1849, Dr. W. P. Page, of Philadelphia, presented to the College of Physicians, in that city, a statement of some facts he had discovered in this connection. In Europe, also, Debout and Zambaco brought its claim, as a special sedative to the genitals, into notice. (See *Lond. Med. Times and Gazette*, Feb., 1855, p. 118.) Painful erections, and excessive venereal desire, are as shown by these accounts, relieved by the liberal use of lupuline. The necessity of large doses — as five, ten, or even fifteen scruples — to be remembered; for if the medicine is given in the ordinary doses, the practitioner will be sure to be disappointed.

Late experience has proven, that though the lupulin is narcotic in some degree, still its power over the brain is not so great as to endanger the nervous system, in quantities as large as above spoken of. The dose, as a common tonic, is gr. x.

Prof. L. Bankston, of the Macon College, Ga., has introduced a nervine compound, in which the lupulin is an ingredient. This compound is a good nervine tonic, composed of articles which have been long in acceptable use in similar combinations.

PIPERINE.

This is an alkaloid principle obtained from the Piper Nigrum, and has had quite a reputation as an anti-intermittent. Several late writers still place it among their most efficient agents of this order; but there are many practitioners who have lost confidence in its power, in this use. The dose is gr. x.—gr. xx.

ILEX.—The Leaves.

Synonyms.—Holly, Evergreen Holly, *Eng.*

Botany.—*Sex. Syst.*—Tetrandria Tetragynia. *Nat. Ord.*—Ilicineæ (sub-order of Rhamni).

Gen. Char. Ilex.—*Calyx* minute, four-toothed. *Corolla* four-parted, wheel-form.

Spec. Char. There are several species of Holly that are considered of equal merits, in a medical sense. The species agree in being shrubby trees, and mostly evergreen.

The I. AQUIFOLIA is an European species, and has been in considerable favor in France for the use of its leaves, in the cure of ague. The viscid juice of the inner bark of this tree constitutes the *bird-lime*.

I. OPACA.—This is the species commonly called *American Holly*. It is an evergreen tree of small size; has hard, stiff, spinous, glaucous leaves, and small red berries, of a bitter taste. It grows in the Atlantic and Middle States, in rocky and mountainous districts.

I. PARAGUAIENSIS.—This is a species of Holly growing in South America, and the leaves of which constitute the famous *Paraguay Tea*.

I. VOMITORIA—A species of Holly growing in the South-Sea Islands. Its leaves are employed as an emetic, and are much esteemed by the natives of some of those islands as a medicine. Its infusion constitutes the famous *black drink* used in the ceremonial etiquette, at the great councils of these islanders. The tree also grows on the coasts of Florida.

The bark of the branches of the indigenous species of the holly, will also form the glutinous principle called *bird-lime*, by boiling it in water.

MEDICAL PROPERTIES—USE.—The decoction of the leaves of the holly has been employed by various nations, as an anti-intermittent, who have not been in correspondence with each other on the subject, and it is hence very evident that the medicine has merit in this use. As above indicated, the leaves of the European species were employed in France with success. In our country, the I. OPACA affords the medical product. The leaves, and also the berries are used. They are tonic, emetic, and purgative. The latter are more nauseant and emetic, and are hence, perhaps, more effectual, if perseveringly used, in preventing the return of the chills. Still, however, the leaves are mostly employed.

A peculiar principle, called *Ilicin*, is found in the leaves, which is proposed as the active principle. The dose of the powdered leaves is ʒj., three times a day.

Order II.---AROMATIC TONICS.

This order is intended to comprise those articles among the vegetable bitters, which possess an aromatic taste, and flavor, and which are hence, more agreeable both to the taste and the

stomach. This is a circumstance much in their favor, as it is well known that most of our vegetable tonics are very disagreeable to the taste, and indeed, quite *repulsive* to many persons. Tonics, sometimes require to be long continued, and thus the individual taking them often gets a dislike to them, even when at first they may not have seemed the least disagreeable. In such cases, the *aromatic* tonics are the least objectionable. A change, therefore, from the use of the common bitters to that of this order, is always agreeable, when the former have been long employed.

The aromatic properties of tonics, also contribute to their medical virtues. They render them more stimulant, and make them more susceptible of being taken in larger quantities than the stomach will bear of the common bitters.

CASCARILLA.—The Bark.

Synonyms.—Croton Eleutheria, U. S.; Croton Cascarilla: Cascarillrinde, *Ger.*; Cascarille, *Fr.*; Cascariglia, *Ital.*; Chacarilla, *Span.*; Cascarilla, *English.*

Botany.—*Sex. Syst.*—Monœcia Monadelphia. *Nat. Ord.*—Euphorbiaceæ.

Gen. Char. Croton.—Male.—*Calyx* cylindrical, five-toothed. *Corolla* five-petaled. *Stamens* ten to fifteen. Female.—*Calyx* many-leaved. *Corolla* none. *Styles* three, bifid. *Capsule* three-celled. *Seed* one.—*Willd.*

Spec. Char. Croton Eleutheria.—A small tree. *Branches* and *twigs* angular, rather compressed, striated, downy, ferruginous. *Leaves* stalked, alternate, ovate, with a short but obtuse point, green on the upper surface, silvery and densely downy beneath. *Flowers* monœcious. *Racemes* axillary and terminal, branched. *Males* uppermost and smallest; *females* below, few, and on short stalks. *Filaments* ten to twelve. *Ovary* roundish. *Styles* three, bifid. *Stigmas* obtuse. *Capsule* roundish, minutely warted, about the size of a pea, with three furrows, three cells, and six valves. (*Lindley*). "Grows in thickets of Jamaica, and other West India Islands. This species, bearing the name Eleutheria, from one of the Bahamas, has been proved

by Dr. Lindley, from information and authentic specimens from the Bahamas, to yield the true Cascarilla bark, as had been before stated by Drs. Wright and Woodville. Nees von Esenb. t. 139. St. and Ch. 150."—*Royle.*

DESCRIPTION.—Cascarilla may be confounded not only with Copalchi, but also with gray Cinchona, or Huanuco bark. It consists, however, of thin irregular fragments, two to three, sometimes four inches in length, moderately quilled, a little twisted, or flat, about the thickness of a quill, or that of the little finger, of a grayish color externally, much fissured, covered in many parts with a whitish lichen, the substance of the bark of a brownish color, and its internal face smooth. It is compact, its fracture short, brittle, the powder of a light brown color. It has a weak, though aromatic odor; the taste is bitter, a little acrid, but also spicy.

ANALYSIS.—The bark was recently analyzed by M. Duval, and was found to contain *Albumen*, *Tannin*, a *bitter crystallizable substance* (*Cascaralline*), *Red coloring matter*, *Fatty matter*, with a nauseous smell, *Wax*, *Gum*, *Volatile Oil* with an agreeable smell, *Resin*, *Starch*, *Pectic acid*, *Chloride of Potassium*, *Salts of Lime*, *Woody fiber*. The *Cascarilline* when pure, is white and crystalline in appearance, without odor, has a bitter taste, which, however, is not at first perceptible from its sparing solubility; but it communicates its bitterness to a large quantity of water. It is very soluble in alcohol and ether, and appears to be a non-azotized neutral substance of the nature of Salicine. The properties of the bark, without much doubt, depend chiefly on the *Volatile Oil* and the Cascarilline. Both are taken up by alcohol, and partially by water.

THERAPEUTIC PROPERTIES AND USE.—Cascarilla is an excellent aromatic tonic, which is much used by the German physicians. It was formerly supposed to be antiperiodic in its effects, but it has now lost that character, and is only prescribed as a general tonic. In this country it is not so much used as many other of our native tonics, on account of its being necessarily more expensive. It is generally prescribed in the treatment of dyspepsia, chronic diarrhœa, dysentery, flatulent colic, fever, and all cases of debility, especially of

the digestive organs. The dose is ℈j. to ʒss., of the powder. It may also be conveniently given in infusion, or tincture. These are prepared in the same way as those of other articles of this kind. Its extract is much less aromatic.

MAGNOLIA.—The Bark and Cones.

SYNONYMS. MAGNOLIA GLAUCA; MAGNOLIA, *Eng.*; Cucumber-tree, *Vul.*

BOTANY.—*Sex. Syst.*—Polyandria Polygnia. *Nat. Ord.*—Magnoliaceæ.

Gen. Char. MAGNOLIA.—*Calyx* three-leaved. *Petals* six or more. *Capsules* two-valved, one-seeded, imbricated in a cone. *Seeds* berried, pendulous.—*Bigelow.*

Spec. Char. There are a number of species of this splendid genus that are very much alike in their medical properties. The *M. Glaucu*, *M. Acuminata*, and the *M. Tripetala*, however, are alone much used in practice. The first is a forest tree, common to the eastern sea-coasts, but is found in the Middle States, growing in swamps and morasses. It is a middling sized tree, with a rough bark. The *leaves* are scattered, petiolate, oval, obtuse, entire, glabrous, thick, opaque, yellowish-green on the upper side, and pale glaucous beneath. The *flowers* are large, terminal, cream-colored. The *fruit* is a cone about an inch long, consisting of numerous imbricated cells, each containing a single scarlet seed. All its soft parts, but particularly the flowers and cones of the tree, are exceedingly fragrant, and scent the air for a considerable distance.

The M. Acuminata is a much larger tree, with foliage, flowers, and fruit larger than the above. This tree is more common in the Western States than the former. It is a common forest tree, growing on rich hill-sides and bottoms, along the Alleghanies, and our Western rivers. It is commonly called cucumber tree, from the resemblance of the shape of its fruit to that of this garden product.

The M. Tripetala is a small tree, but has very large leaves and flowers. The former are often as much as eighteen or twenty inches long, by six or eight in width. The flowers are seven or eight inches in diameter, with from four to twelve oval, acute, white petals. It is found in the Middle, Western,

and Southern States. Another species, the *M. Grandiflora*, is a very large forest tree, common in the Southern States. Its leaves are evergreen.

MEDICAL PROPERTIES AND USE.—The bark of the root, and the fruit of all the species, are very excellent aromatic, and slightly stimulant tonics. They were formerly regarded to be anti-intermittent, and, although they have not maintained that character, they are certainly among the most valuable articles of this order. The cones, or *cucumbers*, as they are called, have long been a domestic remedy for dyspepsia. Both the bark and cones have been successfully employed in chronic rheumatism. As a general tonic in fever, especially in remittent and typhus, the magnolia is a very excellent article. In general debility, and in obstinate cases of amenorrhœa, the medicine will also be found to be as effective as any others of this order.

The dose of the recently dried bark, in powder, is from ʒss. to ʒj. A tincture, prepared by macerating the cones and bark in diluted alcohol or brandy, is perhaps the best preparation. The infusion is also used, but is less efficient. The dose of the tincture is from fʒij. to fʒiv. Its extract is inferior in the aromatic property.

COMPTONIA.—The Root and Tops.

SYNONYMS. COMPTONIA ASPLENIFOLIUM, COMPTONIA DULCIFILIX: Streifenfarren, *Ger.*; Comptonien odorant, *Fr.*; Sweet Fern, Fern-bush, Spleenwort-bush, *Eng.*

BOTANY.—*Sex. Syst.*—Monœcia Triandria. *Nat. Ord.*—Amentaceæ.

Gen. Char. COMPTONIA.—MALE.—*Flowers* in long cylindrical catkins. *Scales* one-flowered. *Perigone* two-leaved. *Stamina* three-forked. FEMALE—*Flowers* in globular, inferior catkins. *Scales* one-flowered. *Perigone* six-leaved. *Pistil* one. *Styles* two. *Fruit* ovate, one-seeded.—*Raf.*

Spec. Char. C. ASPLENIFOLIUM.—*Roots* long, horizontal. *Stem* shrubby, from two to five feet high. *Branches* crooked. *Leaves* alternate, sessile, or subsessile, long, narrow, dentate, or sinuate. *Flowers* appear before the leaves, in globular or cylin-

drical catkins. Grows in sandy or rocky places, in poor soil, from New England to Carolina.

Medical Properties and Use.—Sweet fern has long been a domestic remedy. It is a good aromatic, astringent tonic, highly useful in diarrhœa, dysentery, leucorrhœa, rachitis, hœmoptysis, etc. It is a pleasant-tasted article, and can hence be employed for a considerable time before it proves disagreeable to the taste. It is usually taken in the form of a decoction, but for many cases it is more conveniently taken in tincture. The medicine yields its virtues more readily to alcohol than to water.

CANELLA.—The Bark.

Synonyms.—Weisser Zimmt, Canell, *Ger.*; Canelle Blanche, *Fr.*; Canella Blanche, *Ital.*; Canela Blanca, *Span.*; Canella, *Eng.*

History.—The name Canella is supposed to come from Canna, which was at one time applied to the cinnamon, whence the French name Canella. When the present canella was discovered in South America, it was supposed to be the true cinnamon, and called by the name which cinnamon then had. The earliest full, though not the first account, was given by Monardes (*Clus. Exot., p.* 323), who states that in 1540, an expedition was sent by Pizarro to examine the province Cumaco, where this cinnamon was said to be found. It was also long confounded with Winter's Bark, and at one time called Winterania Canella or Spurious Winter's Bark, though both had been clearly distinguished by Sir Hans Sloane in Phil. Trans.

Botany.—*Sex. Syst.*—Dodecandria Monogynia, *Linn. Nat. Ord.*—Meliaceæ, *De Cand;* Canelleæ, *Lind.*

Gen. Char. Canella.—*Calyx* three-lobed. *Petals* five. *Anthers* sixteen, adhering to an urceolate nectary. *Berry* one-celled, with two or four seeds.—*Willd.*

Spec. Char. C. Alba.—*Stem* straight, branched at the top.

The *bark* is whitish, so that the tree is at once distinguished from others in the wood. The *leaves* are petiolate, alternate, but not regularly so; obovate, the younger ones pellucido-punctate, the older smooth, shining, of a thick consistence,

without nerves, very entire and exstipulate. The *flowers* are arranged in terminal corymbs, small, and of a violet color, but seldom open.—*Royle.*

The Canella alba is a tree which is common in many parts of the West India Islands and in South America, frequently found on the sea coasts, where it seldom exceeds twelve or fifteen feet. In the inland forests, however, it attains a more considerable hight. It is propagated chiefly by wild pigeons feeding on its berries. The tree has a straight stem and branched top, and somewhat resembles the pimento tree.

Description.—When collected, the bark, which is the only officinal part, is removed with an iron instrument, and then being deprived of its epidermis, is dried in the shade. It occurs in flat or quilled pieces, according to the part of the tree from which it has been removed, the thinner pieces drying into the quill-form the most readily. (Goebel and K. I. tab. iii. fig. 1–3). It is of a light buff color, pale internally; has an aromatic odor, a warm, pungent taste, and is brittle; when pulverized, makes a yellowish-white powder.

Analysis.—Boiling water takes up some of its virtues, but alcohol only dissolves its aromatic properties, becoming of a bright yellow color. Distilled with water, it affords a reddish-yellow, fragrant, and very acrid essential oil, which is often mixed with, and sometimes sold for oil of cloves. (*Browne.*) Petroz and Robinet also obtained a *resin*, which is aromatic, a *bitter extractive*, a peculiar *saccharine substance*, which will not undergo the vinous fermentation, and which has been called *canellin*, also *albumen*, *gum*, *starch*, *lignin*, and *salts*. It may be distinguished from Winter's Bark by not being precipitated by nitrate of baryta, nor by infusion of galls, nor by sulphate of iron, as it does not contain tannin.

Therapeutic Properties.—A very pleasant aromatic and stimulant tonic, chiefly applicable as an adjuvant to other less pleasant tonics, as well as cathartics. Dose gr. x.—ʒss. of the powder. It enters into various officinal formulas, Pul. Aloës et Canella, Tinc. Gen. Comp. Vin Aloe., Vin. Gen. Vin. Rhei.

AURANTII CORTEX.

Orange-peel is a very agreeable aromatic tonic, and is much used in combination with other less pleasant tonics. It is scarcely possessed of sufficient power to be used alone.

When employed in this way, it may be taken in powder, simply stirred in cold water; or the infusion may be made by macerating half an ounce of the powder in a pint of boiling water. Perhaps the infusion or the tincture are the best forms in which to take the medicine, as the presence of the powder in the stomach is sometimes disagreeable, and has been, indeed, considered pernicious.

The lemon-peel is used in the same way.

WINTERA.—The Bark.

Synonyms.—Wintera Aromatica; Drymis Aromatica; Drymis Winteri; Ecorce de Winter, *Fr.*; Wintersche Rinde, *Ger.*; Corteccia Vinterana, *Ital.*; Corteza Winterana, *Span.*; Winter's Bark, *Eng.*

Botany. *Sex. Syst.*—Polyandria Tetragynia. *Nat. Ord.*—Winteraceæ.

Gen. Char. Wintera.—*Calyx* with two or three deep divisions. *Corolla* with two or three petals.

Spec. Char. W. Aromatica.—An evergreen tree of variable size, but often fifty feet in hight. Bark of the trunk gray; that of the branches green and smooth. *Leaves* alternate, petiolate, oblong, obtuse, entire, smooth. *Flowers* small, solitary; or in clusters of from three to four. Native of the southern parts of South America.

Medical Properties and Use.—The bark, which is brought to us in quills of about a foot in length and an inch in diameter, and which are of a pale yellowish or reddish-gray color, with red elliptical spots, is quite an agreeable aromatic and stimulant tonic, much used in some parts of the world. But not much of it is brought to this country. It was used by Dr. Winter as a cure for scurvy. The dose of the powder is about ʒss.

Among the less aromatic plants are the following:

1. Liriodendron Tulipifera.
2. Aristolochia Serpentaria.
3. Ptelea Trifoliata.
4. Humulus Lupulus.
5. Amygdalus Persica.
6. Contrayerva.
7. Teucrium Chamædrys.
8. Tanacetum.
9. Inula Helenium.
10. Prunus Virginiana.

Order III.---SIMPLE BITTER TONICS.

Under this head may be arranged all the ordinary vegetable bitters, which do not possess any considerable additional virtues to their simple tonic power. The number of articles that properly belong to this order is exceedingly great, as we find that the barks and foliage of most trees, as well as a very large proportion of the herbaceous plants, are more or less tonic. But it would be entirely beyond the proper or designed limits of this work, to make a collection of all the medical substances that are known. In this, as in the other orders, it must suffice to give as many examples as can well be embraced without trespassing too much upon the general design of the work.

The articles of this order are generally admissible in all cases in which tonics are indicated; and although the circumstances in many cases may indicate more particularly the articles of the other orders, yet when they are not convenient, these may be used, with more or less advantage, in all cases in which this class of remedies is indicated. Thus, although the simple bitter tonics do not possess any specific anti-intermittent virtues, yet, by giving tone and support to the general vital force, they may do much in the control even of every variety of periodic disease. They may also be substituted for the aromatic tonics, by combining them with aromatic stimulants.

POPULUS.—The Bark.

SYNONYMS.—Penplier, *Fr.*; Poplar, *Eng.*

BOTANY.—*Sex. Syst.*—Monadelphia Octandria. *Nat. Ord.*—Amentaceæ; Salicineæ.—*Willd.*

Gen. Char. POPULIN.—MALE.—*Ament* cylindrical, loosely imbricated. *Bract* single-flowered, cuneate, lacerated. *Calyx* turbinate, oblique, entire. *Stamens* eight or more, short, capillary. *Anthers* large, drooping, quadrangular. FEMALE.—*Flowers* as in the male. *Ovary* ovate, pointed. *Style* none. *Stigmas* four to eight, subulate. *Capsule* one-celled, with two concave valves. *Seeds* numerous, small, ovate, beset with long wool.

Spec. Char. There are many medical species of Populus which are very similar in the virtues of their barks. The following are some of the most esteemed:

1. POPULUS TREMULOIDES. (*American Aspen*). *Leaves* sub-cordate, obtusely lanceolate, abruptly acuminate, tooth-serrulate, entire, glabrous, somewhat pubescent at the margin, with two glands at the base on the upper side; *petioles* long and slender, giving the leaf a continuous tremulous motion when the air is moving, whence the name, *Quaking Asp.* Grows in most parts of the U. S., in woodlands, on hill-sides, about springs, and often on low grounds. This is the species which is mostly referred to, when "*poplar bark*" is mentioned in medical works. The adjoining cut represents a leaf of the tree, of about one-fourth its natural size.

P. TREMULOIDES.

2. POPULUS BALSAMIFERA. (*Balsam Poplar*). *Leaves* lanceo-elliptical, or ovate-acuminate, entire with close-pressed serratures, white and net-veined beneath. The tree is of middling size, growing from sixty to seventy feet in hight, and about eighteen inches in diameter. The buds which in most of the poplars are resinous and aromatic, in this and the *candicans*, are very *much* so. By boiling them in

P. BALSAMIFERA.

water, the aromatic resin can be separated, as it will become disengaged by the boiling, and will float upon the water, from which it can be collected and filtered while hot. The tree is found in the Northern States and the Canadas. It is not abundant.

P. CANDICANS.

3. POPULUS CANDICANS. (*Balm of Gilead.*) *Leaves* cordate, acuminate, unequally serrate, whitish beneath, sub-three-nerved, net-veined. This is a species of the poplar that is more common, it is set out as a shade and ornamental tree, among us. It is also esteemed for the balsamic scent it imparts to the air, for some distance about it. It is of very rapid growth, and can be propagated from slips. The size of the tree is about that of the poplars generally, forty to fifty feet high, and eighteen to thirty inches in diameter. Like all the species, it is very much branched. The odor of the tree is chiefly observable in the spring time and is dependent upon its resinous buds. The adjoining cut represents the leaf in less than one-fifth the natural size.

P. GRANDIDENTATA.

4. POPULUS GRANDIDENTATA. (*Tree Poplar.*) *Leaves* round, ovate, acute, unequally and coarsely sinuate-toothed, glabrous; in the young state villous; *petioles* compressed. Grows in various parts of the United States, in rich soil, and along river-bottoms.

The poplars are all middling-sized trees, of a beautiful appearance. Some of the species are cultivated as ornamental trees.

MEDICAL PROPERTIES AND USE.—The bark of the poplars is among the purest bitter tonics that we possess. It is less astringent than many of our tonic barks, and is not disagreeable to the taste. The virtues seem to be dependent upon two alkaloids, one of which is peculiar. These are *Populin* and *Salicin*. The process of obtaining the salicin has already been described.

The poplar bark is applicable in all cases in which the simple tonics are indicated, and it may be relied upon as a very efficacious article. It is best taken in the form of extract; but it is much employed by practitioners, in combination with other articles, in the shape of syrups, tinctures and powders. The virtues of the bark are imparted to water, alcohol, and acetic acid. *Dose* of powdered bark, ℈j.—℈ij.

The buds of most of the poplars are highly medicinal, especially those of the P. Balsamifera and P. Candicans. They are stimulant, tonic, and balsamic; useful in some varieties of pectoral disease, rheumatism, etc.

Pharmaceutic Preparation.—EXTRACTUM POPULI: *Extract of Poplar.*—℞ Poplar Bark, ℔iv.; Aq., Ciij.; Acetic Acid, Oj. Boil the bark in the water and acetic acid for four hours; strain and boil down to the consistence of syrup; remove to a water or sand-bath to complete the process.

Action—Use.—An invaluable tonic, applicable in all cases of debility. The *dose* is gr. v. to gr. xx.

Populin.—The populin may be obtained from the solution, when the *salicin* is procured, by saturating the excess of sulphuric acid, after the last-mentioned alkaloid has ceased to crystallize. The populin will gradually precipitate. This is then to be pressed between folds of blotting-paper, and re-dissolved in boiling water; when upon the cooling of the liquid, the populin will be deposited in the crystalline state. The article thus obtained is very light, pearly-white, and of a bitter-sweetish taste, resembling that of licorice. When heated it melts into a colorless and transparent liquid. It is soluble in two thousand parts of cold, and about seventy parts of boiling water. It is also soluble in boiling alcohol and acetic acid. On adding an alkali, it is precipitated unchanged, from its solution in the acid.

Action—Use.—Populin is a pure and agreeable tonic and being of comparatively little expense, is likely to go into use more extensively than it has heretofore been. But there is no necessity for obtaining it in a state separate from the salicin, the medical properties of both are similar. *Dose* gr. x.

LIRIODENDRON.—The Bark.

Synonyms.—Liriodendron Tulipifera; Tulip Tree, *Eng.*; Yellow Poplar *Vul.*

Botany.—*Sex. Syst.*—Polyandria Polygynia. *Nat. Ord.*—Magnoliaceæ.

Gen. Char. LIRIODENDRON. — *Calyx* three-leaved. *Petals* six. *Samaræ* sublanceolate, one or two-seeded, imbricated in a cone.—*Nutt.*

Spec. Char. L. TULIPIFERA.—A forest tree remarkable for beauty and size, growing sometimes to the hight of a hundred feet or more, and occasionally five or seven feet in diameter. The bark is rough and of a grayish color. *Branches* large. *Leaves* on long foot-stalks, alternate, smooth, of a beautiful shining green color, divided into three lobes; the upper or end lobe is truncated at the apex; the side ones are rounded at the base, and usually pointed at the apex. (See cut, Fig. 1.) The larger leaves are of a different shape, not having the lateral sinuses common to the smaller, but instead thereof, have a lateral projection or pointed tooth on each side, about midway between their base and apex. (See cut, Fig. 2.) *Flowers* large, tulipiferous, beautifully variegated, with different colors, the yellow and red predominating. Grows in rich soil throughout the United States, but is most abundant, and attains the greatest magnitude in the Middle and Western States. It flowers in the latter part of May.

Fig. 1.

L. TULIPIFERA.

Fig. 2.

L. TULIPIFERA.

MEDICAL PROPERTIES AND USE.—The bark of this noble tree is tonic stimulant, diaphoretic and anthelmintic. But is chiefly valuable for its tonic virtues. It has been supposed to be antiperiodic, and has been prescribed against ague. But although it has occasionally proved successful in this application, it has failed to establish its claims as a medicine of this

kind. The bark, however, may well be regarded as among our best general tonics, and has been considered especially useful in the treatment of dyspepsia and chronic rheumatism. It deteriorates much by age, and its virtues are also much impaired by boiling. The decoction of this article, therefore, is of comparatively little value. Thus it appears that the virtues consist in a volatile principle. Prof. Emmet, of the University of Virginia, obtained a solid, white, crystallizable, brittle principle, which he called *liriodendrin*, by boiling the alcoholic tincture of the root-bark with magnesia, till it assumes an olive-green color, then filtering, concentrating until the liquid becomes turbid, and then precipitating the liriodendrin, by the addition of cold water. This he supposed to contain the tonic property of the bark. The extract of the bark when made in the ordinary way is almost useless, the properties being destroyed by heat. The dose of the powdered bark is gr. xx.; that of the tincture, f℥iij.

HYDRASTIS CANADENSIS.—The Root.

Synonyms.—Warnera Canadensis, *Miller*; Hydrophyllum, Verum, *Linnæus*; Hydrastis, *Ellis*; Hydraste du Canada, *Fr.*; Canadische Hydrastis, *Ger.*; Gelb Puckuhn, *Vul. Ger.*; Golden Seal, Yellow-Root, etc., *Vul.*; Puccoon, *Indian.*

History.—This valuable plant owes its generic name *hydrastis*, to the industrious botanist, J. Ellis, who in a communication to Linnæus, gave a description of it under this name, and thus induced the latter to adopt it instead of *hydrophyllum*. But it is hard to see the propriety of either of these names, as this is by no means an aquatic plant. It has been known as a medicine for above half a century. The first knowledge of it seems to have been obtained from the aborigines of this country. They, owing to its color, called it *Puccoon*, and used it to dye their garments. It is also said that the Cherokees used it in the cure of cancer. The early settlers of Ohio and Kentucky employed it as a tonic and antiphlogistic in ophthalmia. On the authority of Professor Barton it was introduced into the Dispensatories, but has never yet gained much character among the general profession. The plant is found

plentifully in most of the States west of the Alleghanies, growing in rich, moderately shaded soils.

BOTANY. *Sex. Syst.*—Polyandria Polygynia. *Nat. Ord.*—Multisiliquæ? *Barton;* Ranunculaceæ, *Lindley.*

Gen. Char. HYDRASTIS.—*Calyx* none. *Corolla* three-petaled. *Filaments* numerous, linear, compressed, a little shorter than the corolla. *Anthers* compressed, obtuse. *Germens* numerous, ovate, formed into an ovate head. *Styles* very short. *Stigmas* broadish, compressed. *Pericarp* an oblong berry, composed of oblong grains with solitary seeds.

Spec. Char. H. CANADENSIS.—*Root* perennial, horizontal, tortuous, with long fibers, which, as well as the caudex, are of a beautiful golden yellow color, and extremely bitter taste. *Stem* upright, slightly pubescent, from eight to ten or more inches in hight, about a line or more in diameter, divided into two nearly equal *branches* above, each bearing a *leaf*, the first or lowermost of which has generally five lobes, the upper three. They at first are comparatively small and shriveled, but as the season advances they spread out, and in shape much resemble the maple leaf. They are unequally serrate, have rather a rough surface, and are of a yellowish-green color. The *flower*, which is of a white or pale rose-color, appears early in the spring, but its petals are frugacious, and hence the perfect flower is seldom seen. Its situation

H. CANADENSIS.

is on a peduncle about three-fourths of an inch in length, arising from the petiole through the fissure of the smaller leaf. The fruit is of about the size of a raspberry, of a red color, and consists of a compound berry, having a number of muricated acini.

ANALYSIS.—Hydrastis contains a *volatile oil*, *extractive*, *amarine*, several *salts*, and a *peculiar principle* (*hydrastin*), of a yellow color. It yields its virtues to water and spirit.

THERAPEUTIC PROPERTIES AND USE.—A valuable acrid tonic, useful both for topical and general application. As a general tonic, it is available in remittent and typhus fever, erysipelas, and general debility. In its topical application, it is highly serviceable in cases of chronic inflammation of the eyes and other mucous tissues, leucorrhœa, blenorrhœa, aptha, etc. It has also been found serviceable when applied to ulcers and cancers. The medicine, however, is much less pleasant to the taste than many other articles of this class. It may be given in powder, decoction, infusion, syrup, or extract. The latter form is best, as it is more conveniently taken in this way.

PHARMACEUTIC PREPARATIONS. — EXTRACTUM HYDRASTIS: *Extract of Hydrastis.*—Obtain a saturated alcoholic tincture of the powdered root; strain, and evaporate to the proper consistence, being careful not to burn it. To avoid the latter, the process should be completed by means of a water or sand-bath. Dose, gr. v.—gr. x.

This is the best or strongest preparation yet made of the hydrastis—at least it contains, in the fullest degree, the virtues of the root.

HYDRASTIN.—Various preparations, in powder and crystalline form, have been offered to the profession, under the name of *Hydrastin*, and *Hydrastine*. But, so far as the experience of the author goes (and he has had considerable), there is as yet a doubt whether the full power of the root of this very valuable plant can be brought into any concentrated form other than that of its *soft resin*. The powdered preparation which has been called *Hydrastin*, and which consists of the alcoholic extract, in a state of dryness produced by the continued application of heat until a partial chemical decomposition has taken

place, and the hydrogen, a constituent of the resin, has been driven off by the excess of heat. A carbonaceous residuum is thus obtained, containing still a part of the virtues of the root, which is seldom of a strength above that of the powdered root.

The powder precipitated from an aqueous infusion of the root, by means of muriatic acid, and called Hydrastine, is a muriate of hydrastin, and possesses some tonic power, but it is inferior to the soft resin above described. The author is informed that Keith & Co., of New York, prepare an article from the hydrastis, by the combination of three several principles, *i. e.*, an alkaloid, resinoid, and simple resin — all first separately obtained; and they praise it much.

JEFFERSONIA.—The Root.

Synonyms.—Jeffersonia Bartoni; Jeffersonia Diphyllum: Jeffersone, *Fr.*; Twin-leaf, Helmet-pod, Yellow-root, *Eng.*

Botany.— *Sex Syst.* — Octandria Monogynia. *Nat. Order.*— Berberides.

Gen. Char. Jeffersonia. — *Calyx* four-leaved, caducous. *Petals* eight. *Stamens* eight opposite the petals. *Stigma* sessile. *Leaves* all radical, binate, on long petioles. *Scape* one-flowered.

Spec. Char. Three analogous species are now described that were introduced to notice by Rafinesque: these are — the J. Bartoni, J. Odorata, and J. Lobata. They have a large, fibrous, yellow, perennial root. *Leaves* radical, on long petioles, binate, lobes ovate, lanceolate, smooth. *Scapes* naked, erect, bearing a single white flower. *Pod* coriaceous, covered with a helmet-like lid. Grows abundantly in many parts of Ohio and Western States, in rich soil, or river-bottoms.

Medical Properties and Use.—Jeffersonia is an acrid tonic, very similar to the Hydrastis, and may be substituted for it, in most, if not all the uses of that important article. Its pharmaceutic preparations are the same, and given severally, in equal doses with those of Hydrastis.

GENTIANA.—The Root.

SYNONYMS.—GENTIANA LUTEA; Enzian, *Ger.;* Genziana, *Ital.;* Genciana, *Span.;* Gentiane, *Fr.;* Gentian, *Eng.*

BOTANY.—*Sex. Syst.*—Pentandria Digynia. *Nat. Ord.*—Gentianaceæ.

Gen. Char. GENTIANA.—*Corolla* one-petaled. *Capsule* two-valved, one-celled, with two longitudinal receptacles.—*Willd.*

Spec. Char. G. LUTEA.—The Gentian genus furnishes but one species that has, as yet, gained much character in a therapeutic point of view; but this is a very popular article of the Materia Medica. It is the *G. Lutea*, a native of Europe. The *G. Catesbæi*, an indigenous plant, is however perhaps, equally good.

The following description is given of the G. Lutea, by Royle:

Root thick, perpendicular, often forked, brown externally, yellowish within. *Stem* straight, two or three feet in hight. *Radical leaves* ovate-oblong, five-nerved; *stem leaves* sessile, ovate-acute; those supporting the flowers cordate, amplexicaul, concave, all of a pale glaucous-green color. *Flowers* in an uninterrupted spike of whorls, large, of a brilliant yellow. *Calyx* membranous, spath-like, three or four cleft. *Corolla* rotate, with five or six green glands at the base, five or six parted, divided usually into five acute veiny lobes. *Stamens* five; *anthers* straight, subulate. *Style* wanting. *Stigmas* two, revolute. *Ovary* and *capsule* fusiform, one-celled. *Seeds* roundish, compressed, with a membranous border. A native of the Alps, Appenines, and Pyrenees, and other mountains of Europe.—(*Esenb. and Eberm.*, 199; *St. and Ch.*, 132.)

DESCRIPTION.—The gentian root, as brought to us, varies in dimensions, but is usually about the thickness of the thumb, and several inches in length, often a little twisted and wrinkled. It is of a brownish color externally, yellowish within, rather soft, but tough. The odor is feeble, but the taste at first slightly sweet, then of an intense but pure bitter. Its virtues are imparted readily to water, spirit, wine, and ether.

ANALYSIS.—The roots contain *bitter extractive matter*, *gum*,

uncrystallizable sugar, *caoutchouc? concrete oil*, *yellow coloring matter*, with a trace of *volatile oil*, and an *acid* which has been called *gentisic*, which in its impure state, was supposed to be the active principle, but, when quite pure, is colorless, and in tasteless, feebly acid crystals. Owing to the presence of sugar and gum, the infusion of gentian ferments with yeast, and yields a bitter distilled spirit, prized by the Swiss and Tyrolese as a stomachic.

THERAPEUTIC PROPERTIES AND USE.—Gentian is one of our best tonics, and is much in use among old-school practitioners, who have not yet much knowledge of our many indigenous articles of this class. The medicine may be regarded as admitting of an application as general as that of any other tonic that we possess. It may be given in substance, but it is most usually prescribed in some other form. The *dose* of the powder is from gr. x.—gr. xxx.

PHARMACEUTIC PREPARATIONS.—**INFUSUM GENTIANÆ (E.) COMPOSITUM**, L. D. (U. S.): *Compound Infusion of Gentian.* ℞ Macerate for one hour, in a lightly covered vessel, sliced Gentian (℥ss. E., U. S.), dried (and bruised Seville, E.) Orange Peel, āā. ʒij., (ʒj. E. D., U. S., Coriander bruised, ʒj., E., U. S.), fresh Lemon Peel, ʒiv., L. (ʒj., D.) in boiling Aq. dest., Oj., L. (℥xij. D.); strain. (Take the solids and pour on them Proof-spirits, f℥iv.; after three hours add cold Water, f℥xvj., and in twelve hours more strain through linen or calico, E., U. S.).

Action—Use.—Aromatic tonic. Useful in dyspepsia, etc., and as a vehicle for acids, etc., in doses of f℥jss.

MISTURA GENTIANÆ COMPOSITA, L.: *Compound Gentian Mixture.* Mix Compound Infusion of Gentian, f℥xij., Compound Infusion of Senna, f℥vj., and Compound Tincture of Cardamoms, f℥ij.

Action—Use.—Aperient and tonic. Useful combination for extemporaneous use in doses of f℥jss. two or three times a day.

TINCTURA GENTIANÆ COMPOSITA, L. E. D. (U. S.). *Compound Tincture of Gentian.*—Macerate for fourteen (seven E.) days *sliced* (and bruised, D.) *Gentian*, ℥iiss. (℥ij. D. U. S.), *dried* (bruised bitter, E.) *Orange Peel*, ʒx. (℥j. D. U. S.), *bruised Cardamoms*, ʒv. L. (℥ss. D. U. S.), (Canella, finely powdered, ℥vj. Cochineal, bruised, ʒss. E.), in *Proof-spirit*, Oij. (by measure ℔ij. D.); strain. *Diluted Alcohol*, Oij., U. S.). Express strongly

and filter. Or, more conveniently prepare by percolation, as Comp. Tinc. Cardamom, E.

Action — Use.—Tonic, stomachic. Adjunct to bitter infusions in doses of f℥j.—f℥ij.

EXTRACTUM GENTIANÆ, L. E. D. (U. S.). *Extract of Gentian.*—Prepare with Gentian Root and eight times its weight of Water, as other simple extracts, D. Take sliced (finely powdered, q. s. E.) Gentian, ℔ijss. and macerate it (mix thoroughly) with boiling Aq. Dest., Cij. (half its weight of Aq. Dest. E.) for twenty-four (twelve, E.) hours. (Put it into the percolator, and exhaust it with temperate Aq. Dest. E.) Boil down to Cj. (concentrate E.), and while hot (before it gets too thick, E.), filter. Evaporate to a due consistence (in the vapor bath. E.).

Action — Use.—Tonic in doses of gr. v.—℈j. in pills, often with other remedies. "The Extract made from the Infusion is considered superior to that made from the Decoction : but that made according to the E. P. is still finer."

VINUM GENTIANÆ COMPOSITUM, E. *Compound Wine of Gentian.*—Digest Gentian, ℥iv., Yellow Cinchona Bark, ℥j., also Bitter Orange Peel, ℥ij., Canella, ʒj., all coarsely powdered, in Proof-spirit, f℥ivss., for twenty-four hours, then add Sherry Wine, f℥xxxvj., and digest for seven days. Strain, and express the residue strongly, and filter the liquor.

Action — Use.—A good Stomachic in doses of f℥iv.—f℥j.

FRASERA.—The Root.

SYNONYMS.—FRASERA CAROLINENSIS; FRASERA WALTERI; FRASERA VERTICILLATA: American Columbo, *Eng.*

BOTANY.—*Sex. Syst.*—Tetrandria Monogynia. *Nat. Ord.*—Gentianaceæ.

Gen. Char. FRASERA.—*Calyx* deeply four-parted. *Corolla* four-parted, spreading; segments oval, with a bearded orbicular gland in the middle of each. *Capsule* compressed, partly marginated, one-celled. *Seeds* few, imbricated, large, elliptical, with a membranous margin.—*Nutt.*

Spec. Char. F. CAROLINENSIS.—The Frasera is one of the most gaudy among all our wild plants, adorning our plains with its beautiful foliage and flowers. The *root* is triennial, large, long, spindle-shaped, fleshy, solid, smooth, and of a

yellow color. The *stem* is large, upright, terete, simple, smooth, and about five, but sometimes ten feet in hight. The *leaves* are radical and cauline, sessile, entire, glabrous, disposed in whorls at intervals of six inches; whorls smaller successively as they ascend. The *flowers* are numerous, of a yellowish-white color, and disposed in a beautiful terminal pyramidical panicle, from one to three, or more, feet long. Its flowering time is from May to July, but it does not bear flowers, nor produce a stalk, until the third year. It grows on plains, and in open woodlands, in most parts of the United States, but is most abundant and luxuriant in the Western States.

F. CAROLINENSIS.

In the accompanying cut, the appearance of the entire plant, at the flowering season, is given. But the form of the root, as here represented, is not the most common form, as it generally sends its roots downward; and instead of its oblong and abrupt appearance, the root will mostly be branched, and have fewer fibers. The small figures represent a branchlet of flowers, and a seed-vessel.

ANALYSIS.—Frasera contains a trace of an *Essential Oil*, *Extractive*, *Amarine*, *Lupuline?* and a *peculiar Principle* (*Fraserine*). It yields its virtues to water and spirit.

THERAPEUTIC PROPERTIES AND USE. — A moderately good tonic, and rather analogous to the gentian in its properties, but it is considered inferior as a tonic to that popular article.

The American Columbo was formerly much used in general practice, and was ranked among the best tonics; but, at the present day, it has lost some of its reputation, as it is supposed to be rather feeble in its power, and not proportioned in this respect, to its bitterness of taste. Nevertheless, the medicine well merits a place among our tonics. When quite fresh, it is somewhat laxative, or even cathartic, in its effects. Although applicable in most cases in which the articles of this order generally are available, it is considered especially serviceable in constipation attended with colicky pains, that is common to some persons, especially pregnant females. The dose of the powder is from gr. xx. to ʒij. It is best taken in the form of an extract.

PHARMACEUTIC PREPARATIONS.—EXTRACTUM FRASERÆ: *Extract of American Columbo.*—This is prepared in the same way as the extract of *Hydrastis*, which see p. 617.

COLOMBA.—The Root.

SYNONYMS.—COLUMBA; COCCULUS PALMATUS; Calumbowurzel, *Ger.*; Colombo, *Fr.*; Columba, *Ital.*; Kalumb, *Hind*, *Mozambique*; Raiz de Columbo, *Span.*; Kalumbo, *Port.*; Columbo, *Eng.*

BOTANY.—*Sex. Syst.* — Diæcia Hexandria. *Nat. Ord.*—Menispermaceæ.

Gen. Char. COCCULUS.—*Sepals* and *Petals* ternate, usually in two, rarely in three rows. *Stamens* six, distinct, opposite the petals. *Drupes* berried, one to six, generally oblique, reniform, somewhat compressed, one-seeded. *Cotyledons* distant.—*De Cand.*

Spec. Char. C. PALMATUS. — The Columba plant has a perennial *root* with several spindle-shaped fleshy tubers, filled with longitudinal fibers, or vessels, which are externally brown, with transverse warts, and internally of a deep yellow

color, devoid of smell, but very bitter. The *stems* are annual, herbaceous and twining, covered with glandular hair, hairy below. *Leaves* alternate, nearly orbicular, cordate at the base, five to seven lobed, lobes entire, wavy on the surface and margin, acuminate, hairy, with long petioles. *Racemes* axillary. *Flowers* small, diœcious, green. *Calyx* of six sepals, in two series, with bracteoles. *Petals* six, obovate half inclosing the six opposite stamens. *Anthers* terminal, two-celled, dehiscing vertically. *Ovaries* three, united at the base. *Drupes* or berries about the size of a hazel-nut, densely clothed with long spreading hairs, tipped with a black, oblong gland. Bot. Mag. t. 2970.71.—*Royle.*

Description.—The Columba, as it comes to us, consists of transverse sections of the root and its lateral tubers, which are flat, circular, about one-fourth to one-half an inch in thickness, and from one-half to two or three inches in diameter. The cortical portion is two or three lines in thickness, covered externally with a dark-colored cuticle; the faces are of a grayish-yellow color. Its interior portion is in concentric rings, easily distinguishable from the cortical, is soft, almost spongy, thinner toward the center, from shrinking there more than in the other portion. The root is brittle, and, therefore, easily pulverized; the powder of a greenish-yellow tinge; its taste is bitter and mucilaginous, with a slightly aromatic odor.

Analysis.—Columba, according to the acknowledged analysis, contains a small quantity of *Essential Oil*, a *peculiar Azotized Substance*, not precipitated by metallic salts, some *Salts of Lime*, and *Potassa*, *Oxide of Iron*, *Silica*, and a *Peculiar Crystallizable Principle* (*Columbin*), in which the bitterness of the root resides.

Therapeutic Properties and Use. — Mild tonic and stomachic. Analogous in its effects to gentian, but more mild. Its application is about the same as that of the latter or frasera. The dose is gr. xx. to ℈ij. of the powder.

Pharmaceutic Preparations. — INFUSUM COLUMBÆ: E. D. (INFUSUM COLUMBÆ, U. S.) *Infusion of Columba.*

Macerate *Columba*, sliced, ʒv. (in coarse powder), ℥ss. E.;

℥ij. D). in boiling *Aq. dest.*, Oj., (℔ss. by measure, D.; cold water E,) for two hours and strain, L. Moisten and percolate till f℥xvj. of infusion are obtained, E. Cold water and percolation remove the bitter principle with less of the starch.

Dose, f℥ss. twice or thrice a day. It soon undergoes decomposition.

TINCTURA COLUMBÆ, L. E. D. (TINCTURA COLUMBÆ, U. S.:) *Tincture of Columba.*

Macerate *Columba* sliced, ℥iij. (℥ijss. D.) in *Proof-spirits*, Oij. (℔ij. D.) for fourteen days and filter. (Digest for seven days, or prepare by percolation in moderately fine powder, which is first to be soaked for six hours, with a little of the spirit, E.)

Dose, f℥j.—f℥ij. as an adjunct to bitter draughts and mixtures.

COPTIS.—The Root.

Synonyms.—Coptis Trifolia; Goldthread, *Eng.*

Botany.—*Sex. Syst.*—Polyandria Polygynia. *Nat. Ord.*—Ranunculaceæ.

Gen. Char. Coptis.—*Calyx* none. *Petals* five or six, caducous. *Nectaries* five or six, cucullate. *Capsules* five to eight, stipitate, stellately diverging, and rostrate, many-seeded.—*Nutt.*

Spec. Char.—C. Trifolia.—An humble, evergreen plant, resembling the strawberry plant in size and general aspect; it has a perennial, extremely yellow, slender, creeping root. The leaves which are supported on long, slender footstalks, are ternate, with roundish or obovate,

COPTIS TRIFOLIA.

sessile leaflets. The scape or flower-stem, is slender, round, rises above the leaves, bearing one small, white flower, each. An inhabitant of the northern regions of this continent, and of Asia, Greenland and Iceland. It delights in the dark shady swamps, cold morasses, and Alpine regions of New England, and Canada.

THERAPEUTIC PROPERTIES AND USE.—The Coptis is a tonic of some value. It is considerably used in New England, and has become officinal. It may be employed as a general tonic like gentian, frasera, columba, etc. In domestic practice it has been much in use as a remedy in aphtha. It may be administered in powder, infusion, decoction or extract, but is principally used in tincture. The dose of the tincture, made by macerating an ounce of the root in a pint of diluted alcohol, is f℥j.—f℥ij. Its virtues consist in a bitter extractive, readily taken up by boiling or cold water as well as by spirit.

CHELONE.—The Leaves and Tops.

SYNONYMS.—CHELONE GLABRA; Balmony, *Eng.*; Turtle-head, Snake-head, etc., *Vul.*

BOTANY.—*Sex. Syst.*—Didynamia Angiospermia. *Nat. Ord.*—Scrophulariæ.

Gen. Char. *Calyx* five-parted, caliculate by three bracts. *Corolla* ringent, ventricose, convex above, mouth gaping with two small lips and five lobes. *Stamina* didynamous; *anthers* woolly, a sterile filament besides. *Capsule* two-celled, bivalve, *Seeds* many, with a membranous margin.

Spec. Char. The Chelone is one of those American genera, not permanently established in botanical character. There is considerable variety in the appearance of the different plants, known to belong to the genus. But whether these are entitled to the character of species, or whether some are species and others mere varieties of species, has not yet been satisfactorily ascertained. Formerly the genus *Penstemon* and *Chelone* were together. Among those species or varieties of the Chelone whose medical virtues have been tested, are the following:

1. C. ALBA.—*Stem* simple, from two to three feet in hight. *Leaves* subsessile, lower ones alternate, upper opposite. *Spike* long, flowers white. Common in Ohio and Western States.

CHELONA ELATIOR, GLABRA.

2. C. LANCEOLATA.—*Stem* simple, two to four feet in hight. *Leaves* sessile, lanceolate, acuminate, serrate, pubescent beneath. *Flowers* white, or tinged with red, lips of corolla large, resembling the head of a turtle.

The adjoining cut is intended to represent this variety. It is one of the most common, and is found abundant in the Western lowlands.

C. LANCEOLATA.

3. C. ELATIOR. This is a large variety of the chelone glabra, having simple stems three to four feet in hight, and large flowers. The leaves are petiolate, lanceolate, broad, large, serrate, glabrous below. *Flowers* white or pinkish, large, projecting, corolla inflated, contracted at the mouth; lips open, lower one somewhat reflected; calyx of scaly appearance. *Raceme* large, loose. Grows in Ohio and Western States. The engraving on page 628, is intended to represent this variety of the Chelone Glabra.

4. C. MACULATA—.*Stem* branched, two to three feet in hight. *Leaves* petiolate, lanceolate, crowded above. *Flowers* white, with a tinge of green in the mouth, spotted with red. *Calyx* margined with a tinge of red.

5. C. PURPUREA.—*Stem* simple. *Leaves* petiolate, oblong, acuminate. *Flowers* purple. A large variety. Grows in Western States.

6. C. CAPITATA.—*Stem* branched, two feet in hight, square. *Leaves* petiolate, lanceolate, floral ones ovate, lanceolate. *Spike* short, capitate. *Flowers* purplish white.

7. C. OBLIQUA.—*Stem* simple. *Leaves* subpetiolate, oblique at base.

THERAPEUTIC PROPERTIES.—Chelone is prominently tonic, but is somewhat unpleasant to the taste, and has rather a sickening odor. Prof. Rafinesque, however, regarded the plant as among our most valuable indigenous productions. He says "It is useful in many diseases, fever, jaundice, hepatitis, eruptions of the skin, etc. In small doses it is laxative, but in full doses it purges the bile and cleanses the system of the morbid or superfluous bile, removing the yellowness of the skin in jaundice and liver diseases." It is perhaps best taken tinctured

in wine, the dose of which is f℥ij.—f℥iv. The dose of the powder is ℥j. Water and spirits extract its virtues.

ARISTOLOCHIA SERPENTARIA.—The Root.

SYNONYMS.—SERPENTARIA: Virginianische Schlangenwurzel, *Ger.*; Serpentaire de Virginie, *Fr.*; Serpentaria Virginiana, *Ital.*, *Span.*; Virginia Snake-Root, *Eng.*

BOTANY.—*Sex. Syst.*—Gynandria Hexandria. *Nat. Ord.*—Aristolochiaceæ.

Gen. Char. ARISTOLOCHIA.—*Calyx* none. *Corolla* one-petaled, ligulate, ventricose at the base. *Capsule* six-celled, many-seeded, inferior.—*Willd.*

A. SERPENTARIA.

Spec. Char.—A. SERPENTARIA.—Numerous species of aristolochia have been in use as tonics, but at the present, the serpentaria is considered the most important. This has a perennial, aromatic root, with a short, knotty, horizontal caudex, and numerous small radicles. *Stem* inclining, jointed, and about eight or ten inches high. *Leaves* alternate, petiolate, cordate, oblong, acuminate, entire. *Flowers* near the ground; corolla of a dark, purple color, monopetalous, tubular, swelling at the base, contracted and curved in the middle, and terminating in a labiate border with lanceolate

lips. *Fruit* a hexangular, six-celled capsule, with several small flat seeds. The adjoining cut represents the plant with a figure of its capsule.

ANALYSIS.—The root of the aristolochia serpentaria contains a *Volatile Oil*, *Gum*, *Starch*, *Albumen*, a *Peculiar Principle*, *Lignin*, and various *Salts*. The virtues are imparted to alcohol, boiling water, and sparingly to cold water.

THERAPEUTIC PROPERTIES AND USE.—A valuable and popular tonic, considerably aromatic and stimulant. Its virtues are very analogous to those of the liriodendron. It has long been in use and has been prescribed in almost every variety of disease. It is chiefly valued as a tonic in amenorrhœa, exanthematous disease, rheumatism and typhus fever. It has been thought to be an antiperiodic. The dose of the powder is gr. x. to ʒss. It is best taken in pills.

PTELEA.—The Bark.

SYNONYMS.—PTELEA TRIFOLIATA: Wingseed, *Vul.*

BOTANY.—*Sex. Syst.*—Tetrandria Monogynia. *Nat. Ord.*—Rhamni.

Gen. Char. PTELEA.—*Calyx* four-parted. *Petals* four, spreading. *Stigmas* two. *Samara* compressed, orbicular, two-celled, two-seeded.

Spec. Char. P. TRIFOLIATA.—A *small tree*, with grayish, smooth *bark*, and triternate *leaves*. The *flowers* are panicled, diœcious. *Seeds* winged. There are several varieties: one the *P. Pentaphylla*, has quinate leaves; and the *P. Pubescens* has pubescent leaves. Perhaps these latter should be entitled to the character of species. Grows in rich soil, in the Western States.

THERAPEUTIC PROPERTIES AND USE.—The bark of the ptelea is one of our most valuable tonics, has been regarded to be antiperiodic, and thus prescribed against ague. Its chief application is in remittent and typhus fever, as well as in dyspepsia. Its virtues are imparted to water and spirit. It is best used in the form of extract. The dose of the latter is gr. v. to gr. x.; that of the powder gr. x. to gr. xxx.

PRUNUS VIRGINIANA.—The Bark.

SYNONYMS.—CERASUS SEROTINA, *De Cand.*; CERASUS VIRGINIANA, *Mich.*; Wild Cherry, *Eng.*

BOTANY.—*Sex. Syst.*—Icosandria Monogynia. *Nat. Ord.*—Lauraceæ.

Gen. Char. PRUNUS.—Differs from the laurus genus only in its fruit being destitute of bloom, and having a round stone instead of an acute one, and the leaves, while in bud, are folded flat, and not rolled up.—*Lindley.*

Spec. Char. P. VIRGINIANA.—*Leaves* oval oblong, or lanceolate oblong, acuminate, glabrous, or bearded along the midrib, beneath, smooth and shining above, finely serrate, with adpressed, or callous, incurved teeth. *Petioles* with two or more glands. *Racemes* elongated, spreading, petals broadly obovate. *Drupes* globose, black.

A beautiful tree growing from forty feet to eighty or more in hight. The flowers are white and fragrant, appear in May. The bark is of a dark ashy hue, rough on the trunk, and smooth on the branches. The epidermis is easily separated, and peels off circularly, leaving the green cellular tissue beneath. The wood is hard. The fruit has a prussic, sweet, and slightly bitter taste.

ANALYSIS.—The bark contains *amygdalin*, which appears in this plant to be a peculiar *neutral principle*, *starch*, *resin*, *gallic acid*, *tannin*, *fatty matter*, *lignin*, *bitter extractive*. By distillation with water a volatile oil can be obtained. This oil is composed of *hydruret of benzule*. It is not fit for medical use, as it is rather harsh in its effects,—considered somewhat analogous to hydrocyanic acid.

THERAPEUTIC PROPERTIES AND USE.—The bark of this tree is an excellent tonic, rather peculiar in its effects. It seems to manifest its tonic power without exciting to any corresponding extent, the circulation. Although valuable as a *general* tonic, it is chiefly useful in the treatment of pectoral affections. The author has been more successful in the employment of this article in phthisis than with any other single medicine, and he confidently recommends to the pro-

fession its use in this disease. It may be taken in substance, but it is most convenient in the form of tincture. The dose of the powder is gr. x.—gr. xx.

PHARMACEUTIC PREPARATIONS.—**INFUSUM PRUNI VIRGINIANÆ.**—*Infusion of Wild-Cherry Bark.*—Wild-Cherry Bark, bruised, ℥ss. Water, Oj., macerate for twenty-four hours and strain. Cold water constitutes the best vehicle, as it secures the decomposition of the amygdalin, or peculiar neutral principle, without the loss of the volatile oil.

Dose.—f ℥ij.

SYRUPUS PRUNI VIRGINIANÆ: *Syrup of Wild-Cherry Bark.*—℞ Wild-Cherry Bark in powder. Water q. s. exhaust in a percolator and add Sugar enough to preserve it.

Dose.—f ℥ss.

EXTRACTUM PRUNI VIRGINIANÆ: *Extract of Wild-Cherry.*—℞ Cort. Prun. Virgin., lbiv. Alcohol, Cjss. Aq., Cij. Digest in the spirit, for twelve days in sun heat, strain and distil until there remains one pint. Boil the Marce in the water and strain; boil down to one pint, and reduce both the liquors together in a water or sand-bath, to the proper consistence.

Dose.—Gr. v.—gr. viij.

SABBATIA.—The Herb.

SYNONYMS.—SABBATIA ANGULARIS.—Thousandgildengrant, *Ger.*; American Centaury, *Eng.*

BOTANY.—*Sex. Syst.*—Pentandria Monogynia. *Nat. Ord.*—Gentianaceæ.

Gen. Char. SABBATIA.—*Calyx* five to twelve parted. *Corolla* rotate, five to twelve parted. *Stigmas* two, spiral. *Anthers* at length, revolute. *Capsule* one-celled, two-valved, many seeded.—*Nutt.*

Spec. Char. S. ANGULARIS.—A most beautiful indigenous herbaceous annual or biennial plant, growing about a foot in

S. ANGULARIS.

hight. The *stem* is square, and winged at the angles, simple below, branched at the top; branches decussating, axillary. *Leaves* opposite, sessile, lanceolate, pointed, entire, nerved, smooth. *Flowers* numerous, terminal to the branches; *corolla* five-parted, with ovate segments, and of a beautiful rose color. *Anthers* yellow. The plant grows in most parts of this country in fields and open woods.

THERAPEUTIC PROPERTIES.—Sabbatia is a fine tonic, and has long been employed in domestic practice, as a common bitters. It has usually been tinctured in spirit, and used as a prophylactic against ague and autumnal fever. It may be given in substance or in tincture, in doses of ℈j.—℈ij. of the former, and of fʒij.—fʒiij. of the latter. Water and alcohol readily extract its virtues.

The CENTAURIUM or *European Centaury*, possesses analogous properties, and may be used in similar doses.

VERBENA.—The Root.

SYNONYMS.—Vervain, Simpler's Joy, etc., *Eng.*

BOTANY.—*Sex. Syst.*—Didynamia Gymnospermia. *Nat. Ord.*—Vitices.

V. HASTATA.

Gen. Char. *Calyx* with one of the teeth truncate. *Corolla* funnel-form, with a curved tube; border five-cleft. *Nuts* two or four. *Pericarp* thin and evanescent.—*Eaton.*

Spec. Char. There are several medical species of Verbena growing as wild plants in most of the States. The following are the most common, and are those generally referred to by medical works:

1. VERBENA HASTATA.—This species is so named from some of its varieties having hastate leaves on the lower part of the stalks. It has white, fibrous, perennial roots. An upright, obtusely squared or furrowed stem three to four feet high. Its leaves are oppo-

site, petiolate, lanceolate, serrate, rough; in some of the varieties, pinnatifid, oblong, or hastate. The flowers are in upright spikes, small, blue. The preceding cut gives the appearance of the plant in the flowering season.

2. VERBENA URTICIFOLIA.—This is the nettle-leaved species of the Vervine, a very common plant, with white flowers, in slender racemes. The leaves are opposite, petiolate, slightly pubescent, ovate, lanceolate. Spikes filiform, axillary and terminal. Flowers somewhat remote, on the spike, white. Grows two to four feet in hight, on roadsides, in fields and meadows, in most of the States. The adjoining cut represents it.

V. URTICIFOLIA.

THERAPEUTIC PROPERTIES.—Verbena is a moderately good tonic, and has long been employed in domestic practice as a prophylactic against ague and many other affections. When taken in large doses it proves emetic. Dr. Thomson considered it a pretty certain remedy in intermittent fever, if taken at first in doses sufficiently large to excite free emesis, and then a prolonged nausea and perspiration. The V. Urticifolia is considered an excellent antidote for poisoning from the Rhus Toxicodendron. The root is to be boiled in milk with oak bark, and then the milk taken freely. Both species have also been regarded of service in incipient phthisis, gravel, scrofulous affections, etc. The dose of the infusion, prepared by macerating an ounce of the recently dried root in a pint of boiling water, is a wineglassful; that of the powder is ℈j—℈ij.

NEPETA.—The Herb.

SYNONYMS.—Cat Mint, Catnip, *Eng.*

BOTANY.—*Sex. Syst.*—Didynamia Gymnospermia. *Nat. Ord.*—Labiateæ.

Gen. Char. NEPETA.—*Calyx* dry, striate. *Corolla* with a

longitudinal tube; underlip with the middle division crenate; throat with a reflexed margin; *stamens* approximate. *Eaton.*

N. CATARIA.

Spec. Char. N. CATARIA.—The only species. A very common herb, growing in yards and out-grounds, about habitations, but never wild in this country. The *stem* is obtusely four-angled, upright, and about two or three feet high. *Branches* axillary. *Leaves* opposite, petiolate, obscurely lobed or tooth-serrate, hoary-pubescent. *Flowers* bluish-white, in whorled terminal spikes. The entire plant has a peculiar, slightly fragrant odor, much admired by cats, and hence its vulgar names, *cat mint*, etc.

THERAPEUTIC PROPERTIES.—A mild, but pure, bitter tonic, but not much esteemed on account of its commonness. Nevertheless, it is equally as good as many more rare articles that are officinal. This article will answer as a general tonic, but seems more particularly adapted to females of delicate habits and general debility, with nervous depression. It may be used in conjunction with cinnamon and cascarilla, in port wine, or it may be taken freely in warm infusion, sweetened.

ZANTHORHIZA.—The Root and Bark of Stem.

SYNONYMS.—ZANTHORHIZA APIIFOLIA, *Bart.;* XANTHORHIZA APIFOLIA, *Raf.;* ZANTHORHIZA TINCTORIA, *Woodhouse;* ZANTHORHIZA SIMPLICISSIMA, *Marshall;* ZANTHORHIZA MARBOSIA, *Bartram;* Sellérieblättrige Gelbwurz, *Ger.;* Parsley-leaved Yellow-root, Yellow-wort, *Eng.*

Botany.—*Sex. Syst.*—Pentandria Polygynia. *Nat. Order.*—Renunculaceæ.

Gen. Char. Zanthorhiza.—*Calyx* none. *Petals* five. *Nectaries* five-petaled. *Capsules* five to eight, one-seeded, semi-bivalvate.

Spec. Char. Z. Apiifolia.—A small shrub growing from two to three feet in hight, a native of the Southern Atlantic States. Grows also abundantly on the banks of the Ohio, and in the mountainous districts of North Carolina.

It has a horizontal root which sends off numerous suckers. The stem is simple, upright; the wood of a bright-yellow color. The leaves are triternate or pseudo-pinnate; leaflets nearly sessile, sinuate, or deeply gashed; some of them lobed; end one, three-lobed; all prominently toothed; teeth serrated. The flowers are of a purple color, have deep-colored purple nectaries, and are disposed in divided, slender, pendulous racemes.

Medical Properties and Use.—A fine, simple and agreeable bitter tonic, and although not yet much in use, has certainly high merit as a general tonic. One of its most commendable characteristics is, that it agrees well with the stomach. It was investigated by Dr. Woodhouse, Dr. Barton, and others, and was pronounced equal, if not superior to Columbo.

The virtues are in a resin, chiefly; although Dr. Barton says that the gum also is extremely bitter. This statement is corroborated by the fact that the virtues are yielded to cold water with great facility.

The process for separating the resinoids, *i. e.*, precipitation from the concentrated alcoholic tincture by the addition of an excess of water, would doubtless furnish us a very fine concentrated tonic, that would happily serve us for general use.

The dose of the powdered root is gr. xxx. That of the tincture, made with diluted alcohol or whisky, is f℥j.—f℥iij.

ABSINTHIUM.—The Plant.

Synonyms.—Artemesia Absinthium, *U. S. Dub.*; Gemeiner Wormuth, *Ger.*; Absinthe, *Fr.*; Absenzio, *Ital.*; Artemisio Azenjo, *Span.*; Wormwood, *Eng.*

Botany.—*Sex. Syst.*—Syngenesia Superflua. *Nat. Ord.*—Compositæ Senecionides.—*De Cand.* Asteraceæ.—*Lind.*

Gen. Char. Artemesia.—*Receptacle* subvillous, or nearly naked. *Seed-down* none. *Calyx* imbricate, with roundish, converging scales. *Corollas of the ray*, none.—*Willd.*

A. absinthium.

Spec. Char. There are several species of the Artemesia that have been officinal; but the *A. Santonica*, *A. Abrotanum*, and the *A. Absinthium*, or *Wormwood*, are the only species that are now the subjects of much attention. The adjoining cut represents a branch of this last species. It is a perennial plant, with a round, branching, striated, or furrowed stem, some two or three feet in hight. The stalk is somewhat woody, and lives several years, sending up annually new herbaceous shoots, which again perish in the winter. The leaves are hoary, radical ones, triply pinnatifid; divisions lanceolate; floral ones undivided, lanceolate. The flowers are of a brownish-yellow color, hemispherical, nodding. A native of Europe, cultivated with us in gardens.

Medical Properties and Use. — Wormwood is a good and reliable tonic, but of rather a disagreeable taste. It enters the circulation, as it gives to the milk of animals fed with it its bitter taste.

Before the Cinchona was introduced, this article was mostly relied upon for the cure of the ague. It is anthelmintic, and has been in domestic use against worm, from time immemorial.

With some, wormwood has been regarded antispasmodic, and has been employed, it is said, with success in epilepsy.

Bruised and applied, externally, it forms a good fomentation in painful swellings, cancers. etc.

The dose of the powder, as a tonic, is ℈j.—℈ij.; that of the infusion made by macerating ℥j. in Oj. Aq. is f℥j.—f℥ij. For the active principle of the A. Santonica see *Santonin.*

ANGUSTURA.

This is the bark of an undetermined tree growing in South America, supposed to be the *Galipea Officinalis*, growing on the banks of the Orinoco. It is called Angustura from a town on this river, from whence it is shipped.

Description.—The bark, as brought to us, is in pieces of various length, but usually short, slightly rolled, or flat and thin. It is covered externally with a soft, yellowish-gray or whitish epidermis. Its flavor is slightly aromatic, but rather disagreeable, The taste is bitter and pungent.

Medical Properties and Use.—The Angustura is a stimulant tonic, but in no way superior to many indigenous agents of this order, and as the article is often comfounded with another imported bark, called *False Angustura Bark*, and which is poisonous; supposed to be obtained from the Strychnos Nux Vomica, it may as well be altogether dispensed with. The dose of the powder is gr. x.—gr. xx.

ALETRIS.—The Root.

Synonyms.—Aletris Farinosa: Aletris Meunier, *Fr.*; Mehlige Sterngrass, *Ger.*; Star-grass, Blazing Star, Aloe Root, *Eng.*

Botany.—*Sex. Syst.*—Hexandria Monogynia. *Nat. Ord.*—Asphodeleæ.

Gen. Char. Aletris.—*Corolla* superior, funnel-form, wrinkled. *Style* three-sided. *Capsule* three-celled, many-seeded.

Spec. Char. A. Farinosa.—*Root* perennial, small, branched. *Stem* simple, upright, with a few scales or rudiments of leaves. *Leaves* radical, from six to twelve, spreading out in form of a star, entire, very smooth, veined elliptically. *Flowers* white, sessile or nearly so; disposed in a long spike; corolla campanulate, deeply six-cleft. Grows in poor soil in most of the

States. There are two species very much alike in their appearance, and also their medical properties, 1, *A. Farinosa;* 2, *A. Aurea.* They are used indiscriminately.

A. FARINOSA.

MEDICAL PROPERTIES AND USE.—A superior tonic, useful in all cases in which this class of agents is indicated. It is very persistent in its effects, and may be confidently relied upon in most cases in which the simple tonics are applicable. The dose required is also less than that of most other agents of this order, being only from five to ten grains of the powder,

and besides this advantage, it is now discovered that the active properties of the root are in a resinous principle that may be obtained in a separate state. This principle, called aletrin, is given below among its preparations.

PHARMACEUTIC PREPARATIONS.—TINCTURA ALETRIS: *Tincture of Aletris.* ℞. Root of Aletris, f℥j. Alcohol ℥xij. Pulverize the root, digest in the alcohol for ten days and filter. *Dose*, twenty to thirty drops.

ALETRIN.—This is the resinoid principle, precipitated from the concentrated alcoholic tincture of the root of Aletris in the same manner as pursued for the preparation of the podophyllin, which see.

Action—Use.—The aletrin is an intensely bitter principle, and is powerfully tonic in the dose of gr. iij. Large doses prove nauseant.

HELONIAS.—The Root.

SYNONYMS.—Star-Root, Unicorn, *Eng.*

BOTANY.—*Sex. Syst.*—Hexandria Trigenia. *Nat. Ord.*—Melanthaceæ.

Gen. Char. HELONIAS.—*Calyx* none. *Corolla* six-parted, spreading, glandless. *Styles* distinct. *Capsules* three-celled, three-horned, few seeded.

Spec. Char. H. DIOICA.—*Root* perennial, oblong, fleshy, white within, yellowish-white without, wrinkled transversely, about two inches in length, three-fourths in thickness, of bitter taste, beset with few small fibers. *Stem* simple, upright, leafy, one to two feet in hight, and terminated with a close spike of white flowers nodding at the top. *Leaves* radical ones obovate, attenuated toward the stem, soft, of yellowish-green color, and verticellated, somewhat like the aletris above described, but not so regularly star-like as those, and the outer ends, instead of being acuminate or pointed, are in this rounded and broad. Grows in Ohio and most of the Northern States on hilly grounds where there is thin soil, also on prairies.

MEDICAL PROPERTIES AND USE.—The helonias is an acceptable tonic, and is now much in use by new-school practitioners. It has been mostly employed in form of powder, and thus com-

bined with other similar articles. Its rank as a tonic is about equal with gentian. Some have though it possessed of expectorant properties, and have employed it in pectoral diseases.

Helonin is a neutral principle precipitated from a concentrated decoction of the root, and possesses considerable tonic power. The dose of this is gr. v.—x. That of the powdered root gr. xx.

QUASSIA.

Quassia is the wood of the *Quassia* Excelsa, a large tree growing in the West Indies and Caribbean Islands. The wood is intensely bitter. It has a white appearance when fresh, but when old becomes yellowish. It comes to us in cylindrical billets of various sizes. In the retail stores, the wood is usually kept in a rasped or split state. The active medical properties of the wood are found in a peculiar crystalline principle called *quassin*.

Medical Properties and Use.—The quassia is a very pure and valuable bitter tonic, very acceptable to the stomach, and hence, desirable in dyspepsia and loss of appetite. It is employed in the forms of *infusion*, extract (*aqueous* and *alcoholic*), tincture, and that of the *Quassin*. The doses of the medicine are not very definite, as it seldom disagrees when given even in doses unnecessarily large.

Order IV.---CHALYBEATE TONICS.

The different preparations of iron furnish a peculiar order of tonics, which are among our most valuable general appliances of this class. They, like the vegetable tonics, are prominently *physio-dynamical* agents, and yet in some degree they involve chemical principles, in the display of some of their physiological effects. These, however, are directly under vital control.

FERRUM.

Synonyms.—Hedeed, *Arab.*; Ahun, *Persh.*; Loha, *Duk.*, *Sans.*, and *Hind.*; Erumboo, *Tam.*; Béssee, *Mal.*; Yákádá, *Cyng.*; Tee, *Chin.*; Eisen, *Ger.*; Fer, *Fr.*; Ferro, *Ital.*; Hierro, *Span.*; Iron, *Eng.*

A description of the physical character of Iron, in the metallic state, will not be here required, as it is not only an article well known, but is always employed as a medicine, in the *prepared* forms.

Physiological Effects.—Whether iron, in its metallic state, has any direct effect upon the system is not yet certainly known, for although we find it as a necessary constituent of the red corpuscles of the blood, and also discover that when it is administered in the finely-divided metallic state, it produces considerable effect, yet it is nevertheless supposed that the metal is always oxidized and combined with an *acid* before it operates.

Iron is set down by the profession to act on the system *generally*, and on most of the structures *topically*, as a stimulant, tonic, and as an astringent.

In order that a more clear and definite view of the physiological effects may be had, it will be best to contemplate the subject in two connections: viz., that of its *topical impression*, and that of its *general*, or *constitutional effect*. For the purpose of observing its *topical impression*, the metal, as in its internal use, requires to be applied in a state of attenuation, or solution, so as to afford those conditions which *all* medical agents require for their action. On the stomach it produces, in small doses, only a gentle degree of excitation, called *tonic*, indicated by an increase of the appetite, and digestion. By a continuation of its use, in small doses, there will be signs of an astringent power, discovered by a tendency to constipation, and the drier, harder, and smaller state of the stools. In quite large doses, there will be irritation of the stomach and bowels, with a sense of heat, weight, and uneasiness in the epigastrium. Sometimes, there will be nausea, vomiting, and not unfrequently griping pains, and diarrhœa. On the mucous surfaces generally, and on denuded parts, the effects will be of a correspondent character, but they are much less developed. Endermic applications are not found to evince effects that are in any tangible degree observable, except those that are to be referred to a mild astringent and tonic power.

A notable phenomenon in the effect of iron, when administered internally, though not a physiological one, is that the

stools are invariably colored black. This may be dependent upon the formation of a sulphuret, or tannate of iron, produced by combinations with sulphur and tannic acid, that may be furnished by the ingesta.

The remote, and *constitutional* effects of iron, are supposed to depend upon its absorption into the circulation, and are usually not traceable for a considerable time after it has been administered. But in a few days, and generally within a week after it is taken, it will show itself in the redness produced in the skin, or complexion, the lips, and the tongue. The pulse will be fuller and stronger, and a general exaltation of the organic functions will ensue.

These results arise from a more enriched state of the blood, from the greater increase of its red corpuscles.

It is now supposed that iron has no small office to perform, in the oxidation of the blood, and also in the physiological uses of electricity; and it may also serve a part in the great function of assimilation.

The peculiarities of the office of iron, whether passive or active, in the *oxidation* of the blood in the lungs; its *metamorphosis* in the capillaries; and its subsequent *decarbonization* in the lungs again, is most probably dependent, in no small measure, upon the part performed by electricity. We have demonstrated polar differences in the structures, and we have in this fact a clue to the principle on which the electrical phenomena may be developed, in so far as they concern the physiological changes of the blood.

Experiments prove, that the chemical union of oxygen with the blood (which, according to M. Le Canu, is in the proportion of one part of the former to every four thousand four hundred parts of the latter, or seven parts of iron to every hundred parts of hematosin), is sustained by an affinity exceedingly powerful, since it is almost altogether insensible to the tests of the acids, by which iron can be detected in all other combinations. It would seem, therefore, that no agency but electricity, could effect the chemical changes that the blood undergoes. Nor can we have even a satisfactory conjecture of the circumstances that would develop such a display

of the electric phenomena as occur in the processes here referred to, except on the principle of polarity in the structures. We know that the secreting, and the nonsecreting organs are in different electrical states; that serous and mucous surfaces are in opposite states; and the only sensible notion that can be formed in the matter, is, that the parts are severally possessed of special and peculiar endowments. Then, as the circulation traverses the different structures, it must become subjected to the laws that are in force in the different empires and provinces of the economy. How truly apparent are the facts of physiology, that a matchless design is involved in their institution. Every new discovery challenges our wonder and admiration.

THERAPEUTIC PROPERTIES AND USE.—Iron appears to be one of the most natural and congenial tonics that are afforded in the immense list of corroborants. It is an essential constituent of the vital fluid, and most of the structures, and it performs a most important part in the physiological phenomena; particularly in the oxidation and decarbonization of the blood, as has already been spoken of. Without the red corpuscles of the blood — or what is equivalent in its sense, and in *fact — without the presence of iron*, life, in the superior animals could not be supported.

The administration of iron always adds to the color, tonicity and strength of the system. Its application in all cases of anæmia, debility, emaciation, and prostration of the physical energies, is thus very apparent.

The diseases in which its special applications have been noted are as follows:

1. IN PASSIVE HEMORRHAGE.—This, whether it occurs from the stomach, lungs, or other organs, as in menorrhagia, hæmaturia, etc., is most permanently restrained by the use of some of the preparations of iron, although the most direct effects of its styptic power are observed in gastric hemorrhage. In hemorrhages, however, it must be remembered, that, as a general thing, iron is to be regarded rather as a constitutional remedy, being too slow for immediate effect.

2. IN GENERAL DEBILITY.—From the remarks that have

been made on the physiological effects of iron, it must be evident that a state of general debility affords one of the most prominent applications of this tonic. It is to be observed, too, that in this state of the body, as in various others, iron will be of avail on other principles than those which are involved in the immediate change and improvement of the blood. It is astringent, and is also capable of effecting a beneficial influence over the nervous system.

But being slow in the development of its tonic power, we can not always rely upon it when an immediate effect is to be produced, as in cholera, diarrhœa, dysentery, congestive fever, remittent fever, yellow fever, etc. In these cases, quinine in water, acidulated with sulphuric acid, is first to be invoked, and then after its immediate advantages are secured, the iron will come into good service.

3. As a Reconstructive Agent.—From the facts detailed in regard to the office of iron in the formation of hematosin, or the red corpuscles of the blood, it is evident that in cases where the blood is impoverished as in *anæmia* and *chlorosis*, iron is the agent required for its restoration.

In cases of debility from a deficient supply of food, excessive secretion, inefficient assimilation, etc., iron will act a good part.

4. In Scrofulous Diseases.—In affections of this kind, when the humors of the body are so liable to be degenerated and corrupted, the vitalizing and antiseptic power of iron is seemingly of indispensable use.

The healing process in scrofulous or other ulcers, as cancers, etc., can not progress until the blood is restored to a healthy and plastic standard.

The *astringent* power of iron is also serviceable in these diseases.

Iron is improved in its remedial action in scrofulous diseases, by combination, or adjunctive use with iodine.

In Phthisis.—In consumption, this article proves beneficial on the same principle as in scrofula.

In Nervous Affections, Hysteria, Neuralgia, Chorea, Epilepsy, Spasmodic Asthma, Pertussis, Amaurosis, etc.

Also In Chronic Inflammatory Diseases, as In Chronic Hepatitis, Enlargement or Chronic Inflammation of the Spleen, Organic Diseases of the Heart, Bright's Disease, Impotency, Barrenness, Amenorrhœa, etc.

In all of these affections here enumerated, iron has been of great use, especially the last. It is unnecessary, however, to speak specially of its applicability in these cases severally. Nor is it necessary to extend the list so as to enumerate the many more forms of disease which have been relieved or benefited by this important medicine.

Pharmaceutic Preparations.—The preparations of iron are very numerous, most of them are prominently tonic, some very powerfully astringent and styptic. Those that are proven especially valuable as tonics, are alone intended to be here treated of. Even these are too numerous, quite, as the advantages afforded by the different chemical and mechanical combinations, are by no means equal to the inconvenience and embarassment caused by the greatness of their number.

FERRI PULVIS: *Powder of Iron.*—This is prepared by submitting the sesquioxide of iron, heated to redness, to a current of hydrogen. The gas abstracts the oxygen, from its greater affinity for this element than that of oxygen for the same. The hydrogen forms water with the oxygen, and escapes as a watery vapor. The iron is left in a metallic state. This is then powdered and kept in well-stopped bottles.

Action—Use.—This is now quite a favorite preparation of iron. It possesses the properties of the metal in a form admitting not only of great convenience in its administration, but the peculiar virtues of iron appear to be more readily developed than what appears to be the case with most other preparations of the article. Perhaps the virgin affinities of the metal will admit of *such* a union with the gastric or other animal acids, as to make this salt more conducive to the development of the dynamical power of the agent, than other salts thereof are.

Another consideration in the use of this preparation of iron is, that there is less disagreeableness arising from it in the escape of hydrogen from the stomach, which is the ground of

much objection to the use of other agents. The dose is from three to five grains, given in syrup or the form of pills, twice a day.

FERRI RAMENTA: *Iron Filings.*—When *iron* filings are properly prepared, they afford a very good form for the use of the metal, but as they are kept in the drug houses, they prove too often to be gatherings of the impure iron dust about the vices and file benches of iron machine-shops or blacksmith's shops.

Iron filings afford a good means of getting the metal into the system in a simple state. The gastric acids will go into combination with the iron, and the salts that are thus formed, will be better adapted to the medical uses required, than any perhaps which can be otherwise prepared. Dose and administration same as the foregoing.

SQUAMÆ FERRI: *Scales of Iron.*—The scales of iron are the oxidized crusts which fall off from heated iron when hammered on the anvil. It is collected, purified by the use of a magnet, and is then pulverized, and put up for use. It is a form of iron in variable states of oxidation. Dose, etc., same as above.

FERRI OXIDUM NIGRUM: *Black Oxide of Iron.*—A black powder.

OXIDUM FERRI NIGRUM HYDRATUM: *Hydrated Black Oxide of Iron.*—A dark soft mass.

FERRI SESQUIOXIDUM: *Sesquioxide of Iron.*—A dark powder.

FERRI OXIDUM HYDRATUM: *Hydrated Sesquioxide of Iron.*—A reddish brown mass.

OXIDUM FERRI MAGNETICUM: *Magnetic Oxide of Iron.*—A grayish-black powder.

All these are of very nearly the same properties, and are administered in about the same way and form. Dose gr. v. to gr. xxx.

FERRI SULPHAS: *Sulphate of Iron*, or *Green Vitriol.*—This article is a powerful astringent tonic. It has been found useful in dysentery, diarrhœa, diabetes; gastric, intestinal and other hemorrhages; leucorrhœa, gonorrhœa, etc. It has also been recommended with much confidence as a remedy in ague, and has proved efficient in the expulsion of the tape-worm.

One of the most important uses of the sulphate of iron is in the colliquative sweats in consumption. The dose is from one to five grains. Topically its solution in water, is serviceable as an injection in prolapsus uteri, leucorrhœa, and prolapsus ani.

FERRI ET POTASSÆ TARTRAS: *Tartrate of Iron and Potassa*, or *Tartarized Iron.*—This is a valuable preparation of iron. When well made, it is in translucent, ruby red scales; but as commonly found, it is much deteriorated, and has a greenish or olive color. It has a mild, sweetish, and not disagreeable taste. It is a good permanent tonic. The dose is gr. x. to gr. xxx. *Citrate of Iron* is similar in its properties and use.

TINCTURA FERRI CHLORIDE: *Muriated Tincture of Iron.*—This is a dark brown fluid, of acid, chalybeate, astringent taste. It is a medicine of very great value, being tonic, astringent, stimulant, and antiseptic.

Its great and most important application is in erysipelas. In this application it has sustained a high reputation. When employed in erysipelas, it is given internally, in doses as large as the stomach will bear, commencing with ten drops, and increasing every succeeding dose, until the stomach resists it. It is also to be applied externally in this disease.

The muriated tincture of iron is also of much service in a great variety of other diseases. Indeed, it is applicable in most of the diseases in which the other chalybeates are serviceable.

FERRI FEROCYANURETUM: *Prussiate of Iron*, or *Prussian Blue.*—This article has become very popular among Eclectic physicians, as a cure for the ague. It has been pronounced a specific for intermittent fever. The author has tested it in a number of cases, and is of opinion that it possesses anti-intermittent powers of considerable character. But it is by no means a specific. The dose is from four to six grains three times a day.

FERRI IODINUM: *Iodide of Iron.*—This is formed by mixing the iodine and iron filings moistened with water; filtering and evaporating. The *solution* of Iodide of Iron has, of late, been most prepared. This preparation is highly tonic and alterative.

PERCHLORIDE OF IRON.—This is a powerful styptic; arrests hemorrhage instantly.

Class III.—ASTRINGENTS.

The term *Astringent* (from *astringo* 'to astringe'), is an appellation applied to that class of medical agents, whose prominent effects upon the system, are marked by a peculiar contraction of the muscular fiber, and an improvement in the cohesive force of the elements of the tissues.

Modus Operandi.—The action of astringents upon the organism, has been regarded as rather *obscure* in some respects. It has been supposed that the chief agency concerned, is that evinced in the action of tannin, directly upon the parts on which the effects are produced. But this alone will not account for the suddenness of the impression that is sometimes produced in parts extremely remote from the point of the inception of the agent. Thus some astringents will arrest hemorrhages from the lungs, uterus, and other organs, with a promptitude or suddenness of effect that must forever preclude the idea that the medicine was first conveyed from the stomach to the point of the obvious display of its virtues.

Again we find that the resiliency or contraction of the muscles, that may be produced by the administration of astringents, occurs under circumstances that will also preclude our accounting for the phenomena on the principle that the medicine acted by direct contact. We have an illustration of this, in the prompt influence of astringents over the uterus during parturition. Thus pains, or a contraction of this organ may be excited with *remarkable promptness*—in some instances, almost instantaneously—by some astringents, taken into the stomach, or applied to parts situated at considerable distance from this organ.

Nevertheless, it is evident, that a great share of the general effects of astringents, is dependent upon a mechanico-chemical power involved in the phenomena, which is dependent upon the presence of tannic or gallic acid. This will apply to their general, as well as their topical influence, for, although they operate partially through the nervous system, as already stated, yet, that the astringent principle may be carried in the circulation without having its acid properties neutralized

entirely, can be readily supposed when other analogous vital phenomena are considered. It may thus be supposed, that these agents may, on this principle, effect some influence even in remote parts, although this may be slowly developed.

Astringents, when topically applied for stanching blood, are denominated *styptics*. Many therapeutists have improperly arranged styptics into a separate class, but it is difficult to see the propriety of dividing a class of remedies involving the same principles of action, for no other reason than a simple difference of their application.

The effect of tannic acid on albumen is very remarkably exhibited in the common process of tanning leather; and it must be presumed that the same effect will follow the influence of this agent on all the tissues into which albumen enters as a constituent, modified, indeed, according to the vital manifestations in those parts.

It has been a matter of curiosity with some whether the *tannic* and *gallic* acids are identical, and if not, whether either may produce this specific effect, or whether both are necessary.

Tannic acid is *tri-basic;* and the general formula for the neutral tannates is $\bar{Q}t$, 3MO in the case of protoxides, and $3\bar{Q}t$, $M^2\ O^3$, in the case of sesquioxides. The formula of tannic acid is $C^{18}\ H^5\ O^9$, 3HO, while the formula for gallic acid $C^7\ HO^3$, 2HO $=\bar{G}$, 2HO, and yet tannic acid may readily be converted into gallic: the principle, however, is not well understood. In some circumstances, it appears to depend on the absorption of oxygen; and, as will be found, *one* eq. of tannic acid, *plus eight* eq. of oxygen, contains the elements of *two* eq. of gallic acid, *four* eq. of carbonic acid, and *two* eq. of water.

The addition of any of the mineral acids to a solution of tannic acid causes a precipitate of tannic acid combined with the acid employed. This precipitate is very soluble in water, and when prepared by the addition of sulphuric acid, in a hot solution, it dissolves in hot diluted sulphuric acid; and when this solution has been boiled a short time, it will contain no tannic acid, the whole being converted into *gallic acid.*

Again, tannic acid, when simply heated, is converted into

metagallic and pyrogallic acids. It seems, also, that an excess of alkali is likewise capable of converting tannic into gallic acid.

Application. — Astringents are generally applicable, and become important remedies in cases where there is a morbidly relaxed and debilitated condition of the system, especially such as are caused by colliquative discharges, as in diabetes, cholera, dysentery, hemorrhages, gleet, menorrhagia, etc.

The topical application of astringents is also extensive, and the history of disease furnishes many instances of excessive local relaxations, which are more circumscribed than those cases of this character that require the ordinary internal application of the remedy. Some of the most prominent of these are pathological relaxations of the uvula and tonsils, prolapsus uteri, prolapsus ani, hernia, hemorrhoids, etc. These may generally be successfully treated by the topical application of astringents, except, indeed, some cases of hernia, where there is much organic lesion.

Besides all this, astringents will also be found serviceable, when exhibited either in combination or collaterally, with other remedies, in view of their tendency to promote the operation of the latter. Thus we find, that they tend manifestly, to maintain the action of tonics, as is proven by combining galls with quinine, when it will be found that one-third less of this article will prove equally effective. The power of *stimulants* is no less promoted in this way, and hence, the popular practice of combining them with astringent articles. The celebrated formula, improperly called *pulvis diaphoretica*,* is an example of such combinations, and the high character of this compound may be considered as a popular assent to the

* It is proper to remark that astringents are not so successfully combined with diaphoretics. This compound, therefore, is improperly named *diaphoretic*, and has only been placed in the order where it stands, in conformity to custom. Nevertheless, it is true that the astringent agents combined, are not sufficient to destroy the diaphoretic power of the other articles of the compound, and thus although the article is chiefly valuable as a stimulant, it may still be profitably employed as a diaphoretic.

principle laid down. The practice of improving the stimulant virtues of the common incitants originated with, and has thus far been peculiar to our new system, and if there were no other claims for improvement except such as may justly be founded on this principle, there would be much to boast of in our enterprise. The power that astringents have to promote emesis has already been noticed.

The antiseptic power of astringents should not be unnoticed here. It has long been known, that tannic acid possesses a peculiar control over the putrefactive process. The acid unites with the constituents of the soft solids, that have lost their vitality (and which are very susceptible of putrefaction, as the albumen and gelatine), and thus forms insoluble compounds with them, that will hence resist the putrefactive process. Tannin also tends remarkably to maintain the integrity of the living tissues, and thus all proper astringents are of service in low putrescent conditions of the system, as, for example, in typhus, low remittents, variola, hospital fever, etc.

In view of their antiseptic effects, astringents are also applied topically, in the forms of lotions, plasters and cataplasms.

Incompatibles.—The incompatibles with astringents are the alkalies, which will neutralize the acids upon which the astringent principle is dependent.

Order I. SIMPLE ASTRINGENTS.

This order is designed to embrace all those articles of the present class, that are pure astringents, or which possess no acrid, stimulant, or bitter principles.

The importance of this distinction will be readily seen when it is considered that the latter properties, or at least some of them, are often contraïndicated, while the simple astringent virtues alone are necessary. It is no hard matter to possess any simple astringent agent at any time, with other virtues by combining them with other articles, as the circumstances may require.

GERANIUM MACULATUM.—The Root.

SYNONYMS.—Cranesbill, Astringent, Crowfoot, *Eng.*

BOTANY.—*Sex. Syst.*—Monadelphia Decandria. *Nat. Ord.*—Geraniaceæ.

Gen. Char. GERANIUM.—*Calyx* five-leaved. *Corolla* five-petaled. *Nectary* five melliferous glands, united to the base of the longer filaments. *Arilli* five, one-seeded, awned at the base of a beaked receptacle; awns, simple, naked, neither spiral nor bearded.—*Willd.*

Spec. Char. G. MACULATUM.—*Root* perennial, tortuous, about the thickness of the finger, of a brownish color without, and a flesh color within, beset with fibers, and of a powerful astringent, but not acrid taste. *Stem* erect, roundish, dichotomously branched, from ten to twenty inches high, and thickly beset with reflexed hairs. *Leaves* large, round, cordate, with a sinus from the base to the petiole, deeply divided into three, five, or seven lobes, which are incised, or toothed at their outer extremities, hairy, and of a rather palish green color, mottled with still paler spots. Those that arise immediately from the root, are supported on long, slender footstalks; those of the stem are opposite, the lower petiolate, the upper subsessile, with lanceolate or linear stipules. *Flowers* of a purple color; corolla with five obovate petals. *Capsules* five, joined by a beak to the long persistent style, curling up and scattering the seeds. Grows abundantly throughout the country, in open woods and hedges. Flowering time from May to July.

ANALYSIS.—The root contains *Tannin* (a large portion), *Extractive Kinic*, or some peculiar *Acid*, which does not redden vegetable blues, and will not pass over in distillation. The virtues are readily imparted to water, cold or hot, and, to some extent, to spirits. The alkalies destroy the astringency.

THERAPEUTIC PROPERTIES.—The Geranium Maculatum is, perhaps, the purest and best astringent that we possess. It is an article of great power, but acts without producing disturbance in the system. It is eminently adapted to all cases

in which a pure astringent is indicated, but particularly in diabetes, secondary stage of dysentery, and cholera infantum, and as a local application in leuchorrhœa, gonorrhœa, fistula, cancers, ulcers, hemorrhoids, hernia, hemorrhages, aphtha, relaxed uvula and tonsils, etc.

PHARMACEUTIC PREPARATIONS.—SYRUPUS GERANII: *Syrup of Geranium.*—℞ Rad. Geranium in coarse powder, ℔iv., Aq., Ciij., White Sugar, ℔vj. Boil the root in the water for three or four hours; strain; reduce to four pints; add the sugar; boil for five or ten minutes; skim off and remove from the fire.

Action—Use.—An excellent article in the secondary stage of dysentery and diarrhœa. Dose f℥j.—f℥ss.

SYRUPUS GERANII COMPOSITUS: *Compound Syrup of Geranium.*—℞ Rad. Geranium, ℔iv., Rad. Rhei, ℥viij., Cort. Cinnamomum, ℥vj., Caryophyllus, ℥iv., Aq. Cong., ℥iv.; Saccharum Alba, ℔vij. Boil until the strength is extracted, strain, reduce to Ov., add the sugar, boil ten minutes, skim off, and remove from the fire.

Action—Use.—Same as the above. Dose f℥j.—f℥ss.

NYMPHÆA ODORATA.—The Root.

SYNONYMS.—NYMPHÆA ALBA: Nenuphar Odorant, *Fr.;* White Pond-Lily, *Eng.*

BOTANY.—*Sex. Syst.*—Polyandria Monogynia. *Nat. Ord.*—Nymphaceæ.

Gen. Char. NYMPHÆA.—*Calyx* four to seven-sepaled. *Corolla* many-petaled, petals about equaling the length of the sepals attached to the germ beneath the stamens. *Stigma* a broad disk, marked with radiated lines. *Pericarp* berry-like, many-celled, many-seeded.

Spec. Char. N. ODORATA.—*Root* perennial, creeping, rough, dark-colored; thick, fleshy, and knotty. *Petioles* one to si feet long, spongy. *Leaves* floating, subpellate, entire, round, cleft at the base; upper surface glossy, of a deep green; lower, reddish or brownish, with radiating nerves. *Peduncles* terete, smooth, bearing one flower each. *Calyx* four sepaled. *Flowers* large, white, many-petaled, of a very sweet odor.

N. ODORATA.

Grows in ponds and marshes in many parts of the United States. The adjoining cut represents a leaf of perhaps one-eighth of the natural size, and a fully expanded flower of about half size; also a little figure of an opening flower-bud.

ANALYSIS.—The constituents of the root are *tannin*, *gallic acid*, *starch*, *mucilage*, *sugar*, *resin*, *ammonia*, *ulmine*, *tartaric acid*, *fecula*, etc. The virtues are imparted readily to water.

THERAPEUTIC PROPERTIES.—The root of the white pond-lily is considered among our best simple astringents, and although very efficient, it is quite mild in its effects. Professor Rafinesque considered it demulcent, anodyne, and antiscrofulous. It may be applied with confidence in all cases in which articles of this order are indicated; but, as an internal remedy, it is chiefly regarded as an astringent in dysentery and diarrhœa, and as a topical application, in the form of a strong infusion for aphtha, scarlatina maligna, etc. It is also employed, and with great success, in combination with ulmus fulva, in the form of a cataplasm. The medicine may be taken in powder, in doses of half a drachm, but is best administered in the form of infusion. ℞ Root in coarse powder, ʒij., boiling Aq., Oj.; macerate for thirty minutes. Dose fʒij.—fʒiv. A syrup

may be made, either simple or compound, in the same way as directed for those of the Geranium Maculatum.

HAMAMELIS VIRGINICA.—The Leaves.

SYNONYMS.—Hexehasel, *Ger.*; Hamamelier D'Hyver, *Fr.*; Witch Hazel, *Eng.*; Winter-bloom, *Vul.*

BOTANY.—*Sex. Syst.*—Tetrandria Digynia. *Nat. Ord.*—Berberides.

Gen. Char. HAMAMELIS.—*Involucre* three-leaved. *Perianth* four-sepaled or four-cleft. *Petals* four, very long, linear. *Nut* two-celled, two-horned.

Spec. Char. H. VIRGINICA.—A small tree, growing in groups, and attaining to ten or fifteen feet in hight. The bark is smooth and gray, interspersed with whitish spots. *Leaves* petiolate, ovate, roundish, entire, with a small sinus at the base, margin with unequal teeth, obscurely developed. *Flowers* on short pedicels, clustered; petals yellow, linear, often undulate or revolute. *Stamina* four, opposed to petals, shorter than the calyx *Fruit* a nut-like capsule, sometimes fancied to resemble a hazle-nut, but is bilobed and split above, with two cells con-

H. VIRGINICA.

taining each a hard, oblong black seed. The flowers appear late in the fall, or, rather in the winter, and the seed is matured the ensuing season. The shrub grows in thickets and woods, in sandy or rocky places, in most parts of the United States. The cut here given represents three stages of the plant all in one view, and thus different from its appearance in nature. There are here two small leaves, very correctly figured, and of about one-third that of the largest size. There is also the appearance of the flowers, which do not occur while the plant is in foliage. The capsules also are represented among the flowers; these do not mature until the following season.

THERAPEUTIC PROPERTIES.—The leaves of the Hamamelis Virginica is a mild but somewhat efficient astringent, much used in some sections, both as an external and internal remedy. The cases in which this medicine seems most indicated are—chronic dysentery, diarrhœa, gleet, leucorrhœa, diabetes, etc., but will answer well in most other cases in which the more irritant astringents are serviceable. It makes a good wash for chronic sore eyes that are attended with a purulent discharge; ulcers, cancers, fistula, etc., also furnish instances for its employment as a wash. With ginger and ulmus fulva, it forms an excellent cataplasm for painful and angry sores, ulcers, cancers, etc. It is best taken in strong, watery infusion. Dose, ℥j.—℥iv. Water is the best menstruum.

RUBUS.—The Leaves, and the Root.

BOTANY.—Icosandria Polygynia. *Nat. Ord.*—Rosaceæ.

Gen. Char. RUBUS.—*Calyx* five-cleft, inferior. *Corolla* five-petaled. *Pistils* numerous. *Berry* composed of many juicy, one-seeded acines, on a dry receptacle.

Spec. Char. There are several of the many species of the rubus that are medical, among which are the following:

1. R. STRIGOSUS: *Red Raspberry.—Stem* shrubby, unarmed, about four feet high. *Leaves* pinnately three to five foliate; leaflets ovate, lanceolate, rough, serrate, green above, pale beneath. *Flowers* in panicled corymbs, white. *Fruit* red, of rich flavor, delicious. Grows throughout the United States. Cultivated in gardens.

RUBUS STRIGOSUS.

R. Strigosus. A drawing of the Red Raspberry taken from nature by the author in the fruit season. The largest berries are represented in state of maturity, the others in course of development, about half the natural size.

2. R. Villosus: *Blackberry, High Blackberry.—Root* perennial, horizontal, knotty, crooked, of a reddish-brown color. *Stems* biennial, from three to seven feet high, shrubby, grooved, curved, brown or green color, armed prominently with strong, sharp, curved prickles. *Leaves* ternate and quinate, villous on both sides. *Flowers* white, racemose. *Berry* green first, then red, and finally, when mature, of a jet-black, edible. Grows throughout the United States in hedges, uncultivated fields, and open woods, sometimes in dense thickets.

3. R. Canadensis, Torry and Gray; R. Trivialis of most Botanists: *Dewberry, Low Blackberry.—Stem* slender, procumbent, prickly. *Leaves* three to six foliate. *Flowers* white, subracemose. *Fruit* similar to that of the blackberry, but much larger and more palatable. Michaux says, that the true R. Trivialis is a Southern plant, and ripens its fruit much earlier than either of the more Northern species do; even as early as the flowering time of the R. Villosus. It appears that the R. Canadensis is a species about midway between the R. Villosus and the R. Trivialis, and that the Trivialis ripens its fruit in June; the Canadensis in July, and the Villosus in August.

The bark of the roots of the three species of rubus is very astringent and agreeable in its internal use. It is employed in forms of decoction and infusion, for dysentery, choleras, diarrhœa, leucorrhœa, etc. Prepare it strong, and take it freely. Water and alcohol are its solvents. The active principle is tannic and gallic acid, with extractive. The fruits of all these species afford the most wholesome luxuries in their season. They are prepared extemporaneously in milk and sugar; also in pies and tarts. Preserved with sugar, in form of jam, syrup, or jelly. They afford a magnificent wine. Bruise the berries; add equal weight of water; mix and let stand for half a day; press out the juice; strain; add one and a half pounds of sugar to the gallon, cold; strain again, and put up. It gets matured in six to twelve months. Some hasten maturity by means of a ferment (yeast).

4. R. Odoratus: *Flowering Raspberry; Mountain Raspberry.*—This beautiful plant is also called *Wild Mulberry*, from the shape of the leaves. The plant is bushy and unarmed. Leaves large, entire, lobed, reticulated. Flowers large, very odorous, and showy. Berry not quite so large as the red raspberry. The leaves are mildly astringent, equivalent to the raspberry leaves.

The adjoining cut was engraved from a drawing taken from nature by the author.

R. ODORATUS.

The leaves of R. Strigosus afford a very pure and mild

astringent, analogous in its effects to those of the Hamamelis Virginica; useful generally where the simple astringents are indicated. But it is supposed that the medicine is peculiarly indicated in tedious cases of parturition, where the pains, *or contractions* are insignificant. Dr. Thomson supposed that the raspberry has a specific influence over the uterus, and will excite its contractions when other agents have failed to produce any good effect. It is given in strong infusion, taken freely. It yields its virtues to water and alcohol.

CEANOTHUS AMERICANUS.

This is an indigenous shrub, the leaves of which constituted the famous "*Jersey Tea*" in Revolutionary times. The plant belongs to *Sex. Syst.* Pentandria Monogynia, and *Nat. Ord.* Rhamni. There are several species, but that indicated by the title above, is the one mostly referred to in medical books. The root is branched, and has a reddish bark, which is the medicinal portion. *Stem* shrubby, one to three feet high. *Leaves* ovate, acuminate, serrated, three-nerved, pubescent beneath. *Panicles* axillary, long-peduncled, sub-corymbed. Grows in New-England, and indeed in most of the States, in barren soil.

The bark of the root is a fine simple astringent, that may be employed as such in all cases requiring these remedies. It has also been esteemed for *special* uses, having been reputed a specific for syphilis. It is certainly valuable in gonorrhœa, both as an internal remedy, and topical application, as by urethral injection. The watery infusion is the common form of its use, taken *ad libitum*.

DIOSPYRUS.

This is the common *Persimmon Tree*, well known, growing to a large-sized tree, and found from New-York to Louisiana. The *fruit*, which ripens late in the fall, is a pulpy, or fleshy, sweet-tasted, yellow, globular berry, containing several compressed seeds.

The fruit, in its immature state, is very powerfully astringent; and has been employed to advantage in many cases

where astringents were indicated. The expressed juice is given in doses of ℥ss.—℥j.

The Bark of the tree is tonic and astringent. Various medical men, among whom were B. S. Barton, and Dr. Mattaur, reported quite favorably of this article in bowel diseases, and hemorrhages. It is taken in syrup, or tincture. The wood of the tree is very hard and solid. The D. Ebenus furnishes the *ebony wood.*

POTENTILLA.

Tormentilla.—This is an European plant, the root of which is much employed as an astringent. It is brought to our market, *Rad. Tormentilla*, in the crude state. It is very much like the geranium of our country in its medical properties. It may be regarded as a good secondary astringent. The constituents are *tannin*, *extractive*, *myricin*, *resin*, *cerine*, *gum*, etc. The solvent, for medical use, is water, and alcohol. Employ as the geranium.

The root of the P. Reptans, or Cinquefoil (five-finger leaf), is also slightly astringent, and has been employed as a domestic remedy.

SPIRÆA.

Hard-hack.—There are many species of the Spirea, which are beautiful, or ornamental shrubs: several are medicinal.

The S. Tomentosa is valued as an astringent and tonic. It is a small shrub, with many simple, upright, downy *stems*, two to four feet high. The *leaves* are alternate, crowded, entire, on short petioles, oblong, lanceolate at both ends, serrate, green above, white below. The *flowers* are in spiral terminal panicles, of a fine rose-color. Grows in many parts of the United States. The root has been made officinal; but by many physicians the leaves, and bark of the stem, are considered much superior. It is employed in form of extract. This is commonly aqueous, but is better when prepared with alcohol. The dose is gr. v.—ʒj.

The S. Opulifolia, or *Nine-bark*, as it is called, is quite equal to the above.

The Spirea deserves a higher position, as a medicine, than

it now holds. It is an astringent and tonic, of considerable power, and is seldom disagreeable even to the most delicate stomach. Useful, particularly in low stages of dysentery, the diarrhœa of phthisis, bowel complaints in dentition of children, lucorrhœa, etc.

FRAGARIA.

Strawberry.—The *leaves* of the common strawberry have been employed as a mild astringent, and will answer as a substitute for other articles of this class; but they are of feeble power. They are used in strong decoction, or infusion, and applied either as an internal remedy, in diarrhœa among young children, or sometimes injected per vaginam, in leuchorrhœa, and in prolapsus uteri. The root is diuretic. The berries are exquisite; they ripen in advance of most other fruit, and with sugar and cream, iced, or otherwise, do the palate right good service.

Order II.—BITTER AND ACRID ASTRINGENTS.

Most of our vegetable astringents have united with them marked bitter and acrid properties. This is more particularly the case with the different barks of trees, which mostly abound with tannin, gallic acid, bitter extractive, and acrid principles.

The simple astringents were placed in a separate order, as they are capable of fulfilling many indications that can not be answered by the articles of this order. On the other hand, again, the acrid and bitter astringents have special adaptations that do not obtain in case of the foregoing order. They are generally more powerful and durable in their effects.

When astringents are exhibited internally, in view of their remote effects, the articles of this order are much the most available. These are, therefore, generally selected, when it is intended to combine astringents with stimulants, tonics, or other classes, the virtues of which they are capable of improving, as already stated.

The acrid and stimulating astringents possess a remarkable

power to disengage the superfluous or impaired secretions of the mucous membranes. The tannic acid is always sufficiently free to unite readily with albumen, and coagulating it, renders the coating of those tissues of a firm and rather impervious consistence. The acrid and stimulant properties excite the flow of serum, which is interposed between the living tissues and their now coagulated coating, and thus the latter is disengaged. The physiological action of the tissues, which is promoted by the astringent power of the medicine, contributes also to the disjunction of those materials. This property of astringents, and particularly of this order, has induced Dr. Thomson to call them "*canker medicines.*"

MYRICA.

Synonyms.—Bayberry, *Eng.*; Sweet-gale, Wax-myrtle, etc., *Vul.*

Botany. *Sex Syst.*—Diœcia Tetrandria. *Nat. Ord.*—Amentaceæ; Myricaceæ.

M. Cerifera.—This is the *bayberry* or *wax myrtle*, the bark of which has now become so prominent as an article of materia medica. It is a shrubby plant growing in low marshy ground, mostly on the Atlantic sea-coast. The root is branched and covered with a brown bark, which has an extremely acrid, stimulant and astringent taste. The stems are from three to ten feet in hight, growing highest in the South. The branches bear a pe-

M. CERIFERA.

culiar greenish-white wax, which envelops the fruit in globular berries, clustered in irregular bunches upon the twigs. It is separated by boiling in water, and is applied to various economical uses, as for candles, and in medicine, a constituent of plasters, cerates, etc. The leaves are cuneo-lanceolate, narrowest at the base, remotely serrate or toothed at the outer end, of a shining green color on the upper side, paler beneath. *Flowers* amentaceous, appear in May. The above cut gives a good representation.

M. GALE.

M. GALE.—This is the *sweet gale* or *bog myrtle*. A shrubby plant growing also in wet places; attains the hight of three to four feet. It has a branched stem, and cuneo-lanceolate leaves, which are toothed at the outer end. *Aments* imbricate; scales acuminate, ciliate. *Fruit* in a scaly head, consisting in berry-like spicy or resinous bodies, alternately disposed on the flower-stalk.

The leaves of this species are employed in Sweden as a substitute for hops. The tincture of the berries is used as a remedy for scabies and tinea capitis: it is applied externally and given internally.

Gen. Char. MALES: *Ament* oblong. *Scales* lunate. *Stamens* four to six. FEMALES: *Ament* oblong, more compact than the sterile. *Sepals* two, ovate, acute, scale-like. *Ovary* ovate, flattish, superior. *Stigmas* two, filiform, spreading, longer than the calyx. *Fruit* one-celled, one-seeded. *Leaves* evergreen.

Spec. Char. This genus furnishes several very valuable medical species, two of which are here noticed, although one of them, the *M. Gale*, would be more appropriately placed among the stimulants: indeed, the bark of the M. Cerifera which secures the position here, is also extremely stimulating in its properties.

MEDICAL PROPERTIES AND USE.—It is the bark of the root

of the *Myrica Cerifera* that is the object of the present attention. This bark, commonly called *Bayberry*, is of very great utility, and in the reformed profession it is an article of the first importance. It is an acrid, stimulating astringent, and thus admits of extensive application. The acrid principle is prominently excitant to the serous and mucous secretions, and will, when the bark is tasted, cause a very copious flow of the saliva. It will also maintain the enteric secretions so that the astringent power of the bark will not cause constipation, even though its use should be long continued.

The noted Thomson is doubtless entitled to the credit of bringing this important and useful article into general medical practice. He called it a "*canker medicine*," and employed it in aptha, stomatitis, dysentery, cholera, scarlatina, cynancha, and in fevers generally. In the administration of his lobelia emetic, this article, with several others in combination, was ever in requisition as a preparatory means.

Besides the general internal application of bayberry bark, which is in most cases in which articles of this order are indicated, but particularly in diarrhœa, dysentery, variola, typhoid and secondary stage of typhus fever, scarlatina, scorbutus, secondary stage of phthisis, etc., it is also of great avail as a topical application in leuchorrhœa, blenorrhœa, fistula, ulcers, cancers, tenia capitis, applied thus in the form of infusion or tincture.

The pulverized bark makes an excellent tooth-powder, and cephalic snuff. It is taken in substance, infusion, and decoction. The dose of the powder is gr. x.—gr. xxx.

PHARMACEUTIC PREPARATIONS.—EXTRACTUM MYRICÆ CERIFERÆ: *Extract of Bayberry.*—This is prepared in the same way as the extract of cornus Florida. *Dose* gr. v.—gr. xv.

SYRUPUS MYRICÆ CERIFERÆ: *Syrup of Bayberry.*—℞. Bayberry bark, in coarse powder, ℥viij. White Sugar, ℔bjss. Aq. Ov. Boil for three hours, strain, boil down to one pint, add the sugar, boil ten minutes, skim, and stir while cooling.

Action—Use.—An excellent remedy in diarrhœa, and secondary stage of dysentery. *Dose* a tablespoonful.

MYRICIN.—This is a resinoid principle of the bark that is obtained by precipitation from the concentrated alcoholic tinc-

ture, in the same way as is practiced in preparing the podophyllin, which see. Myricin is a powerful agent; acrid, stimulant, astringent and tonic, applicable in a very large range of prescription, as the sensible properties readily indicate. It it is much less astringent in proportion to its stimulant power, as compared to the bark. The dose is gr. iij.

GEUM.—The Root.

SYNONYMS. Benediktenwurzel, *Ger.*; Cariofillata, *Ital.*; Cariofilata, *Span.*; Evans' Root, *Vul.*

BOTANY. *Sex. Syst.*—Icosandria Polygynia. *Nat. Ord.*—Rosaceæ.

Gen. Char. GEUM. — *Calyx* ten-cleft. *Petals* five. *Seeds* with a bent awn.

Spec. Char. There are a number of species of this genus medicinal, but only two are officinal, the *G. Rivale*, and the *G. Urbanum*. The latter is an European species and is not used here. The G. Rivale alone, therefore, will here be described. The root of this is perennial, horizontal, jointed, tapering, six inches long, reddish-brown externally, white internally, with yellowish fibers. *Stems* one or more, a foot or more high, simple, erect, pubescent, purplish. *Radical* leaves pinnate, on long hairy footstalks; those on stems in three serrate segments. *Flowers* few, nodding, and yellowish-purple. *Fruit* composed of little nuts.

THERAPEUTIC PROPERTIES.—A powerful astringent, combining the virtues of a tonic. It has long been in use as a remedy in passive hemorrhages, leucorrhœa, phthisis, diarrhœa, and dysentery. It is most commonly used in form of decoction. ℞ Rad. G. Rivale, in coarse powder, ℥j.; Aq. Oj. Boil to Oss. and strain. *Dose*, f℥j. to f℥ij., repeated. The dose of the powder is from a scruple to a drachm. The infusion is made by macerating an ounce and a half of the root in a pint of boiling water.

The virtues are most readily imparted to boiling water.

TRILLIUM.—The Root.

SYNONYMS.—Triole dilatee, *Fr.*; Wild Lily, *Eng.*; Beth Root, Birth Root, *Vul.*

BOTANY.—*Sex. Syst.*—Hexandria Digynia. *Nat. Ord.*—Asparagi.

Gen. Char. TRILLIUM.—*Calyx* three-sepaled, inferior, spreading. *Corolla* three-petaled. *Style* none. *Stigmas* three. *Berry* three-celled, many-seeded.—*Eaton.*

Spec. Char. This genus affords many species that are medicinal, and very analogous in their virtues. Linnæus however, only gave three, the *T. Sessile*, *T. Erectum*, and the *T. Cernuum*. Nuttall, Michaux, Pursh, Elliot, and others, increased the species to the number of fifteen, and Rafinesque, who has given the subject considerable attention, has discovered thirty-four, embracing many varieties, which he, however, arranges under three sub-genera. As the history of this genus of medical plants has created some interest among our practitioners, and as many of the species are destined to become important articles of our Materia Medica, the author has deemed it proper to give this Botanist's monograph of the genus.

I. SUB-GENUS *Sessilium*. *Petals* erect; *anthers* adnate; *filaments* flat; *stigmas* sessile; *flowers* sessile,—corresponds to the T. Sessile of Linnæus.

1. SP. TRILLIUM LONGIFLORUM, Raf. Leaves sessile, spreading, ovate, acute, five-nerved: petals lanceolate, twice as long as the calyx, sessile, acute, and purple. The Tr. sessile of modern authors, which name is wrong and illusive. Found from Lake Ontario to Carolina. Root thick, premorse, and berry purple, as in most all the species; many varieties: 1, Maculatum. 2, Atropurpureum. 3, Parvifolium. 4, Pumilum. 5, Rubricaule. 6, Undulatum. 7, Latifolium.

2. TR. ROTUNDIFOLIUM. Raf. Leaves spreading sessile, rounded ovate, obtusely acuminate, five-nerved; Calyx erect lanceolate, petals rather longer, lanceolate, obtuse, undulate, dark purple, sessile; stamens short. From Lake Erie to Tennessee. Var. 1, Flexicaule. 2, Rubricaule. 3, Maculatum. 4, Orbiculatum. 5, Pallidum. 6, Undulatum.

3. TR. ISANTHUM, Raf. Leaves drooping sessile, oval, elliptic, with an obtuse point, five-nerved. Calyx and petals equal, erect, oblong, acute; stamens nearly as long. In Ohio, Kentucky, Arkansas. Petals pale purple. Var. 1, Albiflorum. 2, Parviflorum.

4. TR. TINCTORIUM, Raf. Root concatenate, red inside; leaves drooping sessile, oval, lanceolate, acute, trinerve; calyx and petals equal, erect, oval, lanceolate acute. In the islands of the Missouri river. Is it a variety of Tr. Isanthum?

5. Tr. Viride, Beck. Leaves ovate acute, maculate; Calyx ovate lanceolate erect obtuse, petals green, rather longer, spatulate and thick; stamens short. In Missouri.

6. Tr. Recurvatum, Beck. Leaves subpetiolate, ovate lanceolate acute trinerve. Calyx recurved lanceolate acute, petals equal to it, ovate lanceolate, purple; stamens short. From Kentucky to Missouri. Var. 1, Sessilifolium. 2, Obovatum. 3, Maculatum. 4, Undulatum.

7. Tr. Angustifolium, Raf. Stem slender, leaves lanceolate acuminate, trinerve, undulate, often erect; calyx erect linear lanceolate acute, petals equal, white, lanceolate obtuse; stamens short. In Kentucky, etc. Var. 1, Gracile. 2, Stenopetalum. 3, Maculatum. 4, Roseum.

8. Tr. Membranaceum, Raf. Stem slender, leaves sessile, thin, and membranaceous, ovate elliptic, obtuse trinerve; calyx erect, ovate lanceolate, obtuse; petals pale, subequal, cuneate acuminate. Glades of Kentucky, Illinois, and Missouri: Flowers small, petals of a dirty pale purple. Var. 1, Ellipticum. 2, Obovatum, 3, Parvifolium.

9. Tr. Unguiculatum, Raf. Leaves petiolate, oval, both ends acute, trinerve; calyx reflexed, lanceolate obtuse; petals subequal to it, anguiculate, oval, oblong, obtuse and purple. In the glades of Indiana, west Kentucky, etc. Var. 1, Crassicaule. 2, Undulatum. 3, Maculatum.

10. Tr. Petiolatum, Pursh. Leaves long petiolate, oval lanceolate, acute trinerve: calyx erect, petals lanceolate linear acute, longer than the calyx. In the mountains Taconick, Alleghany, etc.

11. Tr. Maculatum, Raf. (Tr. sessile, Elliot.) Stem spotted, leaves sessile, ovate acute, trinerve, spotted; calyx erect oblong, petals spatulate, twice as long, dark, purple. In Carolina, etc.

II. Sub-genus *Anthopium*. *Petals* spreading; *anthers* terminal; *filaments* not flat; *stigmas* sessile: *Flowers* pedunculate, erect, or drooping.

12. Tr. Acuminatum. Raf. Leaves sessile, ovate acuminate, undulate, trinerve; peduncles erect, equal to the leaves; calyx and petals subequal lanceolate, acuminate. In the mountains Alleghany. Petals red, not reflexed.

13. Tr. Pictum. Pursh. (Tr. Erythrocarpium, Michaux.) Leaves oval acuminate; base rounded, subpetiolate, five-nerved; peduncle nearly erect, shorter than the leaves; calyx lanceolate acute; petals recurved, oval lanceolate acute, twice as long as the calyx. From Canada to Carolina. Petals white, with purple veins; berries bright red. Var. 1, Undulatum. 2, Roseum.

14. Tr. Amblopsis. Raf. Leaves petiolate, ovate, with a long obtuse acumen, trinerve; peduncle erect, shorter than the leaves; calyx and petals subequal, narrow lanceolate, obtuse. In the mountains Alleghany, etc. Petals white. Var. 1, Longifolium. 2, Incarnatum. 3, Undulatum. 4, Stenopetalum. 5, Angustifolium. 6, Pumilum. 7, Cuneatum. Petals cuneiform.

15. Tr. Pusillum. Michaux. Leaves sessile, oval oblong, obtuse, trinerve; peduncle erect and short, calyx oval lanceolate, obtuse; petals subequal, undulate, cuneate obtuse. From Pennsylvania to Arkansas, in glades. Stem flexuose, purple, three or four inches high; leaves small; petals of a pale flesh color.

16. Tr. Nutans. Raf. (Tr. Erectum of many botanists.) Leaves subsessile, subrhomboidal, very wide; base acute; end acuminate, trinerve. Peduncle nearly as long, inclined. Flower nodding. Calyx and petals subequal, oval lanceolate, acute. From Canada to Carolina. Large plant, leaves and flowers. Petals red or white. Var. 1, Atropurpureum. 2, Bicolor; flower smaller, white; pistil red. 3, Obovatum. 4, Undulatum. 5, Rhombóideum. 6, Flexuosum. 7, Album.

17. Tr. Flavum. Raf. Leaves sessile, rhomboidal acuminate, trinerve; peduncles as long, erect; flower nodding; calyx narrow lanceolate; petals longer, lanceolate, yellow, acute. In the mountains from New York to Virginia, rare.

18. Tr. Pendulum. Wildenow. Leaves sessile, rhomboidal acuminate; base acute, trinerve; peduncle inclined; flower drooping; calyx and petals subequal, oval acuminate; petals white, with red veins. In the mountains Catskill, Alleghany, etc.

19. Tr. Undulatum. Raf., 1807. W. and Elliot. Leaves sessile, ovate acuminate, undulate, trinerve; peduncle erect; calyx lanceolate; petals much longer, undulate, oblong, obtuse, dark purple. Mountains Alleghany in Pennsylvania, etc.

20. Tr. Brevipetalum. Raf. Leaves sessile, ovate rhomboidal, acuminate; base acute, trinerve; peduncle erect, elongated; calyx lanceolate, acute; petals shorter, ovate, undulate, acute, white. Near the lakes Ontario and Erie. Var. 1, Latifolium. 2, Roseum.

21. Tr. Ovatum. Pursh. Leaves sessile, ovate, gradually acute, trinerve; peduncle erect; calyx linear; petals longer and larger, oblong, lanceolate, acute, and purple. Southern States.

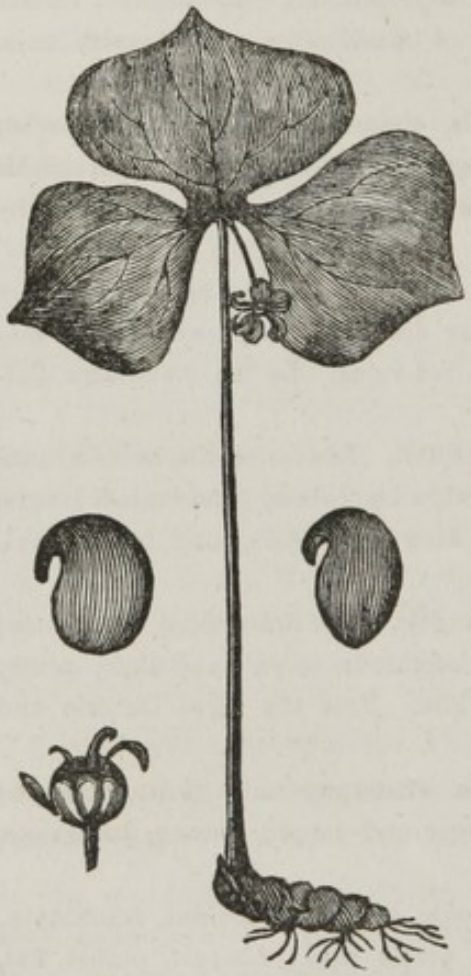
22. Tr. Obovatum. Pursh. Leaves sessile, ovate rhomboidal, acuminate; peduncles erect; calyx oval, lanceolate; petals equal, obovate, obtuse, flat, flesh-colored. From Canada to Ohio.

23. Tr. Grandiflorum. Salisbury. (Tr. Rhomboidum Mx.) Leaves sessile, ovate rhomboidal, acuminate; base acute, five-nerved, reticulate; peduncle inclined, elongated; calyx ovate, lanceolate acute; petals longer, obovate, acute, white. From lake Ontario to Virginia and Kentucky. Petals thin, reticulate, forming a campanulate flower; base connivent. Var. 1, Roseum. 2, Elatior. 3, Rhomboideum. 4, Pumilum. 5, Parviflorum. 6, Macropium 7, Obovatum. 8, Longifolium. Often called Ground Lily, as well as the following species.

24. Tr. Lirioides. Raf. Leaves shortly petiolate, ovate acuminate; base

rounded, trinerve, and reticulate; peduncle short and erect; calyx oval, lanceolate, obtuse; petals larger, oblong, cuneate, obtuse, white. Near Lake Erie, in the glades of Ohio, Illinois, etc. Commonly smaller than the last, flower also nearly companulate. Var. 1, Parviflorum. 2, Pumitum. 3, Roseum. 4, Grassicaule. 5, Longifolium. 6, Maculatum. 7, Undulatum.

25. Tr. Obcordatum. Raf. Stem short and thick; leaves sessile, obcordate, trinerve, reticulate; peduncles as long, inclined; calyx lanceolate, obtuse; petals equal in length, obovate, obtuse, white. In the mountains Alleghany. Is it a variety of Tr. Grandiflorum? only four inches high.



T. LATIFOLIUM.

26. Tr. Latifolium. Raf. Leaves subsessile, very broad, dilatate, wider than long, subrhomboidal, undulate, both ends shortly acuminate, many nerved and reticulate; peduncle reflexed and short; calyx and petals subequal, oval, acuminate, reflexed and revolute; stamens shorter than the pistil. In Kentucky. Stem thick, eighteen inches high; petals dark purple. This and all the next species, belong to the Tr. Cernuum of Linnæus, while the foregoing fourteen species answer to his Tr. Erectum.

The cut represents the entire plant of this species. Also, in small figure, two of the petals, of nearly natural size, and the germen or receptacle. The figure is less than half the natural size.

27. Tr. Spatulatum. Raf. (Tr. Purpureum. Kin. and Elliott.) Leaves sessile, spatulate, ovate, acuminate, trinerve, reticulate; peduncle drooping; petals dark purple, longer than the calyx, ovate, lanceolate. In the mountains Alleghany.

28. Tr. Nervosum. Elliot. Leaves sessile, ovate, lanceolate, both ends acute, membranous, reticulated; peduncle recurved; petals oblong, lanceolate, larger than the calyx, rose-colored. In Carolina and Georgia.

29. Tr. Catesbei. Elliot. Leaves sessile, ovate and obovate, both ends acuminate; peduncle recurved; petals lanceolate, larger than the calyx, rose-colored. Carolina. Figured by Catesby, 1; perhaps the type of Tr. Cernuum, of Linnæus. Var. 1, Obovatum. 2, Incarnatum.

30. Tr. Hamosum. Raf. Leaves sessile, rhomboidal rounded, base acute, end

sharply acuminate, membranous, trinerve; peduncle very short, reflexed, crooked like a hook; calyx and petals oblong, lanceolate, obtuse; petals larger and white. In the Ponoco mountains of Pennsylvania. Root fasciculate, fibrose; stem six inches only; leaves and flower small. Discovered by Mr. Steinhauer.

31. Tr. Medium. Raf. (Tr. Cernuum of our modern botanists.) Leaves shortly petiolate, broadly rhomboidal, both ends abruptly acuminate, five-nerved, reticulate; peduncle recurved, short; calyx and petals equal, ovate lanceolate, flat, white. From New England to Virginia. Var. 1, Gracile. 2, Pudicum. 3, Undulatum. 4, Grandiflorum.

32. Tr. Glaucum. Raf. Leaves sessile, broad deltoid, both ends acute, glaucous beneath, five-nerved and reticulate; peduncle reflexed; calyx and petals subequal, oval, obtuse; calyx erect; petals reflexed back, and white. In Pennsylvania, near Philadelphia; Maryland; Virginia, etc. This is the Tr. Cernuum of W. Barton, Fl. Am. fig. 40.

III. Sub-genus *Delostylium*. A *style; stigmas* three. *Flowers* pedunculate.

33. Tr. Divaricatum. Raf. Leaves sessile, obovate, acuminate; peduncle divergent, horizontal; petals lanceolate, acute, longer than the calyx, flat, and purple. In the Alleghany and Cumberland mountains; six inches high.

34. Tr. Stylosum. Nuttal. Leaves with short petioles, oval lanceolate, acute at both ends; peduncle recurved, very short, petals oblong obtuse, undulate, larger than the calyx; a style as long as the stigmas. In the Southern States. Stem a foot high or less, slender; petals rose-colored. This is probably the Tr. Cernuum of Michaux.

Of the above, the most commonly used are the T. nutans, T. pictum, T. rotundifolium, T. grandiflorum, T. medium, and T. longifolium. But this preference is chiefly founded on the circumstance that these are the most common species, and hence more readily obtained.

The roots of these plants are commonly oblong or terete, tuberose, dark or brownish on the outside, white within, from one to five inches in length, and from a half to one and a half in diameter, beset with fibers laterally. They have a faint odor and a peculiar acrid astringent and sweetish taste.

Analysis.—The root of the trillium contains *Volatile Oil*, a little *Gum*, *Resin*, *Extractive*, *Tannin*, and much *Fecula*. Water is its best menstruum, but spirit will take up its stimulant and tonic virtues, as well as the astringent to some extent.

Therapeutic Properties and Use.—The trilliums are acrid but rather mild astringents, diaphoretics, antiseptics, expecto-

rants, vulnerants, and tonics. They have long been in medical use among the Indians. They considered them capable of promoting parturition: hence, one of the vulgar English names. The most astringent varieties are highly esteemed as a remedy for hæmoptysis, hematuria, and uterine hemorrhage. The most acrid are regarded of much value in asthma, hectic fever, and catarrhal cough. All are considered serviceable in leucorrhœa, amenorrhœa, and all morbid discharges from mucous tissues.

Externally applied, in the form of a cataplasm, the roots and tops are of great service in the treatment of mortified parts, ulcers, cancers, carbuncles, buboes, poisonous bites and stings, burns, and chilblains.

The medicine is best taken in substance, but may be exhibited in decoction, syrup, tincture, infusion, or extract. The dose of the powder is gr. x.—gr. xxx. That of the extract is gr. v.—gr. x. The latter is prepared in the same way as directed for the preparation of the extract of cornus florida.

STATICE.—The Root.

SYNONYMS.—STATICE CAROLINIANA; STATICE LIMONIS; Statice d'Amerique, *Fr.*; Marsh Rosemary, *Eng.*; American Thrift, *Vul.*

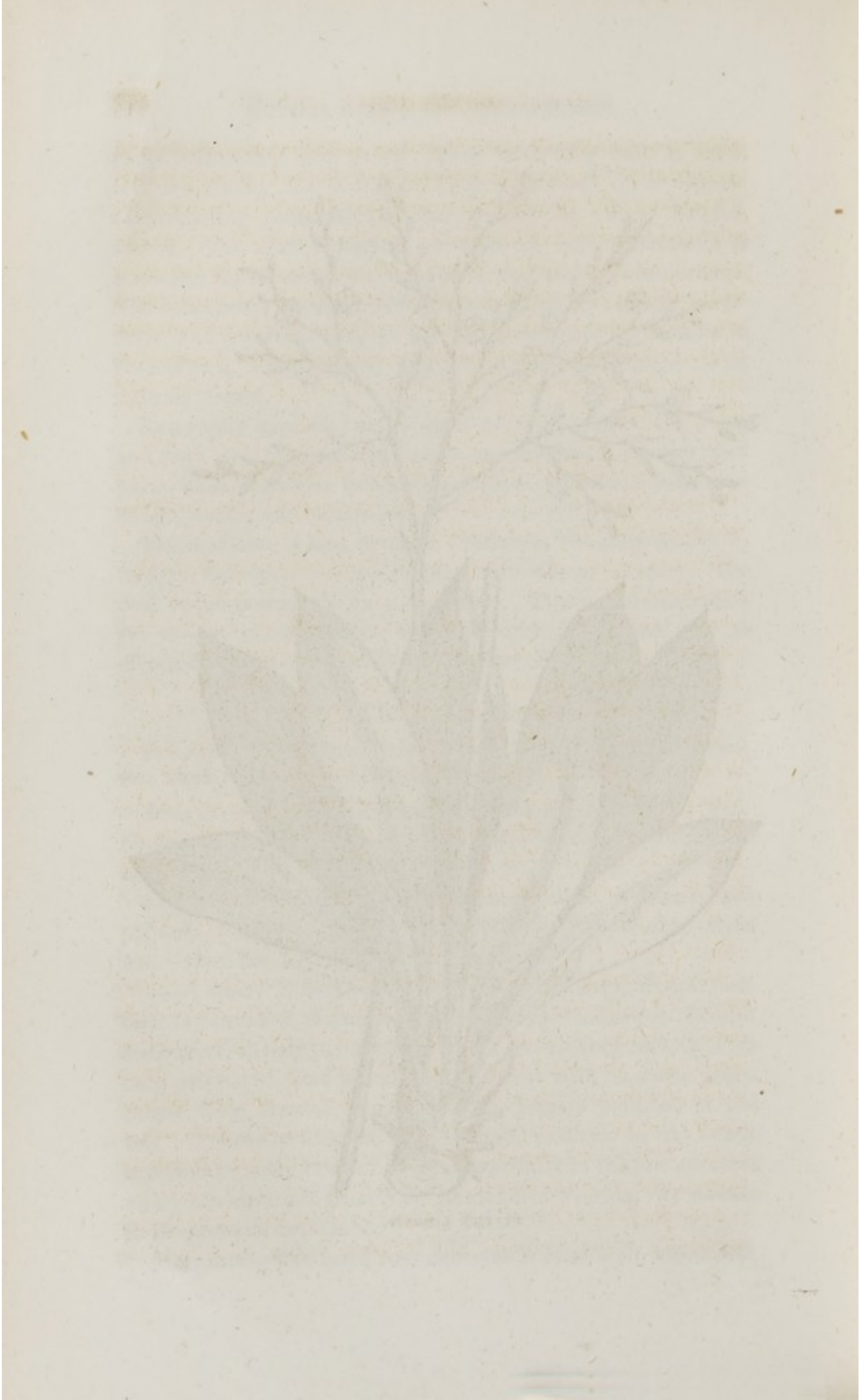
BOTANY.—*Sex. Syst.*—Pentandria Monogynia, *Linn.;* Pentandria Pentagynia, *Wood. Nat. Ord.*—Staticea, *Raf.;* Plumbaginaceæ, *Wood.*

Gen. Char. STATICE.—*Calyx* monophyllous, scarious, and plaited. *Petals* five, inserted on their claws. *Pistil* one. *Styles* five. *Seed* one, invested by the *calyx.*—*Raf.*

Spec. Char. S. LIMONIS.—*Root* perennial, large, fleshy, fusiform or branched, premorse or obtuse; purplish-brown. *Radical leaves* erect, on long petioles, cuneiform, entire, very smooth, with only one nerve; end broader, obtuse, but with an acute point. *Scapes* long, slender, round, smooth, loosely panicled at the top. *Flowers* subsessile, blue-colored, axillary to an ovate, mucronate, scaly bract. Grows plentifully in the salt marshes along the sea-coast from New England to Florida. It flowers in August and September.

ANALYSIS.—The dried root contains *a volatile oil, tannic acid,*

STATICE LIMONIS.



gum, extractive, albumen, resin, caoutchouc, coloring matter, lignin, and various *salts.* It yields its virtues most freely to boiling water.

THERAPEUTIC PROPERTIES AND USE.—Statice is powerfully astringent and somewhat tonic. It may be considered analogous, in its properties, to Geum, and may be used in the same way and for the same purposes as that. It is very much employed throughout New England, and is considered particularly serviceable in cynancha maligna, and aptheous sore mouth. It is commonly prepared in strong decoction and taken freely.

CATECHU.—The Extract of the Wood.

SYNONYMS.—Catechu, *Ger.*; Cachou, *Fr.*; Catecu, Catin, Catto, *Ital.*; Catecu, *Span.*; Cutt, *Hin.*; Catechu, *Eng.*

BOTANY.—*Sex. Syst.*—Polygamia Monœcia. *Nat. Ord.*—Leguminosæ.

Gen. Char. ACACIA HERMAPHRODITE.—*Calyx* five-toothed. *Corolla* five-cleft. *Stamens* four to one hundred. *Pistil* one. *Legume* bivalve. MALE.—*Calyx* five-toothed. *Corolla* five-cleft. *Stamens* four to one hundred.—*Willd.*

Spec. Char. ACACIA CATECHU.—*Willd.*—A tree from fifteen to twenty, but sometimes thirty feet high, with hard and heavy wood. *Branches* with stipulary thorns. *Leaves* bipinnate. *Pinnæ* ten to fifteen pairs. *Leaflets* thirty to fifty pairs. *Inflorescence* a spike, one to three together in the axillæ of the leaves. *Flowers* numerous, white. *Calyx* downy, five-fid. A native of the jungles and low hills of many parts of India.—(*Roxb. Corom. Plants,* 11 *t.*, 175). *Royle.*

DESCRIPTION.—Catechu occurs either in roundish, or square pieces, or balls, varying in color, from a pale whitish or light reddish-brown, to a dark brown; either earthy in texture, or lamellated, or presenting a smooth shining fracture. Some kinds are hence more friable than others; all are without smell; the taste is bitter, astringent, followed by a little sweetness. The pieces are generally of a darker color externally, than they are in the inside.

A large proportion of good Catechu is taken up by water, especially when boiling; the infusion being of a light or

reddish-brown color, according to its strength: "It reddens litmus, and is strongly astringent in taste. It yields a precipitate with the salts of Alumina, also with the Acetate of Lead, and one of a blackish-green color with the salts of the Sesquioxide of Iron."

ANALYSIS.—Sir H. Davy, in analyzing the *dark* and *pale* varieties of the drug, obtained the following results:

	Of Tannin.	Extractive.	Mucilage.	Insol. residuum.		
Dark Catechu,	109	68	13	10	=	200
Pale,	97	73	16	14	=	200

THERAPEUTIC PROPERTIES.—Catechu is a powerful astringent, and is much used by old-school physicians. It is also somewhat bitter, and tonic in its effects, but otherwise is rather purely astringent. Prof. Pereira gives the following as among its prominent applications:

1. *Affections of the mouth and the throat*—aphtha, relaxed uvula, etc.
2. *As a stomachic*, in dyspeptic complaints.
3. *As an alvine astringent*, in diarrhœa, dysentery, etc.
4. *As an astringent*, in hemorrhages of an atonic character.
5. *In lead colic.*
6. *In mucous discharges*—gleet, fluor albus, cystirrhœa, etc.
7. *As a topical application* to ulcers.

Dose, gr. x. to ʒj., taken in substance, in form of a bolus, or in a mixture with sugar.

KINO.

SYNONYMS. Kino, *Ger.*, *Fr.*, *Ital.*; Quino, *Span.*

DESCRIPTION.—Kino is an organic vegetable principle, afforded by many different species of plants. The commercial drug, however, is now chiefly produced by only a few different plants of the East and West Indies, Africa, and South America. Thus we have several commercial varieties of the medicine, as 1, The *East India*, or *Amboyna Kino;* 2, *West India*, or *Jamaica Kino;* 3, *African Kino;* 4, *South American Kino.*

The East Indian variety, is supposed to be produced by the Pterocarpus Mursupium. The West Indian and South American varieties, it is thought, are obtained from the Coccoloba

Uvifera. It is pretty certain that the African variety is produced by the Pterocarpus Erinaceus. Another variety, called the *Botany Bay Kino*, is the concrete juice of the *Eucaliptus Resinifera.*

Kino occurs in small, irregular, somewhat angular, glistening fragments, of a dark brown, or reddish-brown color, brittle, and affording a powder which is rather of a lighter color than the masses. It is without odor, and has a bitterish, highly astringent, and ultimately sweetish taste. It is not softened by heat; cold water partially dissolves it, boiling water more largely, and the saturated decoction becomes turbid on cooling, and deposits a reddish sediment. Alcohol dissolves the greater portion. It consists, chiefly, of a peculiar modification of tannin, with extractive matter, and, in some of the varieties, of a minute proportion of resin.

Analysis.—Kino, according to Vauquelin, contains no *gallic acid*, but *tannin*, and peculiar *extractive red gum*, and *insoluble matter*. Its aqueous solution is precipitated by gelatin (with which it produces a green color, in consequence of the presence of a little *catuchine*).

Therapeutic Properties.—Kino is a valuable astringent, though less powerful than catechu. It is much employed by the old profession in the passive hemorrhagia. It is quite analogous, in its general effects, to the article just named, and may be used in the fulfillment of the same indications noted for that. The dose of the powder is from gr. xx.—gr. xxx. The infusion is a very common form in which the medicine is exhibited. ℞ ʒijss. of the extract is to be dissolved in Oj. of boiling aq., and straining when cool. Aromatics may be added, if desired. The dose of this is fʒj.

QUERCUS.—The Bark.

Botany.—*Sex. Syst.*—Monœcia Polyandria. *Nat. Ord.*—Amentaceæ.

Gen. Char. Quercus Monœcious.—Male.—*Catkins* long, pendulous, lax. *Stamens* five to ten. *Perianth.* Females.—*Flower* solitary, with a cup-shaped scaly involucre. *Stigmas* three. *Ovary* three-celled, two abortive. *Nut*, or *acorn*,

one-celled, one-seeded, surrounded at the base by the enlarged cup-shaped involucre.

Spec. Char. There are many species of the oak that have been reckoned among medicinal plants. The barks of them all are more or less astringent and tonic. The following, however, are among those whose barks are considered the strongest:

1. Q. ALBA: *White Oak.* A most common, majestic, hardy, indigenous forest tree, seventy to eighty feet high. *Bark* rough, grayish-white. *Branches* large. *Leaves* oblong, sinuate-pinnatifid, pubescent beneath; lobes obtuse, entire, narrowed at their base. *Fruit* peduncled. *Cupule* somewhat bowl-form, flattened at the base. *Acorn* ovate.

2. Q. TINCTORIA: *Black Oak.* A large and common indigenous forest tree, sixty to seventy feet high. *Bark* rough, black or dark colored. *Branches* large. *Leaves* obovate, oblong, a little sinuate, pubescent beneath; lobes oblong, obtuse, obtusely denticulate, setaceous mucronate. Fructification biennial. *Cupule* saucer-form. *Acorn* depressed, globose.

3. Q. MONTANA: *Chestnut Oak.* A middling sized, indigenous tree, growing in mountains and rocky places. Forty to fifty feet high. *Bark* rough, grayish. *Branches* large, crooked. *Leaves* broad, ovate, oblong, white-downy beneath, shining above, coarsely toothed; teeth very obtuse, short. *Fruit* in pairs, short, peduncled. *Capsule* hemispheric; scales rugose, tuberculated. *Acorn* ovate.

4. Q. PRINOS: *Swamp Oak.* A large, indigenous tree, growing in swamps and wet places. Seventy to eighty feet high. *Bark* rough, of a grayish color. *Limbs* rather slender, straight. *Leaves* long-petioled, obovate, acute, pubescent beneath, coarsely toothed; teeth equal, spread, callous at the apex. *Capsule* bowl-formed, tapering at the base. *Acorn* ovate, large, sweet-tasted.

5. Q. FALCATA: *Spanish Oak.* A large, indigenous tree, growing on bottom-lands, in rich soil. Seventy to eighty feet high. *Bark* rough, grayish. *Limbs* slender, straight. *Leaves* long-petioled at the base, obtuse, downy beneath, three-lobed or sinuate, lobes sub-falcate, setaceous mucronate, terminal one elongated. *Capsule* bowl-form. *Acorn* globose.

The Q. PEDUNCULATA (*European White Oak*), and Q. ROBUR (*Common European Oak*), are European species, and made officinal in the British colleges.

ANALYSIS.—Oak bark contains *Tannin*, *Gallic Acid*, *Uncrystallizable Sugar*, *Pectin*, *Tannates of Lime*, *of Magnesia*, *and of Potash*, etc. The inner part of the bark contains the largest portion of Tannin, particularly in the spring of the year. From the presence of this principle, a precipitate necessarily

takes place with gelatin, and a blackish-colored one on the addition of a sesquisalt of Iron.

THERAPEUTIC PROPERTIES.—Oak bark is an excellent astringent tonic, and but for its commonness, would be much more used. It is capable of fulfilling most of the indications that mark the use of acrid or bitter astringents. The extract which is made by evaporating carefully the decoction, forms one of the best applications to recent ruptures, or hernia, either in children or adults. Plasters of the extract need only be worn over the breach to insure in many cases, a radical cure. They should be spread upon stiff leather. As a pediluvium, in cases of chilblains, the decoction is of great advantage.

The extract may be taken in doses of gr. x. to gr. xx.

GALLA.

SYNONYMS.—Noix de Galle, *Fr.*; Gallapfel, *Ger.*; Galla, *Ital.*; Agallas de Levante, *Span.*; Galls, Eng.

DESCRIPTION.—Galls are produced as a consequence of injuries inflicted by an insect upon several species of Quercus, but particularly the Q. Infectoria, or *dyer's oak*, a shrub growing throughout Asia Minor, "from the Archipelago, to the confines of Persia."

Galls are not only known by their commercial names, but are distinguished by their physical characters, as into *blue* and *White Galls*. The Blue Galls vary in size, and are of a bluish-gray color. They are gathered before the insect has become perfect, or worked its way out. Some of these are larger, and are called Green Galls, from being of a greenish color. They display on their otherwise smooth surface, a number of bluntly-pointed tubercles, which would appear to be the apices of leaves, stimulated into unnatural growth. The best are heavy, hard, shining, and break with a short flinty fracture. White Galls are so called, from being of a lighter color than the others, but still of a grayish or yellowish hue. They are distinguished by being perforated with a small round hole, that by which the insect had escaped. They are usually less heavy than the others, have a larger internal cavity, and are not so

astringent. Both are easily reduced to powder, which is without odor, but with a slightly bitter and powerful astringent taste. They yield their properties to water, which is the best solvent; also to proof-spirit, and slightly to alcohol and ether.

ANALYSIS.—From five hundred parts of galls, Sir H. Davy obtained one hundred and eighty-five of matter soluble in water, of which he states one hundred and thirty were *Tannin*, thirty-one *Gallic Acid*, with a little *Extractive*, twelve of *Mucilage*, etc., and twelve of *Saline and Calcareous Salts*, the insoluble matter consisting chiefly of *Lignin*. But a larger proportion of Tannin has been obtained by other chemists, as from thirty or forty to sixty, instead of the above twenty-six per cent.

THERAPEUTIC PROPERTIES.—Galls are very powerfully astringent, as may be readily inferred, from the large amount of gallic acid they contain. But although they are very pure, and by no means more unpleasant to the taste than the bitter astringents generally, they have not been so much used as an internal remedy as many other articles of this order. The chief employment of galls has been as a styptic, a gargle, and as an external application. But this will not always be said of an article so potent as this. The medicine is capable, not only of supplying the place of every article of this order, but will prove successful in many cases in which the weaker astringents fail.

It has long since been known that galls will very much improve the power of the anti-intermittents. Thus, ten grains of quinine combined with twenty grains of pulverized galls will be equal to fifteen grains of quinine given alone. As an astringent in diarrhœa, dysentery, leucorrhœa, and all depressing discharges, and especially as a styptic, few articles are of more value. Of its topical application as a styptic, and as a stimulant astringent and antiseptic, to parts affected with gangrene, ulceration, etc., it needs no encomium. The decoction, injected into fistulous ulcers, anthracia, and the cavities of hydrarthrus, will often bring about a healthy condition, and dispose the parts to heal even in the most inveterate cases. Galls may be taken in powder, infusion, decoction or extract.

These preparations are made in the same way as directed for other articles of this order. The dose of the powder is gr. x. to gr. xx. That of the extract, gr. v. to gr. x.

TANNIN.

Tannin or tannic acid is now mostly prepared from galls: the process given in the U. S. Pharmacopœia is as follows: "Take of galls, in powder, sulphuric ether, each *a sufficient quantity*. Put into a glass adapter, loosely closed at its lower end with carded cotton, sufficient powdered galls to fill about one-half of it, and press the powder slightly. Then fit the adapter accurately, to the mouth of a receiving vessel, fill it with the sulphuric ether, and close the upper orifice, so as to prevent the escape of the ether, by evaporation. The liquor which passes, separates into two unequal portions, of which the lower is much the smaller in quantity, and much denser than the upper. When the ether ceases to pass, pour fresh portions upon the galls, until the lower stratum of liquid in the receiver no longer increases. Then separate this from the upper, put it into a capsule, and evaporate with a moderate heat, to dryness. Lastly, rub what remains into powder. The upper portion of the liquid will yield by distillation, a quantity of ether, which when washed with water, may be employed in subsequent operations."

Tannin occurs in greenish or yellowish-white flaky powder; has a very powerfully astringent styptic taste; but is not bitter or otherwise particularly disagreeable to this sense. It is very soluble in water, less so in alcohol and ether. Its chemical formula may be found on page 651.

Therapeutic Properties and Use.—Tannin is the active principle of most of the vegetable astringents, and is applicable, therefore, in all the cases in which those articles are given, for their astringent properties, and it has the advantage over them generally, in the smallness of the dose required, as compared with them. It is to be remembered, however, when this powerful agent is employed as a general astringent for internal use, that it is very liable to be given in excessive doses, and that it may thus give rise to some inconvenience.

Excessive doses occasion nausea, vomiting, pain in the stomach and bowels, a sense of oppression in the precordia, constipation, headache, and loss of appetite. No serious consequences have, however, yet been reported from its effects. The dose is from three to five grains.

ALUMEN.

SYNONYMS.—SULPHATE OF ALUMINA AND POTASSA: Alum, *Fr.*, *Dan. Swed.*; Alaun, *Ger.*; Allume, *Ital.*; Alumber, *Span.*

Alum is a crystalline, solid, efflorescent, mineral salt, possessing a peculiar, acid, and powerful astringent taste. It has long been in use as an astringent, styptic, and general restrainant of secretion. In large doses it proves emetic and cathartic. It is commonly given in solution in water.

Its applications are in aptha, stomatitis, sore-throat, dysentery, hemorrhage, night-sweats, diabetes, gleet, leucorrhœa, etc.

Alum has also been highly recommended in colica pictonum, by no less authority than Kapeler and Gendrin, of Paris, and Copeland of London.

Dr. Bache of Philadelphia, in the U. S. Dispensatory, states that alum will allay nausea and vomiting, relieve flatulency, mitigate pain, and open the bowels with more certainty than any other article.

It is highly recommended in membranous croup. In its application in this case, the powdered alum is placed in one end of a little tube, and then blown with the breath from the mouth, through the tube, into the throat of the child.

Alum in solution is also found serviceable in purulent ophthalmia and conjunctival inflammation. The dose of powdered alum is gr. x. to gr. xx. The solution is made by putting half an ounce or more of alum, in a pint of water; for gurgling the throat this is to be sweetened with honey. Dose of this, f℥j.

AGRIMONIA.—The Root.

BOTANY.— *Sex. Syst.* — Icosandria Digynia. *Nat. Ord.*— Rosaceæ.

Gen. Char. AGRIMONIA.—*Calyx* inferior, five-cleft. *Stamens* twelve. *Nuts* two, in the bottom of the calyx.

Spec. Char. A. EUPATORIA.—*Root* perennial. *Stem* upright, simple, pubescent, two feet in hight. *Leaves* irregularly pinnate, terminal leaflet petioled: leaflets lanceolate, gash-toothed, almost glabrous. *Flowers* yellow, subsessile, situated in a terminal pike. Common plant. Grows in fields and roadsides. The cut here given, represents the upper half of the plant, and the flowering spike.

A. EUPATORIA.

MEDICAL PROPERTIES AND USE.—The root of the Agrimonia is a mild astringent, useful in diarrhœa, leucorrhœa, and summer complaints, and looseness in children at teething time. It has been also praised for its utility in scurvy, jaundice, and even scrofula. The common form of its use is in strong decoction. sweetened. Taken ad libitum.

RHUS GLABRA.

This is the common *sumach* growing abundantly in most of the States. The leaves, bark of the root, and berries, are possessed of fine astringent properties. Tannin has been prepared from the leaves, and the bark of the root is regarded by some practitioners, as especially useful in aptheous inflammation, and in sore-throat in scarlatina. The infusion is an excellent preparation for cleansing foul ulcers, and tinea capitis.

PIPER ANGUSTIFOLIUM.—Matico.

The substance brought to us called Matico, comprises the leaves of some one or more of the species of the Piper family, natives of the tropical regions. The name *Artanthe Elongata*, is now applied to the plant from which it is supposed to be obtained. Dr. Lindley, however, states that *Matico* is the vernacular of the inhabitants of Quito, applied to the *Eupatorium Glutinosum*.

The Matico was introduced to the profession through Dr. Ruschenberger, of the United States' Navy, who in a cruise in 1834, visited Peru, and there discovered the use of a very powerful styptic, called Matico, or *Yerba del Soldago*, of which he sent samples home, with an account of its uses as a styptic. It was reported to stop the flow of blood, almost instantly, even from large vessels. It is applied topically, in substance, and also internally in form of infusion. Its application has been in every kind of hemorrhage, and in leucorrhœa, and other morbid mucous effusions. It has been conjectured, that its extraordinary topical effects depend upon a peculiar characteristic structure of the leaf, which acts as a kind of mechanical agency. The under surface of the leaf is highly reticulated with veins, and covered with hairs: and it is said this surface should be applied, to insure its wonderful effects. What would this indicate, in reference to our verbascum thapsus (Mullein)? Alcohol and water extract its virtues. It is commonly given in form of infusion. ℞ Matico, ℥j.; Aqua bul., Oj. *Dose*, f℥jss. ℞ Matico, ℥iij.; Proof-spirit, Oj. *Dose*, f℥j.

Class IV.—NERVINES.

The term *nervine* (Nervinus, from *nervus*, a 'nerve,') is applied to that class of medicines calculated to remove nervous disorders.

All medical substances affect the nervous system to some extent, but those of this class operate upon it in a peculiar way. They, in a very special manner (either by relaxing the nervous tissue or modifying its sensibility) restrain their spasmodic action, and relieve pain.

These powers of this class are considered of two distinct orders, and are called *antispasmodic* and *anodyne*, which will be considered respectively.

It is supposed by some therapeutists that nervines are dependent, for their specific or peculiar effects, upon their special influence over the *cerebro-spinal* nerves. But if the new views of the celebrated Prof. M. Hall are correct, these speculations are illy founded.

It is evident that nervines very prominently affect at least two of Hall's subdivisions, that is the cerebral, or *sentient*, and *voluntary*, and the true spinal or *excito-motory;* as we find that the different remedies of this class will operate both as anodynes and antispasmodics.

It is not difficult to perceive how an anodyne may occasionally prove antispasmodic, and *vice versa* (admitting all Prof. Hall's views), seeing that both the sentient and motory systems involve the ganglionic system, and are thus connected. Again, the circumstance of the anodynes operating as antispasmodics may be explained without regard to the intervention of the ganglionic system. Thus, as the sentient nerves convey their impressions always *inward*, or toward the encephalon and the motory from the medulla spinalis *outward*, the antispasmodic effect may be the result of a reflex action, upon the latter in response to the former.

There is, indeed, strong reason for the conclusion that all nervines, like most other remedies, produce their primary impression upon the sentient nerves, and then their antispasmodic effect by a reflex action.

Order I.—ANTISPASMODICS.

Antispasmodics are remedies which, as the name denotes, are calculated to obviate or relax spasm. But as the latter is dependent upon so many different causes, it is difficult to define this order. They are necessarily very contingent in their action. When spasm arises from intestinal irritation, the best remedy may be found among the anthelmintics, antacids, purgatives, etc., which remove the source of irritation. Again, when spasmodic movements attend severe pain, anodynes, fomentations, and other soothing means may prove antispasmodic. Finally, we find mere debility, when excessive, will often occasion spasm; then tonics will afford complete relief.

There are, nevertheless, in this order of nervines, a number of articles which possess a relaxing or quieting influence that seems to be of quite a *specific* character. It is very reasonable to suppose that the functions of the motory nerves may be specifically influenced as well as any other parts of the organization. This order is designed only to embrace such articles as are considered to have this peculiar power over the motory nerves.

LOBELIA.

Lobelia Inflata, without doubt, stands at the very head of our antispasmodics. But it may be well, in contemplating these virtues of the medicine, to know how much of the antispasmodic power that it possesses, is peculiar to it as an *individual* article, and which is not common to all nauseants.

It has already been intimated that the latter agents possess a special power over the motory nerves, and that *spasmodic movement is incompatible with nausea;* and, it is evident that the antispasmodic power of lobelia is principally owing to its nauseating virtues; for we find that there is generally a correspondence between the extent of both these effects of the medicine. There is also some *analogy* existing between the antispasmodic effect of lobelia and that of other nauseants.

But still we find that although these facts *generally* obtain, instances do occur, in which the antispasmodic effects of lobelia

precede the nauseant; and again, it seems, that there is sometimes a want of correspondence in the *extent* of the two. It is true these circumstances may, perhaps, be much dependent upon the peculiar stimulant power of the medicine; yet can only be satisfactorily accounted for in view of its specific antispasmodic virtues, which it most undoubtedly possesses.

Application.—It was remarked, in the general consideration of this order of nervines, that spasm is the result of a diversity of causes that induce nervous irritation; and it was briefly shown that a discrimination is necessary in the application of antispasmodic remedies. If there be an exception to this fact, it is illustrated in the paramount influence of lobelia over spasmodic action generally. Reformers may justly glory in the triumph of this article over the success of the lancet. The latter has been regarded the only general antispasmodic that can be at all depended on. But that it is inferior to lobelia as an agent of this kind, every one acquainted with the latter, and who has had opportunities to witness the effects of the former can fully testify. Besides this, the deplorable *mischiefs* that are the common attendants of phlebotomy, are not to be feared from the use of *lobelia*.

Those spasmodic affections, in which this article seems to be particularly available, are hydrophobia,* tetanus, spasmodic asthma, pertussis, hysteria, some varieties of epilepsy, apoplexy, convulsions attending the taking of poisons (in which case emesis should always be excited), spasms attending intoxication, etc. But the medicine may be serviceable in many other cases, which the foregoing remarks will suggest.

The *dose*, or the manner of taking the lobelia varies exceedingly, depending entirely upon the cause of the disease, and other existing circumstances. There should, however, always be enough given to produce nausea, and the doses must be repeated frequently, so as to keep up the nausea. In very

* The author has had many opportunities to try the virtues of lobelia in this dreadful disease, and he is happy to state that it has never failed to prevent the occurrence of the disease, in persons that had been bitten by dogs which died in the fits of the disease, and which had bitten other animals that also died of the disease.

many cases it is necessary to give sufficient to excite vomiting; this is especially the case in *violent* attacks, as hydrophobia, tetanus, and apoplexy. In such cases as the latter, the lobelia must be administered by injection into the rectum, as well as to be taken per stomach.

ICTODES FŒTIDA.—The Root, and Seeds.

Synonyms.—Dracontium, *U. S.*, *Willd.*; Symplocarpus, *Nutt.*, *Barton*, *etc.*; Pothos, *Mich.*, *Pursh.*; Spathyema Fœtida, *Raf.*; Calls Arum; Stinkende Zehrwuntz, Biskatzenkraut, *Ger.*; Anhangsel, *Hol.*; Swamp Cabbage, Skunk Cabbage, *Eng.*; Skoka, *Ind.*; Skunk-weed, *Vul.*

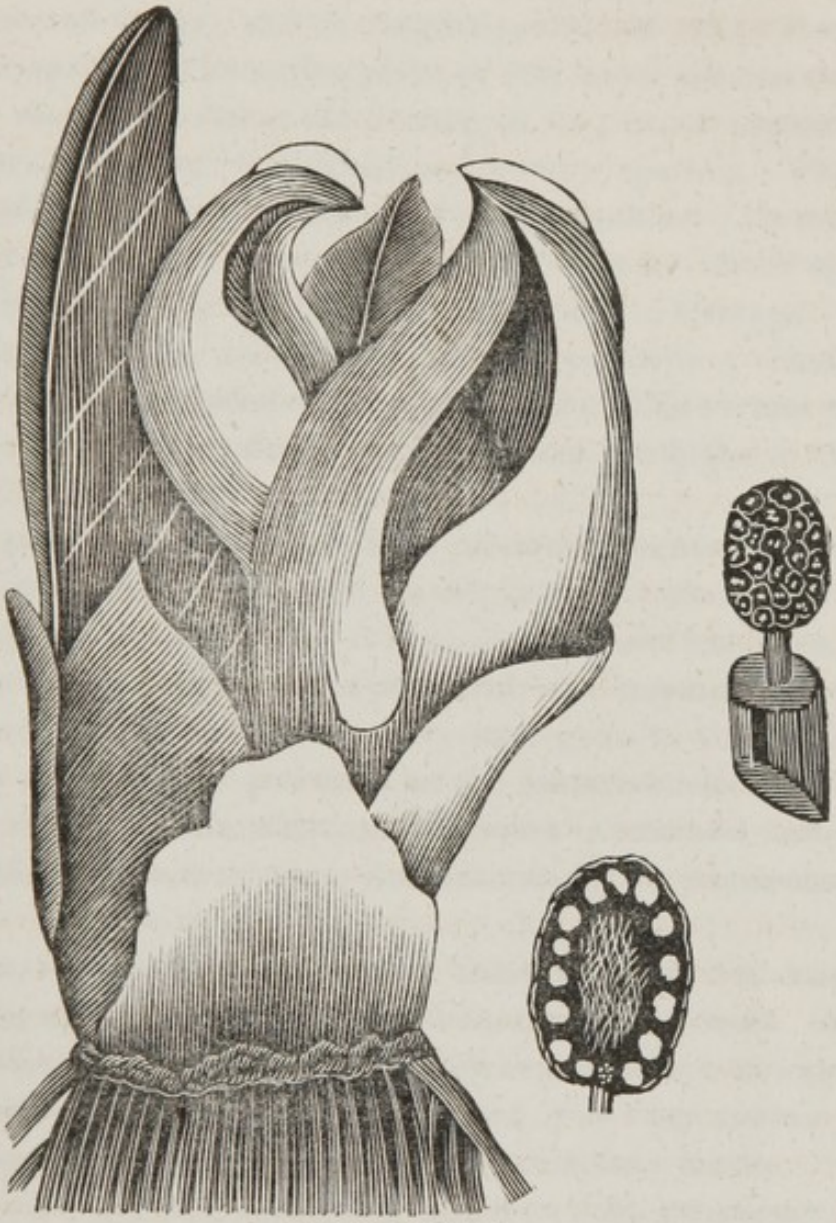
History.—This singular plant in nativity is peculiar to America, but in 1735 it was introduced into England, by P. Collinson, Esq. Its medical character has been variously regarded by the profession. But, except with a few individuals, it had never gained much attention, until it came in use by the Reformers.

Botany.—*Sex. Syst.*—Tetrandria Monogynia. *Nat. Ord.*—Aroideæ.

Gen. Char. Ictodes.—*Calyx* a spathe. *Spadix* simple, covered with flowers. *Perianth* coral-like, deeply four-parted, permanent, becoming thick and spongy. *Style* pyramid-form, four-sided. *Stigma* simple, minute. *Berries* globose, two-seeded, inclosed in a spongy spadix-receptacle.—*Eaton.*

Spec. Char. I. Fœtida.—*Root* perennial, large, abrupt, and thickly beset with numerous large, fleshy fibers. *Leaves* very large; sometimes two feet in length, about one or more in width, radical, numerous, folded at first, then spreading, with long grooved petioles, strongly veined, oblong, pointed, cordate, fleshy, entire, smooth, of a green color when mature. *Spathe* ovate, acuminate, auriculated at the base, folded, appears before the leaves, of a brownish-purple, and speckled with red, yellow, and green. *Flowers* within the spathe, purplish, numerous, crowded upon a globose peduncled spadix. *Seeds* globular, many, large, embedded in the spadix beneath the styles. The flowering time is early in the spring.

The plant is characterized by a peculiar odor, which is



ICTODES FŒTIDA.

A figure of the plant representing its appearance early in spring-time as it appears about the ground, and before the leaves are unfolded. The upper small figure gives a diminutive appearance of the spadix, and the lower is the cut face of the spadix vertically divided showing the seeds.

supposed, by some, to be somewhat similar to that of the *Viverra Mephritis*, or Pole-cat.

W. P. C. Barton has given the figures and descriptions of two species, that he calls Symplocarpus Fœtida (which is the most common one), and S. Angustispatha, so called from its narrow spathe. The entire plant of this latter species, though in the main resembling the former, in its general appearance, is more slender, narrow-leaved, and narrow-spathed. The latter is of a plain purple, that is, it is not speckled. Its medical virtues do not differ from those of the former. Both species grow in low, wet grounds, as meadows, and in swamps.

Analysis.—The root of the Ictodes contains a *volatile oil*, *volatile fatty matter*, *fixed oil*, *wax*, and *fecula*. The virtues of the plant consist in its volatile principles, and has hitherto eluded all our menstruums.

Physiological Effects.—This plant was formerly regarded as poisonous, which idea had its origin in the circumstance of its disagreeable odor. But it is now considered harmless. In its recent state the root is very acrid, and imparts a taste, or impression upon the mouth, very analogous to that of *arum*, though not quite so powerful as the latter article. In large doses, it proves stimulant, and evinces a marked influence over the nervous system, demonstrating its antispasmodic power.

Therapeutic Properties and Use.—Few articles are more valuable as a general antispasmodic than the *Ictodes*. Heretofore the medicine has chiefly been regarded for its expectorant virtues, by our practitioners, yet it is very certain that its *antispasmodic* powers are more valuable than those.

Both the root and seeds may be given with confidence, as a general antispasmodic, but are particularly serviceable in cases of spasmodic asthma, pertussis, hysteria, the convulsions attending pregnancy, parturition, etc. The dose is from ten to twenty grains of the fresh root, and from twenty grains to one drachm of the dried root, or seed.

The medicine is to be given in substance, as it does not yield its virtues to alcohol, ether, water, or oil, to any considerable extent. This fact should not be overlooked, seeing that not

only the reputation of a very valuable remedial agent is at stake, but, in practice, much time may be lost in depending on ineffectual preparations of this article, which, in many cases, may determine the fate of the patient.

The common practice of combining this with other articles, when preparations of it are made, has much tended to prevent the discovery that its virtues are not imparted to the common solvents.

Age, or even dessication, impairs its virtues, and boiling destroys them entirely. These facts are important to be borne in mind.

ASAFŒTIDA.—The Gum-resin.

Synonyms.—Ferula Asafœtida: Pérungyum, *Tam.*; Ingoova, *Tel.*; Hinga, *Sans.*; Hing, *Duk.*, and *Hin.*; Ingoo, *Malay*; Hinghoo, *Cyng.*; Hingu, *Bali*; Ingu, *Jav.*; Stinkasant Teufelsdreck, *Ger.*; Ungoozeh, *Per.*; Οπος κυρηναικος, *Gr.*; Hilteet, *Arab.*; Asafetida, *Ital.*; Asafetida, *Span.*; Asafœtida, *Eng.*, *Port.*; Asafœtida, *Lat.*, *Fr.*

History.—Asafœtida, a product of Persia and Affghanistan, is mentioned in the ancient Sanscrit Amera Cosha. The ancients highly esteemed a gum-resin which the Romans called *Laser*, and the Greeks *οπος κυρηναικος*, or the Cyrenaic Juice, from being produced in that region. The plant *σιλφιον* yielding it was an Umbellifer, and is represented on the coins of Cyrene. It has been discovered of late years, and named *Thapsia Silphium.* This Laser had become scarce even in the time of Pliny, who, as well as Dioscorides, describes another kind as obtained from Persia, India, and Armenia, which was probably the same that was known to the Hindoos. Avicenna describes *hulteet* as of two kinds: one of good odor from Chiruana (Cyrene?), and the other fetid, the present *Asa-fœtida.* The term *asa* is no doubt of oriental origin, since it is applied to other gum-resins. Thus Benzoin is called *hussee looban;* it used to be called *Asa dulcis* in old works. Dr. Lindley has received the seeds of a Ferula called *hooshee. Anjedan*, the fruits or seeds (*φυλλον* of the Greeks), is usually translated *Laserpitium.* The plant is called *Angoozeh* by the Arabs. The root of *Silphion* is described by Arrian, as tida and Galbanum

in the Alcohol with the aid of a water affording food to herds of cattle on Paropamisus.—*Royle.*

Asafœtida is a product of Asia, found in the south of Persia, on the mountains of Fars and of Beloochistan, but principally in Khorassan, and Affghanistan; also, on the north of the Hindoo Khorssan range of mountains.

BOTANY.—Asafœtida has generally been considered to be the product of the *Ferula* genus, and is no doubt yielded by it, as stated by Kæmpfer and others, who report from actual observation. The following is the *Botany* of the *Ferula Asafœtida.*

Sex. Syst.—Pentandria Digynia. *Nat. Ord.*—Apiaceæ or Umbellifera.

Gen. Char. FERULA.—Margin of the *Calyx* shortly five-toothed. *Petals* ovate, entire, acuminate, with an ascending or incurved point. *Fruit* flattened at the back, with a dilated flat border. *Mericarps* [half-fruits] with three dorsal filiform ridges, the two latter obsolete and lost in the dilated margin. *Vittæ* in the dorsal channels three or more; in the commissure four or many. *Seed* flat. *Carpophorus* bipartite.—*Herbs. Root* thick. *Stem* tall. *Leaves* supra-decompound; the segments usually divided into linear lobes. *Umbels* of many rays, lateral, often opposite or verticellate. *Involucre* various. *Flowers* yellow.—*De Cand.*

Spec. Char. F. ASAFŒTIDA.—*Stem* terete, simple; clothed with leafless sheaths. *Leaves* radical, pinnatisect; the segments one or two pinnatifisinuate; lobes oblong, obtuse. *Involucre* none.—*De Cand.*

Dr. Falconer, superintendent of the East India Company's Botanic Garden, at Saharunpore, thinks that the true *Asafœtida* plant belongs to a "genus allied to, but distinct from Ferula," and which he calls *Narthex.* In an account of the plant, which he sent to Dr. Royle, he says:—

"*Narthex*, both in the characters of the flowers and fruit, and in its 'Pæony-leaved' habit, differs widely from any known species of Ferula, and appears to constitute a distinct and well-marked genus.

"In the Dardoh or Dangree language (the Dardohs being

the Daradi of Arrian) the plant is called 'Sip' or 'Sup.' The young shoots of the stem in spring are prized as an excellent and delicate vegetable.

"The species would appear to occur in the greatest abundance in the provinces of Khorassan and Laar, in Persia, and thence to extend on the one hand into the plains of Toorkestan on the Oxus north of the Hindoo Khoosh mountains, where it seems to have been met with by Sir Alex. Burns, and on the other to stretch across from Beloochistan, through Candahar and other provinces of Affghanistan to the eastern side of the valley of the Indus, where it stops in Astore, and does not occur in great abundance. The whole of this region, which constitutes the head-quarters of the gum-bearing Umbelliferæ, possesses the common character of an excessively dry climate, indicated in Berghaus's hygrometric map in Johnson's Physical Atlas, by a belt of white.

"Besides the gum-resin, the fruit of *Narthex Asafœtida* is imported into India from Persia and Affghanistan, under the name of 'Anjoodan,' being extensively employed by the native physicians in India: 'Anjoodan' being the epithet applied to the seed of the 'Heengseh,' or 'Hulteet,' by Avicenna, also quoted by Kæmpfer, and used by the Indo-Persian and Arabic writers generally in describing the Asafœtida plant. Another umbelliferous fruit is also imported with it, and sold under the name of 'Dooqoo,' (a word evidently connected with the *δαυκος* of the Greeks), being recommended as an excellent substitute for 'Anjoodan,' which it closely resembles in its general appearance. This I found to be the fruit of a species of true Ferula; it is one of the two Asafœtida-like fruits mentioned by Dr. Royle as occurring in the bazaars of northern India. The species of Ferula yielding this fruit may furnish some one of the obscurely-known gum-resins resembling Asafœtida produced in Persia."

Description.—Asafœtida is obtained by making incisions into or taking successive slices off the top of the root, and then collecting the produce, which is united in masses, and in this state is usually met with in commerce. It is at first soft, but becomes hard, of a yellowish or reddish-brown color.

When broken, an irregular, whitish, somewhat shining surface is displayed, which soon becomes red. The mass is composed of various-shaped pieces, some like tears pressed together, and in some parts agglutinated together by darker-colored gum-resin. Some parts are cellular. By thus becoming red on exposure to the air, and by its intolerable alliaceous odor, asafœtida may be readily distinguished. The taste is garlicky, bitter, and acrid. It is best preserved covered by bladder. It is powdered with difficulty, even when hard; softens by heat, and burns with a clear flame.—*Royle.*

Analysis.—Asafœtida is composed of *Resin* 65 parts, *Volatile Oil* 3·6, *Gum* 19·44, *Bassorin* 11·66, *salts* 0·30.—*Pelletier.* Brandes obtained less *Resin*, *Volatile Oil* 4·6, and 10·5 of various salts and impurities. The Oil is at first colorless, but becomes yellowish-brown, has an exceedingly offensive odor, a bitter and acrid taste, and contains some sulphur. Water will dissolve the gum, and forms an emulsion with the other ingredients. Pure alcohol is a good solvent, but on the addition of water the tincture turns milky, owing to the elimination of the resin.

Therapeutic Properties and Use.—Asafœtida has borne a creditable character as an antispasmodic, from the days of Hippocrates to the present. Almost all the writers on medicine, for the last three thousand years, speak in its praise. Dr. Ainslie says that the Tamool and other Indian physicians use the medicine a great deal at the present time.

Our own experience in the present day corroborates all this, and there is only one circumstance that could prevent its universal employment as an antispasmodic, and that is the disagreeableness of its odor.

This agent is, however, not usually relied upon in spasmodic diseases of violent character, as convulsions and apoplexy; its power not having been regarded equal to such emergencies. But in more moderate nervous diseases, as the milder cases of hysteria, chorea, spasmodic asthma, hooping-cough, etc., the medicine has proved by feebler, yet permanent powers of action that it is entitled to our continued regard. It is best given in pills. One or two pills are a dose.

PHARMACEUTIC PREPARATIONS.—MISTURA ASAFŒTIDÆ, L. D. U. S.: *Asafœtida Mixture, or Emulsion.*—Rub up, until well mixed, Asafœtida, ʒv., (ʒj. D.), Aq. Oj. L. (Aq. Pulegii gradually added by measure, ℥viij. Make an emulsion, D.) (Asafœtida, ʒij., Water, Oss. U. S.)

Action — Use.—Antispasmodic. Useful in Hysteria, and feigned diseases.

TINCTURA ASAFŒTIDÆ, L. E. D. (U. S.): *Tincture of Asafœtida.*—Take Asafœtida (in small fragments, E.), ʒv. (℥iv. rub it up in Aq., ℥viij. by weight, D.) (℥iv., U. S.) Macerate for fourteen days (7, E.) in Rectified Spirit, Oij. (lbij, by weight, D.) Strain. (Not easily made by percolation, E.)

Action — Use.—Antispasmodic. Prescribed in Hysterical cases, etc., in doses of fʒj.—fʒij.

EMPLASTRUM ASAFŒTIDÆ, E. (U. S.): *Asafœtida Plaster.*—Melt together Asafœtida, ℥ij., Galbanum, ℥j. Strain them. Add melted Litharge Plaster, ℥ij., and Beeswax, ℥j. Mix thoroughly.

℞ Asafœtida, Lead Plaster, Galbanum, Yellow Wax, each half a pound; Diluted Alcohol, Oiij. Dissolve the Asafœtida in the Alcohol by aid of the water-bath; strain the liquor while hot, and evaporate to the consistence of honey; then add the Lead Plaster and Wax previously melted together, stir the mixture well and evaporate to the proper consistence. U. S.

Action—Use.—Antispasmodic. Applied to the epigastrium, or over the abdomen in protracted hysteria, and to the chest or between the shoulders in hooping-cough.

PILULÆ ASAFŒTIDÆ: *Asafœtida Pills.* — Select a pure article of Asafœtida, warm it by the fire; form into pills, and coat them with gum or flour.

SCUTELLARIA.—The Herb.

SYNONYMS. — Toque Lateriflore, *Fr.;* Scullcap, Madweed, Hoodwort, Blue Pimpornel, *Vul.*

HISTORY.—Scutellaria was known as early as 1772, when it was brought into notice by Dr. Vandesveer, as a prophylatic against hydrophobia. It was stated that from the time of his discovery till 1815, the period of his death, he by means of this plant, had prevented hydrophobia in four hundred persons, and one thousand cattle, that had been bitten by mad dogs. His son is also said to have cured forty persons with it,

in the space of three years, in New York and New Jersey. In the first part of the present century, the plant sustained great popularity as a remedy for hydrophobia. But at present its character as such is insignificant, since it has been denounced by Barton, Tully, and others, as being inefficient.

BOTANY.—*Sex. Syst.*—Didynamia Gymnospermia, *Linn. Nat. Ord.*—Labitæ, *Juss.*

Gen. Char. SCUTELLARIA.—*Calyx* bilabiate persistent, upper lip with a lid covering the seeds like an operculum. *Corolla* bilabiate, upper lip concave entire, lower lip trilobe. *Seeds* four in the closed calyx.—*Raf.*

Spec. Char. There are several species of scutellaria that possess very nearly the same virtues.

1. S. LATERIFLORA.—*Root* perennial, fibrous, yellow. *Stem* erect, one to three feet high, branched, smooth, quadrangular. *Branches* opposite. *Leaves* on long petioles, opposite, thin, entire, subcordate, ovate lanceolate, acute, dentate, slightly rugose. *Flowers* pale blue, situated laterally on the long axillary racemes (whence the specific name), bractated, each flower axillary to a bract. Grows in open and wet places, pastures, and meadows. Flowers from July to September.

S. LATERIFLORA.

2. S. HYSOPIFOLIA.—*Root* perennial, branched, fibrous. *Stem* eight inches to two feet high, four sided, sometimes simple, but usually much branched above; branches opposite erect, terminating in loose racemes, garnished with bracts. *Leaves* lanceolate, oblong, obtuse, attenuated at base; those at the root ovate, with one or two obscure teeth, petioled. The few first pairs on the stem very entire, sub-petioled, with petiole somewhat winged; upper stem leaves sessile. *Corolla* bilabiate, with lower lip divided, invested densely with down, purplish, with a white confluent, divided spot on the lower

lip of the palate. *Stamens* flax-blue. *Anthers* purple, globose. *Pistil* blue. The entire plant covered with a dense, short down. Grows in low, wet grounds. Flowers in July and August. Perennial.

3. S. GALERICULATA.—*Stem* branching. *Leaves* subsessile, lance-ovate at the base, crenate, a little white-downy beneath. *Flowers* large, blue, axillary, subcordate to the pairs. A native of Europe and America. Flowers in June. Perennial.

4. S. INTEGRIFOLIA.—*Stem* rather simple, densely pubescent. *Leaves*, lower ones ovate, crenate, tapering to the base; upper ones lance-linear, obtuse, entire, sessile. *Racemes* loose, leafy. *Flowers* blue. Grows in low grounds. Flowers in July.

ANALYSIS.—Scutellaria contains—1, an *Essential Oil;* 2, *Fixed Oil*, soluble in ether; 3, a *Bitter Principle*, soluble in water, alcohol, and ether; 4, *Chlorophylle;* 5, a *Peculiar Volatile Matter;* 6, *Albumen;* 7, a sweet *Mucous Substance;* 8, a *Peculiar Astringent Principle;* 9, *Lignin;* 10, *Chloride of Soda* and *other Salts.*

Water and alcohol extract its medical virtues.

THERAPEUTIC PROPERTIES AND USE.—Scutellaria is of late considerably used by Reformers as an antispasmodic and nervine tonic. Many practitioners esteem it very highly, and the medicine bids fair once more to become popular.

Prof. Rafinesque says: "It has been used chiefly, of late, in all nervous diseases, convulsions, tetanus, St. Vitus' dance, tremors, etc., and has availed in many instances. In hydrophobia, it appears to be a good prophylactic, if not a certain cure; a physician (Dr. White, of Fishkill) bitten by a mad dog, has assured me that himself alone avoided the disease by using it, while others bitten by the same dog, died. Many instances of the same kind are on record; nay many, who believe in this property, say that it never fails. We lack, however, a series of scientific and conclusive experiments made by well informed men; they have been discouraged by the ridiculous denial of sceptics."

The author has treated a number of persons that had been bitten by rabid animals (that at the same time also, had bitten other animals, and which went mad), with a combination of this article and lobelia, and it affords him pleasure to state, that in every case the remedy was a successful prophylactic.

He has been disposed to believe, however, that the lobelia was the principal agent that effected the purpose.

The scutellaria may be used in powder, decoction, infusion, or extract. The dose of the powder is from gr. xx. to ʒj.

PHARMACEUTIC PREPARATIONS AND USE.—TINCTURA SCUTELLARIÆ: *Tincture of Scutellaria.* ℞ Scutellaria, ʒiijss; Alcohol, Oij., digest in the sun for seven days and strain.

Action—Use.—An excellent Nervine tonic, and moderately good antispasmodic. Useful in most nervous diseases that are accompanied with debility. Dose, fʒj.—fʒiij.

EXTRACTUM SCUTELLARIÆ: *Extract of Scutellaria.* ℞ Scutellaria, ʒxvj. Aq. Ovj. Boil for three hours and strain; evaporate to proper consistence.

This extract is best given in the form of pills. From gr. v. to gr. x. is a dose.

MUSCHUS.

SYNONYMS.—Bisam, *Ger.*; Musc, *Fr.*; Muschio, *Ital.*; Amizcle, *Span.*; Kustooree, *Hindoo*; Mishk, *Arab.*; Musk, *Eng.*

HISTORY, ETC.—"The Musk animal differs from common Ruminants, in the absence of horns, and in having long canine teeth on each side of the upper jaw. It inhabits the mountainous regions of central Asia, extending from the Himalayas to the Altai Mountains, and from these to China. Hence, as in the case of rhubarb from the same regions, we have Russian, China, and Indian musk. It is singular that the common Hindoo name of the musk, and in the Himalayas that of the musk animal, is *kustooree*, a name similar to Castoreum, a substance which musk so closely resembles in nature. The name *musk* is no doubt derived from the Arabic *mishk* or *mooshk*, which is evidently the same word as the Sanscrit *mooshka*. This has been used as a perfume and as a medicine by the Hindoos from very early times. It seems to have been adopted from the Hindoos by Serapion, but it was previously mentioned by Ætius."

Musk, as found in the animal, is in a plano-convex, oval, hairy bag, of which the opening is situated just before the præputial orifice. The sac is flat, smooth, and naked above,

where it is applied to the abdomen, convex below, and hairy, composed of several coats. The musk is secreted by small gland-like bodies situated in little pits on the most internal of these coats. The quantity in each sac varies from one and a half to three drachms. It is most abundant in the rutting season, and when fresh is soft, and of a reddish-brown color. (*Royle*). When it is dried, and contained in its native sacs, it forms the best varieties brought to us. But it is often taken out mixed with other substances, and then returned into the sacs. The kinds known are the Chinese and Siberian; the last is inferior, in its fragrance to the other.

ZOOLOGY.—*Class:* Mammalia, *Linn.* *Order:* Pecora, *Linn;* Ruminantia. *Cuvier.*

Gen. Char. MOSCHUS.—*Horns* none. *Fore-teeth* eight in the lower jaw. *Tusks* one on each side in the lower, projecting out of the mouth.

Spec. Char. M. MOSCHIFERUS.—*Gmelin.*

The animal bears a close resemblance to the deer tribe in shape and size. It is usually less than three feet in length, with the haunches somewhat more elevated than the shoulders. The want of horns and the projecting canines have already been mentioned. There are, altogether, thirty-two teeth: namely, eight incisors in the lower jaw, two canines in the upper, and twenty-four molars. The canines are not met with in the female. The ears are long and narrow, and the tail very short. The fleece, which consists of strong, elastic undulated hairs, varies in color with the season, the age of the animal, and perhaps the place which it inhabits. The general color is a deep iron-gray. The individual hairs are whitish near the root, and fawn-colored or blackish toward the tip. The gestation of the female was quite unknown until Mr. Hodgson, in Nepal, ascertained that it was about one hundred and seventy days. They are extremely timid, mild, and gentle in their nature. Found on the tops of difficultly-accessible and generally open mountains, usually in the neighborhood of the snow, but coming nearer to the plains according to the inclemency of the seasons, springing from rock to rock with great agility.

DESCRIPTION.—Musk is in grains or lumps, that are soft and unctuous to the touch, of a reddish-brown color with a persistent and diffusive smell. It is usually adduced as an instance of the subtlety of the particles of matter. The taste is rather bitter, disagreeable, and somewhat acrid; it is very inflammable. Alcohol and ether are its best solvents. Analyzed by different chemists, it has been found to contain a variety of principles, as *Stearine*, *Elain*, *Cholesterine*, an *Oily Acid* combined with *Ammonia*, *free Ammonia*, various *salts* and animal principles, as *Albumen*, and its peculiar *Odoriferous Principle*. But the quantity and proportions of the constituents vary considerably, perhaps this arises from the imperfection of the specimens, which may have been subjected either to abstractions or to additions. The *hunters* even are said to adulterate it, and if *they* do not, the Chinese merchants *do*.

THERAPEUTIC PROPERTIES AND USE.—Musk is an antispasmodic and stimulant, which has long been in use. In its effects it appears rather to exalt nervous power, while at the same time it regulates it. "In almost all spasmodic diseases," says Dr. Wood, "so far as mere relaxation of spasm is desirable, it is more or less efficacious; but peculiar advantages may be expected from it in those cases in which a prostrate condition of the system, attended with great nervous agitation, or irregular muscular action, calls for the united influence of a highly diffusible stimulant and powerful antispasmodic. Such are very low cases of typhus disease, accompanied with subsultus tendinum, tremors, and syngultus. Such, also, are many instances of gout in the stomach, and other spasmodic affections of this organ." Convulsions of infants, which have their origin in spasms of the intestines, epilepsy, hysteria, hypochondriasis, asthma, pertussis, palpitations, cholera, and colic, are also among the numerous spasmodic affections in which circumstances may render the employment of musk desirable.

PHARMACEUTIC PREPARATIONS.—**MISTURA MOSCHI, L.**: *Musk Mixture.*—Rub up Musk and Sugar, āā. ʒiij.; then add powdered Acacia, ʒiij.; gradually adding Rose Water, Oj.

TINCTURA MOSCHI, D.: *Tincture of Musk.*—Digest for seven days, Powdered Musk, ʒij., in Rectified Spirit, by measure, ℔j. Strain.

CASTOREUM.

Synonyms.—Bibergeil, *Ger.;* Castoreum, *Fr.;* Castoro, *Ital.;* Castores, *Span.;* Castor, *Eng.*

History.—This article was employed by Hippocrates. He considered it to have the power of acting on the uterus. The Arabs also used the medicine, and described it under the head of *joond bedustur*. Dioscorides gives a description of the animal. It is singular, however, that the castor sacs were formerly confounded with the testicles. The castor sacs can be distinctly seen only on the removal of the skin of the abdomen. Besides these, there are two others, i. e. oil sacs. All are situated between the pubic arch and the cloaca, a common hollow which is covered with a wrinkled hairy protuberance, into which open the oil and castor sacs, and the rectum and prepuce. The castor sacs are somewhat pear-shaped and compressed, communicate by the same opening at their narrow extremities, but their fundi diverge. Like the musk-bags, these sacs have several coats; within all there is a convoluted mucous membrane, covered with scales, with a small brownish body, supposed to be a gland. The secreted matter, or castor, in these sacs is at first of a yellow orange-color, but turns of a brownish color as it becomes exposed to the air.

Zoology.—*Class* Mammalia.—*Linn. Order* Rodentia.—*Cuvier.* Glives.—*Linn.*

Gen. Char. Castor.—*Incisors* four, two above and two below. *Canines* none. *Molars* sixteen; four in each maxillary on either side. Five toes on each foot, the anterior short and close, the posterior long and palmated. *Tail* broad, thick, flattened horizontally, of an oval form, naked, and covered with scales.

Spec. Char. C. Fiber.—*Linn. Fur* consisting of two sorts of hair, one coarse and brownish, the other downy, more or less gray. About two feet long. The usual color of the beaver is brown, but individuals of other colors have been met with, as black, yellow, white, and spotted, but the latter two are rarely met with. The animal is remarkable for its habits, in building huts and dams, and in Europe, for their burrowing.

DESCRIPTION.—Two kinds of castor are known in commerce: one American, imported by the Hudson's Bay Company, and the other Russian, which is very rare. This may be distinguished by a tincture of 1-16th part in Alcohol being of the color of deep Sherry; while that of the American castor is of the color of London porter. The American, moreover, effervesces when dropped into an acid, which the Russian does not do. (*Per.*) The sacs are united together by a part of the excretory duct, and sometimes the oil sacs may be seen with them. They are divided internally into numerous cells, the membranes of which may be seen when the castor is dissolved out; or when torn they may be seen intermixed with the castor, which often breaks with a resinous fracture, and is of a reddish-brown color. The odor is strong, fetid, heavy, and the taste bitter, rather disagreeable.

ANALYSIS.—The chemical constituents of castor are a *Volatile Oil*, *Resin*, *Ozmazome*, *Albumen*, *Mucus*; *Urate*, *Carbonate*, *Benzoate*, *Phosphate* and *Sulphate of Lime*, with *Salts of Soda* and Potash, some *Carbonate of Ammonia*, and a peculiar *non-saponifiable substance*, which crystallizes, and has been called *Castorin*; but there has been no proof given of its being the active principle.

THERAPEUTIC PROPERTIES AND USE.—Castor is an antispasmodic of some reputation. Some have questioned its power as an agent of this kind. But Dr. Trousseau has justly remarked that, "we are not justified in inferring that, because a medicine does not affect those in health, that therefore it will have no effect on those laboring under disease, especially when this is of a nervous nature." He found it decidely useful in many nervous and spasmodic affections, and in all its actions to resemble valerian and asafœtida rather than musk. He recommends its union with tincture of asafœtida or of aloes. It may be exhibited in powder or in pills in doses of ʒss.—ʒij.

PHARMACEUTIC PREPARATIONS.—TINCTURA CASTOREI (ROSSICI,) D. L. E. U. S. *Tincture of Castor.* Macerate for 14 (7, D.) days bruised (Russian, D.) Castor ℥ijss. (℥ij. D., U. S.) in Rectified (Proof, D.) Spirit Oij. (by measure ℔ij. D.) Strain. (Prepare by digestion or percolation, as Tinct. Cassia, E.)

Action—Use.—This article is intended to be antispasmodic, but is too weak a preparation.

TINCTURA CASTOREI AMMONIATA, E. *Ammoniated Tincture of Castor.* Digest for seven days in a well-closed vessel, bruised Castor, ℥ijss.; and Asafœtida, in fragments, ʒx.; in Spirit of Ammonia, Oij. Strain and express strongly the residuum. Filter the liquor. Not conveniently prepared by percolation.

Action—Use.—The ammoniated tincture of Castor is stimulant antispasmodic in doses of fʒj.—fʒij. Spirit of Ammonia is a good solvent, and both it and the Asafœtida are useful in the same class of cases as the Castor is applied for.

GELSEMINUM.

BOTANY.—*Sex. Syst.*—Pentandria Digynia. *Nat. Ord.*—Apocynaæ.

Gen. Char. GELSEMINUM.—*Calyx* five-sepaled, very small. *Corolla* funnel-shaped, border spreading, five-lobed, nearly equal. *Capsule* compressed, flat, two-celled. *Seeds* flat, attached to the margins of the valves.

Spec. Char. G. SEMPERVIRENS.—*Root* perennial, long, horizontal. *Stem* twining, long, smooth, glabrous. *Leaves* opposite, perennial, lanceolate, entire, green above, paler beneath. *Flowers* yellow, inodorous, small. Grows abundantly in Florida, where in its season it gives, in some places, a yellow appearance to the marshes where it grows. It is also found in considerable abundance in Texas, Louisiana, Alabama, Georgia, and other States further north. But as we go north, we find it more and more seldom. It is the *Yellow Jessamine.* The *Purple Jessamine* has similar properties, but is narcotic.

The root is the part commonly used, yet the entire plant is possessed of its peculiar virtues, though in less degree in the leaves and stem.

PHYSIOLOGICAL EFFECTS.—Gelseminum is an article of very notable properties, and evinces a great power over the system when taken in full doses. It appears that the spinal, or *excito-motory* system is mostly affected thereby.

To the taste the impression produced by gelseminum is but slight, being somewhat aromatic and sweet. When swallowed

in small quantities, the first impression apparent is that of a sedative : it moderates the tonicity of the excito-motor nerves, modifies the muscular irritability, manifested by a slight sense of relaxation, and lowering of the pulse. This is direct, not secondary ; there is no antecedent exaltation of the irritability, or excitement of the circulation. In this small dose there is, perhaps, no other effect appreciable. When the quantity given is increased, there is but little more impression to the taste, and perhaps still no traceable effect upon the body generally, other than that involving the excito-motory system. Here, however, we are able distinctly to trace the measure of the increase of the dose given. From thirty to forty drops of the saturated tincture of the root, in proof-spirit, will produce general relaxation of the muscular system, very sensible diminution in the force of the circulation, and more or less impression upon the general nervous system. General sensation is in some measure modified, being less distinct. The special senses are affected, showing that the *cerebro-sentient system* is also impressed : the vision is indistinct, the eyes are heavy, the lids relaxed. The mind is less active, thoughts are transient, escape without consciousness, and the general executive power of the mind is less active. The *ganglionic system* also now participates, perhaps, to about the same extent as the *cerebral* and *sentient :* secretion is less active, but the elimination of the products of secretion, *i. e.*, the contents in any cyst, or reservoir, will escape with facility from the relaxation of the sphincters or emunctories. But it requires a dose still larger than that named above to make this fact especially apparent.

In excessive doses, as from one to three drachms of the saturated tincture, the effect, not only upon the excito-motory system, but that upon all the nerves, will be alarming and serious. There is now a paralysis of the nerves of motion. The subject is prostrated, without the power of motion. His pulse is reduced greatly, and is much interrupted. Respiration is stertorous, very laborious, and the extremities are cold. The organs of special sense are somewhat less affected, but still show the greatness of the power of the agent, even over

them. Vision is indistinct, duplicate, or absent, and the pupils are much dilated. The other special senses are also correspondingly affected. The intellectual functions are suspended, or much impaired, and there is stupor and insensibility. In the ganglionic system, we see effects of an analogous character. Digestion, secretion, etc., is suspended, or interrupted. The sphincters are relaxed, and the urine and feces may be involuntarily discharged. Such doses often produce death.

It must be remarked that the symptoms here enumerated are to be regarded only as the *type* of the action of this agent, and that there are variations, and exceptional cases, that would make a very different history, when correctly detailed.

In a few instances there has been, apparently, a disproportioned activity and extent of its influence over the respective systems of nerves. In one case there were spasmodic symptoms, or involuntary muscular contractions, which were most observable in the superior extremities. But it is very probable that the spasm arose from a reaction upon the sedative power of this agent.

On the whole gelseminum may be regarded as being an antispasmodic, or sedative of the most powerful order, differing little in the quality of its impression from many other articles which have been long in professional use, but possesses these properties in an incomparably greater degree. Most other articles are self-limited in the extent of their action; that is, they can not be taken in doses sufficiently large to give rise to such extraordinary symptoms. Nevertheless, there are a few that are very capable of notable effects in this way. Such are botrophis racemosa (macrotys), lupulin, spigelia, lobelia, etc.

THERAPEUTIC PROPERTIES.—It is unnecessary to dwell long in therapeutic *details* upon this article, important as it may be, since that which has been said of its *physiological* effects, will serve to indicate its general use.

It may be advisable, however, to inquire here, somewhat into the question of its *admissibility* into our Materia Medica, as a therapeutic agent, since it has been proven to be capable of producing such extreme symptoms. Here the author is

impelled to the confession, that however popular and useful this article may prove to be, when its virtues are yet more thoroughly tested, he can never claim credit for any help afforded by him in its introduction, for he has certainly been one of the most conservative in this matter, of the entire profession, having gone forward only step by step, as the experience and enthusiastic reports of his professional brethren have led the way, and even now, does not habitually employ the agent.

But the conservative portion of our profession have more than the simple *history* of its use, or the empirical *facts*, to warrant their assent to the use of this agent. The physiological, or indeed it might be said *pathological* effects above noted, are by no means within the range of its *therapeutical use*. Our profession have always reserved the right, in their theoretical position, to the adoption of any remedial measures, whose agents are not *intrinsically* poisonous. Hence, when any proposed article of medicine can be harmful only in the *degree* of its action, or by its cumulative, or highly concentrated force, it is not to be rejected; especially is this true, when on the other hand, its proper use would be of great importance.

The principle, serving as the ground of this objection, would thus not only deprive us of many cherished agents, but it would be inconsistent with a sound and rational philosophy. It may be held then, that in all the legitimate indications for its use, and they appear to be many, its application is in the proper sense, *harmless*.

These remarks having already been extended far beyond a desirable limit, must be speedily closed. To the intelligent practitioner, a few hints more will quite suffice. Gelseminum involves few principles in the accomplishment of the great results claimed for it. It operates mainly as an antispasmodic, or with a true definition of the term, it may be said to act prominently as a *sedative*.*

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* The term *sedative* is here employed in its true etymological sense, and is intended to represent simply, a quieting power. The word *sedative* comes from the Latin *sedo*, which means to *calm*, or to *quiet*, understood as a transitive

But to the question, as to how far a simple sedative, quieting or relaxing power, which thus shows its control over the characteristic phenomena of fever and inflammation, will tend also to remove the remote cause of the disease, the limits here, will not admit of satisfactory discussion. At least no attempt could here be made, to reconcile the conflicting views entertained upon this question; though one thing is very certain, it is much less difficult to give a complete solution of the most difficult problem, in the entire range of pathology, than it would be to get the entire profession to recognize any answer, however correct, to a controverted question. It is extremely difficult for any one laboring for all, to *suit* all, it is indeed impossible. The introduction of this article of medicine, and several others that appear in the work will, without question, give offense to many. Others will complain that their favorite remedies have been neglected.

CHLOROFORM.

Synonyms.—Chloroformum; Carboneum Chloratum; Superchloridum Formilicum; Perchloride of Formil; Terchloride of Formil; Chloric Ether (improper name); Chloroforme, *Fr.*

History.—It appears that this remarkable agent was simultaneously discovered in America and Europe. Dr. Samuel Guthrie, of Sackett's Harbor, N. Y., Soubeiran, in France, and Liebig, in Germany, as nearly as can now be ascertained, made their discoveries of chloroform respectively about the same time in 1831. But the precise chemical nature of it was not known until 1834, when Dumas found that it is a compound of three equiv. of chlorine, with one of formyle, or bicarburet of hydrogen.

Preparation.—The U. S. Pharm. directs for the preparation of chloroform, the distillation of a mixture of chloride of lime, water, and alcohol. The product of this distillation is

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verb. This was also the sense in which the word was originally employed in medicine. At the present time, however, it is by many, made to mean the estruction of the essential vital manifestations, or the *life principle*, a very uestionable restriction and speciality of its use.

two liquors, a light and a heavy one, the latter is impure chloroform, i. e. it is chloroform containing some alcohol and an excess of chlorine. The alcohol is then removed by washing (shaking) with water, which will remain separate and may be removed. The excess of chlorine is to be removed by washing in the same way with a solution of carbonate of soda.

PROPERTIES.—Chloroform is a heavy, limpid, colorless liquid, having a very agreeable, fragrant, etherial, fruity odor, and sweet, spirity, pungent taste. It may be distinguished from all other liquids by the following characteristics, which though not individually peculiar, are yet not to be found all together in any other liquid. 1, Great specific gravity, being once and a half times as heavy as water; 2, It will not mix with water; 3, It is extremely volatile, and evaporates without a residue; 4, It boils at a low temperature, 142° F.; 5, It is incombustible; 6, It is very liquid, being thinner than any other fluid, since it will average 240 drops to the fluid drachm.

PHYSIOLOGICAL EFFECTS.—Chloroform appears to have a special sedative and paralyzing power over the *cerebral* or *sentio-voluntary system of nerves* in like special manner as was noticed in the preceding article on the effects of *gelseminum*, upon the *spinal* or *excito-motory system*. *Sensation* and *Volition* are most emphatically the subjects of the power of chloroform, and all the functions and structures of the economy are impressed by it measurably in the order or relation which they sustain to the sentio-voluntary system. In a subordinate degree, is also the *excito-motory system* reached. This fact again appears to justify an allusion to the action of gelseminum, for it would seem that these two remarkable agents stand in a reverse relation to the cerebral and the spinal system of nerves respectively. Both effect prominently either system, and *one* more than the *other*: chloroform influences the cerebral functions most, gelseminum the spinal.

The heart is subject to the action of chloroform in a most singular way, though this impression is exceedingly rare. Perhaps *this* is the only ground for any serious apprehension from its general use. When this organ, as in several rare, fatal instances is shown, is peculiarly susceptible to its action,

death will result sometimes in less than one minute from its respiration, even in the smallest quantity in which it can be supposed to operate in any ordinary degree: and we have no means to direct us in any precautions in its use, if applied at all. Attention to quantity affords no protection, since the amount necessary for any good effect may cause death in a few minutes. No appliances for arresting its power have yet availed in these peculiar cases. Still, as above stated, this result of the use of chloroform is very rare, perhaps not occurring *once* in a *thousand* full medical applications of the agent. It is amusing, therefore, to observe the singularities common to human nature; people have an awful dread of chloroform, but when novelty or idle curiosity comes in competition with prudence, it is found that this *modest* "*divinity*" has but little authority. The same class of people who dread chloroform as a deadly agent, will climb precipices, descend caverns, race on horses, carriages, boats, cars, or baloons, with unrestrainable eagerness. Nevertheless, the sentiments here expressed, are not that chloroform is to be trifled with: it should never be employed except when important uses justify the risk involved.

Upon the Ganglionic system, chloroform appears not to have much direct influence, as we find the functions over which this system presides are seemingly not affected until in a secondary way they are reached by the effects produced by the chloroform upon the cerebral and the spinal systems.

In the general, we find that when chloroform is taken so as to give rise to insensibility and unconsciousness, the functions of organic life proceed with but comparatively little interruption.

Therapeutic Properties and Use.—In the action of chloroform we have a striking means of proving the specific impressibility of not only the *organs* of the body, but also their several *special endowments*. In other words, we find in the action of chloroform that the nervous structures may be much impressed while nearly all, if not all, the other structures, *per se*, are not affected; and the peculiar endowments of the nervous system may likewise be most strikingly modified, while all

the other special attributes of the organic principles remain undisturbed.

This fact is indeed no *new* discovery, for certain it is that the physiological and therapeutical processes never have been correctly understood without a recognition of this principle. Still it appears to the author that in the phenomena that characterize the action of chloroform, the fact here alluded to is preëminently more apparent than in all the other processes within the range of human observation.

We have now become familiarized with the practice of exalting or depressing the most subtle and wonderful elements in the kingdom of animate nature. We now complacently enter into direct intercommunication and treaty with the *essential vital principle* within its own citadel—we assume to assist in regulating all its intermediate appliances in sustaining the phenomena of organic life, and at will we command the highest attributes of the vital entity, and it is only by *accident* that we disturb the integrity of the principle itself. Science is indeed now making some of her most glorious triumphs.

As a direct therapeutic agent, chloroform has not served us in a very large degree. Our purposes in its employment having been, in a great measure, simply to obviate urgent symptoms, as the relief of pain, the abatement of spasm, and the subversion of preternatural excitement. In painful surgical operations, it has been employed as an anæsthetic, with very happy effects. The most painful and difficult operations have been performed during the insensibility produced by its use, without the least consciousness or apparent suffering of the patient. In such cases, the person operated upon, will come to consciousness, comparatively quick, after the discontinuance of the chloroform, and he will always be agreeably surprised, to find the operation performed. All that he will remember of the entire matter is, that an operation was intended to be performed, and that he commenced taking the chloroform as a preparation therefor. But not having any consciousness or knowledge of what else was done, he is ever found to expect that *all is still to be done!*

As a topical anæsthetic, chloroform has also been found of very

considerable utility; and thus in cases of great local pain, and where small operations are to be performed, it may be employed with success. In such cases, the agent is simply put in contact with the part intended to be rendered insensible, by its continued application, or its confinement thereto, by keeping substances moistened with it, upon them. By this means the parts will be rendered more or less insensible for a time, and thus the agent has proved to be of great utility.

Chloroform has also been employed in *parturition*, but this use of it, is of doubtful propriety. The insensibility to pain, and the unconsciousness produced by it, will however, not interfere, to any very considerable extent, with the involuntary functions of the body, and the uterine contractions are found to go on, and labor proceed, while the woman is insensible thereof. Yet there are, nevertheless, other reasons objectionable to its employment. In the first objection, it may be remarked that, in these cases, as in all others of its constitutional use, the risk of its peculiar action over the heart, is equally incurred. Secondly, if this objection should be waved, there is another that will not so easily be overcome: it is necessary, in parturition, to keep up the action of the anæsthetic so *long*, if we would secure the final end (that of the *delivery*), that there is always more or less injury sustained from the chloroform. In the third place, it is always desirable to have the patient in a state of proper consciousness in parturition, since much advantage arises from her own voluntary help. Finally, it may be remembered, that although the involuntary functions are not generally much influenced in the transient, or non-protracted use of chloroform, yet when it is so continuously applied, as is often necessary in parturition, it will retard, in a greater or less degree, the progress of the labor.

Application. — The most common, and perhaps the best method of applying chloroform is, by inhalation from a sponge moistened with it, and held in position for its inspiration, so as to admit of its being freely taken into the lungs with the breath. An inhaling bottle answers a good purpose for this application.

Another common method of its administration is, by its

introduction to the stomach, in the ordinary way. But for this application, it requires to be attenuated or diluted; and as it will not readily mix with water or diluted spirit, it is well for the practitioner to know what are the most convenient methods of its administration. The yolk of an egg will answer well for its admixture, or the syrup of orgeat, mucilage of gum Arabic or slippery-elm. If a mixture, capable of sustaining the chloroform is not made, it will be found that this article will become separated, and from its greater specific gravity, will descend below all the other contents of the stomach, and by contact will become irritant, and cause nausea and vomiting, when taken in quantities sufficient to produce the constitutional effect.

For topical or external use, it needs only to be applied in its simple state, or it may be shaken or mixed with oils, and thus applied. When used alone, it will, at first, be somewhat irritant and smarting, but this will soon be over, and more or less insensibility of the part, will ensue.

Dose.—When taken into the stomach, the dose is usually from forty to eighty drops. When inhaled, it is given in quantities of about a fluid drachm, and when administered by injection, it is given in quantities slightly larger than that proper to be taken into the stomach. As a usual thing, the medicine is to be repeated carefully as the circumstances demand, according as returning sensibility in operations may indicate, or as the intolerance of existing pain may call for, it being commonly safe to continue the influence for twenty or thirty, or even sixty minutes.

VERATRIN.

A notice of this powerful agent is given in this order of the present classification, because it is deemed improper to inaugurate an order of *sedatives*, at present, while the meaning of the term is so improperly defined, as is now the case with many of the general profession.

Narcotics, sedatives and anodynes, have been confounded indiscriminately together, by the profession, until very recently; and, indeed, even now some do it; but whether from their

ambition to appear as conservators, or whether they are still uninformed of the many demonstrative facts our science now furnishes in proof of the radical distinction, *physiologically* and *therapeutically*, between them *all*, and between them *respectively*.

It is upon *such* a basis, in medical philosophy, that the article whose cognomen heads the present subject, can be admitted into our Materia Medica, since *narcotics*, as necessary medical agents, are absolutely and properly rejected by true reformers in medicine.*

But with some there is still a doubt whether the veratrum is not narcotic after all, and with such, therefore, this article is still rejected. Perhaps this matter is not yet sufficiently settled to admit of a full commitment to its employment; and in using this language the author would not be intimidated or driven into measures by the soubriquet *dogmatist*, or that of *hunker*. His *own convictions of truth* must be his guide, and to recommend the use of an agent of questionable character, he *can not*, until he is satisfied that it is *safe* and *proper*. If we were in conditions of necessity, the matter would hold quite a different phase, but what school of medicine in the wide world has more ample resources than ours?

The author's own experience in the use of this agent does not enable him to speak of it with that confidence that would be desirable in authorizing its use: he has not tested it in a sufficiently large number of cases, and under a proper variety of circumstances, to fully satisfy his own mind. Some of his professional friends inform him that the article is of *inestimable value;* that they "*could not now get along in treating fever and inflammation without it!*" Others say that from their observations they suspect that it is narcotic—too much so to admit of its use.

Physiological Effects.—The veratrum, that is, the root of

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* Lest the position of reformers, in reference to the use of narcotics, may still not be definitely understood, it may be here added, that they do not claim that all the articles of medicine which they employ, are indeed absolutely free from all narcotic property. But it is claimed by them that this property is never with them the *object* of the *employment* of such agents as may possess them.

the American Hellebore (*Veratrum Viride*) has, like its European congener (*V. Album*), been classed with colchicum, aconitum, conium, belladonna, hyoscyamus, arnica, etc., as a narcotic, and has not been the subject of any special inquiry in our country,* until Dr. W. C. Norwood, of Cokesbury, S. C., aroused the attention of the general profession throughout the length and breadth of our land by his pamphlet.

In this so much was *claimed in favor* of the article, while also enough had been said directing to a view of its *freeness from narcotic power*, as to cause many of the reformers, as well as old-school men, to test its virtues more critically. The result, as nearly as can be judged from the numerous reports made of its effects upon the system, is that it is prominently *sedative*, *emetic*, *expectorant*, slightly *cathartic*, *alterative*, *diaphoretic* and *emmenagogue* (and some say slightly *narcotic*, others say not).

Although this article now is one of much interest, the remarks here contemplating its physiological effects will, for reasons already expressed, not be further extended.

Therapeutic Properties and Use.—Those among reformers who employ the *veratrin* or active principle of the veratrum viride, use it mostly in view of its sedative—or as they mostly call it *relaxant*,—and its diaphoretic powers in febrile, inflammatory, and spasmodic diseases. They claim for it all that can be effected by *lobelia*, as a relaxant and diaphoretic, while at the same time these results are secured without the intervention of nausea.

In rheumatism, acute or chronic, and in gout also, it is claimed that veratrin is preëminently *the* remedy. Thus this new agent stands out boldly as the first-class agency in the treatment of the *inflammatory*, *febrile*, *spasmodic*, and *arthritic* diseases, the four great classes of the sthenic diathesis.

The dose of veratrin is from one-eighth to one-fourth of a grain; though it is thought to be a good plan to commence its use in smaller doses when first applied in a case. Over-doses will produce vomiting, and prostration of the excito-motory

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* Prof. Tully, of Yale College, and Dr. C. Osgood, of Prov., R. I., had given this article some attention, see *Am. Jour. Med. Sc.*, 1835, xvi. 296.

powers of the system; and although the article is not considered to be intrinsically poisonous, yet as it is most certainly one of very great power, it requires to be used with discretion.

Here the author is disposed to let this article rest for the present. In future editions this, and also the two preceding may demand something more.

Order II.—ANODYNES: PAREGORICS.

The terms *Anodyne* (from *ανα*, '*priv.*,' and *ωδυνη*, '*pain*,'); and *Paregoric* (from *παραγορεω*, '*to mitigate*,' '*to assuage*,') are terms applied to medical substances which possess the power to allay pain.

It is not a little strange that the general medical profession should, in the present advanced state of physiological and therapeutic knowledge, be so unaccountably inclined to confound the *narcotic* and simple anodyne effects of agents upon the system as is the case. It is admitted, indeed, by all experimentalists that, a narcotic power is *not necessary* to the development of the simple paregoric or pain-assuaging effect; but, *practically*, the mass of practitioners, nay, even most of the *professors* and *authors* on practical medicine, have lost sight of this very important truth.

Narcotics have universally been employed to fulfill indications requiring simple anodynes alone; and it seems that practitioners can scarcely think of relieving pain without recurring to opium.

Errors so gross, and which involve matters of such great importance, can not be too soon abandoned.

Nervines (formerly called cerbro-spinants) possess properties whose action upon the system is characterized by *quality* of impression as certainly as that of any other class of agents. These qualities, as must be presumed, are dependent upon *different principles contained in the article used*, as well as upon the peculiar susceptibilities of the parts impressed by them.

Would it not be an anomaly in nature to find that, while all other organic substances possess not only different physical principles, but different medical virtues, these alone can have

but a *single identical power?* Rhubarb possesses two apparently opposite powers — *astringent* and *cathartic.* Sanguinaria is emetic, cathartic, diaphoretic, expectorant, antiseptic and corroborant, some of which properties seem also to be in opposition to each other.

The doctrine which contemplates a narcotic power necessary to the development of a full anodyne effect, or even the *soporific*, stands opposed to observation; and does it not conflict also with the theory of animal magnetism?

The principles of the new anti-poison system very justly exclude narcotics, as medical agents, from our Materia Medica; nay more — articles *otherwise valuable*, are also rejected when found to be possessed of this property to any considerable degree. Thus opium, stramonium, hyoscyamus, digitalis, etc., are not admitted.

Nevertheless, refusing to investigate articles of this kind could only be regarded as a display of the greatest folly. The improvements in organic chemistry, for which the present age is distinguished, have made it an easy matter to analyze medical agents, and to isolate the valuable and harmless principles from those that are useless and pernicious. Thus opium, and many other similar articles, have been made the subjects of experiment with the most gratifying success.

Modus Operandi.—It must be admitted that the sensibility may be morbidly increased, as well as any other endowment of the nerves. To say that this principle is incapable of derangement, is to assume more than has been proven of any other principle or structure of the entire system.

Now that the nerves are susceptible of being sanatively influenced in such a way as may moderate excessive or morbid sensibility, is not in the least more strange than that *other* specific influences should be developed. The questions, why and how do *stimulants*, *tonics*, or any other class of agents, produce their respective specific effects? are no less difficult of solution. The reason why one agent will stimulate one organ or set of organs to a certain specific action, and another, *different* ones, is chiefly dependent upon the special endowments of those structures. It is very improper to conclude that an

agent capable of modifying sensibility when morbidly exalted, by obviating the cause of such derangement, is necessarily, a *narcotic* power, any more than any *other* agent which may modify other excessive or morbid movements, by removing *their* cause.

Application. — Objections have been urged against the employment of anodynes, on the ground that pain is nature's "intelligencer," reporting encroachments or the invasions of disease; and, that as its intensity is always indicative of the extent of the mischief or danger, it should not be interfered with under any circumstances.

Irritation, fever, inflammation, etc., are also "intelligencers" of the invasion of disease; and do we never attempt to modify them by removing their causes? Nor is pain always an index to the extent of the mischief or danger of disease. What comparison is there between the *danger* and the *pain* of toothache, arthritis, paronychia, ferunculus, the sting of a bee, or even a slight burn or the contusion of the finger nail? And is not the chief indication, in all these cases, the mitigation of pain? How, also, will these compare, in danger, with that of paralysis of the heart, hemorrhages, hydrothorax, hydrocephalus, etc., which are comparatively painless diseases?

Nothing is more clear than the range of influence possessed by this order of remedies, it being dependent upon the manifestations of pain. All the particulars to be observed in their employment are two obvious points: *First*, it is sometimes important to know just how much of our future diagnosis and prognosis may be dependent upon the development of pain, so that when this is our chief index to the case we may be governed accordingly, in our efforts to assuage it. *Secondly*, it is well to know the particular circumstances that give rise to pain. This is not always the result of a morbidly increased sensibility, but may be dependent upon various mechanical conditions, etc., in which, if they *were* prescribed, they would be of little avail.

PAPAVERINE.

This is the purely anodyne principle of opium. In the

former edition of this work, a process was given for the preparation of this principle from the capsules of the poppy, and was called denarcotized extract of papaveris. But experience has led to its preparation from opium, as affording the principle with the most facility. The article is now in very extensive use in the reform profession.

PREPARATION. — Opium, ℥xvj.; Dist. Water, q. s.; Quicklime, ℥iv.; Sal Ammoniac, ℥j. Pulverize or cut fine the opium, and macerate thoroughly in Oiij. of dist. water; press out strongly; repeat the maceration three times successively, first, in three, and afterward in two pints of distilled water, pressing thoroughly. If there is no bitter taste in the remaining mass, this step is completed; but if there is bitterness, the maceration must be repeated. Put all these several infusions together into a vapor-bath, and bring to the boiling point, and add a *milk* of the lime, also boiling hot; let the mixture boil ten minutes; filter through a cloth; pour on the limy mass upon the filter a little cold water, and wash through what of the desired principle may remain; boil down to two pints; filter, hot, through paper, in the water-bath funnel; add the salt of ammonia in solution, and boil a few minutes, or until the slight excess of ammonia is driven off; then set aside for crystallization. The papaverine is thus obtained by throwing off the liquor and drying the crystals.

The product of this process is a light gray or ash-colored crystalline powder, which amounts to about eight or nine per cent. of the weight of the opium used, if the latter be good, and the process is well conducted. It is very bitter, and possesses all the anodyne power of the opium without its narcotic and tetanic principles.

The *rationale* of the process for obtaining it will now be given. It is to be borne in mind, that in this process the *double* purpose is all the time in view, of not only obtaining the anodyne power, but the extraction of this to the exclusion of the other principles above named. Otherwise the common authorized processes of the Pharmacopœias would be much preferable.

The chemical natures of the several active organic princi-

ples can alone be the basis of a process that will reach the desired end. The *narcotic* power of opium has long been acknowledged to depend upon the NARCOTINA, and the *tetanic* upon the THEBAINA. The first of these principles is insoluble in alkaline solutions, and is thus susceptible of separation by a process contemplating this fact. Thebaina is also insoluble in the alkaline solutions, even when much in excess, and may thus also be disposed of on the same principle as the narcotina. On the other hand, the papaverine, or anodyne power, is very soluble in any alkaline solutions. Here, then, we have an advantage in this dissimilarity in the chemical character of these organic principles that is of much *avail*.

Opium also possesses other principles to be treated with in the process. Resin, lignin, coloring matter, gum, fecula, and an extractive principle; all of which are to be separated. Codea, Meconin, Narcene, and some other peculiar principles, all of which, being in small quantity and neutral in power, are disregarded, but are, nevertheless, owing also to their own chemical nature, mostly removed by the process here given.

The cold water constituting the solvent in the first part of the process, being in excess takes up the anodyne principle, though but sparingly soluble in this liquid. Distilled water is employed because it is more pure, and is free from minerals. In this solution, the lignin, resin, fecula, and fatty matter (and but for the presence of acids, also the thebaina and narcotina), are left behind, from their insolubility in water. The frequent repetition of the maceration is for the thorough exhaustion of the marc. By the addition of lime, the precipitation of the narcotina and the thebaina is effected, as they are incapable of remaining in solution after the acid is neutralized. The excess of lime is necessary to keep in solution the principle sought. The boiling with the lime, completes the solution of the papaverine, while it does no harm. The straining removes the lime in part, with much of the coloring matter, thebaina, narcotina, etc. The evaporation now has for its object the reduction of the liquid, to facilitate the precipitation, or final part of the process; and the heat in the filtration is to prevent precipitation, which (now in this con-

centrated state of the solution) is liable to occur. Adding the solution of the ammonia is done to neutralize the lime by the formation of chloride of lime, and this remaining still in solution, and the papaverine being insoluble therein, is precipitated in an imperfectly crystalline state, and is thus also freed from extractive matter, chlorophylle, and other principles.

In this process nothing is claimed over that producing the commercial salts of morphia, except the freeness of this product from the aforesaid narcotic and tetanic principles.

The anodyne power here called *papaverine*, is not in the least more effective as an anodyne than the salts of morphia; nor is it different in principle from one of the three prominent constituents of these salts; i. e., the principle called *morphia*. The case is that in this process the morphia (papaverine) is separated as a neutral and purely anodyne principle. In the other, the salts, that is, the muriate, sulphate, acetate, etc., are tribasic, having *morphia*, *narcotina*, and *thebaina* conjointly in combination with the respective acids employed in the formation of the salts.

The name *papaverine* is not, therefore, set forth to represent a new principle, but one long recognized, yet never sufficiently tested in its isolated state. The name morphia might indeed have been retained, since this principle (*papaverine*) has been commonly referred to under this name by chemists, when pointed out separately, but from the probability that it might be confounded, by many, with the common commercial salts, called *morphine*.

Therapeutic Properties and Use.—If the papaverine possessed no other than simply anodyne powers, it would scarcely be necessary to speak here specially of its application. All know the use of a pain-relieving agent. No practitioner but has witnessed throughout his practice the constantly recurring indications for the use of the anodynes. But the papaverine is not only a peerless anodyne, but is also scarcely equaled as a diaphoretic, relaxant, or antispasmodic, and expectorant.

What an immense range of application is thus presented by this view of the properties of papaverine. First, as a simple

anodyne, it serves as an angel of mercy in cases of extreme suffering from pain, no matter what its cause may be when the suffering arises from an exalted or a morbid state of sensibility, as is often the case in states of high inflammation. Secondly, as an *antispasmodic* and *anodyne*, in febrile diseases, attended with conjestion, violent paroxysms, spasms, etc.; also in tetanus, cramp, nervous asthma, and kindred diseases. As an *expectorant* and *diaphoretic*, in pneumonia, phthisis, asthma, bronchitis, croup, etc.

Some of the most urgent cases demanding the use of this medicine, and in which it will do eminent service, are strangulated hernia, colic, intussusceptio, trismus, epilepsy, cholera, dysentery, parturition, pain in cancer, gravel, fractures, and other injuries; in all of which cases *several* of its properties will be in requisition.

Its combination with other agents, to modify and improve their properties, is of great importance. As an anodyne it goes best, perhaps, with camphor; as an antispasmodic, diaphoretic, and expectorant, with lobelia inflata.

The dose of papaverine is from one-fourth of a grain to half a grain. But one full grain has often been given with impunity. In excessive doses, it overstimulates the brain and general nervous system, causes congestion, headache, giddiness, dullness, vomiting, and protracted nausea. No narcotism, as dilatation of pupil, stupor, delirium or coma, and suppression of the involuntary functions.

Misapprehensions sometimes occur in reference to the character or safety of some of our concentrated remedies, and it has been objected that no article that is not a poison, is limited to so small a compass. But it must be remembered that a single grain of some of the alkaloids or extracts, sometimes contains the power of perhaps an ounce of the crude substance from which it is obtained. Then when two grains are taken, there may possibly be the force of two whole ounces! Who, for instance, would think of giving even an ounce of any of our prominent medicines, as lobelia and capsicum. From half a grain to five grains of lobelina is a full dose, and more would be as improper as an increase of the dose of the medicine in

question. It should be borne in mind that intrinsically the medicine is harmless, and hence when mischief follows its use, it must be attributed to the circumstances attending its employment, as in other cases, in which innocent articles are made to result in mischief, by excess of dose or otherwise.

LACTUCA.—The Extract.

SYNONYMS.—Laitue, *Fr.*; Lattig, *Ger.*; Lattuga, *Ital.*; Lechuga, *Span.*

BOTANY.—*Sex. Syst.*—Syngenesia Æqualis. *Nat. Ord.*—Compositæ-Cichoracæ, *De Cand.*; Cichoraceæ, *Lind.*

Gen. Char. LACTUCA.—*Receptacle* naked. *Calyx* imbricated, cylindrical, with a membranous margin. *Pappus* simple, stipitate. *Seed* smooth, *Willd.*

Spec. Char. It is uncertain in the present stage of inquiry, in reference to the physiological effects and therapeutic properties of the different species of Lactucas, as to how many of them should be admitted into our Materia Medica. Some of them have been considered narcotic in their effects.

1. L. ELONGATA: *Wild Lettuce.*—*Root* biennial. *Stem* from three to six feet in hight, cylindrical, terete, smooth. *Leaves* clasping, long, smooth below; lower ones toothed, and runcinate; top ones lanceolate. *Flowers* in corymbose panicles, small, and of a pale yellow color. The stem and leaves, when wounded, emit a milky juice. Indigenous, and growing in all latitudes of the United States, from Canada to the Carolinas. It is common in open woods and uncultivated fields. Its flowering time is in June and July.

2. L. SATIVA: *Garden Lettuce.*—Of this species there are so many varieties that a general description is difficult. The Var. *Romana* has oblong, straight leaves, narrowed at the base. Var. *Crispa* has sinuate-crenate leaves, toothed, undulated, crisped; the radical ones hairy on the keel. Var. *Lacinnatta* has the lower leaves pinnatifid, and *the upper ones runcinate.* Fructification same as the foregoing. Introduced, cultivated in gardens as a salad.

The *L. Virosa*, or European species is considered quite narcotic; *L. Hirsuta*, *L. Integrifolia*, *L. Sanguinea*, *etc.*, are species of whose therapeutic character we do not know much.

GENERAL DESCRIPTION.—When young, the leaves of Lettuce contain a peculiar, pellucid, pleasant-tasted juice containing mucilage and sugar; but when the flowering stem begins to appear, the juice becomes milky, bitter in taste, and of a strong, peculiar odor. These characteristics increase until the flowers

have blown. If slices of the stem be cut off, or incisions be made in its cortical portion, the milky juice exudes, and on drying becomes of a brownish color, forming what is called *Lettuce Opium* or *Lactucarium*, to which Dr. Coxe of Philadelphia, and Dr. Duncan, Sr., of Edinburgh, first called attention. Dr. François subjected it to further examination, calling it *Thridace*. Lactucarium is prepared by collecting the above exuded juice, and by pressing out that of the incised stems when in flower, and then evaporating it to the proper consistence in a water-bath. This forms the best kind. It is of the consistence of a dry extract, having a brown color, smell somewhat like that of opium, and a bitter, slightly acrid taste. It is apt to attract moisture. It yields to analysis about half its weight of *Bitter Extractive*, *Wax* and *Resin*, with a principle analogous to *Caoutchouc*, in considerable quantities. No crystalline principle has as yet been discovered.

Physiological Effects.—Authors generally have regarded the L. Virosa as being considerably narcotic and sedative; and some also consider the L. Sativa of like character, although many assert that from extensive trials of its virtues, they were led to conclude that it is not only a pure anodyne, but a most valuable medicine. One thing is certain, that when *young* the latter is not possessed, to any considerable extent, of these powers, as it is eaten in quantities so large as would necessarily produce unequivocal testimony on this point; although the general opinion is that when lettuce is eaten, as usually prepared at table, to something near a full meal, which would amount to from eight ounces to a pound, it does dispose the individual to sleepiness, and in some persons it will give rise to obtuseness or dullness of feeling. There is however no evidence of a narcotic power here. Sleep is a physiological phenomenon, and when not attended with debility or any other unpleasant condition, it can not be said to be the result of a mischievous influence.

The *L. Elongata* is perhaps more purely anodyne than any other one of the species. *M. Aubergier*, who made numerous experiments with different species of lactuca with a view to ascertain from which lactucarium might be most advantage-

ously obtained, appears to have furnished evidence that this species is absolutely without narcotic power.

THERAPEUTIC PROPERTIES.—There can be no rational doubt in reference to the therapeutic virtues of the lactuca. The medicine has been fully tested by many experienced practitioners, and competent judges. It is applicable in most cases in which anodynes are indicated, but particularly in the distressing irritation that often attends pulmonary affections. In some cases of phthisis there is a distressing hacking, and coughing, dependent upon an irritable condition of the nerves, and which has seemingly become chronic. Some of the preparations of lactuca will obviate this irritation and thus relieve the patient astonishingly. Some practitioners who have been in the practice of using opium, on their discovery of the virtues of this medicine, have been induced to employ it in preference to the former, stating that this, though not quite so active as that potent article, possesses to some extent its calming influence over the nerves, without being attended with any of the unpleasant effects that often follow the use of opium. Among other affections in which the lactuca is particularly useful, are chorea, neuralgia, periodic headache, hemicrania, gout, tetanus, and other spasmodic affections. The medicine is never used in substance, as the quantity necessary is too inconvenient. It is important to bear in mind that all the species of lactuca require to be in full maturity before they are fit for medical use.

PHARMACEUTIC PREPARATIONS.—LACTUCARIUM: *Lettuce Opium.* —This, which is the medical portion of the plant, has been obtained in various ways. One method is to cut the stalk transversely, remove the juice repeatedly as long as exuded, then cutting again at a short distance below, and thus continuing until the stalk is gone. This juice is then inspissated in the sun, and forms the lactucarium, a darkish-colored substance of the consistence of opium. See description on the preceding page.

The London College direct an extract, prepared by inspissating the expressed juice of the leaves.

The best plan to procure the lactucarium is to cut up in small transverse pieces, the entire plant when in flower, and placing it in layers between clean pieces of linen, of suitable size, and pressing under a screw, or by other means. The

cloths absorb the milky juice, which may then be removed by soaking in a very little water for a day, and then wringing and pressing the cloths. The liquid may then be inspissated spontaneously in shallow vessels placed in the sun.

Dose, from gr. v.—gr. xx.

EXTRACTUM LACTUCÆ: *Extract of Lettuce.*—Take of lettuce bark (obtained by scraping the stalk of lettuce when in bloom, and drying), ℔j.; dilute alcohol, Ovj. Digest for four days, strain, and press. Evaporate the tincture spontaneously to the proper consistence.

Dose, gr. v.—gr. xv.

VINUM LACTUCÆ: *Wine of Lettuce.*—℞ Bark of Lettuce, prepared as above, ℔j.; good Madeira, Cj. Digest for seven days, strain, and press.

Dose, f℥j.

TINCTURA LACTUCÆ: *Tincture of Lactuca.*—Prepared with dilute alcohol, as directed for the Vin. Lactuca.

Dose, ʒfij.—ʒfiij.

CYPRIPEDIUM.—The Root.

Synonyms.—Frauenschuh, *Vul. Ger.*; Venus Jaune, *Fr.*; Ladies Slipper, American Valerian, Umbil, etc., *Vul.*

Botany.—*Sex. Syst.*—Gynandria Diandria. *Nat Ord.*—Orchideæ.

Gen. Char. Cypripedium.—*Calyx* colored, four-sepaled, spreading. *Corolla* none—by some the calyx is considered a corol. *Nectary* large, hollow, inflated. *Style* with a terminal lobe, and petal-like appendage on the upper side.—*Eaton.*

Spec. Char. All the species of the present genus possess analogous virtues. There are some six species discovered, with many varieties, which are best noticed separately.

1. C. Pubescens (*Barton*, etc.), C. Lutem (*Raf.* etc.). *Roots* perennial, fibrous, fleshy, undulated or crooked, long, about a line in diameter, and of a peculiar, somewhat aromatic taste and smell. *Stem* round, leafy, about a foot to eighteen inches in hight. *Leaves* large, sheathing, oblong, lanceolate, entire, plaited, cauline, generally only about four in number, nearly the same on both sides. *Flowers* of singular structure, generally solitary; the corolla, considered by Prof. Eaton as being a colored calyx, is four-petaled; petals long, linear, pointed, generally spiral, of a brownish yellow or siskin-green

color, nectary or labellum very large, globular or moccasin-shaped, of a bright gamboge-yellow. The entire plant is pubescent.

Rafinesque, who calls this species *lutenum*, makes eight varieties, viz.: 1, Pubescens; pubescent throughout. 2, Glabrum; nearly smooth. 3, Grandiflorum; slightly pubescent, labellum very large. 4, Parviflorum; slightly pubescent, labellum small. 5, Maculatum; labellum more or less spotted with red dots, lobule often red. 6, Biflorum; with two flowers and bracteoles. 7, Concolor; the whole flower yellow, or yellowish, unspotted. 8, Angustifolium; leaves and bracteoles lanceolate. Grows throughout the United States in woods, and rich soils.

C. PUBESCENS.

C. ACAULE.

2. C. Acaule.—Identical with the *Humile* of W. P. C. Barton. *Root* perennial, an irregular bulb, beset with numerous carnose fibers. *Leaves* two, radical, ovate, lanceolate, pubescent, sheathing each other and the scape, deeply nerved. *Scape* naked about eight or twelve inches high, erect, embraced by the folded leaves while the plant is in flower. *Flower* solitary, terminal. *Petals* dull purplish-green, or purple and yellow, long. *Nectary* large, pendulous, globose, lake-red, delicately striped with darker lines of the same hue. Grows in most parts of the United States, in shady swamps and morasses, in accumulations of mold, or decayed vegetable matter, more rarely in drier and poorer places. It flowers in May and June.

C. SPECTABILE.

3. C. SPECTABILE.—*Leaves* crowded, embracing each other, rather sheathing, elliptical, very acute or acuminate at the apex, and attenuated at the base, nerved or plated. *Petals* white, broad-ovate. *Nectary* deeply striped with reddish-purple; belly white, and spotted internally with red. Grows in mountainous land. Flowers in June. Often two-flowered. Pubescent throughout. Not very common.

4. C. CANDIDUM.—*Stem* leafy. *Leaves* lance-oblong. *Flower* white; lobe of the style lanceolate, rather obtuse; lip compressed, shorter than the lanceolate petals. Not very abundant.

5. C. ARIETINUM. (Eaton.)—*Stem* leafy, about six inches high. *Lobe of the style* orbicular, obtusish. *Petals* five; the two lower ones lance-linear, deflexed; the two lateral, linear, spreading; upper one ovate-oblong, acute. *Lip* of the length of the petals, obconic before, saccate. Grows in Canada and Maine.

6. C. PARVIFLORUM.—This is the *calceolus* of Michaux. *Stem* leafy. *Flower* whitish-green; *ovate lip of the style* triangular, acute. Outer *petals* oblong-ovate, acuminate; inner ones linear, contorted. *Lip* compressed, shorter than the petals. Grows from N. England to Virginia.

THERAPEUTIC PROPERTIES.—Cypripedium is an excellent nervine, and, when properly given, proves anodyne. As usually prepared, however, its virtues are not displayed to the fullest extent, as we find that water will not take up all its valuable properties; and, when taken in substance, it is inconvenient to take a sufficient quantity.

The alcoholic extract is the only form in which the medicine can be administered with a hope of displaying its full powers. This preparation will be found available in most cases of nervous derangement, but particularly in subsultus tendinum, shaknig palsy, and all cases of pure nervous debility. The author arrested at once a most alarming paroxysm of delirium tremens, with two doses of this medicine.

There is little doubt, but that the improved mode of its exhibition will restore this article to its former reputation in the new physiological practice.

The dose of the powder is ʒss.—ʒjss.

PHARMACEUTIC PREPARATIONS.—EXTRACTUM CYPRIPEDII: *Extract of Cypripedium.*—℞ Cypripedium, in coarse powder, ℔ij.; Alcohol Cj.; proceed by percolation to obtain the tincture; distil off until there remains one pint; place over a water or sand-bath, and evaporate to the proper consistence.

Action—Use.—This preparation contains the virtues of the plant in a highly concentrated form, and is hence an article that may be employed with confidence, in all cases in which a nervine tonic and mild anodyne is required. *Dose* gr. x. to gr. xx.

TINCTURA CYPRIPEDII: *Tincture of Cypripedium.*—℞ Cypripedium, in coarse powder, ℥xvj.; Alcohol, Ovij.; macerate ten days, and decant or filter.

Action—Use.—This is also a good preparation of the cypripedium, and may be employed with confidence, in most cases in which the articles of this order are indicated, especially in cases of nervous debility. *Dose* f℥j. to ʒiij.

PULVIS ANODYNUM.

℞	Papaverine,	ʒj.
	Camphora,	ʒij.
	Pul. Lobelia,	ʒij.

Pulverize the camphor, by moistening first with alcohol, and then mix the articles well.

Action—Use.—One of the best anodyne and antispasmodic preparations the author has ever used. Scarcely any thing like it in assuaging *after-pains*, and the distress attending dysmenorrhœa. *Dose* gr. j. to gr. iij.

VALERIANA.—The Root.

SYNONYMS.—VALERIANA OFFICINALIS; Valeriane, *Fr.*; Wilde Baldrinwurzel, *Ger.*; Valeriana Silvestre, *Ital.*; Valerian Sylvestre, *Span.*; Valerian, *Eng.*

BOTANY.—*Sex. Syst.*—Triandria Monogynia. *Nat. Ord.*—Valerianaceæ.

Gen. Char. VALERIANA.—*Calyx* very small, finally enlarged into a feathery pappus. *Corolla* monopetalous, five-lobed, regular, gibbous at the base. *Capsule* two-celled (Lond. Encyclopedia of Plants). *Stamens* exserted, one, two, three, and four, *Nut.*

Spec. Char. V. OFFICINALIS.—A native of Europe. Herbaceous plant. *Root*, perennial, tuberous. *Stem* two to four feet

high, smooth, furrowed. *Leaves* all pinnate, or pinnately cut; leaflets lanceolate-dentate, in seven to ten pairs, terminal one very little, if at all larger than the others. *Inflorescence* a corymb, becoming at length somewhat panicled. *Bracts* ovate lanceolate. Calyx-limb involute during flowering, then unrolled into a deciduous pappus, consisting of many plumose setæ. *Corolla* roseate; tube funnel-shaped, gibbous at the base; limb five-lobed. *Stamens* three. *Fruit* smooth, compressed, one-celled, one-seeded.

Description.—The root is the officinal portion. As brought to us, it consists of numerous long, slender, cylindrical fibers, issuing from a tuberculated head or rhizoma. Its color, externally, is yellowish or brown—internally, white. The taste is, at first, sweetish, then bitterish or aromatic.

Analysis.—Trommsdorf found the root of valerian to consist of 1·2 parts of *Volatile Oil;* 12·5 of a *Peculiar Extractive*, soluble in water, insoluble in ether and alcohol; 18·75 of *Gum;* 6·25 of a soft, odorous *Resin;* and 63 of *Lignin.* The virtues appear to reside in the essential oil, and, perhaps, in the resin; they are imparted to alcohol, and, to some extent, to water.

Therapeutic Properties.—An excellent nervine tonic, and somewhat anodyne in large doses; very applicable in hysteria, hypochondriasis, epilepsy, hemicrania, and most nervous affections of this kind. *Dose* of the oil four or five drops; that of the root gr. xxx. to ʒjss. The decoction, or extract is nearly insipid.

Pharmaceutic Preparations.—INFUSUM VALERIANÆ, D. (U. S.) *Infusion of Valerian.* ℞ Digest for one hour the root of Valeriana Sylvestris in coarse powder, ʒij., in boiling Aq. by measure, ℥vij. When cold, strain. (U. S. Valerian, ℥ss., boiling water, Oj.

Action—Use.—Moderate stimulant in doses of f℥j. to f℥ij.

TINCTURA VALERIANÆ, L. E. D. (U. S.) *Tincture of Valerian.* Take bruised (powdered, D.) Valerian Root, ℥v.; (℥iv. D. U. S.); Proof-spirit Oij., (by measure Ibij.) Macerate for fourteen (seven, D.) days. Strain. (Proceed by percolation or digestion, as for Tinct. Cinchonæ, E.)

Action—Use.—Stimulant adjunct to draughts, in doses of fʒss. to fʒiv.

TINCTURA VALERIANÆ COMPOSITA, L. (AMMONIATA), E. D. (U. S.) *Ammoniated Tincture of Valerian.* Take Valerian Root bruised, ℥v., (℥ij., D.) (℥iv., U. S.); Aromatic Spirit of Ammonia, Oij. (Spirit of Ammonia, Oij. E., by measure; ℔j., D.) Macerate for fourteen (seven, D.) days, and strain. (Proceed by percolation, as directed for Tinct. Cinch. E.)

Action—Use.—Antispasmodic, and more stimulant from presence of ammonia; may be given in doses of f℥ss.—f℥ij.

SANICULA.—The Root.

Synonyms. Sanicle, Indian Sanicle, *Eng.*

Botany.—*Sex. Syst.*—Pentandria Digynia. *Nat. Ord.*—Umbelliferæ.

Gen. Char. Sanicula.—*Carpels* hispid, with hooked prickles. *Calyx* five-parted, permanent. *Umbel* subsimple, capitate. *Involucre* few-flowered.—*Eaton.*

Spec. Char. There are several species of analogous properties. But the *S. Marylandica* is the most commonly employed. This has a perennial, fleshy, fibrous root; young radicles whitish; older ones darker, of an aromatic taste and rather grateful smell. *Leaves* digitate; leaflets oblong, gashed. *Flowers* white; part fertile, sessile and sub-ter-

S. MARYLANDICA.

nate; others barren, pedicelled and the most numerous. The variety *Canadensis* has its leaves sub-ternate; leaflets ovate and coarsely toothed. Both grow from one to three feet in hight. Found in most parts of the United States, in woods and new grounds.

THERAPEUTIC PROPERTIES AND USE.—Nervine tonic, and slightly anodyne in large doses. Very analogous to valerian, and may be substituted for it. It is a useful adjunct to other and more powerful anodynes. Applicable in most nervous affections. Said to be a remedy for snake-bites. The virtues reside chiefly in a volatile oil, procured by distillation with water. Its decoction and extract, as may be inferred from the fact of its virtues existing in a volatile principle, are almost worthless. *Dose* of the powdered root, ʒss.—ʒjss.; that of the volatile oil, v. to x. gtt.

ASARUM.—The Root.

SYNONYMS.—ASARUM CANADENSIS; Canadischeschlangenwurzel, *Ger.*; Canada Snake-Root, *Eng.*; Wild Ginger, *Vul.*

BOTANY.—*Sex. Syst.*—Gynandria Decandria. *Nat. Ord.*—Aristolochiæ.

Gen. Char. ASARUM.—*Calyx* somewhat bell-form, three or four-cleft, superior. *Corolla* none. *Anthers* proceeding from the middle of the filaments. *Stigma* six-cleft. *Capsule* coriaceous, six-celled, crowned with calyx.—*Eaton.*

A. CANADENSIS.

Spec. Char. A. CANADENSIS.—*Rhizoma* horizontal, fleshy, about a third of an inch in diameter, jointed, beset with radicles, of a fragrant and peculiar smell and spicy taste. *Leaves* broad, reniform, in pairs, woolly. Fructification close to the ground, singular.—(*See Generic Description.*)

THERAPEUTIC PROPERTIES AND USE.—An aromatic nervine tonic, and in large doses anodyne. It may like valerian, be used in most cases of

nervous derangement, and forms an excellent adjunct to more active articles of this order. Its virtues reside chiefly in a volatile oil, and are hence most readily imparted to alcohol, but are also yielded to water in virtue of its extractive and mucilage. It is chiefly employed in the form of tincture and the essential oil. The dose of the latter is from five to ten drops. The tincture is taken in doses of from a teaspoonful to a tablespoonful. The infusion is prepared strong and taken freely. The powder is inconvenient, as the dose necessary is too large.

PANAX.—The Root.

SYNONYMS.—PANAX QUINQUEFOLIUM; Ginseng, *Ger., Fr., Span.*; Ginsen, *Ital.*

BOTANY.—*Sex. Syst.*—Pentandria Digynia (Polygamia Diœcia. — Linn). *Nat. Ord.*—Araliaceæ.

Gen. Char. PANAX.—*Flowers* polygamous. *Umbel* simple. *Calyx* five-toothed. *Corolla* of five petals. *Berry* inferior, subcordate, two, sometimes three sided. *Calyx* in the male flower entire.—*Nutt.*

Spec. Char. P. QUINQUEFOLIA.—*Root* perennial, tuberose, spindle-shaped, often dichotomous. *Stem* annual, about a foot high, simple, round smooth, and divided at the summit into petioles. *Leaves* compound, consisting of

P. QUINQUEFOLIA.

five, more rarely seven or three petiolate, oblong, lanceolate, ovate, acuminate, serrate leaflets. *Flowers* small, greenish, and arranged in a simple umbel, supported by a peduncle, which rises from the fork of the stem. The plant is indigenous, and found in rich open wood-lands in most parts of the United States.

THERAPEUTIC PROPERTIES AND USE.—The ginseng is a mild aromatic nervine tonic and anodyne, in large doses. Its popularity as a medicine or universal panacea, among the Chinese, is well known. Its virtues are nearly similar to those of Valerian or Sanicle. It may be employed in all nervous affections dependent upon debility and irritability. It should be taken in substance, although the dose is necessarily large. It contains an essential oil, and abounds with fecula and gum. It yields its virtues to some extent to alcohol and water. Dose ℈ij.—℥iij.

LIATRIS.—The Root.

SYNONYMS.—Colic-Root, Button-Root, Gayfeather, Prince's Feather, etc., *Eng.*

BOTANY.—*Sex. Syst.*—Syngenesia Polygamia. *Nat. Order.*—Corymbifereæ.

Gen. Char. LIATRIS.—*Involucre* imbricate, oblong. *Anthers* entire at the base. *Akenes* hairy, obconic. *Egret* permanent, plumose, colored. *Receptacle* naked.—*Eaton.*

Spec. Char. L. SPICATA.—There are several species that have been medically employed, but this is that commonly referred to, under the title of *Liatris.* It has a short, thick, perennial root (cormus), 1 to 2 inches long and 1 inch thick, which is beset with numerous fibers; and has a very strong, acrid, aromatic taste, and odoriferous smell. The *stem* is simple, three to four feet high. *Leaves* long, narrow, sword-shaped, glabrous, ciliate at the base, nerved, and punctate. *Spike* long, loose. *Flowers* sessile, red, appear in August. *Involucre* scaly, large. Grows in the Western States, in gravelly and sandy soil, and in prairies.

THERAPEUTIC PROPERTIES AND USE.—The root of the liatris spicata is stimulant, diaphoretic, antispasmodic, and anodyne It has long been in popular use as a remedy in colic, and its

L. SPICATA.

utility in this disease has given it one of its vulgar or common names. The medicine might be more properly classed with the aromatic stimulants, if its position in the Materia Medica were strictly fixed upon its most obvious properties; but the list of stimulants is very large and that of simple anodynes comparatively small, and hence its present location. The medicine will do good service as an anodyne, if combined with other more active articles of this order. Its most obvious use is in colic, and cramp of the stomach and bowels. It is also serviceable in dysentery, cholera, and diarrhœa; has also gained some character in pectoral diseases, and fevers, particularly remittent.

Its nicest form for medical use is that of the essential oil distilled from the powdered root with water. The fluid, and semi-solid alcoholic extracts, also afford eligible forms for its

employment. But the tincture is the common preparation used by the profession. Its virtues are in an essential oil, soft resin, and extractive, but principally in the two first.

DIOSCOREA.—The Root.

SYNONYMS.—Yam-root, Wild Yam, *Eng.*

BOTANY—*Sex. Syst.*—Diœcia Hexandria. *Nat. Ord.*—Dioscoraceæ.

Gen. Char. DIOSCOREA.—STAMINATE FLOWERS.—*Calyx* six-parted. *Corolla* none. PISTILLATE FLOWERS.—*Styles* three, capsule three-celled, three-winged, compressed. *Seeds* two, membranaceous.

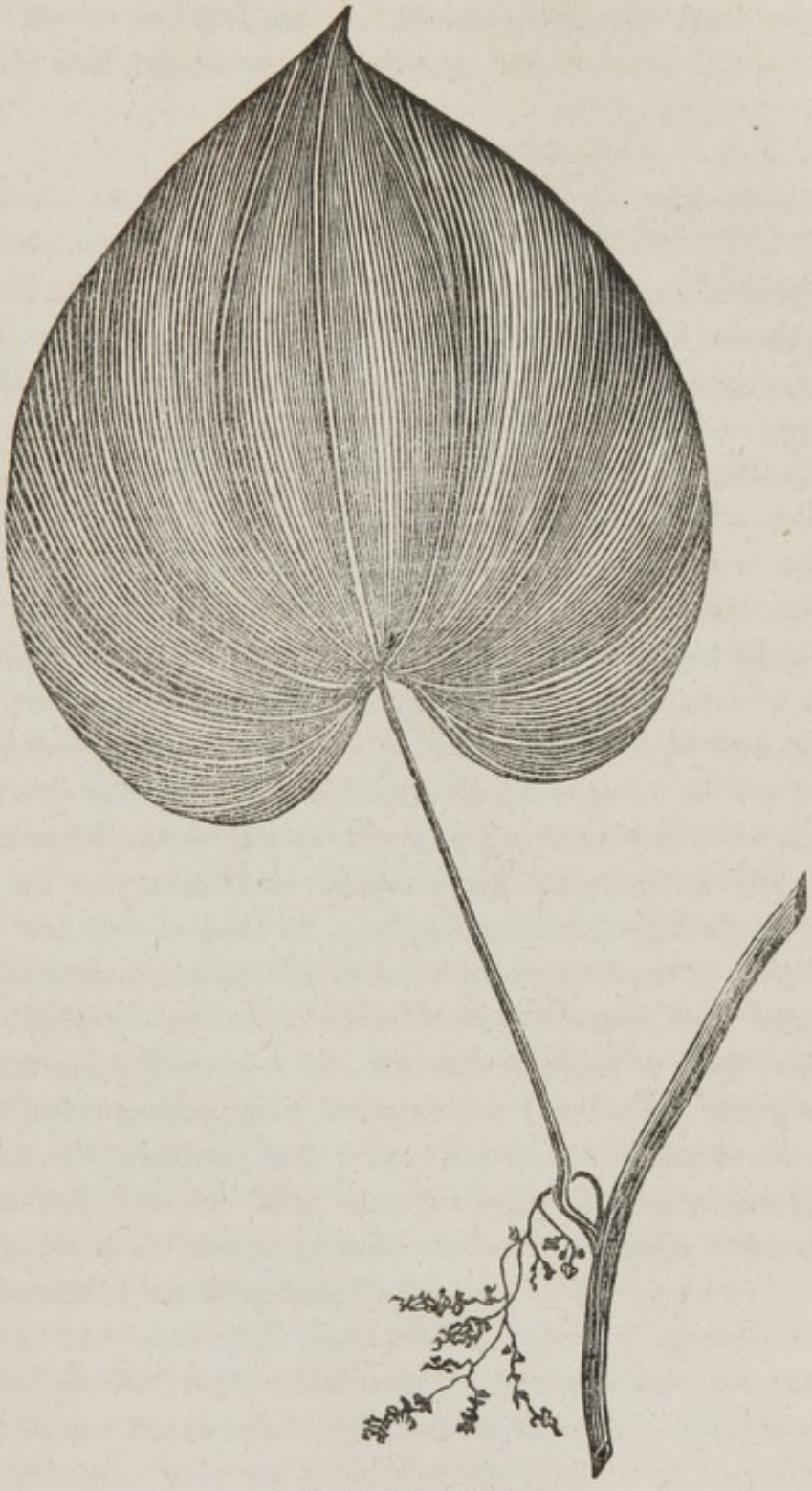
Spec. Char. D. VILLOSA.—*Root* perennial, tortuous. *Stem* slender, climbing, three to eight feet in hight. *Leaves* large, alternate, cordate, acuminate, entire, on long petioles, nine-nerved. *Flowers* small, white, on thread-like, branched, axillary, pendulous racemes. *Seeds* triangular, wing-edged, two lines or more in width, and somewhat longer.

The D. QUATERNATA, is another species much resembling this, with verticellated leaves by fours, at base of vine. Med. prop. the same.

MEDICAL PROPERTIES AND USE.—The root of the Dioscorea has now been tested for over thirty years, since first presented to the medical profession by Dr. H. Howard; and it is very satisfactory to know that its first highly favorable commendations have been fully sustained. The medicine is anodyne, antispasmodic, and diaphoretic. Particularly valuable in colic, and cramp of the stomach and bowels. Also of great service in irritability of stomach in gestation, dysmenorrhœa, and in fevers.

The medicine is usually given in form of tincture. ℞ Rad. Dioscorea, ℥j. Alcohol, Oss. Digest and filter. Dose, f℥ij.—f℥iv.

DIOSCOREIN.—This is the resinoid principle of the root of the dioscorea, obtained by precipitation with water, from the concentrated alcoholic tincture. It is a most valuable medicine, containing the properties of the root in a highly



DIOSCOREA VILLOSA.

An engraving of a cut portion of the vine, with a leaf of natural size and flower branch.

concentrated form. It is considered almost a specific for bilious colic. Dose gr. ij.—gr. v. Over-doses will nauseate the stomach, and finally cause vomiting.

THEA.—The Leaves.

SYNONYMS.—Thé, *Fr.*; The, *Ger.*, *Ital.*; Théah, *Chin.*; Tsjā, *Japan*; Cha, *Arab.*, *Pers.*; Tea, *Eng.*

Tea is an article very extensively used as a table beverage, and although it has received relatively but little attention as an article of Materia Medica, yet in a therapeutic point of view, it certainly requires more attention than has generally been given to it in works of this kind. That tea is an article possessing power sufficient to affect the constitution of man, in the quantity in which it is habitually taken, there is not the least question. It, therefore, becomes a question of some importance in diagnosis, especially in nervous diseases, as to how much the symptoms may be dependent upon, or how much they may be modified by the greater or less use of this article.

Patients are ever in the habit also to inquire of the physician in reference to the quality and properties of the different kinds of *teas*, and their effects upon the constitution. And where will the student of medicine expect to get his information upon this subject in reference to which he is so frequently called upon to give his opinion and counsel, but from the authorities on Therapeutics, Materia Medica, or Hygiene?

The main questions of interest are two: *First*, That which respects the qualities and properties of the different varieties of tea; and, *Second*, That which relates to the physiological and therapeutic effects, as well as the pernicious influence of the respective kinds in use.

Much has been said and written on the question as to whether the different varieties of tea brought into Europe and America, are the product of the same species of the tea-plant. Dr. Abel, who was an extensive traveler, and had unusual facilities for acquiring information of this kind, gave it as his opinion that the two prominent kinds of tea, the *green* and the *black* are the products of the same plant—that the green is

collected earlier in the season, when the leaf is yet small, while it contains a quantity of a viscid and somewhat narcotic juice, of which the leaf when older is more free. He also says that the process of drying has much to do with the color of the tea. The green is dried slower and with more care than the black, and keeps its color better by this means. It is said to be dried in the shade, while the black is dried faster, generally by means of artificial heat, being dried in shallow pans over a charcoal fire.

Dr. Royle, on the other hand, is of a different opinion, and he also had good opportunities for observation. He had been in the Medical Staff of the English Army in India, and at the request of the Medical Board of Bengal, he gave his attention particularly to the products of India and the East, with a view to find whether their dependence upon home or European resources could not be obviated. His observations, therefore, were critical and reliable. He states it as his opinion that the two kinds of tea, with their varieties, are produced by two plants. One called THEA VIRIDIS, yields the *Green Tea*, including the *Imperial*, *Gunpowder*, *Hyson*, *Young Hyson*, and *Twankay*. The other plant is the THEA BOHEA, which furnishes the different kinds of *Black Tea*, that is the *Pekoe*, *Lapsang*, *Souchong*, *Congou*, *Bohea*, etc. The first, or Pekoe, is the best, and the Bohea is inferior. Yet Dr. Ainsley says that the Chinese used the best kinds of bohea most.

In regard to the preparation of the teas, Royle says that some of the green teas are "colored with indigo and sulphate of lime;" he adds that "Mr. Warrington has ascertained that of the green teas of commerce, some are *unglazed*, others *glazed*. The former are of a yellow-brown tint, tending on the rubbed parts to a blackish hue without a shade of green or blue; while the *glazed* are faced, or covered superficially, with a powder consisting of Prussian blue and sulphate of lime, or coalin, with occasionally a yellow or orange-colored vegetable substance. Indigo with gypsum is sometimes used, as by the China tea-makers sent to Assam. Even the *unglazed* have a little sulphate of lime attached to their surface, either to act as an

absorbent of moisture, or to give the bloom characteristic of the green tea of commerce."

Physiological Effects.—The accustomed use of tea, like that of tobacco or any other substance, will very much modify its constitutional impression. The animal system is capable of accommodating itself to the influence of foreign substances with remarkable facility, and it therefore requires special attention if we would properly estimate the real character of the physiological effects of such articles as are in habitual use.

The circumstance, therefore, that noteworthy effects from tea are not more common, is not in the least singular, even on the supposition that it is an agent of considerable potency.

As the matter now is in our society, it is difficult to find a standard of comparison, in order to test the character of the effects of tea. In view of these several facts therefore, it is advisable to practice our experiments for testing the effects of tea, by the use of decided or large portions. In this way the symptoms are found to be somewhat variable on different persons. On some, a decided stimulant effect on the nervous system is produced, the symptoms are a sense of exhileration, and flow of spirits, wakefulness succeeded with a feeling of nervous tension, and pressure upon the brain, attended with headache. When after this, the quantity taken is increased, there will be nausea, dizziness, or delirium, tremors, palpitation.

In other cases, tea operates as a sedative. The symptoms are lassitude, debility, nausea, faintness, intermittent pulse and syncope. The stimulant, or exhilerating effects are, by far, the most common. Hence, it is by no means unusual, to find habitual tea-drinkers complain, when deprived of their accustomed beverage, of a want of elasticity of mind and spirits; sometimes this amounts to dejection and peevishness.

Tea is well-known to produce wakefulness, and persons who are required to watch at night, are wont to "*take a strong cup of tea*," to keep them awake. This proves tea to be an excitant to the nerves, since it is known that exhaustion of the excitability is what disposes to sleep. The man who has been

subject to fatigue, generally is inclined to sleep. And it is a fact long observed, that to persons in a state of fatigue and prostration, tea will generally prove beneficial. It will steady the nerves, relieve a sense of exhaustion, revive the spirits, and give tone and vigor to the general system. Dr. Clarke, in his Travels (vol. ii. p. 533), speaking of *tea* says, "the exhausted traveler, reduced by continued fever, and worn by incessant toil, experiences in this infusion, the most cooling and balsamic virtues; the heat of his blood abates, his spirits revive, his parched skin relaxes, and his strength is renovated." Dr. Ainslie in his Materia Indica, *Lond. Ed. Vol.* i. 1826, makes the above quotation from Clarke, in favor of tea, and then adds the following enthusiastic language: "In this eulogium I most cordially join from my own personal experience; that the use of tea may be abused, like any thing else, no one will dispute; and that green tea drank in any considerable quantity, brings on watchfulness, and nervous agitation, I am ready to allow; but I must, at the same time maintain, that the better kinds of black teas, so far from being prejudicial, have positive virtues in cheering the spirits, strengthening and comforting the stomach; and giving, after great fatigue, a new life and tone to the whole frame. To the sedentary and literary, tea is certainly a great blessing; as it enlivens without heating, nay I should be almost inclined to go a little further, and partly ascribe to its prudent use, somewhat of the brilliancy of imagination and fineness of fancy, which so peculiarly distinguish the poets, and novel writers of our happy country! [England], where so much is drank."

Persons of intelligence can usually know pretty well, whether tea proves beneficial or otherwise; for there are few that have not sometimes drank it in excess, and by this means discovered its constitutional effects. The physician will seldom be at fault in this regard, if he inquires critically after the effects, as evinced when tea is drank in excess.

If nervous diseases exist in persons accustomed to use tea largely, which can not readily be accounted for from other causes, tea may justly be suspected.

As to the comparative liability of harm, from the excessive use of the different kinds of tea, it may here be remarked, that by what is evident from the observations of men well informed, the green teas are more liable to prove narcotic, and are likewise more apt to be damaged by foreign substances applied in curing or dressing them. They are hence, more liable to objection. Experience and observation in their use, seem also to go in their disfavor, more than the other.

Green tea is of less matured leaves than the black, whether it be taken from the same plant or not; and it is in accordance with general observation, that immature vegetables are less agreeable to the animal economy, than those that are ripe.

Tea is injurious to many insects, and some of the larger animals. To some, the infusion has been observed to be sufficiently poisonous to destroy life in a short time, when applied to them.

Therapeutic Properties.—Since what has already been said of the action of tea on the human system, it is quite unnecessary to extend remarks here. Tea has as yet been but little in use in a professional way. Few works on Materia Medica treat on it at all; and were it only for the intrinsic medical activity that agents were to be admitted into works of this kind then certainly tea would have been here omitted But as was said at the commencement of this article, physicians are very frequently interrogated in regard to the effects of tea, and it may here be added, coffee; so that a more special knowledge of the subject seems to be required by the physician, to say nothing of the help such knowledge may be in diagnosis, and the general treatment of diseases, particularly those of the nervous kind.

Tea however, may be regarded as a gentle stimulant to the nervous system; as a tonic and slight astringent. A strong infusion thereof may sometimes do better for some nervous old women—aye, and men too—than any other sort of medicine. There is no form however, in which it has been officinal. The active principle has been isolated, and has been called *thein*. It it is analogous to *caffein*, which see.

COFFEE.—The Fruit.

SYNONYMS. — Bun, *Arab.*; Boond, *Dukha.*; Copi cottá, *Cyngalese*; Kāwa, *Malay*; Tochém Kéwéh, *Persh.*; Chaube, *Turk.*; Eleave, *Egypt.*; Kaffe, *Dan.*; Koffy, *Dutch*; Coffe or Kaffe, *Ger.*; Caffe, *Port.*; Café, *Fr.* Caffé, *Ital.*; Coffee, *Eng.*

BOTANY.—*Sex. Syst.*—Pentandria Monogynia. *Nat. Ord.*—Stellatæ.

Gen. Char. COFFEA.—*Tube of Calyx* ovate, globose; *limb* small, four or five toothed. *Corolla* infundibuliform. *Style* bifid at apex. *Berry* umbilicated, naked, two-seeded.

Spec. Char. COFFEA ARABICA. — The coffee tree is an evergreen shrub growing from ten to twenty feet in hight; native of Arabia and Africa; cultivated in South America, the West and East Indies, and other places.

Coffee is treated of here in part, from the considerations alluded to in reference to tea (which see), and in part from its real merits as an article of Materia Medica. In the Homœopathic practice, it occupies an important position, and is regarded as an agent of great power.

PHYSIOLOGICAL EFFECTS.—Jahr in his Manual of Homœopathy (Hull's third American edition), speaks of the physical and moral effects of coffee with very decisive language. Its physical effects according to this author, are: A sense of dryness in the mouth, burning of the upper part of the tongue, with heat in the throat; bitterness of taste; loss of appetite; aversion to food; aversion to coffee; sometimes great hunger before meals; violent thirst; a sense of soreness of the flesh, as if bruised, darting pains, debility; weakness of the lower limbs; headache; hemicrania; aching of the temples; pressure upon the brain; aching pain on the top of the head; pulsating, snapping pain in the head near the region of the ear; pain in the eyes, the right eye; electric sparks; rush of blood to the head (congestion); blindness upon rising up; vertigo; humming in the ears; toothache; bleeding of the nose; a sense of pressure, tension, and pain in the stomach; a sense of fulness, cramping, darting, colicky pain in the abdomen; diarrhœa in children; oppression of the chest, attended with

cough and irritation, with spasmodic stricture in larynx; pressure on the bladder, and burning or smarting of the urethra; want of sexual feeling and pain in the testes; cold feet and hands; general chilliness; sometimes sense of heat. The *moral* effects he reports to be — restlessness, anguish of heart and conscience, excessive relaxation of body and mind, gloominess, inability to think correctly; great wakefulness in the evening; sleeplessness in the night, drowsiness with weariness in the morning; talking in the sleep; long vivid dreams in the night; yawning; sometimes ecstacy.

It is to be observed however, that the above description of the effects of coffee by this learned Homœopathic author, is given as the pathological effects, and not the physiological. To off-set this therefore, we must have here the moral and physiological effects of coffee, given by his Highness Abd-al-Kader Anusari Djezeri Hanbali, son of Mohammed, which was translated from the Arabic and published in a German Journal 1834: — "O Coffee! thou dispellest the cares of the great; thou bringest back those who wander from the paths of knowledge. Coffee is the beverage of the people of God, and the cordial of his servants who thirst for wisdom. When coffee is infused into the bowl, it exhales the odor of musk, and is of the color of ink. The truth is not known except to the wise, who drink it from the foaming coffee-cup. God has deprived fools of coffee, who with invincible obstinacy condemn it as injurious.

"Coffee is our gold, and in the place of its libations we are in the enjoyment of the best and noblest society. Coffee is even as innocent a drink as the purest milk, from which it is only distinguished by its color. Tarry with thy coffee in the place of its preparation, and the good God will hover over thee and participate in his feast. There the graces of the saloon, the luxury of life, the society of friends, all furnish a picture of the abode of happiness.

"Every care vanishes when the cup-bearer presents the delicious chalice. It will circulate fleetly through thy veins, and will not rankle there: if thou doubtest this, contemplate the youth and beauty of those who drink it. Grief can not

exist where it grows; sorrow humbles itself in obedience before its powers.

"Coffee is the drink of God's people; in it is health. Let this be the answer to those who doubt its qualities. In it will we drown our adversities, and in its fire consume our sorrows. Whoever has once seen the blissful chalice, will scorn the wine-cup. Glorious drink! thy color is the seal of purity, and reason proclaims it genuine. Drink with confidence, and regard not the prattle of fools who condemn without foundation."

This eulogium of the princely Arab is quite in accordance with the fervid imagination of that people, and forms a proper contrast to the ascetic German account of the effects of this article above given. The true history lies between these extreme pictures, and is dependent upon the constitutional and specific character of the subject of its use. Perhaps, as is the case with the use of tea, by far the greater portion of people are not particularly affected by its moderate use, either good or bad.

Diluents, in some form, seem to be required in the taking of food. This is shown by the history of the habits of mankind in every form of society, from the barbarous to the most civilized in every era of the world. All have taken fluids with food in greater or less extent. Water, milk, wine, fermented liquors, and a great variety of vegetable infusions, are the liquids mostly used. Among these, *water* is the most simple diluent, *milk* the most nutrient, fermented liquors the most stimulating, and vegetable infusions may combine all these qualities.

Coffee, the beverage, as taken at the table with milk and sugar, is diluent, nutrient, stimulant and tonic. In most habits it is at least innocent, if not useful. If the practice of almost all nations can be taken in argument, the latter would be proven. In many cases we *know* it is useful, and even medicinal; in some others it is equally well known to be hurtful.

By a close observance of the effects of an excessive use of the article, in any particular case, a good opinion may be

formed of its bearing upon that constitution, and the physician availing himself of such information as may be elicited by a critical inquiry into the habits of his patient, will not only satisfy himself, but will be able to render satisfaction to the interested inquirer.

Analysis.—Coffee contains a minute quantity of *volatile oil*, a *fixed oil*, *gum*, *resin*, an *extractive principle* (which has the characteristic taste of the coffee, and affords a dark-green precipitate with the salts of iron), *albumen*, a little *sugar*, some undetermined *salts*, *lignin*, and a *peculiar crystalline principle*, called *caffein*. This may be prepared by precipitating the extractive, albumen, etc., from an aqueous infusion of coffee, by means of acetate of lead; filtering the liquor, depriving it of its excess of the acetate of lead, by means of sulphureted hydrogen, and then evaporating the liquid gradually until the crystals of caffein are formed. These are in opaque, silky, flexible needles, of a slightly bitter and somewhat disagreeable taste, soluble in water, alcohol and ether. Caffein, according to Liebig, is one of the most rich in nitrogen of all the organic substances of the vegetable kingdom, and comes to a very close approximation to the most highly organized animal substances. Coffee is much changed in its properties by the process of roasting, it becomes much more bitter and aromatic.

Therapeutic Properties and Use.—Coffee is unquestionably possessed of valuable medical properties, but it has not been until late years that its applications have been properly understood. The results of the chemical investigations of Liebig in regard to this article, have somewhat startled some of the profession who have ignored the active properties of coffee. *Caffein* is proven to lack only the presence of the elements of water, or oxygen and hydrogen to form *taurine* the substantive principle of bile. Liebig says that *caffein*, or *theine*, *asparagine* and *theobromine*, which are very much alike, almost identical in their chemical constitution, are better calculated to atone for a deficiency of motion than all other nitrogenized vegetable principles. This is exactly in accordance with certain facts observed in the use of either coffee or tea. They both augment the excitability of the system. When

taken freely in states of fatigue, they will be quite equivalent to rest or repose in relieving the sense of tiresomeness or exhaustion. Taken in the evening, they will prevent sleep, which is equivalent to a *plus* state of excitability. Coffee must, therefore, by the law of practical induction, be proven to be specifically useful in a great variety of asthenic nervous diseases. This, moreover, is in accordance with observation, as it has been found useful in its applications in nervous diseases of this class.

As an antisoporific, and antinarcotic, it is of great importance, and may be given with confidence to counteract the pernicious effects of opium, stramonium, tobacco, belladonna, and all other narcotic and sedative agents. In these cases the infusion of the roasted seeds is generally employed.

In intermittent diseases, especially in ague, the infusion of raw coffee has been employed with great success. Dr. Peirson (Mat. Alimentaria, p. 110), and Dr. Grindel, of Russia, have given very favorable reports of its power in intermittents. In the Western States, particularly in Indiana and Illinois, strong infusions of roasted coffee have been found eminently successful in the cure of ague.

As a nervine, and as an exhilerant to the spirits and moral faculties, coffee has been prized from time immemorial.

Asthma has also been relieved by it, and Dr. Pringle considered it the best thing for this use that he had ever employed.

Nervous headache, hysteria, hypochondriasis, general nervous debility, nervous dyspepsia, palpitation of the heart, intermittent pulse, and various other nervous diseases have been relieved by the use of this agent when properly applied.

As an antiëmetic, coffee has in some places acquired quite a reputation; and since it has a decided power to obviate nausea, the infusion (a common cup of coffee) affords a good vehicle to take other medicines which are disagreeable to the taste. Castor-oil may be thus taken very agreeably.

Pharmaceutic Preparations.—There are no officinal preparations of this article, except in the Homœopathic practice. The caffeine, however, will doubtless ere long take its position in our Materia Medica; see this article under the head of the

analysis of coffee. The *infusion* or *decoction*, which is still more efficient, is commonly employed. This is prepared either from the raw or the roasted seeds of coffee. They are to be ground or bruised, and digested in boiling water for half an hour. Two ounces of the seed are put to the pint of water. It is taken *ad libitum*. The raw or unroasted coffee is the most powerful agent over the nervous system, but the infusion of the roasted is more palatable and most used.

A short list of anodyne agents, of less note, is here added:

Canabis Sativa: *Hemp.*—The leaves of this plant are unquestionably possessed of anodyne power, but are probably also narcotic, and have hence not been generally used. It is much employed in India and Persia. It is reported to be of most decided utility in hydrophobia; also in epilepsy. It exhilerates the spirits somewhat as alcohol does. It is given in powder. Dose, gr. iij.

Artemesia Vulgaris: *Mugwort.*—The new roots of this plant are employed as an anodyne and antispasmodic. Its application is in epilepsy. The article is just now acquiring some fame in Europe, and also among some American practitioners. The dose of the powdered root is one drachm.

Anagalis.—There are several species of the anagalis: *A. Arvensis* (*Scarlet Pimpernell; Red Chickweed*), *A. Cerula* (*Blue Pimpernell*). They are supposed to be similar in medical properties. The plant is given in powder and extract. It is regarded antispasmodic and anodyne, and has been a secret remedy among the vulgar as a specific for epilepsy. The author has never used either of them; suspects they are narcotic. The dose is one scruple.

Class V.---ALTERATIVES: EUTROPHICS.

The profession has for many years admitted a class of remedies, which, although capable of effecting an important influence upon the condition of the system, do not, like most articles, produce effects immediately sensible, but seem to display their power, either directly on the elements of the blood, in modifying its condition so as to influence the functions of assimilation, or they operate on the nervous system, and thus indirectly effect the functions of secretion, assimilation, and the metamorphosis of the tissues. These remedies are called *alteratives*, as they simply alter the condition of the system, without apparently producing any mechanical or evacuant effects. The term, however, is rather too general, and may

mean much more than is intended in this restricted sense. All medicines, in one sense, are alteratives, as they literally alter the condition of the system, or at least are intended to alter it from a pathological to the physiological state. Some authors have esteemed the term *eutrophic* (from ευ, '*well*,' and τροφη, '*nourishment*'; i. e. *well nourished*) best, as they have supposed this class of agents to produce their effects upon the functions of assimilation only.

Alteratives, therefore, as understood here, are agents that will sooner or later after their exhibition, produce an improvement upon the symptoms and the constitution, without evincing any other evidence of their action. It may, however, be readily supposed, that it will be difficult to judge, in all cases, whether any improvement, that may follow the use of alteratives, is really the effect of the medicine, or whether it is not simply the result of the recuperative power of the system.

It will be observed, that although alteratives are considered to be agents which do not necessarily occasion any evacuation from the system, still there are articles embraced in this class that are also evacuant. Such articles are not taken in here with any view to their additional properties; being found to produce effects that could not be attributed to any other principle, but that characterizing the action of alteratives proper, and these being their most prominent virtues, they are here embraced.

Application.—Alteratives are most applicable to chronic forms of disease, particularly those that implicate more especially the glandular and cuticular tissues, as scrofula, phthisis, syphilis, and the exanthematæ.

SARSAPARILLA.—The Root.

Synonyms.—Sarza; Smilax Officinalis, *L.*; Smilax Sarsaparilla, *D.*; Sarsapareille, *Fr.*; Sarsaparille, *Ger.*; Sarsapariglia, *Ital.*; Zarzaparilla, *Span.*

Botany.—*Sex. Syst.*—Diœcia Hexandria. *Nat. Ord.*—Smilaceæ.

Gen. Char. Smilax.—Male: *Calyx* six-leaved. *Corolla* none. Female: *Calyx* six-leaved. *Corolla* none. *Styles* three. *Berry* three-celled. *Seeds* two.—*Willd.*

Spec. Char.—1. SMILAX SARSAPARILLA. This was considered by most authors to be the source of the drug, until of late. But it is doubted by some of the most respectable writers, whether any of the Sarsaparilla of the shops, was ever procured from this species. It is a native of the United States. Its stem is long, slender, shrubby, angular, and beset with prickles. The leaves are unarmed, ovate, lanceolate, with about five nerves, rather glaucous beneath, and supported alternately upon foot-stalks, at the base of which are long tendrils. *Flowers* three or four on a peduncle, which is longer than the petiole. Grows in swamps and hedges in the Middle and Southern states. This species is now receiving more attention. Prof. I. M. Comings, of the Macon Medical College, Georgia, thinks that the product of this species is quite equal to that of any other. The extract of Georgia Sarsaparilla, as it is called, put up by Dr. J. Dennis, of Augusta, is made of this, and is now used considerably by the profession. Prof. J. T. Coxe, a very intelligent physician, of Macon, esteems it very highly.

2. SMILAX OFFICINALIS. This species was discovered by Humboldt and Bonpland in New Granada, on the banks of the Magdalena, in Colombia. As its roots are collected by the natives, called *Zarzaparilla*, and taken to Carthagena, and thence exported to Jamaica, it is more than probable, that this yields some of the Sarsaparilla of commerce; hence it is adopted in the L. and E. pharmacopœias. It has a twining, angular, smooth, and prickly stem; but the young shoots are unharmed. The leaves are ovate, oblong, acute, cordiform, five or seven nerved, coriaceous, smooth, twelve inches long, and four or five in width, with smooth petioles, about an inch long, and furnished with tendrils.

3. S. SYPHILITICA. *Stem* round, smooth, armed at the joints, with from two to four thick, straight prickles. *Leaves* oblong, lanceolate, acuminate, three-nerved, coriaceous, shining, and about a foot in length. A native of South America, growing in New Granada, upon the banks of the river Cassiquiare, and by the Rio Negro. It is supposed to yield the Brazilian Sarsaparilla.

4. S. PAPYRACÆ. An under-shrub with compressed stem, angular below, and supplied with spines at the angles. *Leaves* elliptical, acuminate, and three-nerved. A native of Brazil, inhabiting the banks of the Amazon and its tributaries. It is supposed to yield a part of the Brazilian Sarsaparilla.

5. S. MEDICA. *Stem* angular, armed with straight prickles at the joints, and a few hooked ones between. *Leaves* variable in form, sometimes cordate, auriculate-hastate, or cordate-ovate; they are smooth, bright green on both sides, five-nerved, with the veins prominent beneath. *Inflorescense* in an umbel, of from eight to ten flowers, with an axillary peduncle. A native of Mexico. Yields Mexican Sarsaparilla.

DESCRIPTION.—Sarsaparilla roots are usually imported in bundles, formed of the roots folded up, but sometimes unfolded,

as in the Brazilian variety, frequently still adhering to the *rhizoma* (chump of druggists). These roots are flexible, several feet in length, about the thickness of a quill, cylindrical, but wrinkled longitudinally, with radicles attached along their length. The color varies, probably owing to adventitious circumstances. They are composed of a thick, cellular cortex, covered by a thin epidermis, and of the meditullium or duramen, an inner layer of ligneous intermixed with cellular tissues, having a central pith, often containing starch, in its interior. Hence, a transverse section resembles one of an exogenous stem, but without medullary rays. Sarsaparilla is without odor, often with little else than a mucilaginous taste; but when good and fresh it is a little bitter, nauseous and acrid, which affords, according to Dr. Hancock, the best criterion of its goodness. The roots are often split in the middle and cut into short pieces, for the facility of making preparations. In this, it is more difficult than in the entire state, to distinguish the different kinds.—*Royle.*

Jamaica Sarsaparilla is usually the most esteemed, it is in bundles one to two feet in length, and from four to five inches in breadth, distinguished from other kinds by its reddish color, and by having more rootlets attached to it, hence it is sometimes called *red-bearded* Sarsaparilla. It is less mealy, but yields more extract than the other kinds, and the bark five times more than the woody part, *Pope.* When powdered it is of a reddish color.

Brazilian, *Lisbon* and *Rio Negro* Sarsaparilla is all the same, and ought to be of as good quality as any other, if yielded by the *S. papyracea*, which Martius thinks has the sensible properties more marked than other species; though some is yielded perhaps also by some other species. The roots are in bundles of from three to five feet in length, and not folded up, often with the chump attached, are less wrinkled longitudinally, have fewer radicles, a reddish-brown color, and are amylaceous.

The *Honduras* Sarsaparilla has a grayish-brown color, and like the last, has but few radicles attached, it is very amylaceous, and appears mealy when broken.

Lima Sarsaparilla, though originally brought from Lima, is also imported from Valparaiso and Costa Rica. *Per.* From its resemblance to Jamaica Sarsaparilla, it is often deceptively sold for it. It is folded in bundles three feet long and nine inches across, having the chump attached, and contained in the interior.

ADULTERATIONS.—The inferior sorts are often passed off for superior kinds. The roots of Agave, and of Herreria Stellata, and Aralia Nudicaulis, and even the stems of Dulcamara and of the Hop, are substituted.

ANALYSIS.—Sarsaparilla contains much *Lignin*, *Starch*, and *Mucilage*, a little *Acrid Bitter Resin*, a trace of *Volatile Oil*, (which has the odor and acrid taste of sarsaparilla), and a *Peculiar Principle*, which has been variously named, because thought to be different by different chemists, as, first, *Pariglin*, by Pallota, *Smilacin*, *Salsiparin*, and *Parallinic Acid*, all which have been proved to be identical by Poggioli. *Pariglin* (*Smilacin*) is white, crystallizable, without odor, but having a bitterish taste, very slightly soluble in cold, more so in boiling water, and in hot spirit, also in ether and oils. Strong Sulphuric Acid turns it red, and finally yellow. Muriatic Acid dissolves it, and becomes red. It is composed of Carbon 62·53, Oxygen 28·8, Hydrogen 8·67 = 100. (Poggioli.) The active properties of Sarsaparilla are taken up both by hot and cold water, but are impaired by long boiling. They are readily extracted by diluted spirit; a little addition of this, therefore, in making its preparations, is very useful, while long boiling is positively injurious.—*Royle.*

THERAPEUTIC PROPERTIES AND USE.—There has been much fluctuation in the reputation of this article. When its use was introduced into Europe, about the middle of the sixteenth century, it was highly extolled as a specific for the venereal disease. But as the greatest displays of its virtues, to which its popularity was then chiefly owing, was in the West Indies, and as, perhaps, much of the drug employed in Europe was of an inferior kind, the reputation of Sarsaparilla was soon lost, and the medicine was little used until about a century ago, when it was again brought into notice by Fordyce and others,

as a remedy in *lues* venerea. Since its reïntroduction, a variety of opinions have been entertained in reference to its merits; while some have had the most unbounded confidence in it, others, among whom was Cullun, considered it entirely inert. This discrepancy, no doubt, has been much dependent upon disappointments caused by a want of due discrimination in the selection of the medicine, and from a want of due attention to other circumstances necessary to insure its good effects.

Sarsaparilla, at present, has perhaps as high a reputation as at any time, and were the medicine indeed devoid of any virtues at all, it must be presumed that the discrimination now practiced among the profession, would have clearly settled the matter.

On the whole, a genuine article of Jamaica or Honduras Sarsaparilla, an article which possesses originally (that is, without its being produced artificially), the acrid and stimulant properties that are characteristic of the good kind, may be justly regarded as among our best alteratives. It may, therefore, be confidently employed in all cases in which alteratives are indicated.

In referring to its particular applications, Dr. Wood, in the U. S. Dispensatory, justly remarks that they are, in "the treatment of secondary syphilis, and syphiloid diseases, and that shattered state of the system which sometimes [often] follows the imprudent use of mercury, in these affections, chronic rheumatism, several cutaneous diseases, and other depraved cachetic habits of the system."

The medicine may be taken in powder, infusion, syrup or extract. But it is rather inconvenient to take the powder, as the dose of this required is necessarily too large, being half a drachm or more, three times a day.

Pharmaceutic Preparations.—INFUSUM SARSAPARILLÆ COMPOSITUM: *Compound Infusion of Sarsaparilla.* Macerate Sarsaparilla root, first washed in cold water, and then sliced, ℥j., in lime-water, by measure, Oj., in a covered vessel for twelve hours, occasionally agitating. Strain. The lime in the water is now, by some, considered unnecessary.

Action—Use.—Alterative in doses of f℥iij., two or three times a day.

DECOCTUM (SARSAPARILLÆ, D.) SARZÆ, L. E. *Decoction of Sarsaparilla.* Macerate sliced Sarza (washed in cold water, D.), ℥v. (℥iv. D.) in boiling *Aq. dest.*, Oiv. D.,) for 4 (2, E.,) hours, in a lightly covered vessel, near the fire, L., (at a temperature somewhat below ebullition, E.) Then take out the Sarza, and bruise it. Replace it, and in the same way macerate for two hours. Then boil down to Oij., (Oij., Imp. measure, D. Squeeze out the decoction, E.,) and strain. The long boiling, L. D., is injurious; as good a preparation may probably be made by the maceration without the boiling down. The sarza ought to be well divided, perhaps bruised. The extract is often prescribed with it, and the syrup added.

Action—Use.—Alterative. Much used in doses of f℥iij.—f℥vj., two or three times a day.

DECOCTUM (SARSAPARILLÆ, D. U. S.) SARZÆ COMPOSITUM, L. E.: *Comp. Dec. of Sarsaparilla.*

Boil together for one-quarter of an hour Decoction of Sarza, Oiv., by measure (Oiv., D.) bruised Sassafras, rasped Guaiacum Wood, and bruised (fresh, E.) Licorice Root, āā. ʒx., (℥j., D.) Mezereon, ʒiij., (℥ss., E.) Strain. The boiling will necessarily dissipate the Volatile Oil of the Sassafras.

℞ Sarsaparilla sliced and bruised, ℥vj., Bark of Sassafras Root sliced, Guaiacum Wood rasped, Licorice Root bruised, each ℥j., Mezereon sliced, ʒiij., Water, Oiv. Boil for a quarter of an hour and strain.

Action—Use.—Alterative. A substitute for the Lisbon diet drink, in doses of f℥iij.—f℥vj., two or three times a day.

EXTRACTUM (SARSAPARILLÆ, D. U. S.) SARZÆ, L.: *Extract of Sarsaparilla.*

℞ Prepare as Extr. Gentian, L. Take cut Sarsaparilla Root, ℔j., and boiling Aq., Cj. Macerate for twenty-four hours, then boil down to ℔iv.; while hot, strain, and with heat evaporate to the proper consistence, D.

Action—Use.—Alterative. Often given with the Decoction in doses of ʒss.—ʒij.

It is proper to remark, that the extract of this article, prepared according to the Lond. or Dub. formulæ, is of comparatively little value, as we find that the virtues of sarsaparilla, are very apt to be dissipated by the heat necessary in the ordinary process of evaporation. Moreover, the active principle is not readily imparted to water, or at least not all of the

amount of root employed, is given out to a quantity of water so small as that ordered in the formulæ. The following method of preparing the extract, recommended in the U. S. Dispensatory, and which corresponds to that of the French Codex, is much better.

℞ Sarsaparilla in coarse powder, ℔j., diluted Alcohol, Oiv.; moisten the sarsaparilla with the alcohol, and having allowed it to stand for twenty-four hours, transfer to an apparatus for displacement, and gradually add the remainder of the diluted alcohol. When the last portion of this shall have penetrated the sarsaparilla, pour in a sufficiency of water from time to time to keep the powder covered; cease to filter when the liquid which passes begins to produce a precipitate as it falls into that already passed. Distil off the alcohol from the filtered liquor, and evaporate the residue to the proper consistence. Taste acrid.

Dose, gr. x.—ʒj.

Dr. Wood, one of the authors of the U. S. Dis., considers the dry or concentrated extract alone worthy of confidence, on the ground that the virtues are not sufficiently soluble in water to be held in solution in so small a quantity as there is in the fluid extracts, but states that when the latter form of preparation is especially desired, the formula of Dr. Hodgson, Jr. is the best. This is a compound liquid extract, the formula of which is here given:—

℞ Sarsaparilla bruised, ℥xvj. Licorice Root bruised, Guaiacum Wood rasped, Bark of Sassafras Root, each, ℥ij. Mezereon, ʒvj. Dilute Alcohol, Oviij. Digest for fourteen days at a common temperature; then strain, express, and filter; evaporate in a water-bath to f℥xij.; then add ℥viij. of white sugar, and remove from the fire as soon as the sugar is dissolved.

Dose, fʒj.

SYRUPUS (SARSAPARILLÆ, D.) SARZÆ, L. E.: *Syrup of Sarsaparilla.*

Macerate cut Sarza, ℥xv., (℔j., D.) in boiling *Aq.*, Cj. for twenty-four hours. Then boil down to Oiv., (℔iv., D.) and while hot, strain. Then add Sugar, ℥xv., L. E., and evaporate to the consistence of syrup. (Proceed as for making Syrup, D.)

Action—Use.—Alterative in doses of fʒiv., with water, or added to the decoction.

SYRUPUS SARSAPARILLÆ COMPOSITUS, U. S.: *Compound Syrup of Sarsaparilla.*

℞ Sarsaparilla bruised, ℔ij. Guaiacum Wood rasped, ʒiij. Hundred-leaved Roses, Senna, Licorice Root bruised, each ʒij. Oil of Sassafras, Oil of Anise, each gtt. v. Oil of Partridge Berry, gtt. iij. Diluted Alcohol, Ox. Sugar, ℔viij. Macerate the Sarsaparilla, Guaiacum Wood, Roses, Senna, and Licorice Root, in the diluted alcohol for fourteen days, then express and filter; evaporate the tincture, by means of a water-bath, to four pints; filter. Add the Sugar, and proceed in the manner directed for Syrup. Lastly, having rubbed the Oils with a small quantity of the Syrup, mix them thoroughly in the remainder.

Dose, fʒss., three or four times daily.

STILLINGIA.—The Root.

Synonyms.—Stillingia Sylvatica: Queen's Root, *Eng.*; Cock-up-hat, Queen's Delight, *Vul.*

Botany.—*Sex. Syst.*—Monœcia Monodelphia. *Nat. Order.*—Euphorbaceæ.

Gen. Char. Stillingia.—Male: *Involucre* hemispherical, many-flowered, or wanting. *Calyx* tubular, eroded. *Stamens* two and three, exserted. Female: *Calyx* one-flowered, inferior. *Style* trifid. *Capsule* three-grained.—*Nutt.*

Spec. Char. S. Sylvestica.—An indigenous, perennial, herbaceous plant. *Root* large, woody. *Stem* herbaceous, two to three feet high. *Leaves* sessile, alternate, oblong or lanceolate-oblong, obtuse, serrulate, tapering at the base, and accompanied with stipules. *Flowers* yellow, staminate and pistillate flowers separate on the same plant; they are arranged in a spike, of which the upper part is occupied by the male, and the lower by the female. When wounded, the plant yields a milky juice. Grows in pine barrens, from Virginia to Florida. Its flowering time is from May to June. There are two other species, the *S. Sebifera* and *S. Ligustriana.*

Therapeutic Properties.—Stillingia is a very valuable alterative; it is also somewhat purgative, but its alterative virtues seem to be in no way dependent on the latter. There is, perhaps, no article now more employed as a general alterative, among Eclectics, than this, in the treatment of

syphilis. It appears equally available in the various skin diseases—as lepra, frambœsia, as well as in other affections of a chronic character, dependent upon a depraved and cachectic habit of the system. It was an ingredient of Swaim's Panacea. It is taken in doses large enough to keep up a laxative effect.

GUAIACUM.—The Wood.

SYNONYMS.—GUAIACUM OFFICINALE, LIGNUM, D.; Guayaco, *Span.*; Legno Guaiaco, *Ital.*; Pockenholz, *Ger.*; Bois de Gayac, *Fr.*; Guaiac, *Eng.*

BOTANY.—*Sex. Syst.*—Decandria Monogynia. *Nat. Ord.*—Zygophyllaceæ.

Gen. Char. GUAIACUM.—*Calyx* five-cleft, unequal. *Petals* five, inserted into the calyx. *Capsule* angular, three or five-celled.—*Willd.*

Spec. Char. G. OFFICINALE.—A large evergreen tree, forty to sixty feet in hight, and sometimes as much as four feet in diameter. The wood is extremely hard and heavy, being very compact. Its fibers are cross-grained, the strata running obliquely into one another in the form of an X (Browne, 1789), or obliquely at an angle of thirty degrees with the axis. The leaves are opposite, abruptly pinnate, with two, sometimes three or four pair of leaflets; these are smooth, obovate, or oval, obtuse, delicately veined. The flowers are borne on long, single-flowered peduncles, eight or ten generally rising together from the axils of the upper pairs of leaves.—Royle.

DESCRIPTION.—The virtues of the guaiac tree exist in the juice of the wood, which is extracted, and affords a separate article of commerce. It is proper, therefore, to consider the wood and gum-resin separately.

GUAIACI LIGNUM, *Guaiacum Wood*, known in commerce by the name of *lignum vitæ*, is imported in great logs, generally without bark, but sometimes covered with, a smooth, gray bark, from Jamaica, Cuba, St. Domingo, etc. "It is remarkable for its weight (sp. gr. 1·33), hardness, and toughness, and is therefore much used in machinery, also for rollers, pestles, mortars, etc. It is distinguished by its cross-fiber, and is surrounded with the alburnum or *sap-wood*, which is smooth, hard, and yellow, like box; while the *heart-wood* is of a dull, brownish-

green color, from containing a large proportion of guaiac. It is usually met with in shops, in the form of shavings and turnings, which are, however, apt to be intermixed with those of other woods, as of box. The sawdust of guaiacum, as stated by Richard, becomes green by exposure to the air." The chips and dust may be known by their becoming bluish-green by the action of nitric acid, or its fumes. The bark, which is of a dark-greenish color with grayish spots, has sometimes been used officinally. It is acrid in taste, and has been thought by some to be as efficacious as the wood. The wood is without smell, except when rubbed or heated; it has a slightly bitter and pungent taste, chiefly affecting the throat. It is very combustible.

GUAIACI RESINA: *Guaiac.*—This is the concrete juice of the tree, obtained either by spontaneous exudition, or by incisions made into the trunk. Sometimes it is procured by sawing the wood into billets, boring them through longitudinally, and placing one end over the fire, when the juice will run out at the orifice. It is also obtained by boiling the chips or sawdust of the wood with water, and skimming off the resin. Guaiac occurs in grains, sometimes agglutinated, but usually in homogeneous lumps (sp. gr. 1·2—1·23); but sometimes mixed with pieces of the wood and bark; of a brownish-green color, often with a tinge of red; fracture brilliantly shining, glass-like, and resinous; brittle, powder at first of a grayish color, but becoming green like guaiac wood and resin generally, when exposed to light. It softens in the mouth: the taste, at first scarcely perceptible, is slightly bitter, but becoming acrid, produces burning in the fauces. The odor is slight, increased on pounding or on heating it, when it melts and evolves a balsamic odor. Water has but moderate action on it, dissolving about nine per cent., chiefly extractive. The fixed and volatile oils scarcely act upon it. Alcohol dissolves 91 per cent. of the peculiar substance called Guaiac, becoming of a deep brown color. The Guaiac is precipitated on the addition of water. Ether also dissolves the resin, and separates the *Guaiacic Acid* from the extract. Solutions of Potash and Soda dissolve it freely, as does Ammoniated Alcohol. Chlorine produces remarkable changes of color in the tincture, from green to blue, and from that to brown. The changes of color seem to be dependent on the absorption of oxygen.

The Tincture of Guaiac imparts a blue color to Gluten, and to substances containing it; also to mucilage of Gum Arabic made with cold water, and to transverse sections of various roots: hence slices of the potato are employed as a test of its purity.

ANALYSIS.—Guaiac consists of an *Extractive-like Matter*, which is taken up by water, and the *Resin*, which, having peculiar

characters, has been called *Guaiacin* (Guaiacic acid, *Per.*) Underdorben considers this to be composed of two resins, one soluble in ammonia, and the other, which forms the largest portion of Guaiac, merely mixes with it.

"M. Thierry has, by means of Ether, separated from the extract of Guaiacum, what he calls Balsamic Resin, and from it obtained an acid, which he calls Guaiacic acid, and which resembles Benzoic and Cinnamic acids, but differs from them in being perfectly soluble in water. Besides the Balsamic Resin, the extract, he states, contains another resin, which is soluble in Ammonia. Dr. Ure, in an ultimate analysis of Guaiacum, found it composed of Carbon, 67·88, Hydrogen, 7·05, Oxygen, 25·07=100. Prof. Johnston considers its composition to be C^{40} H^{23} O^{10} and its Eq. 343."

Tests.—The fresh fracture is red, passing, changing to green; the tincture slowly strikes a lively blue color on the inner surface of a thin paring of a raw potato. E. P.

THERAPEUTIC PROPERTIES.—Guaiacum is one of our very best general alteratives, and is now extensively employed in every country. Its special applications are in rheumatic and gouty affections, but it is serviceable in most cases indicating the use of alteratives. It is also considerably stimulant and cathartic in its effects, and hence may be employed in fulfilling compound indications.

Dose, gr. x.—ʒss. in powder or bolus, or in the following mixture:

MISTURA GUAIACI, L. E.: *Guaiacum Mixture.*

Triturate *Resin of Guaiacum*, ʒiij., with *Sugar*, ℥ss.; then with *Mucilage of Gum Arabic*, f℥ss.; lastly, add gradually *Cinnamon Water*, f℥xix. (xixss. E.), constantly rubbing up.

An emulsion is formed with the aid of the Sugar and Gum, in which all the constituents of the Guaiac are suspended. It may be given in doses of f℥ss. to f℥ij., two or three times a day.

DECOCTUM GUAIACI, E. DECOCT. GUAIACI COMPOSITUM, D.: *Compound Decoction of Guaiacum.*

Boil *Guaiac* (Wood, D.) *turnings*, ℥iij., and *Raisins*, ℥ij., E. gently in *Aq.*, Oviij. (by measure, ℔x. D.) till reduced to Ov.

SILPHIUM PERFOLIATUM.

Drawn from Nature by Dr. D. W. Bloom, for the author.

(half, D.) toward end adding *Sassafras rasped*, ℥j. (℥x., D.) and *Licorice Root bruised*, ℥j. (℥ijss., D., ℥ij., E.) Strain the liquor.

Dose, f℥ij.—f℥iv.

SILPHIUM.—The Root.

Synonyms.—Silphium Perfoliatum: Cup-plant, Indian Cup-plant, *Vul.*

Botany.—*Sex. Syst.*—Syngenesia Polygamia Necessaria.

Gen. Char. Silphium.—*Involucre* squarose; scales leafy, broad; egret a two-horned margin. *Receptacle* chaffy. *Akenes* compressed, obcordate, margined, bi-toothed.—*Eaton.*

Spec. Char. S. Perfoliatum.—*Rhizome* perennial, horizontal, pitted, beset with radicles. *Stem* large, herbaceous, four-sided, smooth, about three to six feet high. *Leaves* large, opposite, connate, lanceolate, ragged at the edge. *Flowers* terminal, with numerous oblong, lanceolate, yellow petals, and a large, dark-colored disk. There are several other species.

Therapeutic Properties.—The root of this plant is stimulant, diaphoretic, and alterative. It has long been in use by the aborigines, who considered it a medicine of great value, stating that it was capable of making an old man young—thus intimating the character of its virtues. In the recent state, the root has quite an acrid taste, which is very durable. The author has not had much experience in its use. The dose is gr. xx. of the powder.

OLEUM MORRHUÆ.

Synonyms.—Oleum Jecoris Aselli: Cod-Liver Oil, *Eng.*

History.—Cod-Liver Oil, is obtained from the livers of the common Cod-fish and other species of the same genus (see Zoology below). It has long been of use in the arts, as well as for medical purposes, although it had not obtained much popularity in our own country until of late years. It appears to have been first employed in a medical way by the Dutch and the Germans; perhaps also cotemporarily by the English and Swiss. In 1782, Dr. T. Percival, of England, recommended it in chronic rheumatism (*Lond. Med. Jour.*, vol. iii., p. 393), and in 1807, Dr. Bardsley, also an English physician,

states that the oil was in high repute in Lancashire, where it was used in rheumatism and rickets. In 1822, a paper published by Dr. Schenck, in *Hufeland's Journal*, giving a series of observations upon its efficacy in chronic rheumatic affections, especially in *sciatica* and *lumbago*, arrested the attention of the profession in all countries, and it was soon tested in other forms of disease. Consumption was early added to the list of diseases curable by the remedy. It has been tested thoroughly in the hospitals, and by the profession generally in our country, and has been sustained as an efficient alterative and nutrient tonic.

Zoology.—*Linn. Syst.*—Pices. *Ord.*—Malacopterygii Subrachiati.

Gen. Char. Gadus.—*Ventrals* sharp-pointed, attached to the throat. *Body* slightly elongated, compressed. *Scales* soft. *Head* without scales. *Fins* soft. *Jaws and front of Vomer* armed with unequal pointed teeth in many rows. *Branchiæ* large, seven rays, two or three dorsal, one or two anal, and a distinct caudal. Inhabit cold and temperate seas. Important fishes.—*Lemmonnier.*

Spec. Char. (Sub. Gen.—*Cuv.*) Morrhuæ.—*Dorsal fins* three. *Anal fins* two; a cirrus at the point of the lower jaw.—*Lemmonnier.*

A large fish, of the northern and temperate seas; furnishes excellent flesh, and is taken by fishermen in immense numbers at the "Cod Fisheries."

Description and Physical Properties.—The oil of the liver of the Cod is the medical portion. This is of about the consistence of common fish oil or of lard oil. The best variety is clear or light-colored, or but slightly tinged with yellow, not disagreeable in smell. Other varieties are of a brownish, but yet clear color, less agreeable odor; and the poorest is still darker in color and quite unpleasant in smell and taste.

The oil is obtained from the livers of the fish by exposure in tubs to the hot sun; the oil melts out of the livers and floats upon the surface, whence it is taken up, strained, and barreled for market. It is also taken out by boiling the livers in water, when the oil is disengaged and floats on the surface,

from which it is taken and treated as in the other case. The first obtained, while the livers are yet fresh and good, furnishes the prime oil, and as the livers get old and decomposed, the oil, though less affected, is still damaged and acquires a putrid taste, caused by the decomposition.

THERAPEUTIC PROPERTIES AND USE.—The cod-liver oil has been classed with the tonics, on the supposition that its remedial powers are simply of a tonic or nutritious character. But it would seem from observation, that the notions governing its most common application, would indicate something more than a simple tonic or nutrient power. Those very men who class it with tonics employ it principally in those diseases commonly supposed to demand strictly the use of the alteratives. In the brief history given above, of its first introduction into medical use, it appears that its applications were in rheumatism, lumbago, sciatica, and rickets.

It is now principally esteemed in scrofula, especially that form more specifically marked by a tendency to softening of the tissues, or ulceration, and in consumption. But there are many who now employ it with much confidence also in rheumatism, bronchitis, chronic dysentery, general debility, and in the *sequelæ* of all chronic and debilitating diseases, etc.

The medical properties of the cod-liver oil have been variously credited, to the iodine and bromine, which is found on analysis to be contained in small quantities,—to a peculiar alterative organic principle, to its peculiar animal acids,—and to its simple nutrient power. It is given to adults in doses of a tablespoonful, three or four times a day, and to small children in the quantity of a teaspoonful. Sometimes its use has to be continued for many weeks to prove its power.

CELASTRUS.—The Bark of the Root.

SYNONYMS.—CELASTRUS SCANDENS: Staff-vine, Bitter-Sweet, *Vul.*

BOTANY.—*Sex. Syst.*—Pentandria Monogynia. *Nat. Ord.*—Celastrineæ. Rhamni.

Gen. Char. *Calyx* five-lobed, flat. *Corolla* spreading. *Capsule* obtusely three-angled, three-celled, berry-like. *Cells* one or two-seeded. Seeds calyptred or aurilled.

Spec. Char. *Root* very long, creeping, red or yellowish-red without. *Bark* thick, woody within. *Stem* twining. *Leaves* oblong, elliptical, acuminate at both ends, serrate, and scattered upon the branches. *Flowers* yellowish-white. *Berries* red, with red-arils; they hang on through the winter. Indigenous, growing in woods and hedges.

THERAPEUTIC PROPERTIES.—Celastrus has long been esteemed as an alterative, and has been employed with a view to this effect, in various cutaneous affections. The *Solanum Dulcamara* has been confounded with this article, owing to the identity of their vulgar names, *bitter-sweet*. This is another evidence of the impropriety of using the delusive vulgar names of plants. For ordinary external use, however, this mistake can do little harm, as this species of solanum is considerably detergent. But for internal use, careful discrimination is necessary, as this last-mentioned article is considerably narcotic.

In view of the decided effects of celastrus, its use must be long continued. It is best taken in the form of extract, which may be prepared in the same way as directed for the preparation of the extract of cornus florida. The dose of this is gr. x. to gr. xxx. The powder is taken in portions of ʒj. to ʒjss. Its topical use is in the form of ointment.

RUMEX CRISPUS.—The Root.

SYNONYMS. — Schmallbattericher-halvergaul, *Vul. Ger.*; Narrow-Leaved Dock, *English.*

BOTANY.—*Sex. Syst.*—Hexandria Trigynia. *Nat. Ord.*—Polygonaceæ.

Gen. Char. RUMEX.—*Calyx* three-leaved. *Petals* three, converging. *Seed* one, three sided.

Spec. Char. R. CRISPUS.—*Root* perennial, yellow, spindle-shaped, branched. *Stem* smooth furrowed, reddish-brown, or greenish, about three feet high. *Leaves*, radical ones large, lanceolate, long, undulate or crisped, entire, pointed, with prominent ribs or veins on the under side, and standing on long, grooved foot-stalks; cauline ones smaller, linear, more pointed. Fructification in terminal spikes. *Seeds* three-sided. A very common indigenous plant, growing in meadows, pastures, and

CELASTRUS SCANDENS.

An engraving of a section of the stem with branch, leaves and several clusters of the berries.

along streams. There are many other species which much resemble each other, and which are possessed of analogous properties, and may be used as substitutes for each other. Among the other species most used, are the R. aquaticus, R. britannica, R. obtusifolis, and R. verticellatus.

A number of the species have acid leaves, and are much esteemed as topical remedies. The inspissated juice of the R. Acetosa or *sorrel*, is much employed as an application to cancers, ulcers, and all sores difficult to heal.

THERAPEUTIC PROPERTIES.—Rumex crispus is a good alterative and detergent. It has been long employed both externally and internally, in the treatment of cutaneous diseases. For external use, the fresh root is often simply scraped into fresh cream, and left to remain in a warm place for twenty-four hours, when the cream is separated for use. This is applied in the treatment of scabies and different varieties of herpes. A soft extract may be employed with profit in the same way. Internally the powdered root is taken in doses of gr. x.—gr. xxx.

IODINUM.

PREPARATION.—Iodine is procured from certain *sea-weeds*—particularly the *Fucus Palmatus*. The most common method of obtaining Iodine, is to take kelp, in powder, lixiviate with water, evaporate, and remove the soda salts (such as carbonate and sulphate) as they form; allow the liquor to cool, when crystals of chloride of potassium will be deposited. Decant the dark-colored mother-liquor, which contains the iodide of sodium with other salts; supersaturate with sulphuric acid, when an evolution takes place of carbonic acid, sulphureted hydrogen, and sulphurous acid gases. After standing for a day or so, the residuary liquor, or iodine ley, is mixed with binoxide of manganese, and heat applied. Water and iodine pass over, and are condensed in receivers.

In the mutual action of sulphuric acid and binoxide of manganese, or any chloride in the iodine ley, there will be the detachment of chlorine (*v.* hydrochloric acid). This, as stated above, will decompose the iodide, set the iodine free; or, as usually explained, one equivalent of the oxygen of the binoxide combining with the sodium, equally, sets the iodine free; and the sulphuric acid will combine with the soda and the oxide of manganese, and thus form a sulphate of soda (the oxide of sodium), and a sulphate of the oxide of manganese.

PHYSICAL PROPERTIES.—Iodine occurs in bluish-grey, metal-like scales. It has an acrid taste, and an odor resembling that of chlorine. Its Sp. Gr. is 4·94—still it is somewhat soft, and crumbles when rubbed. It stains the skin, and other substances brownish-yellow. In water it is almost insoluble, but is very soluble in alcohol and ether.

THERAPEUTIC PROPERTIES.—Iodine is perhaps the most reliable alterative and detergent we possess; being capable of discussing tumors and enlarged glands, even those which are not inflamed, and are seemingly in a healthy state, as enlargements of the thyroid and submaxillaries. It is, however, a very powerful agent, and in excessive doses is irritant. Its internal use should always be gradually commenced, and continued in slightly advanced doses, until from the signs (the extent of the toleration of the stomach) the dose has reached its acme. It is usually given in solution in alcohol, in form of tincture. See preparations.

TINCTURA IODINII: *Tincture of Iodine.*—℞ Iodine, ℥ijss.; Rectified Spirit, Oij. Dissolve.

TINCTURA IODINII COMPOSITA: *Compound Tincture of Iodine.*—Macerate Iodine, ℥j.; Iodide of Potassium, ℥ij., in Rectified Spirit, Oij., until dissolved. Strain.

USE.—Alterative; very powerful; requires care, as it is very irritant. *Dose*, ten to twenty drops, which may be gradually increased to forty. Both these tinctures, in their external use, may be employed alone, or mixed with soap liniment, and then applied over the tumors to be discussed. The latter of the tinctures is the best: stains the skin for a while.

UNGUENTUM IODINII: *Iodine Ointment.*—℞ *Iodine*, ℈j. *Alcohol*, min. xx. *Lard*, ℥j. Rub with the alcohol first, and then with the lard. *Uses* as below.

UNGUENTUM IODINII COMPOSITUM: *Compound Iodine Ointment.*—Rub *Iodine*, ʒss., *Iodide of Potassium*, ʒj., and *Rectified Spirit*, f ʒj., together, then mix up with *Lard*, ℥ij.

USE.—Employed as an external application in Bronchocele, scrofulous enlargements of the glands, or tumors. Superior.

POTASSII IODINUM: *Hydriodate of Potash.*—PREPARATION.—L. E. Iodine, ℥vj. (dry, ℥v., E.); Carb. Pot., ℥iv. (dry, ℥ij. and ʒvj., E.); Iron filings, ℥ij. (fine Iron wire, ℥iij., E.); Aq. dest., Ovj. (Water, Oiv., E.). Mix iodine with aq., Oiij., and add iron,

stirring frequently with a spatula for half an hour. (Boil the iodine, iron, and part of the water, together in a glass matrass, at first gently, and then briskly, until about f℥ij. remain, E.) Apply a gentle heat, and when the liquid becomes greenish add the carb. potash dissolved in the rest of the water. (While hot, add the carb. pot., dissolved in a few ounces of the water, and stir carefully, E.) Filter, and wash the powder with boiling aq. dest., Oij. (a little water, E.), and again filter. Evaporate the mixed liquor (at a temperature below boiling, E.), that crystals may form, to dryness; purify this from oxide of iron, etc., by dissolving in less than its own weight of boiling water, or by boiling it in twice its own weight of rectified spirit, filtering the solution, and setting it aside to crystallize. More crystals may be obtained by concentrating and cooling the residual liquor, E. Iodide of iron is first formed, which is decomposed by the carb. pot., protocarbonate of iron falls down, and the iodide of potassium, which remains in solution, is concentrated, after being filtered, and allowed to crystallize.

Description.—This is a colorless salt, though sometimes slightly tinged with yellow. It has an acrid, and peculiar saline taste; is transparent when properly made, but is often opaque. It crystallizes into cubes, or quadrangular prisms. It is readily decomposed by the mineral acids, but is permanent in the dry air; soluble in two-thirds its own weight of water; very soluble in alcohol of Sp. Gr. ·850. It renders iodine more soluble in water, and in alcohol.

Action—Use.—This preparation is still more valuable than the iodine itself. There is certainly no general alterative superior to it—perhaps none other *equal* to it in syphilis, or in glandular enlargements. It is now extensively used in those cases which require decided, and reliable alteratives. But it is unnecessary to repeat here the applications of this class of remedies. The dose is from three to ten grains, and may be gradually increased, if it does not disturb the stomach. As an external application, it may be used in solution with water, but is commonly applied in unguentum form. See above.

CARYA.—The Leaves.

Synonyms.—Juglans; Καρυα, *Gr.*; Hickory, *Eng.*; Hickernuss-baum, *Ger.*

Botany.—*Sex. Syst.*—Monœcia Polyandria. *Nat. Ord.*—Juglandaceæ.

Gen. Char. CARYA.—STAMINATE FLOWERS.—*Ament* imbricate. *Scales* three-parted. *Stamens* three to eight. PISTILLATE FLOWERS.—*Calyx* four-cleft, superior. *Corolla* none. *Styles* none. *Stigma* disk-like, four-lobed. *Pericarp* four-valved. *Nut* subquadrangular, smooth.

Spec. Char. There are several species equally meritorious, in a medical sense:

I. C. SULCATA: *Shell-bark Hickory.*—A large forest-tree; heavy trunk and limbs; loose outer bark. *Leaves* aromatic, pinnate; leaflets seven to nine, obovate-lanceolate. *Fruit* very fine, oily. Common.

2. C. PORCINA: *Pignut Hickory.*—A large forest-tree; heavy trunk and limbs; rough, cracked bark. *Leaves* aromatic, pinnate; leaflets seven, lanceolate, acuminate. *Nut* oblong, not so good as the former.

3. C. AMARA: *Bitter-nut Hickory.*—A large forest-tree, with heavy trunk, rough bark; aromatic, pinnate leaves; nine ovate, oblong leaflets; and bitter, globular nut.

4. C. ALBA: *Shag-bark Hickory.*—A large tree, with shaggy bark; pinnate, aromatic leaves; with seven leaflets, having long petioles. *Nut* globose, very good.

5. C. TOMENTOSA: *White-heart Hickory.*—A large tree; loose bark; pinnate, aromatic leaves; nine lance-oblong leaflets. *Nut* globular, hulls very thick, nucleus very fine.

6. C. OLIVAFORMIS: *Pecan-nut.*—A small Southern species. *Nut* soft-shelled, fine.

MEDICAL PROPERTIES AND USE.—The leaves of all the hickory trees, and those also of the several kinds of *Walnut* (Juglans), are lately proven to possess very superior alterative power. Employed in tincture. Dose f℥iij.—f℥ss.

BAPTISIA.—The Root.

SYNONYMS.—Wild Indigo; Indigo-fera; American Indigo, *Eng.*

BOTANY.—*Sex. Syst.*—Decandria Monogynia. *Nat. Ord.*—Rhinanthus.

Gen. Char. BAPTISIA.—*Calyx* four or five-cleft half way, sometimes two-lipped. *Corolla* papilionaceous; wings of the length of the reflexed banner. *Stamens* caducous. *Legume* inflated, smooth, many-seeded.

Spec. Char. B. TINCTORIA.—*Root* perennial, large, woody, dark-colored outside, yellowish within. *Stem* smooth, glabrous, speckled, branched, from two to three feet in hight. *Leaves*

small, sessile, ternate; leaflets obovate, of a bluish-green color. *Flowers* yellow, and disposed in loose terminal racemes, *Legume* about the size of a pea, ovate, long stipid, of a bluish appearance. There are several other species of similar character.

B. TINCTORIA.

MEDICAL PROPERTIES AND USE.—The root of the baptisia is a very powerful medical agent, and although pretty generally employed, is still much less mild in its effects than many other agents of this class. It is alterative, cathartic, antiseptic, and emetic. Its applications are in scrofula, glandular swellings, etc. Topically it exerts a healthful influence over ulcers. It is thus a good article for application to cancers, and other ulcers, carbuncles, kings' evil, and to burns. Also excellent in aphthea, sore-throat in scarlatina, and measles. Typhus fever, and even yellow fever, are diseases which have been put into the list for the application of baptisia. But there is perhaps no disease where it serves better than in chronic hepatitis, and dyspepsia.

The tincture of the root-bark is used. The dose is f℥ij. —f℥iv.

DIELYTRA.—The Root.

SYNONYMS.—CORYDALIS: Turkey Corn, Turkey Pea, *Eng.*; Stagger-weed, Dutchman's Breeches, *Vul.*

HISTORY.—This beautiful little plant has of late years come

into medical practice by the Eclectic physicians, but has been incorrectly called *Corydalis.* On account of this error, it is thought necessary to make some special remarks here, in reference to its Botanical character. The genus corydalis differs from the dielytra, in having but a single spur to the corolla, while the latter has two spurs.

Now, all who are in the least acquainted with this plant, know the double-spurred appearance of the flower, and which has given this most lovely plant the homely name of *Dutchman's-breeches.*

As to the etymological meaning, dielytra comes from the Greek δις, '*two,*' and ελυτρον, '*outer wing,*' i. e., two outer wings: this answers to the flower of the plant which is two-winged. The word corydalis comes from κορυδαλλις, the ancient name of the fumatory to which genus it formerly was supposed to belong; κορυνε is the name of a club and the club-shaped, or one-winged flower of the Corydalis certainly resembles it more than it does the flower of the Dielytra.

Botany.—*Sex. Syst.*—Diadelphia Pentandria. *Nat. Ord.*—Fumariaceæ.

Gen. Char. Dielytra.—*Sepals* two, deciduous. *Corolla* two-spurred, saccate. *Capsule* pod-shaped, many-seeded.

Spec. Char. The medical species of the dielytra have not as yet been well defined. There is no doubt but that the roots of several species at least, are indiscriminately taken. In the northern part of Ohio, New York, and Canada, the *D. Formosa* is the most common, and is the species used. In southern Ohio, Indiana, Virginia, Kentucky, etc., the *D. Canadensis* is also found, and furnishes much of the root taken into market. The *D. Cucularia* is perhaps still more abundant than either of the others in Ohio, Kentucky, Virginia, etc. The beautiful foreign species cultivated here as an ornamental plant, commonly called *D. Spectabilis,* is a much larger species than the American. It is questionable whether this plant is correctly named among us, since Don, in his Gard. Botany, says that the spectabilis is purple flowered. It appears to correspond with this author's Kamtschatka species, *D. Tenufolia,* which has a pink-colored flower, tipped with a deeper color of red.

The roots of the three first species are bulbiferous, and somewhat tuberose in the *Canadensis;* about the size of a filbert or less. The stem is smooth, and from six to ten inches in hight. The leaves are radical, somewhat multifid, or triternate in the *Cucularia* species; biternate, with leaflets pinnatifid, and with linear segments in the *Canadensis.* The flowers are of peculiar shape, not unaptly compared to the "*Dutchman's Breeches;*" inflated dichotomous, saccate at the base, three-fourths of an inch long, half an inch wide, and less than a fourth of an inch in thickness. In the *cucularia*, their color is yellowish-white; in the *formosa* red, and in the *Canadensis* greenish-white. They are pendulous, with the base downward, and the spurs upward.

Medical Properties and Use.—There are few medical plants that have so suddenly gone into general use by the profession as has this article; and there is no question but that much of its popularity is well merited. The author's acquaintance with the article enables him to indorse much that is said in its favor, but he can not, by any means, say that it is equal as an alterative to some others of our Materia Medica.

The root has been employed in tincture, and in powder, but the medicine is now most esteemed in the concentrated form. Mr. Merrell, of this city, prepares an alkaloid, and also a resinoid principle, with which he supplies the trade; and Keith & Co., of New York, make a preparation in which three of the organic principles are first separately obtained, and then recomposed. The preparations from both these houses are named Corydalin, an appellation obviously incorrect. Still, however, this has nothing to do with the *medical properties* of their preparations; and, in this regard, there has been very much said in favor of each. Both are pronounced very excellent alteratives. The dose is generally about gr. ij.

CROCUS.—The Stigmas.

Synonyms.—Crocus Sativus; Safran, *Ger.*, *Fr.*; Zafferano, *Ital.*; Azafran, *Span.*; Saffron, *Eng.*

BOTANY.—*Sex. Syst.*—Triandria Monogynia. *Nat. Ord.*—Tridaceæ.

C. SATIVUS.

Gen. Char. CROCUS.—*Spathe* radical. *Corolla* funnel-form, with a long slender tube. *Stigmas* deep gashed, crested.

Spec. Char. C. OFFICINALIS.—*Root* (*Cormus*) a depressed, perennial bulb, beset with fibers. *Leaves* radical, long, slender, or linear, slightly revolute, with a deep furrow. *Flowers* large, beautiful lilac or bluish purple, tubular, supported on a slender, white, succulent tube. *Style* hangs out through a cleft of the corolla, and suspends the *stigmas*, which are three large, convoluted bodies of beautiful orange-color, with notched summits, very fragrant. These are the medical or officinal portion. The adjoining cut represents the entire plant.

MEDICAL PROPERTIES AND USE.—Saffron has been made officinal, and has been long in use, not only by the profession, but still more by the people. Its use in a domestic way, is traditional. It is considered alterative and detergent, and is supposed to have the power to "*cleanse the blood.*" As a medicine, it is now chiefly used by old women to bring out eruptions on young children. In pharmacy, it is of good service, as its tincture or infusion will impart a most beautiful yellow or orange color, and a fine flavor to tinctures or medical liquors. For this purpose it enters into more than twenty officinal preparations. The dose is gr. x. to gr. xx.

AMPELOPSIS QUINQUEFOLIUM.—This is the common American Ivy, or *Radical Woodbine*, called also *Virginia-Creeper*, *Five leaves*, etc. It belongs to *Sex. Syst*—Pentandria Monogynia, and *Nat. Ord*—Vitaceæ.

It is not the *Rhus Radicans*, or *Poison-Ivy*, but bears a very close resemblance to it. The latter has ternate leaves, this is quinquefoliate, and thus by remembering the number of leaflets on the petiole, the two plants may be distinguished very easily.

The root of this plant is now very much esteemed by many physicians in the author's acquaintance, and there is no question but that it is of considerable importance. It is alterative, expectorant, and astringent, but is mostly employed in the treatment of syphilis, scrofula and skin diseases. It is prepared in syrup, tincture, and also in a concentrated form. The dose of full strength syrup, is a tablespoonful once a day. The tincture is taken in doses of fʒij. to fʒiij. The concentrated preparation or precipitated extract called by some *Ampelopsin* is gr. ij. to gr. iv.

Phytolacca Decandria.—The common Poke-root is a very excellent alterative, not inferior to Stillingia, Dilytrea, or even perhaps Sarsaparilla. But it is acrid and perhaps narcotic, yet the author has not observed any narcotic effects in the use he has made of it in some five or six years of his practice. Though in his employment, it was never given in large quantity.

A resinous principle, containing the active properties of the root, can be obtained in large quantity by precipitation, from the concentrated alcoholic tincture, in the method as given for the preparation of podophyllin. This substance thus obtained has been called *Phytolaccin*. The dose is gr. j. to gr. ij.

Rudbeckia Purpurea.—This is the *Cone Sunflower*, common on the Western Prairies. The root is highly esteemed as an alterative by some physicians, who have used it in private practice. It is given in form of syrup, in doses of a tablespoonful, when of full strength.

DIVISION II.

CHEMICAL REMEDIES.

Although chemical, or rather chemico-vital phenomena are extensively displayed in the various remedial actions, as well as in the simple *physiological* movements, yet the number of articles used as medicine, whose remedial influence is *purely* chemical, is comparatively small. This is more especially the case with the agents of the Materia Medica of the new system. The action of acids and alkalies, however (for example), in neutralizing each other, must be regarded to be strictly on chemical principles, *in* the system as well as *out* of the system. All the articles of the Materia Medica, which act thus obviously on chemical principles, are intended to be embraced in this division.

This division has been arranged into three classes, viz.:—1, Acids. 2, Alkalies. 3, Antidotes.

Class I.---ACIDS.

Acids (from *acidus*, 'sour,' or *axis*, 'a point, sharp,') are characterized by their sour or peculiar sharp impression upon the organs of taste. They unite with, and neutralize alkalies with avidity, and thus with them form salts. They change the color of vegetable purples, etc., into red. They combine with water in every proportion, with a condensation of volume and evolution of heat.

It was formerly supposed that oxygen was the only acidifying principle, and that the generation of an acid always involved the chemical union of this element with a combustible substance. But more modern researches have led to the

discovery of a number of acids, as *fluoric*, *hydriodic*, *hydrochloric*, *hydrocyanic*, etc., in which hydrogen serves as the acidifying principle, and also *chloriodic*, *chloroprussic*, *fluoboric*, etc., in which neither oxygen nor hydrogen have a part in their formation.

The elements of water are present in acids, in two forms—in liquid acids, it is observed to be in a different state from what is observed to be the case in dry or crystal acids, where the water is the medium of crystallization.

Although acids are often serviceable and sometimes important in the treatment of disease, they are of much more consequence in pharmacy.

Order I.---MINERAL AND INORGANIC ACIDS.

Mineral and inorganic acids are formed by the union of oxygen or some other acidifying base, with a mineral or inorganic element — as oxygen with sulphur, or chlorine with hydrogen.

The mineral and inorganic acids generally, but especially the mineral, are much less complex than most of the vegetable acids. Their reaction and behavior with other agents, is much better understood and easier defined than that of the latter. For instance — in sulphuric acid we have a given and well known amount of oxygen, and a definite quantity of sulphur; and we know the affinities of these two elements in their simple, and also in their present combined state. In every case, therefore, when this acid is used with other agents, we can know what its action will be, if we understand the chemical character of the latter. This serves us, in all varieties of combinations. Thus with such definite premises, the laws of induction will be eminently serviceable to us. But it is not so in the organic acids. Their bases are less simple, and are governed in their affinities with a greater variety of laws that are much less understood.

The mineral acids therefore, are preëminently more serviceable in chemistry and pharmacy. What could we do with the compound or complicated acids of turpentine, as compared with

sulphuric acid in the practice of analysis. The mineral acids generally possess the greatest power.

ACIDUM SULPHURICUM.

Synonyms.—Schwefelsaure, *Ger.*; Acide Sulphurique, *Fr.*; Acido Solforico, *Ital.*; Acido Sulfurico, *Span.*; Sulphuric Acid, *Eng.*; Oil of Vitriol, *Vul.*

Preparation.—Sulphuric acid is obtained by oxydizing sulphur. When sulphur is burned alone the product is sulphurous acid, or a compound of one equivalent of sulphur and two of oxygen. Now as the acid to be obtained has three proportions of the latter combined with one of sulphur, it is necessary to conduct the process of combustion under circumstances which will furnish oxygen in such a quantity as is necessary to impregnate the sulphurous vapor with the amount of this element necessary for sulphuric acid. With this view, nitre in the proportion of one-eighth in weight, is mixed with the sulphur, so that on the combustion of the compound, the nitre may yield its oxygen to furnish the additional equivalent necessary.

Various plans have been adopted to conduct the process of the combustion so as to expose the vapors together. But the course now pursued is to conduct the sulphurous acid from burning sulphur, nitric acid, vapor and steam simultaneously, into oblong leaden chambers, so partitioned that the vapors can only advance slowly, and thus allow the whole of the sulphuric acid formed to be deposited.

When the acid thus forming attains the specific gravity of 1·5 it is drawn off and concentrated, first in shallow leaden vessels, and then in platina or glass retorts until it has a Sp. Gr. of 1·84 when cooled.

Physical Properties.—Liquid Sulphuric Acid ($S O^3 H O$ =49) is a dense, oily-looking liquid, usually colorless, devoid of smell, but intensly acid and powerfully corrosive. At first it feels oily, from destroying the cuticle, but soon acts as a caustic, charring both animal and vegetable substances by combining with the water and setting free the carbon. It freezes at from 15° to 29°, according to its density, and boils at 620°, F. Its affinity for water is great, heat and condensation being produced on their union. It absorbs moisture from the atmosphere one-third of its weight in twenty-four hours, and six times its weight in a twelvemonth, and consequently becomes weaker the longer it is exposed. Professor Graham

is of opinion that Sulphuric Acid combines with water in several other definite proportions. It may be diluted with it to any extent. It unites with alkalies, earths, and metallic oxides, rapidly dissolving some metals, as iron and zinc, when diluted with water. By its action on alcohol, Ether is produced. Several substances, as Charcoal, Phosphorus, etc., when heated with Sulphuric Acid decompose it, by abstracting its oxygen, and evolving Sulphurous Acid.

TESTS.—"The presence of Sulphuric Acid, or of the soluble Sulphates, is easily ascertained by a solution of Chloride of Barium, or of the Nitrate of Barytes, as they form a white precipitate of Sulphate of Barytes, which is insoluble in either acids or alkalies. Sulphuric Acid should be colorless; Sp. Gr. 1·845. What remains after the acid has been distilled to dryness should not exceed $\frac{1}{400}$ part of its weight. Diluted Sulphuric Acid is scarcely colored by Hydrosulphuric Acid. The want of color indicates the absence of organic matter. The E. P. states its density to be 1·840, or near it: Mr. R. Phillips says, he never found it under 1·844. Commercial Sulphuric Acid is apt to contain Nitrous Acid, or an oxide of Nitrogen, Sulphate of Lead. When diluted with its own volume of water, a scanty muddiness is produced by the deposition of Sulphate of Lead, alluded to by the L. P. as amounting to $\frac{1}{400}$ part, and is pointed out by the H. Sulphuric Acid, which forms a Sulphuret of Lead. No orange fumes escape when no Nitrous Acid is present, which, as well as Binoxide of Nitrogen, is indicated by a solution of the Protosulphate of Iron."

PURIFICATION.—"The D. P. directs distillation of Sulphuric Acid in a retort of flint glass, containing a few slips of Platinum, to restrain the ebullition; the first twelfth part is to be rejected as containing too much water. Sp. Gr. 1·845."

"E. P. If commercial Sulphuric Acid contains Nitrous Acid, heat f℥viij. of it with between 10 and 15 grains of sugar, at a temperature not sufficient to boil the acid, till the dark color at first produced shall have nearly or altogether disappeared. This process removes the Nitrous Acid. Other impurities may be removed by distillation, as in D. P., but in a

sand-bath, or with a gas-flame, and having a canopy above to keep it hot."

Action—Use.—Sulphuric acid as shown throughout this work is of the greatest importance in pharmacy, especially in the preparation of the alkaloids and some of the extracts. It is also considerably used as a medical agent. In its pure or concentrated state, however, it can not be given or even brought in contact with any part of the body without more or less disorganization of the organic substance exposed to it. But in a dilute state it is generally, not only harmless in the direction or play of its affinities, but may, in many cases, be of very great therapeutic importance. Its general action, in the state of dilution with water, is astringent, tonic, antiseptic, and refrigerant. It serves well as a restrainant to debilitating or colliquative discharges, as in the night-sweats in phthisis. It proves corroborant in combination with vegetable tonics generally; its conjoint use with quinia, proves this eminently well. The dose of sulphuric acid is from one to five drops in water.

The acid is somewhat injurious to the teeth, and when much of it is to be taken, it is a good plan to suck it through a quill, or something of the kind, which may convey it back of the teeth, and thus favor its being swallowed without being much diffused through the mouth.

Its antidotes are the alkalies and oils; but in cases of its accidental introduction into the stomach, no attempt must be made in the way of diluting it with water, since water brought into contact with sulphuric acid will produce a great deal of heat, and which may itself result in harm.

ACIDUM HYDROCHLORICUM.

Synonyms.—Acidum Muriaticum; Saltzsaure Kochsalzsaure, *Ger.*; Saltzgaest, *Vul. Ger.*; Acide Hydrochlorique, *Fr.*; Acido Mariatico, *Ital.*; Muriatic Acid, *Eng.*; Marine Acid, Spirit of Sea-Salt, *Vul.*

Preparation.—Take Sulphuric Acid, ℥xx.; (pure 3 parts, E.), (of commerce, 87 parts, D.); mix it with Aq. Dest., f℥xij.; (Aq., 1 part, E.), (62 parts, D.); Add this to Chloride of Sodium, dried, ℔ij., [purified by solution in boiling Aq.,

concentrating, skimming off the crystals, draining, slightly washing, then well dried, (3 parts, E.), (100 parts, D.), when the mixture is cold, E., D. Put the mixture into a glass retort; fit on a receiver containing Aq. Dest., f℥xij., (Aq., 2 parts, E.), (62 parts, D.) Distil over a sand-bath (or naked gas flame with a gentle heat, E.), and let the liquid absorb the gas. Gradually increase the heat. (Keep the receiver cool, E.) (The sp. gr. of this acid is 1170, E.; 1160, D.)

The philosophy of the above process is, that both the Chloride of Sodium and the water are decomposed; the Chlorine of the former, combining with the Hydrogen, forms Hydrochloric Acid, while the Oxygen of the water unites with the sodium to form Soda, which is seized upon by the Sulphuric Acid to form Sulphate of Soda, which remains as the residual salt, and will be a Bisulphate of Soda if an excess of acid has been employed.

Physical Properties.—Muriatic Acid is a corrosive liquid, possessing a peculiar burning, acrid taste, and emiting acrid or suffocating fumes. When pure, it is perfectly colorless, but it is usually of a yellowish-pale straw-color, from the presence of a little Chlorine formed from the decomposition of the acid, when long kept, especially when exposed to light. It has a sour, irritating, and corrosive taste, with the odor of its gaseous acid. When heated to 112° F., it bubbles, from the quantity of Hydrochloric Acid gas which escapes. It freezes at — 60° F. Hydrochloric Acid combines with water in all proportions, with the evolution of heat. Sp. gr. 1·16, when it contains about half its weight of Hydrochloric Acid gas.

Tests.—The presence of strong Hydrochloric Acid may be known by the white fumes which are produced in the neighborhood of Ammonia; also by Nitrate of Silver producing in a solution containing it a white curdy precipitate (*Chloride of Silver*); which darkens in the air, and is soluble in a solution of Ammonia, but insoluble in Nitric Acid. Sp. gr. 1·16.

When pure, Muriatic Acid will evaporate without residue in a platinum spoon. If the Sulphuric Acid be present, a solution of Chloride of Barium will cause a precipitate of Sulphate of Baryta in the acid, previously diluted with distilled water. Free Chlorine may be detected by the acid having the power to dissolve gold-leaf.

Action—Use.—Important in pharmacy, as shown in the preparations of some of the medical alkaloids.

Medically, Hydrochloric Acid is antiseptic and resolvent. It is considerably used in typhus fever, small-pox, scarlatina, and yellow fever. It is also of much service in syphilis, as an alterant and chemical antisyphilitic. In phosphatic deposits, Muriatic Acid is of great utility. As a general thing, it is given in doses of ten to thirty drops, much diluted. As a gargle in sore, and especially putrid sore throat, it has been of very considerable use, but must in all these cases be properly reduced in strength by mixture with water.

Nitric Acid, and other mineral acids not here mentioned, are seldom used in pharmacy, and still more rarely in medical practice, although very lately this has gained quite a reputation as a remedy in scrofula. Dose, three to five drops, diluted.

Order II.---VEGETABLE ACIDS.

Vegetable Acids are employed in pharmacy as well as in practice. In a pharmaceutic point of view, they are perhaps less important than some of the mineral acids, but, in the treatment of disease, they are employed much more than the latter. Their most obvious internal use is in the cases of poisoning by some of the stronger or caustic alkalies.

Vegetable Acids are antiseptic, diuretic, rubefacient and refrigerant. They form agreeable drinks in fever, when combined with sugar and scented with some pleasant aromatic. Stimulant gargles are prepared of them, with capsicum, and other articles, for affections of the throat. Stimulant solutions or lotions are also made by macerating capsicum, etc., in acids, but these are not chemical agents. There is sometimes a peculiar appetency for acids, with the sick, and it is usually the case that a gratification of this, will be followed with an obvious improvement in the symptoms. This longing for acids seems to be dependent upon the prevalence of an excessive alkaline state of the humors. Vegetable acids are also antidotes to poisons. They are antidotes to alkaline poisons.

ACETUM.

Synonyms.—Acetum Britannicum, *L.*; Acetum Gallicum, *Ed.*; Acetum Vini, *Dub.*: Essig, *Ger.* Aceto, *Ital.*; Vinaigre, *Fr.*; Vinagre, *Span.*; Vinegar, *Eng.*

Preparation.—Vinegar is prepared in various ways, and from many different vegetable substances. It appears that any article that has gone through vinous fermentation, or which is susceptible of this, is capable of producing vinegar. Thus sugar and water, or any of the saccharine vegetable juices, or alcoholic liquors with water, if subjected to the action of a ferment, with an access of air, may be converted into vinegar, if kept at a temperature between 75° and 90°.

For most medical purposes, vinegar requires to be distilled to separate it from various impurities it contains in the ordinary state. Its physical properties are too well known to need description.

Action—Use.—This is more used both in pharmacy and practice than any other vegetable acid. When distilled it may frequently be substituted for dilute acetic acid.

It will often serve in place of sulphuric acid, to render the virtues of plants soluble in water. In practice it is employed in poisoning by the stronger alkalies, and in the form of lotions, gargles, oxymels, syrups, effervescing and cooling draughts, etc. But in these latter applications, it does not operate as a chemical agent.

ACIDUM ACETICUM.

Preparation.—℞ Acetate of Soda, in powder, ℔j. Sulphuric Acid, ℥viij. Red Oxide of Lead, ʒj. Pour the Sulphuric Acid into a glass retort, and gradually add the Acetate of Soda; distil in a sand-bath, at a moderate heat into a glass receiver, until the residuum becomes dry; mix the liquid proceeds with the oxide, and again distil, with a moderate heat to dryness. The specific gravity of the acid thus procured, is 1.06, and 100 grs. of it saturate 83·5 of crystallized bicarbonate of potassa.

The Dub. P. orders it prepared by distillation from a mix-

ture of Acetate of Potassa and Sulphuric Acid, in the proportion of two parts of the Acetate, and one of the Acid.

The philosophy of this process, is, that a sulphate of the alkali is formed by the action of sulphuric acid, while the acetic acid distils over. The object of the oxide of lead, is to retain in the second process, whatever sulphuric acid may have passed over in the first process—thus to produce the pure acetic acid.

Acetic Acid, when pure, is a colorless, inflammable, volatile liquid, having a powerfully acrid and acetic taste, and fragrant, pungent smell. It unites in all proportions, with water, and dissolves, to a certain extent, in alcohol.

Use.—Acetic Acid is chiefly used in pharmacy, or pharmaceutic chemistry.

ACIDUM PYROLIGNEUM.

Synonyms.—Holszessig, *Ger.*; Acide pyro-ligneux, *Fr.*; Acido pyro-lignico, *Ital.*; Pyroligneous Acid, *Eng.*

Preparation.—Pyroligneous acid is a product of the destructive distillation of wood. The process of distillation is usually conducted in iron cylinders, with condensers attached. The woody matter being decomposed by heat, its elements unite to form new compounds, and by distillation an acid liquor passes over with water, tarry matter, Empyreumatic Oil, and much inflammable gas, while a large proportion of excellent charcoal, is left in the retort.

Physical Properties.—Pyroligneous acid is a brown, transparent liquid: consists essentially of acetic acid, diluted with water, holding in solution tar, with some Empyreumatic Oil, and has a smoky smell. It is distilled and further purified, by the addition of Carb. of Soda. This is saved as *Acetate of Soda*, or used for making a purer Acetic or Pyroligneous Acid. When the acetate of the above alkali is formed, it is purified by crystallization and re-solution, afterward decomposed with sulphuric acid; the acetic acid set free, is again distilled, and the processes repeated until a nearly colorless acid, with the odor of the acetic, is produced, but which is often Empyreumatic.

TESTS.—Pyroligneous acid is nearly or entirely colorless; Sp. Gr. at least 1·034; one hundred minims neutralize liij. of Carb. of Soda; it is unaffected by Sulphureted Hydrogen or Solution of Nitrate of Baryta.

Action—Use.—This acid is sometimes used as a chemical agent in the preparation of medicine, but is much more employed in the treatment of disease. It is a powerful antiseptic; capable of preserving flesh or fresh meat for a long time, or even restoring it from a state of putrefaction, unless the decomposition has gone too far. It may be applied to mortified parts, foul ulcers, cancers, etc.

As the Tartaric, Citric, and other common vegetable acids are not generally employed as chemical agents, they are not entitled to a consideration here. It is true, however, that they are sometimes used in effervescing draughts, and in poisoning by the caustic alkalies, when their chemical characters are displayed.

Class II.---ALKALIES.

Alkalies are of equal importance with acids, both in a pharmaceutic and practical point of view. They are employed to precipitate substances from their solutions in acid liquids, and sometimes to render oily or resinous principles soluble in water. When taken internally, they are capable of neutralizing any acids in the same way that they do out of the body. Their most common medical use is in poisoning by acids, and in cases of acidity of the stomach or "*heart-burn*," *dyspepsia, etc.*, as well as in calculous concretions depending upon the agency of acids. They are absorbed into the circulation, and hence may develop their virtues in any part of the system, when they remain free.

SODÆ CARBONAS.

SYNONYMS.—Carbonate de Soude, *Fr.*; Einfach Kohlensaures Natron, *Ger.*; Carbonate of Soda, *Eng.*

"The substance known by the name of Soda is a Carbonate of Soda, but mixed with various impurities, according to the

source whence it has been obtained; that is, either from the different Natron Lakes, from the burning of maritime plants or sea-weeds, or from the decomposition of other Salts of Soda. It is introduced into the Pharmacopœias for the purpose of obtaining from it pure Carbonate of Soda."

PREPARATION.—Carbonate of Soda is now obtained very cheaply from Chloride of Sodium or Common Salt. This is first converted into Sulphate of Soda by the action of Sulphuric Acid, then mixed with pounded Coal and Chalk, and heated in a reverberatory furnace and stirred. "The Carbonaceous matter abstracts Oxygen both from the Sulphuric Acid and the Soda; Sulphuret of Sodium is formed, and decomposed by the Lime; Carbonate of Soda, insoluble Oxi-Sulphuret of Calcium, Caustic Soda, and Carbonaceous matter being the result. The insoluble parts are separated by lixiviation, and the Sulphur subsequently burnt away; during which the Soda is completely Carbonated. The mass now contains about fifty per cent. of Soda. Being lixiviated and evaporated, the Carbonate is obtained in large crystals. As Barilla is not sufficiently pure for medicinal purposes, the L. and D. Colleges give directions for its purification. The E. College justly consider the Carbonate of Soda produced as above, pure enough."

PHYSICAL PROPERTIES.—Carbonate of Soda ($Na\ O\ C\ O^2 + 10$ Aq.=144), prepared as above, is in large and clear colorless crystals, without odor, but having a disagreeable subalkaline taste, and an alkaline reaction on Turmeric. The crystals are oblique rhombic prisms, or rhomboidal octohedrons, entire or broken. In the air they effloresce, but when exposed to heat melt in their water of crystallization; when this becomes dissipated the salt becomes a white, porous, anhydrous mass, commonly known as *dried carbonate of soda*. Water at 60° dissolves half, and at the boiling point its own weight of it; but it is insoluble in alcohol.

Action—Use.—Carbonate of Soda is one of the most important of the alkalies. It is used as a precipitant in pharmaceutic chemistry, and is antacid for medical employment.

SODÆ BICARBONAS.

SYNONYMS.—SODÆ SESQUICARBONAS: Bicarbonate de Soude, *Fr.*; Zwifach Kohlensaures Natron, *Ger.*; Common Carbonate of Soda, *Eng.*

PREPARATION.—L. D. Dissolve Carb. Soda, ℔vij. (5 parts, D.),

in Aq. Cong, j. (5 parts, D.), filter, pass Carbonic Acid Gas (from the action of Muriatic Acid on Marble) through the liquid to saturation. Let the salt subside, press in folds of linen, and dry with a gentle heat.

U. S.—Take of Carbonate of Soda in crystals, a convenient quantity. Break them in pieces, and put them into a wooden box, having a transverse partition near the bottom pierced with numerous small holes, and a cover which fits tight. Through water in a bottle, with two tubulatures, pass Carbonic Acid, and let it come into the box until the Carbonate of Soda is fully saturated.

DESCRIPTION.—As usually sold, it is in colorless white powder, or in minute, scale-like crystals, having a saline, slightly alkaline taste and reaction. It is but little changed in the air. Soluble in thirteen parts of temperate water, but in much less of boiling water. Hence it crystallizes as this cools, or indeed, as it is formed. When heated, it first loses a portion of water, then half an Eq. Carbonic Acid, finally all its water, and becomes reduced to dried Carbonate of Soda. It is easily distinguished from this salt, *i. e.*, the Carbonate, by its less alkaline taste, less solubility, and by not forming a white precipitate on the addition of Sulphate of Magnesia to the solution.

Action—Use.—This is the most common form in which the carbonate of Soda is employed in medical practice. It is a mild alkali, and can be readily taken dissolved in water. Dose, half a teaspoonful. Useful in acidity of the stomach; also in dysentery; and as an antidote to acids. It is less useful in pharmacy than the pure carbonate.

POTASSA.

Potash is obtained by the manufacturing chemist from the ashes of wood, by lixiviation, or percolation with water, and evaporation of the solution. As thus procured, it is a very impure, dark-colored substance, unfit for medical or chemical use. In a chemical sense, it is an impure protoxide of the metal potassium. When subjected to calcination it becomes more pure and white, and is then called *pearlash*. In this condition it is sometimes used as an escharotic, and occasionally for pharmaceutic purposes. It is still deliquescent, and has its

caustic or burning taste. From this article all the different preparations of potash are, either directly or indirectly made, the most important of which are the following:

POTASSÆ CARBONAS: *Carbonate of Potash.*—℞ Pearlash, ℔iij.; Water, Oijss. Dissolve in the Water and filter. Evaporate gently in a clean iron vessel, till the solution thickens. Remove from the fire, and stir constantly with an iron spatula till the salt granulates.

By this process, the insoluble impurities, which are chiefly of an earthy nature, are removed, and the salt is obtained in a granular state, white, caustic, and deliquescent. It still contains water, some sulphate of potash, chlorides of potassium and of calcium, and silica.

Tests.—Almost entirely dissolved by water; deliquescent; renders turmeric brown. 100 parts lose 16 (20, E.) of water by a strong heat, and 26·3 parts of carbonic acid on the addition of sulphuric acid. When supersaturated with nitric acid, neither carbonate of soda nor chloride of barium throw down any thing (nitrate of baryta only a haze, E.), and nitrate of silver but little.

Use.—In this state potash is considerably used in pharmacy, and sometimes in practice as an antacid, and in effervescing draughts. ℞ Carb. Pot., gr. xx. = to Citric or Tartaric Acid, gr. xviij.; Aq. q. s. ℞ Carb. Pot. gr. xx. = Lemon Juice, f℥iv.; Aq. q.s.

POTASSÆ BICARBONAS: *Sal Æratus.*—Preparation.—L. D. (U. S.) Dissolve Carb. Potash, ℔vj. (℔iv., U. S.), (prepared from Pearlash 1 part, D.) in Aq. dest. Cong., j. (Ox. U. S.), (2 parts, D.) Pass Carbonic Acid (obtained by acting on white marble with diluted Muriatic Acid, D.) through the solution (till it becomes turbid; filter, and again transmit the gas, D.) till saturation. Apply a gentle heat, to redissolve any crystals that may have formed, put the solution in a cool place to crystallize. Dry the crystals (without heat, and keep in a well stoppered bottle, D.)

It may also be prepared by simply exposing carbonate of potash to the air for some months, in order that it may absorb the additional equivalent of carbonic acid; or a stream of carbonic acid may be passed through its solution as long as the acid is absorbed.

PHYSICAL PROPERTIES.—Bicarbonate of potash is a colorless and transparent crystalline salt; its crystal is a modification of a right oblique-angled prism. Its taste is much milder than that of the carbonate, and it has so little alkalinity as to color turmeric paper only slightly. It is soluble in about four parts of water at 60°, and in five-sixths of hot water. Boiling water speedily decomposes it, by expelling a part of its carbonic acid, and hence becomes a sesquicarbonate. It is insoluble in alcohol. Exposed to a red heat it loses one whole equivalent of carbonic acid, likewise any water which may be deposited within its crystals, and is converted into the carbonate of potash. Hence this method is adopted to procure the pure carbonate.

Action—Use.—The Bicarbonate of potash is much used as an antacid, antilithic, and, sometimes, with other articles, as a diuretic and resolvent. It is also much employed in effervescing draughts. ℞ Bicarb. Potash, gr. xx. = to crystals of Citric or Tartaric Acid, gr. xv., or fʒiijss. of Lemon Juice, with Aq. q.s.

MAGNESIA.

Magnesia occurs as a constituent of sea water, the water of some springs, and exists also in different earths, as noticed on p. 209, and is largely manufactured from the brine or bittern remaining after the crystallization of common salt.

Common, or calcined magnesia, is prepared from the carbonate, by heating it in a strong fire, for about two hours, or until the powder, when suspended in water, displays no effervescence on the addition of muriatic acid. It occurs in white cakes or powder, which are light, and have a slightly dry and alkaline taste. It is scarcely soluble in water, or alcohol.

Action — Use. — Magnesia is used as a precipitant in pharmaceutic chemistry, and in practice as an antacid and laxative; but it sometimes compacts the bowels, and thus proves mischievous. The dose, as a laxative, is from ℈j. to ʒj.

MAGNESIÆ CARBONAS. L. E. D. Dissolve Sulphate of Magnesia, ℔iv. (25 parts, D.), Carbonate of Soda, ℔iv., ʒiij. (Carb.

Pot. 14 parts, D.), each separately in Aq. dest. Cij. (400 parts, D.), and strain. Then mix and boil the liquors, stirring constantly with a spatula for a quarter of an hour; lastly, the liquor being poured off, wash the precipitated powder (collected on a filter of linen or calico, E.) with boiling or distilled water, and dry it.

Here the Sulphate of Magnesia and the Carbonate of Soda (or of potash) mutually decompose each other; the Sulphuric Acid uniting with the Soda, forms a sulphate of soda, which remains in solution, while the Carbonic Acid unites with the Magnesia. The salt formed, being insoluble, is precipitated as a hydrated carbonate of magnesia, but in consequence of a portion of the Carbonic Acid escaping, it is not strictly neutral.

PHYSICAL PROPERTIES.—"Pure Carbonate of Magnesia is sometimes found in nature in rhomboidal crystals; as usually seen, the officinal Carbonate is of a white color, light and soft to the touch, without smell, devoid of any other than an earthy taste when properly prepared." It is unalterable in the air, and nearly insoluble in water, but, like the Cal. Mag., more soluble in cold than in boiling water. Its solubility is much increased if Carbonic Acid be present, forty-eight parts of water being said to be then sufficient.

Action—Use.—Antacid, laxative, very similar to Calcined Magnesia, but differs in its tendency to eliminate carbonic acid gas from the stomach, when coming in contact with acids. It is also sometimes given in effervescence like Carb. Soda. *Dose* gr. v. to ℈j., as an antacid, and gr. xv. to ʒj., as a laxative.

CALX.

Lime occurs in nature in the greatest abundance, but it is never found pure, being combined with acids, as with Carbonic Acid in Limestone, Chalk, Marble, Calcareous Spar, and Shells; with Sulphuric Acid, in the various kinds of Gypsum; and with Phosphoric Acid in the bones of animals. Quicklime (Oxide of Calcium) is prepared from any of the above materials by simple calcination. But this is not sufficiently pure for most medical and pharmaceutic purposes; the following is the officinal calx.

PREPARATION.—Break Chalk (white marble, E.) into small pieces, and burn it in a strong fire for one hour L. (in a covered crucible, at a full red heat for three hours, E.)

Lime must be kept well closed up, to prevent it from absorbing moisture and carbonic acid. Its composition is Ca. 71.42+O 28·58=100.

Action—Use.—A highly important pharmaceutic and medical agent. It is a powerful antacid, the cheapest that can be had, and yet one of the very best.

CALCIS HYDRAS: *Slaked Lime.* PREPARATION.—Sprinkle with Aq. q. s. to reduce into fine powder.

Milk of Lime is prepared by adding an excess of water so as to make a milky solution.

LIQUOR CALCIS: *Lime Water.*—℞ Lime, ℥iv.; Distilled Water, Cj. Digest, shaking it up occasionally, and decant.

Action—Use.—Antacid, antilithic, resolvent in glandular affections. *Dose*, f℥ss. to f℥viij., three or four times a day.

CRETA.

Chalk is well known as an extensive secondary formation, of a dull white, earthy appearance; tasteless but adhering to the tongue; usually friable, sometimes hard; sp. gr. 23; but either variety may be employed, though the softer is usually preferred for medical use. Its chemical characters are the same as those of marble. In the arts it is commonly known by the name of *Whiting*, which is chalk ground in a mill, and the grosser impurities separated by precipitation in water; the pure chalk being still suspended, is allowed to settle in another vessel, and is then made into small loaves. For medical use (Prepared Chalk), it is similarly, but more carefully prepared by the process of levigation, and in drying is made up into small conical masses.

Action—Use.—Sometimes used in pharmacy, and also as an antacid and astringent in practice, but is unfit as a medicine, (owing to its gritty particles), until it is prepared as below.

CRETA PRÆPARATA, L., E., D., U. S.: *Prepared Chalk.*—PREPARATION.—Add to chalk ℔j, a little water, and rub to a fine powder. Throw this into a large vessel of water, then agitate and after a short period pour off the supernatant water still

turbid, into another vessel, and set it aside for the suspended chalk to subside. Lastly, the water being poured off, dry this powder and preserve for use. The direction of E. and D. are essentially the same. *Oyster Shells*, first freed from impurities, and washed with boiling water, may be prepared in a similar manner, forming the TESTÆ PRÆPARATÆ, L.

MISTURA CRETÆ: *Chalk Mixture.*—℞ Prepared Chalk, ℥ss., Sugar, Gum Arabic, in powder, āā, ʒij.; Cin. Water, Water, āā, f℥iv. U. S.

Action—Use.—Antacid, demulcent. Much employed in diarrhœa arising from acidity. *Dose*, f℥ss. to f℥ij. every three or four hours.

PULVIS CRETÆ COMPOSITUS, L., E., D.: *Compound Powder of Chalk.*—PREPARATION.—L., E., D., reduce separately to fine powder, Prepared Chalk, ℔ss., (℥iv. E.); Cinnamon, (bark, D.), ℥iv., (in fine powder, ʒjss., E.); Geranium Mac. and Gum Arabic, āā., ℥iij., L. D., (Nutmeg in fine powder, ʒj., E.), and Long Pepper, ʒss., L. D. Mix well.

Action—Uses.—Antacid, stimulant and astringent. In diarrhœa or low states of the constitution. *Dose* gr. v. to ℈j.

TROCHISCI CRETÆ, E., (U. S.): *Chalk Lozenges.*—PREPARATION.—Reduce to powder Prepared Chalk, ℥iv.; Gum Arabic, ℥j.; Nutmeg, ʒj.; Pure Sugar, ℥vj. Beat, with water, into a proper mass for making Lozenges.

Action—Use.—Antacid. Useful in acidity of the primæ viæ.

AMMONIA is also a valuable alkali, useful in pharmacy as well as in practice.—(See page 521 *et seq.*)

Class III.---ANTIDOTES.

The term *antidote*, in its general acceptation, is very indefinite, as it might be made to embrace all remedies. But when we speak of chemical antidotes, the term is much more restricted, meaning such substances as have the power or quality of neutralizing or destroying directly the various morbific agents against which they are exhibited. The articles in question, therefore, differ widely in the character or quality of their effects, from those of simple physio-dynamic remedies, which mostly evince their power against disease indirectly—that is, by exalting vital resistance against it, instead of acting in direct opposition.

Order I.---COUNTER-POISONS.

The term counter or anti-poison, is too extensive, in meaning, to admit of a full consideration of all the articles that are comprised under it. Many of them as emetics, etc., are mechanical remedies; others are physio-dynamics. Such, therefore, can not, according to the arrangement, be considered here. Chemical antidotes, alone, are intended to be noticed in this place. Nor is it necessary to treat severally of these articles, or to point out the indications particularly.

The Alkaline, Acid, and Corrosive mineral poisons, are those kinds most under the control of chemical antidotes. In reference to these, the following hints may be in place:

Poisons.	Antidotes.
1. *Acid Poisons*—	
Muriatic, Sulphuric,* etc.:	Carbonates of Soda, Lime, Potash, Magnesia.
Nitric, Oxalic:	Carbonates of Magnesia and Lime.
Hydrocyanic Bit. Alm.:	Chlorides of Lime and Soda, Chlorine, and [the cold *Douche*.
2. *Alkalies*—	
Potash, Ammonia, etc.:	Vegetable Acids.
3. *Corrosive Minerals*—	
Antimony:	Strong infusions of Vegetable Astringents.
Arsenic:	Hydrated Peroxide of Iron, in water, Rubigo
Mercury:	Albumen, as the White of Eggs, etc. [Ferri.
Bismuth:	Milk, Mucilaginous drinks.
Copper:	Albumen, as White of Eggs, Milk, etc.
Lead:	Sulphate of Magnesia, Phosphate of Soda.
Nitrate of Silver:	Muriate of Soda.
Muriate of Tin:	Milk, White of Egg.
Zinc:	Carbonate of Soda, Albumen.

Order II.---ANTILITHICS.

"Antilithics (from *αντι*, '*against*,' and *λιθος*, '*a stone*,') is a preferable name to *Lithontriptics*, and is applied to remedies which counteract the tendency to the deposition or formation

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* In poisoning by Sulphuric Acid, water must be carefully avoided, on account of the heat it occasions with this acid.

of Urinary Calculi. The Urine, compound in nature, and very variable, is, in a healthy state, a little acid, from the presence of Super-Lithate of Ammonia. But there may be an excess of this, as in the '*Lithic acid diathesis*,' from irregularities of the digestive organs, checks to the functions of the skin, etc. A deposit takes place of a reddish powder, or rather crystals, consisting chiefly of the Super-Lithate of Ammonia, sometimes with some pure Lithic Acid. But when there is a deficiency of acid in the urine, a white sandy deposit takes place, consisting chiefly of an Ammonia-Magnesian Phosphate with some Phosphate of Lime. Sometimes there is deposition of Oxalate of Lime, as in the *Mulberry* calculus."

In the use of antilithics, as in other cases, the remedies must be selected according to the diagnosis; thus, in the Lithic Acid diathesis, *Alkalies* are indicated: in the Phosphatic, *Acids*, etc. Attention to diet and the fluids taken, is of the greatest importance. It is also well to change the character of the ingesta as much as practicable, from that under which the prevailing diathesis was established.

It is unnecessary to treat separately on the different articles of this order, as they have been elsewhere described. All that is here required, is to place them into juxtaposition with the indications.

1. Lithic Acid Diathesis.—In this, the following are among the most prominent remedies:

α. Potassæ Liquor. Potassæ Carbonas et Bicarb. Liq. Potassæ Carb. and Liq. effervescens. These must be in the proper state of dilution.

β. Effervescing Saline Draughts produce an alkaline reaction in the urine.

γ. Potash and its Carbonates are more eligible than Soda, because the Lithate of Potash is soluble, that of Soda insoluble.

δ. Soda and its carbonates. Soda siccata and Liq. Sodæ effervescens. Sapo durus. Alkaline mineral waters.

ε. Ammonia and its carbonates, act as stimulants and as antacids in the stomach.

ζ. Calcis Aqua. Creta præparata.

η. Magnesia or its Carb. Magnesia-water, the Bicarb. with excess of Carbonic Acid gas.

2. Phosphatic Diathesis.—In this the weight of authority is in favor of the following:

α. Muriatic, also Sulphuric and Phosphoric Acids. Ure has particularly recommended Benzoic Acid and soluble Benzoates. Carbonic Acid. The Acids must be in a state of proper dilution.

β. Vegetable acids, as of Vinegar, Lemon-juice, Cider, etc., may sometimes be used successfully.

γ. Vegetable bitters are required, with generous diet, Wine, Capsicum, and the avoidance of every thing depressing.

3. Oxalic Acid Diathesis.—Here the most effectual remedies are the mineral acids, with tonics, the Muriatic or Nitro-Muriatic. Capsicum, Meat, and nourishing farinaceous diet.

Local Lithontriptics, as injecting very weak Nitric Acid into the bladder, or weak alkaline solutions. Electro-Chemical action. Lithrotity. Dr. E. Hoskins (Phil. Trans, 1843) recommends the introduction of weak solutions of chemical decomponents (as the Nitro-Sacchorate of Lead) instead of solvents, into the living bladder.

Order III.---ANTISEPTICS.

The term *antiseptic* (from *αντι*, '*against*,' and *σηπω*, '*to putrefy*') comprises that order of agents calculated to prevent or arrest the process of putrefaction, as the *stimulants* and tonics, as well as chemical agents. The two former prove antiseptic, by their power to exalt the vitality of the tissues implicated, and, according to the present plan of arrangement, are not entitled to a special consideration here. The most powerful stimulants and tonics, as Capsicum, Zinziber, Myrrh, Brandy, the Essential Oils, and Cort. Cinchona, Cort. Cornus Florida, etc., are considered among the best antiseptics of these kinds.

The chemical antiseptics are intended more particularly to be here represented. These consist principally of two kinds, viz: *Astringents* and *Absorbents*—the first impart preservative principles *to*, and the other abstract septic agents *from* the tissues. The first prove antiseptic by yielding their tannic or other acids to the tissues, and thus, by a chemical union with them, render their composition more permanent.

All the most active astringent barks and roots, as Geranium, Myrica Cerifera, Geum, etc. (see astringents), are good antiseptics.

CALX CHLORINATA.

Chlorinated Lime is prepared by passing Chlorine through Lime until saturated. The Chlorine may be obtained by heating Hydrochloric Acid with Binoxide of Manganese, gently. The lime may be spread out in a proper vessel and the gas thus exposed to it.

Physical Properties.—When fresh and properly prepared, chlorinated lime, or *chloride of lime*, as it is sometimes called, is a dry, grayish-white, pulverulent substance, possessing a bitterish, acrid, hot, astringent taste, and a feeble odor of chlorine. It possesses powerful bleaching properties. When the lime is perfectly saturated with chlorine it dissolves almost entirely in water, but when long exposed to the air it absorbs carbonic acid; thus carbonate of lime and chloride of calcium are formed, and the powder becomes moist, more insoluble in water, has the chlorine smell less strongly, and is much less valuable.

Action—Use.—An invaluable antiseptic and disinfectant. It will arrest putrefaction in an astonishing manner. Thus not only gangrenous parts are restored, but even putrid meat, putrid water and vegetables are recovered by its use, to a sweet and natural state. Although it can not be supposed to restore to *vitality* any parts that have entirely *perished*, it will yet arrest at once the *progress* of mortification and putrefaction, and, as just stated, will restore parts affected with gangrene or the incipient stage of mortification. Its power, in this way, seems to be dependent on the feeble attachment existing between the lime and chlorine; the latter being disengaged by very slight affinities, when the lime will be free to absorb the various septic gases, as carbonic acid, carbureted and sulphureted hydrogen, azote, and other noxious matters. The chlorine itself, however, appears to perform a very important part in the antiseptic action of the chlorinated lime.

Chlorinated lime may be taken internally, in from gr. iij. to gr. vj., or more, according to the strength, dissolved in one or two fluid ounces of sweetened water. From ʒj. to ʒiv. of the powder may be dissolved in Oj. of aq., to form solutions for external or internal application. But it is difficult to give any precise directions as to the strength of the solution that may be required in all cases. This solution is not only useful as a general antiseptic, but is of incalculable utility as an application to putrid ulcers, cancers, mercurial sores, syphilitic ulcers, ulcerated sore-throat, burns, chilblains, etc., in all of which cases it will not only correct any attendant fetor, but will dispose the parts to heal. When the solution of chloride of lime is used for putrid sore-throat, it is freely applied as a gargle. It is also a very successful remedy in scabies, much better, cleaner, and more agreeable than sulphur; also, good as a wash in tinea capitis, and many other cutaneous diseases. It is an excellent ingredient in enemas from dysentery, typhoid fever, cholera, cholera morbus, and all putrid diseases. It is the best remedy in poisoning by hydrocyanic and hydrosulphuric acid, hydrosulphuret of ammonia, sulphuret of potassium, etc. The solution is said, also, to prevent the pitting of small-pox.

LIQUOR SODÆ CHLORINATÆ.

Preparation.—℞ Chlorinated Lime, ℔j.; Carbonate of Soda, ℔ij.; Water, Cjss. Dissolve the carbonate of soda in water, Oij., with heat; to the remainder of the water add, by degrees, the chlorinated lime, previously well triturated, stirring the mixture after each addition. Let the dregs subside, decant, and mix with the solution of the carbonate of soda. Decant from the precipitated carbonate of lime, filter through linen, and keep secluded from light.

Action—Use.—Same as the solution of chlorinated lime, but more agreeable for internal use, and as a gargle in sore-throat, fetid breath, ulcerated gums, etc. It is an excellent internal, as well as external application, in all putrid diseases, especially in all fetid discharges from the uterus, vagina, and bladder. The latter may be rinsed and washed with the solution by means of a syringe and double canula.

CARBO LIGNI.

Charcoal is commonly prepared by subjecting wood to a smothered combustion, by covering conical piles of it thinly with earth, and then igniting it through an aperture at the top, communicating to some fine combustibles in the center, which is to be closed up as soon as the fire is well started. The best way to prepare charcoal, however, is by charring wood in iron cylinders prepared for the purpose. For medical use it must be well prepared and kept from the air.

Action—Use.—Charcoal is one of our best antiseptics. It should be prepared in fine powder, in which form it may be taken in molasses, or milk, in doses of from a teaspoonful to a tablespoonful. Externally, it may be applied in the form of a cataplasm made with yeast. It is also of great advantage in many other cases besides gangrene. Thus it is sprinkled upon ulcers, cancers, etc., to correct their fetor, absorb acrid humors, and dispose the parts to heal. Its antiseptic power is well proven by its property of restoring putrid meat, putrid water, etc. It is a valuable pharmaceutic agent, employed chiefly for its discoloring properties.

CARBO ANIMALIS.

Animal Charcoal is obtained by subjecting bones, horns, muscles, etc., to a red heat in close vessels, until vapors cease to be emitted. The residue, after being powdered, is known by the name of *bone-black*, and *ivory-black*. In this state it contains eighty-eight per cent. of phosphate of lime, and carbonate of lime, also two per cent. of carburet with siliciuret, and a trace of sulphuret; it is bitterish in taste, and may readily be distinguished from vegetable charcoal, by burning a little of it on a red-hot iron. Animal charcoal is officinal on account of its attraction for the coloring matter of organic substances—a property probably owing to its extreme subdivision, and to the extent of surface which it exposes to any liquid filtered through it. The decolorizing power of vegetable charcoal may be increased by mixing chalk, or pounded flint with the vegetable matter previous to its being carbon-

ized. Animal charcoal is extensively employed in the arts, and in the laboratory, for removing the coloring matter of syrup, and also in the preparation of citric and of tartaric acid, and of the vegetable alkalies and their salts, as quinia, lobelina, populin, salicin, etc. The same charcoal may be used several times, but it requires to be first dried and subjected to a red heat. It is either mixed or boiled with the liquid to be decolorized, or the latter is allowed to filter slowly through a thick layer of it. For some purposes it requires to be purified.

Purification.—Take of Animal Charcoal, ℔j., and pour on it gradually a mixture of hydrochloric acid and Aq., of each f℥xij. Digest with a gentle heat for two days, frequently shaking. Set it aside and then pour off the supernatant liquor; wash the charcoal with water till no acid is perceptible, and then dry it. The Edinburgh College, subsequent to digestion, direct the mixture to be boiled and diluted with two pints of water. Collect the undissolved charcoal on a filter of linen or calico, and wash it with water till what passes through scarcely precipitates with solution of Carbonate of Soda. Heat to redness in a closely covered crucible. Keep tightly stopped in bottles.

Order IV.---DISINFECTANTS.

Disinfectants (from *dis*, a prefix, which here signifies separation, and *infect*, to contaminate) are substances calculated to free the air in buildings and rooms, as well as infected bodies, in general, of the invisible, and often imperceptible particles which constitute infection and propagate disease. Although some of the means employed are purely mechanical, most of them are chemical in their action. *Fumigations* and *Pastiles* in most cases only conceal the smell, without removing the causes, and are, therefore, worse than useless, in some cases, in which there is danger that may be at first detected only by the smell. They are of great utility in many cases where exposure to offensive effluvium is unavoidable, as in judicial exhumations, dissections, etc., in which cases, that disgusting and insupportable fetor, generally eliminated, may be entirely obviated, simply by wrapping the subject up for an hour or two in a sheet dipped in a strong solution of Chloride of Lime or Soda, or by sprinkling with the solution, by means of a

common watering pot. Hospitals, Alms-houses, Jails, Ships, Sick-rooms, Privies, Sewers, Docks, etc., may be conveniently disinfected, either by simply sprinkling the floors, walls, etc., with the solution of these preparations, or by setting in them a vessel or two containing some of the chloride. Should the circumstances render the preparation thus employed insufficient, a little Muriatic or Sulphuric Acid may be added to the chloride; and in places not occupied, the chlorine itself may be used. This may be obtained by heating gently together the Binoxide of Manganese with Muriatic Acid.

As additional means of this kind, the following may be named: Ventilation; Caloric; Acid fumes, as Sulphurous acid Gas, Hydrochloric Acid Gas; Nitrous acid fumes. (Acetic and Pyroligneous acids are less effectual.) Destruction of infected matter by application of heat, of Quicklime, of Charcoal, etc., is very successful.

Fumigations, Pastiles, Balsamic Resins, and Aromatic Vinegar only diffuse an agreeable odor, covering but not destroying the fetor; and it is indeed questionable, whether disinfectants ever do more than simply neutralize the fetor or smell.

Order V.---COSMETICS.

The term cosmetic (*cosmetica*, from *κοσμεω*, 'I adorn,') is applied to such agents as are used for the purpose of preserving and restoring beauty; and although these articles do not in the strictest sense, belong to the Materia Medica, yet as physicians are often called upon for articles of this kind, and as many defects in the appearance of the skin, which may be removed by these remedies, are indeed pathological in character, the author has thought proper to give a few brief and practical hints on this subject.

Cosmetics may be said to consist of three varieties, viz: 1, Those which relate to the *skin*. 2, Those which relate to the *hair*. 3, Those which relate to the *teeth*.

1. Cutaneous Cosmetics.—Cosmetics are applied to the skin to soften or toughen the cuticle, improve the color, and to remove spots or discolorations.

Oleaginous, and Saponaceous substances soften the skin; Almond and Spanish Soaps, Milk of Roses, and Cold Cream, are also favorite articles of this kind.

Rose-water containing a little Tannin, or any other innocent, discolored vegetable astringent will toughen and harden the skin.

Armoracia, Horse-raddish, infused in milk, is considered by Dr. Withering as one of the safest and best cosmetics for the skin. *Bitter Almonds*, the juices of *Chelidonium Majus*, *Asclepias Syrica*, *Lobelia Inflata*, etc., are considered good to remove ephelides (*freckles*). Diluted Acids, Alkalies, and the Chlorides of Soda and Lime, Charcoal, decoction of Wheat Bran, etc., are serviceable in removing blotches and spots. The Bicloride of Mercury, which has been so much used, forming with bitter Almond emulsion, Gowland's lotion, should not be used, as it has often done much mischief.

Face paints are employed to give artificial colors to the skin: *Carmine* to communicate a red, and starch powder a white tint, may be employed without any injurious effects; but the white metallic compounds, as *Trisnitrate* of *Bismuth* *Carbonate* of *Lead*, and *White Precipitated Mercury*, Dr. Pereira justly says, are dangerous, as they are liable to become absorbed.

2. Hair Cosmetics.—Cosmetics are applied to the hair to render it smooth, glossy, and disposed to curl—to color it—to promote its growth—and, sometimes, to destroy it.

A *pomatum* for the hair, of excellent character, may be made as follows: ℞ Olive Oil or Oil of Almonds, ℥ij.; Spermaceti, ʒiij.; Oil of Roses, gtt. xx. Or it may be scented with other pleasant-scented oils.

Many substances have been employed to promote the growth of hair, most of which have proved very unsatisfactory. The Oleo-resinous Extract of Lobelia, Olive Oil, and Alcohol, in equal parts, constitute the best preparation of this kind the author has ever used. It may be scented with Oil of Roses, or any other aromatic oil, according to fancy.

Depilatories are employed to remove superfluous hair. The articles commonly used for this purpose are Orpiment and

Quicklime, which are mixed in the proportion of twelve parts Lime and one of Orpiment. If ten parts of starch be added to this, and the mass then made into a paste with water, it forms Plenck's celebrated *Pasta Epilatoria.* But Arsenic is unsafe, and should not be employed. The following is better: Lime, ℥j.; Carbonate of Potash, ℥ij.; Charcoal in powder, ʒj. Mix. It is applied moist to the parts where the hair is to be removed, and neutralized and washed off when the object of its use is accomplished.

Hair Dyes are also made of various substances, some of which, as the Nitrate of Silver, etc., are injurious to the hair. *Orfila's* hair dye, which colors the hair black, is composed of Litherage (*oxide of lead*) and Lime in equal parts, or a little the most of the first, made into paste with hot milk or water. It is to be applied for some five hours, keeping the hair close or shielded with oiled silk.

3. Teeth Cosmetics.—Cosmetics are applied to the teeth, to cleanse and whiten them, and to destroy their unpleasant odor.

Astringent dentrifices restore spongy gums: such are the extracts of Myrica Cerifera, Geranium Maculatum, and Cornus Florida. But the best is the leaves of the Ligustrum Vulgare, *Privet;* the powdered root of the Orris—Florentine Orris—is very popular. When put up it is scented with some aromatic oils.

Pumice, Charcoal, and the bone of Cuttle-fish in powder, will polish and clean the teeth. Chloride of Lime, Chloride of Soda, and Charcoal, are used as disinfectants for the teeth.

Order. IV.—ESCHAROTICS.

Escharotics are agents employed to corrode, decompose, or destroy abnormal growths, excrescences, or semi-vital parts, which can not be restored, and which become a source of annoyance, and often serious obstruction. When it is fully determined, that these diseased parts can not be restored, and they must, of necessity, be disposed of, they are either removed with the knife, or the use of escharotics. Formerly the

actual cautery was a popular means of this kind. Its employment had been discontinued from its barbarous appearance, until now again it is receiving attention. Prof. Blackman, Physician to the Commercial Hospital of this city, employs it in preference to all other escharotic means. He declares it less painful and more effectual than the potential cauteries. But the iron, when applied, must be heated to whiteness, so as to crisp the parts before the radiation of the heat can take place. It is the radiated heat that causes the smarting and pain.

Nitrate of Silver is a very popular escharotic. The mineral acids, also—particularly Nitric Acid; but none are so good as Carbonate of Potash. This article produces as little pain as any other article of this kind, and is, perhaps, followed with less inflammation than any other. It has also the advantage of being capable of being arrested in its operation, almost at an instant, and that without any pain, and by means that will, themselves, be a benefit to the sore produced. Thus any of the soft oils will soon arrest the operation of potash, by forming a mild soap with it, and by which means the air is excluded, and the sore anointed. Acids will still more promptly arrest this escharotic. Among other articles that have been employed and found useful, are podophyllin, sanguinarin, powdered hydrastis canadensis, etc. Brown sugar, scorched alum, scraped horn, etc., have also been considered good, as articles of this kind. The most common applications of this class of remedies, are in cancerous tumors, polypus, hemorrhoids, unhealthy granulations, fungus hæmatodes, etc.

DIVISION III.

MECHANICAL REMEDIES.

Mechanical remedies only act as ordinary physical agents, in virtue of their mechanical properties; and hence are rather of limited application, and of minor importance when compared to the physio-dynamic remedies. Still there are numerous cases in which we are required to protect an abraded surface, lines an irritated canal, dilute acrid secretions, increase the solvent power of an excretion, attenuate humors, and liquefy solids. For such purposes the more powerful remedies are as unsuited as these milder agents would be unfitted for controlling the more urgent symptoms of disease.

Class I.---EMOLLIENTS.

Emollients, as their name indicates (from *emollio*, to soften), are medicines calculated to soften the tissues to which they are applied, and may thus include many of the expressed oils, the liniments, embrocations, cerates and ointments, cataplasms and fomentations; of which latter the results must be ascribed "to the relaxing effects of warmth and moisture upon the extreme vessels of the surface, propagated by contiguous sympathy to the deeper-seated organs." (*Paris.*) It seems desirable to retain the name of emollients for external applications, and that of demulcents for those intended for internal exhibition.

Order I.---OLEAGINOUS EMOLLIENTS.

Among the simple agents of this order may be named Oleum Olivæa (*olive oil*), Oleum Amygdalæ (*oil of almonds*), Cetaceum

(*spermaceti*), Adeps (*lard*), and most other soft *animal oils.* The following are some of the most important preparations of this kind:

UNGUENTUM CETACEI: *Spermaceti Ointment.*—℞. Spermaceti, ʒvj.; White Wax, ʒij.; Olive Oil, fʒiij. Melt them together slowly, and stir constantly until cold.

Use.—A common dressing for wounds, sores, excoriations, etc.

UNGUENTUM SIMPLEX: *Simple Ointment.*—℞. White Wax, ℔j.; Lard, ℔iv. Melt together, and stir till cold. ℞. Olive Oil, fʒvss.; White Wax, ʒij. Melt, and stir till cold;—Ed.

Use.—A base for other ointments; also applied as a dressing for wounds, sores, etc.

UNGUENTUM STRAMONII: *Stramonium Ointment.*—℞. Fresh Stramonium (*gimson*) leaves, bruised, ℔ij.; Lard, ℔iij.; Yellow Wax, ʒviij. Simmer together until the leaves become crisp, and strain.

Use.—A detergent and anodyne ointment, useful in cancer and other painful ulcers.

UNGUENTUM SULPHURIS: *Sulphur Ointment.*—℞. Sulphur, ʒxvi.; Lard, ℔ij.; Oil of Bergamot, fʒij. Mix.

Use.—A remedy in itch.

Other formulæ of this kind are found elsewhere in the work, see pages 443, 444.

Order II.---AQEOUS EMOLLIENTS.

This order embraces the various cataplasms, or poultices.

CATAPLASMA SIMPLEX: *Simple Cataplasm.*—The D. College direct Oat Meal two parts and Flax-seed Meal one part. But Flax-seed, simply pulverized, and without having its oil pressed out, will make a better poultice than that of the Dublin College. The cataplasm is mixed up with hot water, and overspread with lard or oil to prevent too much adhesion.

CATAPLASMA CARBONIS LIGNI: *Charcoal Cataplasm.*—℞. Charcoal red hot from the fire, pulverize, and incorporate with simple or linseed cataplasm in a tepid state.

Use.—Antiseptic and absorbent cataplasm, very useful in ancers, foul ulcers, etc.

CATAPLASMA DAUCI: *Carrot Cataplasm.*—Boil the root of the common Carrot in water until soft. Form into a mass.

CATAPLASMA FERMENTI: *Yeast Cataplasm.*—℞. Wheat Flour, ʒxvj.; Yeast, Oss. Mix and expose to gentle heat until it begins to rise.

Use.—An antiseptic poultice. It also promotes suppuration, and corrects the fetor of old sores.

℞. Yeast q. s.; Charcoal prepared as above. Mix.

Class II.---DEMULCENTS.

Demulcents do not differ very materially from the Emollients in their therapeutic character, as both are calculated to soften the tissues and to shield unprotected surfaces. These mostly consist of mucilaginous, saccharine, and starchy substances, which are frequently found useful in softening irritated surfaces, and diminishing sensibility to pain, either when applied externally, or taken internally, as in coughs, inflammation of the intestinal canal, or irritation of the urinary passages.

These are intended for internal use, the emollients for external application.

Order I.---MUCILAGINOUS DEMULCENTS.

ACACIÆ MUCILAGO: *Mucilage of Gum Arabic.*—℞. Gum Arabic, in powder, ʒiv.; Boiling water, Oss. Add the water gradually to the Gum; agitate until dissolved.

Use.—Of great service in diseases of the mouth, throat, stomach, and bowels, when there is a lack of the natural secretions which are designed to protect the surfaces. Inflammations of the mouth and throat, as well as fevers generally, cause dryness of the mucous surfaces of these parts, and demand demulcents. The gum Arabic mucilage is excellent in such cases. It also answers as a vehicle for taking down other medicines; and is eminently serviceable as a basis for medical and simple diluent injections.

In dysentery, gastritis, enteritis, cystitis, nephritis, etc.,

this mucilage has ever been in the highest esteem. Taken *ad libitum*.

MUCILAGO ULMI: *Mucilage of Slippery Elm.*—℞. Slippery Elm bark, powdered, ℥ij.; Boiling water, Oj. Pour the water upon the powder, stir until it thickens, and strain.

Action—Use.—Same as the foregoing.

MUCILAGO AMYLI: *Mucilage of Starch.*—℞. Starch, ʒiv.; Water, Oj. Rub the starch in the water till mixed, then boil for a time.

Use.—This, for immediate internal use does very good service.

MUCILAGO TRAGACANTHÆ: *Mucilage of Gum Tragacanth.*—℞. Tragacanth, ℥j.; Boiling water, Oj. Macerate for twenty-four hours, stir occasionally, then triturate or mash so as to render the mucilage uniform, and forcibly strain through linen. Tragacanth is not completely soluble in water.

MUCILAGO LINI SEMENÆ: *Mucilage of Flax-seed.*—℞. Flax-seed, ℥iv.; Boiling water, Oj. Macerate for twenty-four hours; strain.

Use.—Same as gum Arabic mucilage.

MUCILAGO ADIANTUM: *Mucilage of Adiantum, (Maiden-hair).*—℞. Adiantum, ℥ij.; Boiling water, Oj. Macerate twelve hours and strain.

Use.—An excellent mucilage in bronchitis.

Other articles, still, are in use in forming mucilages, some of which are equal to any of the above: SYMPHY-

C. MULTIFLORA.

TUM OFFICINALE (*Comfrey*); GLYCYRRHIZA, (*Licorice*); ABELMOSCHUS ÆSCULENS (*Okra*); TAPIOCA, etc., all make excellent mucilages by maceration in cold or hot water.

CONVALARIA MULTIFLORA: *Solomon's Seal.*—This is a beautiful wild plant, found in rich soil, and slightly shaded woods, in the Middle and Western States. It belongs to *Sex. Syst.* Hexandria Monogynia, and *Nat. Ord.* Smilaceæ. The *root*, rhizome, is horizontal, of the thickness of the little finger, ten to fifteen inches in length, sending up stalks in its course; yellowish-white outside, white within, very succulent, mucilaginous, and, when dry, is quite mealy. *Stem* two to three feet high, inclining, simple. *Leaves* alternate, clasping, oblong-ovate. *Flowers* on pendulous axillary peduncles, numerous, white.

MEDICAL PROPERTIES AND USE.—The root of this plant affords one of the most useful mucilages for internal use, especially in dysentery and in inflammation of the bowels. It is prepared by boiling an ounce or two of the root in milk. Taken *ad libitum*.

Order II.---SACCHARINE DEMULCENTS.

SYRUPUS SIMPLEX: *Simple Syrup.*—℞ Refined Sugar, ℔ijss.; Water, Oj. Dissolve the sugar in the water, by means of heat, remove any scum which may form, and strain the solution while hot.

SYRUPUS ALTHÆÆ: *Syrup of Marsh Mallow.*—℞ Marsh-Mallow Root, ℥viij.; Refined Sugar, ℔iijss.; Water, Oiv. Boil the root in the water till there remains one half the latter; express and let stand for twenty-four hours, so that the dregs may subside; pour off and adding the sugar, boil down to the proper consistence.

Sugar may also be simply eaten, or Sugar Candy, Sugar Lozenges, etc., may be dissolved in the mouth, and thus taken in view of their demulcent effects. The sweet syrups are all more or less demulcent.

Action—Use.—Same as the mucilaginous demulcents.

Class III.---DILUENTS.

Diluents are very closely allied to demulcents. The only difference being, that in this class the water or aqueous por-

tion of the compound is the chief agent, and is taken in much larger quantities.

Diluents are calculated to supply the functions of secretion, to dilute acrid fluids, and diminish viscidity. They are of great importance in fever, and inflammation, when involving the organs of the prima viæ, and the viscera.

Cold water is the most congenial diluent in fevers and inflammations, and should never be prohibited. No medicines should ever be given, that will necessarily exclude the use of water.

Medical diluents are of compound advantage, for while the water in them will subserve the common purposes of diluents, the medical principles with which the liquid is impregnated, will fulfill other indications. Thus diaphoretic properties are often imparted to water, in the preparation of drinks or "*teas*" for fever patients.

Class IV.---BATHS.

Bathing may be considered among our most important means of cure. Baths are variously denominated according to their forms of application. The common *Vapor Bath* is the most important. This is capable of fulfilling three prominent indications; thus it proves *stimulant*, *relaxant*, and *diaphoretic*. The *Medicated Vapor Bath* has the additional advantage of the medicine incorporated. The *Tepid Bath* is more slow, but permanent in its effects. The *Cold* or *Shower Bath* proves refrigerant in its primary effects, and diaphoretic and tonic in its secondary. This appliance has been treated upon in various places in the work, and does not here require special notice.

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