ELEMENTS

OF THE

MATERIA MEDICA,

AND

THERAPEUTICS.

BY

HENRY R. FROST, M. D.

PROFESSOR OF MATERIA MEDICA IN THE MEDICAL COLLEGE
OF THE STATE OF SOUTH-CAROLINA.

PART I.

CHARLESTON:
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gift
Mrs J. C. Weaver
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PREFACE.

The following Elementary Treatise has been prepared for the use of the class, in attendance upon the Lectures, in the Medical College of the State of South-Carolina. Such a work would seem superfluous at the present time, abounding in Treatises upon almost every subject, and it would not have been undertaken but from the author's connection with the College. In this relation, it furnishes the lecturer with a work to which he can refer his pupils, as a companion and assistant, during the period of their studies. The succession of Lectures with which the student is daily occupied, renders it proper, that the course of studies be facilitated by every practicable method. In no department are such facilities more required, than in the Materia Medica—which being addressed more particularly to the memory, requires all the aid which can be brought to its support. In addition, he hopes, that in his arrangement of his subject, and the articles, in the exposition given of the operations of medicines, and the Therapeutics proper, he has been able to add much to the information usually found in the Treatises adopted in the several schools.

The Introductory Lectures, comprise, in a great degree, matter not to be found in any of them, in his view, so important, that it has always been a subject of surprise, that they should have been overlooked.

In preparing this part of his labours, he must confess obligations to many in this country, and abroad, and more particularly to the writers of the French School. To enumerate them all would be a difficult task, since, the work put forth, is the result of reading and observation for many years, and the thoughts of others have become so incorporated with his own, that a separation is not now attainable. He has not overlooked the most important sources from which he has received assistance, and they will be found appended at the conclusion of each separate subject.

This book is from the library of the late Dr E. A. Frewellyn of Thomaston Ga, who was Medical Chief in Braggs Brigade during the Civil War. He was a nephew by marriage of Dr Jno. Colin Drake of Thomaston, Ga - the maternal grandfather of Dr Jno Colin Weaver, formerly of Thomaston. Ga but now of Allanta Ga.

i.

General View of the Materia Medica.

Before entering upon the particular consideration of the department which it is my province to teach, I shall devote a few Lectures to the consideration of certain general subjects, to which allusion will frequently be made in the progress of the course. These will be brought to your view in their proper order.

In the present lecture I shall take a general view of the Materia Medica; point out its connection with other studies; the subjects it embraces; and offer such remarks as suggest themselves in reference to the object proposed. The Materia Medica, to which also the term Pharmacologia has of late been applied, (from Pharmakon, Medicine, and Logos, Discourse,) is that part of the study of medicine which treats of the various remedies in use. It comprehends a knowledge of the intimate composition of these agents, the physiological effects which follow their employment upon the system, and the practical benefits which are derived from their operation. To obtain all these objects in the highest degree, it is proper that we should be acquainted with the Physical and Chemical qualities of the substances which constitute a medicine, and to know the changes and the alterations which these substances experience before they can be rendered useful. The study of these several subjects extends the boundaries of our science, and brings under its domain a number of others, which become necessary for its full and thorough acquaintance.

Natural History is tributary to it, when it searches into the productions of the Three Kingdoms of Nature for the substances which are endowed with medicinal qualities. Pharmacy, which is occupied in converting these substances into medicines, in giving them a form which favours the exercise of their properties, is also a branch of this science. The Materia Medica is associated with Chemistry, when it penetrates into the texture of medicinal articles, when it separates the immediate principles which constitute them, when it enumerates the number of these principles, and when it determines the proportion of each in these compound bodies.

On the other hand, in tracing the action of medicines upon the body, the nature of the impression which is made upon the several organs, and the effects which follow their employment, it is necessary that we should recur to Physiology, which teaches the action of these organs. With the Practice of Medicine there must exist a very considerable and close alliance: for can we speak of an article without regarding the diseases to which it is applicable, without having reference to the assistance which it furnishes in opposing the progress of sickness, and of viewing it as an agent proper to remove, in many instances, the morbid actions which exist?

With this very general view of the connections of the Materia Medica, I shall take up the consideration of the natural substances employed in medicine.—These, as you already know, are extremely numerous. Man, under the influence of pain, seeks relief in every thing which surrounds him. Having exhausted all the accustomed

sources of relief, he addresses himself to others. Any success encourages his boldness, and substances the most dangerous, and most contrary to his organization, are transformed into medicinal means. Deprived of any fixed principles in directing his researches after substances proper to become medicines, he adopts at first without scruple, and without examination, every production which appears likely to become useful. Thus it is, that a multitude of remedies of doubtful properties are accumulated together; and whatever the Animal, Mineral, or Vegetable kingdoms could furnish have been made a part of the Materia Medica. The number of these articles I shall much curtail, and will endeavour to present to you such only as are of tried and acknowledged powers—such as are capable of making upon the living structure an impression which modifies its actual state.

The substances which constitute the Materia Medica are derived from one or other of the Three Kingdoms of Nature—from Vegetables, Minerals, or Animals.

From the Mineral kingdom we obtain but few articles in comparison with the Vegetable; but this deficiency is supplied by their very great activity. "In their pure or metallic state they exert but little action upon the system, and any effect they do produce appears to arise from their being chemically acted on by the gastric juice. When oxidated they become more active; and still more so when the oxide is combined with an acid. The degree of oxygenation considerably influences their powers: so that from the same metal preparations of very different degrees of medicinal activity may be obtained, though all agreeing in the kind of action they exert."—*Murray's Materia Medica.*

It is from the Vegetable kingdom that we are supplied with the greater number of articles employed in the Materia Medica. Being the products of organization, their composition is more simple, and resolvable into a few elements, while the mode in which they are formed is much more complicated. Thus the ultimate elements of Vegetable substances are few in number, consisting of Carbon, Oxygen, Hydrogen, and sometimes Nitrogen; and it is the various combination of these principles that gives rise to the great variety of vegetable products. Combinations of the same elements are formed therefore greatly diversified, and properties are derived from differences of proportions or modes of union. Hence an infinite variety is observed in the productions of this kingdom, and as these productions are greatly extended, we are in possession of remedies different in powers, and adapted to every state of disease.

The active principles of plants being influenced by a variety of circumstances, particular attention should be paid to whatever relates to their growth or preservation. It is important when we wish to avail ourselves of their medicinal properties, that we should regard the period of their maturity, since to each period of their growth, there corresponds most commonly a chemical composition peculiar to that stage. The Roots, the Stems, the Leaves, the Flowers arrive successively to maturity, when each of these parts are possessed of

properties rendering them capable of being made efficacious medicines. Before the time of their perfection, these properties are not matured—beyond this they are exhausted.

The Intimate Constitution of Plants is influenced by the soil in which they grow, the degree of moisture or of heat to which they are exposed, as well as by the portion of light and air which they enjoy. These are the causes which affect the functions of the vegetable life, which regulate the operations upon which depend the developement of all parts of the plant. These causes decide the chemical composition which the different parts exhibit, and render deficient or abundant the medicinal principles from which the value of the article is derived.

I shall embrace the present opportunity to make a few remarks upon the general economy of plants, with directions upon the period of gathering and preserving them. I am the more particular, as you will find but little said upon this subject in any of the systems to which you can have reference.

Plants are to be gathered from places and soils where they grow spontaneously in a dry season,—when they are neither wet with showers nor dew,—they are to be collected annually, and those which have been kept longer should be thrown away.

The gathering of roots should always be made when the leaves and stalks are dead. There are two seasons when this may be done, the Spring and Autumn. Authors are not agreed which of the above periods should be preferred in making a collection—some recommending one season, and others another. The best period is the Autumn, after the sap has descended into the roots. At this season the active principles not being engaged in giving nourishment to the plants, are collected in the roots, and may be said to be in a concentrated state, while in the Spring they are diluted by the quantity of aqueous fluid which the root appropriates to itself, and which in short renders its substance soft, pulpy, and almost without activity. Experience has shown that the roots of this season are reduced in drying one-half more than in the fall, especially those which are large and fleshy. They are also liable to undergo a degree of fermentation from the quantity of moisture they contain. The Autumn, therefore, should be preferred.

Barks ought to be collected at that season when they can most easily be separated from the wood. The general rule is to collect in the fall, the bark of those trees which are not resinous, and in the spring those which are.

Leaves should be chosen when they are most vigorous and in their best state. The plant is in that state when the flowers are about to unfold. It would seem that the design of the growth, and increase of the rich foliage and the gorgeous flower with which Nature decorates the vegetable kingdom, has for its ultimate object the formation of the seeds, and the propagation of the plant. The display which we so frequently witness terminates in this act—the fœcundation of the seeds—since when accomplished the plant fades, withers, and

dies. The leaves, therefore, and every part of the plant, are in the highest state of perfection when the flower is about unfolding, and at this period they should be gathered.

Flowers are to be plucked when lately unfolded.

Seeds are to be collected when just ripe and before they begin to fall from the plant. They ought to be preserved in their proper seed vessels.

In the Preservation of Plants it is proper to pay particular attention to the drying of them. It is essential that their desiccation be conducted in such a manner that the substances so submitted may not sustain any alteration in their nature, and that the principles to which are attached their medicinal virtues may be preserved. For this purpose they should, soon after they are gathered, be thinly spread out, and dried as quickly as possible, and with a heat so mild that their colour be not changed—then preserved in places or proper vessels, excluded from the access of light and moisture.

The following is the method practised in their preservation. Plants to be preserved are collected during a dry season, and after the dew has been dissipated. All foreign substances should be separated from them, they should be stript of the dead or faded leaves, placed upon a hurdle or table, and exposed to the heat of the sun, or upon a stove, or in a bakehouse. The Leaves are turned several times a day in order to renew their surfaces, and they are left exposed until they become perfectly dry—that is until they are readily broken in the hand. They are then removed and kept in a dry place for several hours. The leaves attract moisture so as to lose much of their brittleness. They are then preserved in proper places excluded from the light and moisture. The best method of preserving the virtues of Plants is that practised by the Friends of New Lebanon, in the State of New-York. After the leaves are thoroughly dried in the manner I have mentioned, they are placed into moulds and firmly compressed. I show you a specimen of the manner in which it is done. By this method they are preserved from the changes of the weather—from moisture—light—and whatever tends to injure the properties of the plant.

Preservation of Roots. They should be gathered as I have mentioned in the fall season. They should be washed in water to get rid of the dirt, and some of the mucous substance that would otherwise render them mouldy. The larger roots are cut into pieces—split or peeled—but in most aromatic roots as those of the Umbelliferous plants, the odour residing in the bark, they must not be peeled. The pieces are spread on sieves or hurdles, and dried in a heat of about 120° Fahrenheit, either on the top of an oven, in a stove, or steam closet, taking care to shake them occasionally to change the surfaces exposed to the air. Thick and juicy roots, as those of Jalap, Rhubarb, Briony, are cut into slices strung upon thread, and hung in garlands. Others, as Squills, are scaled, threaded, and dried in chaplets round the tube of a German stove, or in a hot closet.

It will be proper to consider the means by which the Medicinal Properties of Plants may be discovered.

The Sensible qualities of Plants, such as *Colour*, *Taste*, and *Smell*, have an intimate relation with their properties, and may often lead by analogy to an indication of their powers. Certain it is, that many substances which are insipid, and inodorous, rarely possess any virtue; and a number of such articles have been discarded from practice. It is true, that observations derived from this source will not serve us in forming very minute distinctions, but they will be found almost always adequate in vegetable productions to enable us to distinguish what is innocent and salubrious, from what is noxious and virulent. That a foundation exists for this distinction, we would infer from the conduct of the brute creation, who in their selections of food seem to be directed by the sensible properties of the plants presented to them, and it is rarely that any bad effects follow their reliance upon this guide. That to a certain extent we can be determined in the choice of substances by these characters, we know from the practice of mankind, who in the examination of an unknown substance instinctively apply to the senses for information respecting its properties. In respect to *Taste* it may be observed that what is sweet, agreeable, or aromatic, proves nutritive and salutary, while on the other hand vegetable poisons are nauseous, acrid, and disgusting. Bitterness, when not extreme, denotes a tonic quality, which will stimulate the stomach and intestines, and promote the process of digestion. Astringency is indicated by a styptic taste: aromatics are stimulating, &c. Taste cannot be relied upon, for we know that both Quinia and Strychnia have a bitter taste, yet they differ widely in their effects—one being tonic, the other poisonous.

As relates to *Smelling*, it may be observed, that strong odours are narcotic and often poisonous—Nature thus seemingly protecting the more rational part of creation from the pernicious consequences which would arise from their use. Notwithstanding what has been said upon the subject of these two senses, there are so many causes of obscurity and error in these indications that they do not admit of very extensive or accurate applications. For such is the diversity of tastes, and so difficult is it to reduce them to any precise definitions or descriptions, that but few general rules can be formed from them.

Another means of judging of the medicinal qualities of plants, is by paying attention to the Botanical affinities. By these affinities is meant, that plants agreeing in their general structure, habit and appearance, have also a similarity in their effects upon the system. The greater number of authors appear to believe, that plants which resemble each other in their external form, also resemble each other in their properties: but no one has asserted the above fact in such strong terms as Linnæus in his Dissertation upon the properties of plants, in which he not only asserts that plants of the same general characters have the same properties, but that the same natural orders have properties allied to each other, and that even those of the same class approach each other in their effects. Jussieu has adopted the same opinion. Not only authority, but analogy, confirms the above belief. Thus all the Grasses have their seeds of a nutritive and farinaceous

character. Lolium Temulentum, a plant growing in England, an exception, said to be deleterious—Festuca Quadridentata, a Peruvian grass, described by Humboldt, very poisonous and even fatal to animals, another exception. The Labiated plants are stomachic and cordial—as Sage, Rosemary, Hyssop, Horehound, Lavender, Mint. The Umbelliferous have seeds tonic and stimulating—as Angelica, Fennel, Coriander, Assafœtida, Ammoniacum. Those of the Euphorbiaceous are acrid and purgative—as Castor Oil, Croton Oil, Euphorbia Ipecac, and Ammoniarum Corrollata. The juice of the Coniferes, trees bearing cones—as the Pines, Larch, etc., are resinous. The bark of the Amentaceæ is astringent and febrifuge—Amentaceæ, so called from the flowers of the trees hanging down in the form of a rope, as the Oaks, Hazels, etc. This mode of judging of the plants would seem to lead to pretty correct conclusions respecting their properties, and experience does in many cases prove that such analogies are well founded. For it would be reasonable to suppose that a certain structure of the leaves, of the parts of fructification, and of the general economy of the plant would lead to a similarity in their secretions and properties. This general structure is, in short, what might be called the physiognomy of plants, and by observing which we are capable in many instances of determining their qualities. When, therefore, a new species of any genus is discovered, the discoverer may infer that it possesses virtues similar to those of the genus to which it belongs. I might illustrate the preceding remarks by examples from other of the natural families, but in a study so little known as Botany to the generality of students, further details might be tiresome. I shall be satisfied with having called your attention to the subject and illustrated it by a few examples. It must however be observed, that the remarks upon this subject must not be taken in an unqualified sense; exceptions do occur, and in some particular instances, this close alliance in structure and habit is attended by very great differences in effects. As familiar examples, I may mention the Solanum Nigrum or Deadly Nightshade, and the Solanum Tuberosum or Irish Potatoe—the Cucumis Melo or Musk Melon, and the Cucumis Colocynthis or Bitter Cucumber. These very great distinctions may be in some measure attributed to cultivation, which changes the habits and properties of the vegetable as much as it does of animal life. To take a few examples—who would suppose that the Sour Sloe had by cultivation been ripened into the pleasant Plumb, or the austere Crab Apple of the woods into the Golden Pippen? That the common Colwort by culture, continued through many ages, appears under the improved and more useful form of Cabbage, Savoy and Cauliflower? Though cultivation has had such influence upon the Solanum Tuberosum as to render it one of the most useful vegetables which is planted, yet it has not destroyed altogether the characters by which it is classified, nor separated it from its kindred article, the Solanum Nigrum, since it has been lately shown that an extract prepared from the leaves and flowers possesses valuable properties as an *anodyne* remedy. The subject has of late excited

much attention, and it is admitted that with some exceptions, the botanical affinities will afford very important aid in determining the properties of plants. A knowledge of them with the information which is to be derived from the sensible qualities, will give to the Physician great advantages in his researches, and enable him very frequently, without an acquaintance with a plant, to judge of its general properties. It would be desirable that such of you as have opportunities of cultivating Botany should make yourselves acquainted with this interesting study, at least with its general principles. Certain it is, that an acquaintance with its principles will give to the physician, in forming his opinions, the same advantages which the educated practitioner possesses, over the mere pretender in medicine.

The several means enumerated, of judging of the medicinal properties of a plant, will however be insufficient of themselves—they must be subjected to the test of experiment. This is unquestionably the most conclusive method which can be pursued, and to which all the preceding are subsidiary. When any article has been experimented with, and certain results follow its administration, they may be considered as the effects which will follow its use. When these results take place with tolerable uniformity, they constitute what has been called experience. This is undoubtedly the highest evidence we can desire, and the surest guide when the observations are sufficiently correct, and the circumstances discriminated in so clear a manner as not to create any confusion. Where these requisites are not attended to, the conclusions drawn may be very fallacious, and hence such a discrepancy in medical opinions often prevails.

It may not be amiss to state some of the circumstances which in our experiments often lead to false conclusions, and which should be guarded against. There are a variety of circumstances which, abstracting from any suspicion of bad faith in those on whose testimony the credibility of facts depends, have a tendency to vitiate the accounts of what is commonly dignified by the title of experience. Such is the case where the experimenter has some previous opinion to support, when it always happens, that the results are considered through the medium of his preconceived views. This is so obviously the case, that it only need be mentioned in order to show how irreconcileable such a state of mind will be, with a candid statement of facts. Another circumstance calculated to weaken the evidence from experience is, that admitting there are no preconceived opinions, and a jealous exclusion of all theoretical views, still there will always be a great deal of doubt and conjecture in whatever appertains to the operations of the living system, at least when compared with what is required in Chemistry or in Mechanics. From this cause it happens, that the operations of nature are often mistaken for those of our remedies, and many properties attributed to them which they do not possess. Thus it is that Seneka Snake Root acquired a reputation for curing the bite of the rattle snake—that burnt Sponge was a remedy for consumption, and in our day that Iodine was calculated to remove the equally distressing disease, scrofula.

The case of Mrs. Stephens may also be cited as coming under this head.—She received a large grant from Parliament for the discovery of certain medicines for the cure of the Stone. A committee of professional men were appointed to ascertain its efficacy, and a patient with Stone was selected for the purpose of trying the remedy. The patient's suffering was relieved upon taking the medicine, and upon examining the bladder some time after, no Stone could be felt. It was therefore agreed that the patient had been cured and the Stone dissolved. Some time afterwards this patient died, and on being opened a large stone was found in a pouch formed by a part of the bladder, and which communicated with it.—*Paris.*

Admitting however that the difficulties I have mentioned in the way of acquiring correct experience were less founded. Another obstacle would arise in the fact, that the description of any medical case, can seldom or ever include all the circumstances with which the result was connected, so that though certain effects followed the use of any particular article we can not say what were the particular conditions of the system, what concurring circumstances tended to produce such an effect, or how the system was favourably disposed to the action of the agent employed. Therefore though the facts described be true, yet when the conclusions to which they lead come to be applied as a general rule in practice, it is often a rule transferred from a case imperfectly known, to another of which we are equally ignorant. From this cause it happens that such frequent complaints are made of the uncertainty of medicine, and that disappointment so frequently attends the operation of our remedial agents. The fault probably does not depend upon the substance employed, but to the want of discernment, or what has significantly been called tact in the physician. With the truth of the remarks I have made, in the difficulties of acquiring correct experience, there are few physicians who have been engaged in practice, who will not acquiesce. Do not understand me as wishing to undervalue the utility of this highest of all evidence, but as suggesting caution in receiving all that is referred to this head, and in forming your opinions.

The last method of acquiring a knowledge of the virtues of plants usually resorted to, is Chemical Analysis. There can be no doubt that from this mode of investigation much useful knowledge may be acquired, and considerable insight afforded into the medicinal properties of plants. With the discovery of certain principles we are led to the virtues and the applications of the article under examination. Thus with the discovery of Tannin and Gallic acid, astringency is known to exist, and with Resins a cathartic property. Gums, Mucus, and Fœcula are emollient, demulcent and nutritious. Fixed Oils are laxative, and the volatile are aromatic. Bitter extractive is usually tonic, and the acids are refrigerant and antiseptic, etc. But though Chemistry unfolds to us the particular principles which predominate in a plant, and to which it owes its efficacy; yet it can never take the place of experience, since while it points out the number, it has not been carried to that degree of perfection as to de-

termine their exact combination, the state of chemical union, and those nice proportions of different ingredients upon which the distinctions between vegetable substances so frequently depend.

Carbonic Acid, and Oxalic, are composed of the same ingredients, but in different proportions, yet affect the stomach in an opposite manner. Quinia, Morphia, and Strychnia, present but slight differences in their composition, yet their operation is very dissimilar.

	Quinia.	*Morphia.*	*Strychnia.*
Carbon	75 76	72 20	77 21
Hydrogen	7 52	6 24	6 73
Nitrogen	8 11	4 92	5 96
Oxygen	8 61	16 66	10 10

The analysis of vegetables has of late been carried to a very great extent. It has in several instances been able to seize upon and separate the active principles of a plant from all other ingredients, and thereby prove to us that in the substances upon which the experiments have been made, the active property is a distinct and essential principle. Whether the number of these articles will become extended, and in each the differences of their action will be found to depend upon a distinct substance, or on the combination of the vegetable principles already known, time only will determine. In the mean time we cannot but acknowledge the very important assistance the Materia Medica is daily deriving from that science, and its utility in pointing out the medicinal properties of plants.

From the Animal kingdom we derive but few medicines, and such as have been employed are so nauseous, and frequently so inert, that they have been discontinued in practice, or nearly so. There are, however, one or two articles of great power still in use.

The substances, then, or medicines which are comprehended under the title of the Materia Medica, are derived from the Three Kingdoms of Nature. It is rarely or never that they are simple substances, but they are composed of principles which are different in their nature, and more or less numerous. This variety gives to each medicine properties which are peculiar, and which distinguish them from every other. If aqueous, gummy, oily principles, etc. prevail, they form medicinal agents, inert, insipid, and without much virtue, which are only useful as demulcents. If principles which are bitter, saline, resinous, enter into the composition of a medicine, it becomes possessed of powers much less equivocal—and these principles enter into the majority of those substances which are usually employed. In other cases there are found elements so energetic, as to give to the article in which they are discovered great activity, insomuch that they may become dangerous. These are medicines which contain the vegetable alkalis, as the Emetine, the Strychnine, the Morphine, the Brucine, etc., and which are to be given with great caution and in small doses.

It is easy from this view to conceive, that each medicine is endowed with an active power, which becomes sensible as soon as it is brought

into contact with the living system. Can we develope the essence of this action, or penetrate into the conditions of its existence? Notwithstanding the difficulties of the subject, the curiosity of physicians has been excited to inquire into the cause of this inherent power of medicinal agents. They have made various efforts to raise the veil which obscures the subject, and have buried themselves in a number of researches to discover the sources of it, and to know the causes of it. So far we must confess that the means of investigation employed in the Physical and Chemical sciences have been useless, and the conjectures which have been formed as to the immediate cause of the active powers of medicines generally, have been vague and visionary. The effects which follow their action may be conceived to depend upon the impression made by their particles upon the organic structures, and that the sensible effects which are produced, may be considered, for the most part, as a reaction which the powers of the vital principle determines in these parts to resist their operation. In the application, therefore of a medicinal agent to a living part, if it is capable of making an impression, there is an effort excited to resist its action, and from this there results a connected series of movements, which are manifestly the efforts of these organs to rid themselves of the medicinal substance. This leads to the modus operandi of medicines, which will form the subject of the next lecture.

Having said much upon the Relations of Botany to Medicine, I cannot conclude this Lecture without enforcing the study upon you from threefold considerations.

1. Its utility in the stations you are to occupy as physicians. You are aware that the most valuable of our remedies are derived from the Vegetable kingdom, and that these are influenced in their effects by circumstances connected with their growth, age, season at which they are gathered, etc. It is therefore highly important that we should be acquainted with the organization of the vegetable world—know the laws which regulate its increase, maturity and decline—the changes to which they are subjected at different stages of their growth. Without this knowledge we cannot be certain that the plant which we are employing is in a state to furnish all the benefits which may be afforded.

A knowledge of this science is further necessary to enable us properly to discriminate one plant from another. Common names are often so fancifully and arbitrarily applied, often too the same name, or a slight variety, designating plants totally different in their classification, properties, habits, that a degree of knowledge more than is commonly possessed is required to distinguish one plant from another —to show the fallacies which have determined its title or its application—and to establish in one's mind a correct estimate of the value which should be attached to its reputed properties.

Furthermore, the common people in their discussions upon the names and properties of plants, are apt to appeal to physicians as umpires in their disputes. When the information sought after can be furnished, and that determined by a scientific acquaintance with

the subject, the effect is uniformly favourable to the attainments of the physician, and proportionately raises his character.

In the second place, it furnishes the mind, particularly when the scene of our labours is the country, with a source of much and ever varying amusement. The faculties of the mind which are called into exercise in the pursuit of this study, are such as conduce to its improvement as well as to its gratification. With the exercise of memory in treasuring up the names and localities of plants, the powers of observation become enlarged, and the perceptions are also awakened. The mind passes with rapidity from one object to another—dwells upon its prominent beauties, or dives into a minute analysis of its structure—derives pleasure in the order, regularity, fitness of parts which are so conspicuous in all, even the most insignificant of Nature's works. An amusement so rational, while it purifies and elevates the feelings, fills up much of the vacant hours of life, which often, from no other cause than the absence of occupation or a pursuit, are spent in unprofitable amusements, sensual indulgences, or vicious and degrading excesses. Once a Botanist, his pleasures are not confined to his immediate climate—the productions of other countries invite and captivate him—wherever chance or inclination lead him, he is at home—to him all nature smiles, and myriads of objects court his acquaintance, and seem formed for his pleasure.

Lastly, it affords to an improved mind, much and rich food for philosophical reflection.

"Take the phenomena of vegetation, and what a secret world of wonders is there in every plant! Growth, vegetable growth, which to the ignorant is a bare and naked fact, is to the scientific eye a history, a whole history of things the most interesting to every intelligent mind. Survey it throughout from its foundation silently and mysteriously wrought in the dark and senseless earth until it rises up to the stately plant or the towering forest tree—examine its intimate structure—trace the firm and tough fibres which give it strength to resist the storms amidst which it flourishes—observe the ducts and channels carefully laid in it to convey streams from the rich fountains of life below—mark its numerous cells, those secret laboratories of Nature—survey all this exquisite and wonderful workmanship, and who, I ask, would not know something of all this? Who would not give a little time to procure so great satisfaction? Who would be content to pass through one spring season, and understand nothing of these most curious and wonderful processes that are going on around him?"—*North American Review.*

References.—*Traite Elementaire de Matiere Medicale*, par J. B. G. Barbier; *Paris' Pharmacologia; Seyder's Examinations; Cullen's Materia Medica; Pereira's Lectures.*

On the Modus Operandi of Medicines.

PREVIOUS to the consideration of the Materia Medica properly so called, it may be expected, and it is usual to give some general idea of the modes of operation of those articles which I shall present to you. This is not a subject of mere speculation, but one upon which you will be expected to have such settled views as the obscurity in which it is involved will admit. I wish it was in my power to remove all the doubts and difficulties which overhang the subject; but as our path is checkered and beset with many difficulties, I will endeavour to be as good a guide on the way as I can, hoping that it may be the good fortune of some of you, to fall upon a nearer and less intricate rout.

The Modus Operandi of Medicines is, as I have observed, an intricate and obscure subject, one upon which much speculative and ingenious reasoning has been exercised, and one to a physician teeming with interest. The only point fully admitted upon this subject, is, that the operations of medicines do not depend on the laws of matter and motion which take place in inanimate bodies, but on a principle which exists in living animals only.

"Medicamenta non agunt in cadaver."—This principle we have denominated life, and upon which as controlling and modifying the actions of medicines, I shall make a few remarks. What *life* is, I cannot attempt to explain, but only the circumstances under which it is found. It is found intimately connected with organization, and the greater or less perfection of the organic arrangement gives rise to more or less perfect life. In the higher orders of animated bodies, we observe a variety of functions continually exercised, and from these numerous phenomena ensue. In them we observe a cavity of the skull which is filled with the brain—a spinal marrow—nerves of two sorts—five senses—muscles partly obedient to the will, partly independent in their action—a digestive canal—vessels and lymphatic glands—arteries and veins—a heart and lungs. From these various actions arise, and the term *life* is applied to an aggregate of phenomena which manifest themselves in succession for a limited time in organized bodies. These organs are but so many parts of a machine destined for the preservation and support of the animal; impair these health is impaired, and the energies of life—for health and life, we conclude, are designed from the animal mechanism; destroy any of these organs of importance to the system, and health and life are destroyed. The misfortune is, that life has been considered as a principle existing by itself, and independent of the actions by which it is manifested. It has been considered as distinct from the body, and as separable from it. Organization is however essential to life, and it can no more exist without it than gravitation without weight.

By one class of writers the phenomena of life have been ascribed to organic structure, just as the sounds of a musical instrument are referred to the mechanical arrangement of its parts.

By another class it has been assumed, that there exists a living

internal principle, (some have compared it to the electrical,) distinct from the body, and which is the cause of the organization.—*Barclay on Life and Organization.*

Of the nature of this principle we can know nothing, and all attempts to explain it have terminated in absurdity. We can only judge of it by its effects. These we know are a capacity of resisting the combined action of *heat*, *moisture*, and *air*, to which the body yields when deprived of it. Here chemical operations commence which tend to its destruction, and it is these laws which are kept in subjection while vitality continues. The latter maintains our existence, while the former is our perpetual enemy, we may say. By a preponderance of the one, we are kept in health—by a preponderance of the other we become diseased, we die, and are decomposed. Between these laws, therefore, there is a constant struggle.

Another property inseparable from vitality, is the capacity of adding to the growth and increase of the system. The conversion of alimentary matter into a nutritive fluid, and its assimilation, experience no interruption while the animal is in health.

Caloricity, or the power of animated bodies to maintain a certain temperature in every variety of latitude, is another property peculiar to life. Such are the effects of this wonderful principle. We do not know of it in a separete and distinct state of existence, and only become acquainted with it in connection with organic arrangements.

Upon the subject of Physiology and the principle of Life particularly, Bichat has written much, and has added more original matter than any writer that has preceded him. His essential doctrine is, that there is no one single, individual, presiding principle of vitality, which animates the body, but that it is a collection of matter, gifted for a time with certain powers of action, combined into organs which are thus enabled to act, and that the result is a series of functions, the connected performance of which constitutes it a living thing. This is the most simple and general view of life.

In considering the subject further, he points out two remarkable modifications of Life as considered in different relations;—one common both to vegetables and animals, the other peculiar to animals. The one he calls Organic Life, and the other Animal Life. By organic life food proper for our nutrition is submitted to the operation of digestion, is thrown into the circulation, undergoes the action of the lungs, and is then distributed to the organs to be applied to their nutrition. This is the life by which all parts of the body are kept in a state of repair; it is the life of waste and supply. By animal life, we become related to the world around us; the senses convey to us a knowledge of the existence of other things besides ourselves—we feel, we reflect, we judge, we will, we react upon external things by means of the organs of locomotion and voice, we become capable of communicating and receiving pleasure and pain, happiness and misery. In fact, by organic life we merely exist negatively—by the animal that existence becomes a blessing or a curse, a source of enjoyment or suffering. For further differences between these two lives, I

must refer you to Bichat's Researches on Life and Death, a work replete with interest. I have said thus much upon a subject about which we cannot have settled views. I have stated such as seem to me most correct, and as much as was necessary for my purpose, for it is by the agency of life that medicines operate, and have their actions modified.

In proceeding to speak of the Modus Operandi of medicines, I enter upon a field of controversy, in which every step has been the subject of attack and defence—a field in which the contending advocates have been as irreconcileable, as partial and contracted views could make them. Theories having nothing for their support but the zeal and plausibility of their founders, built upon limited views of the subject, and the purport of which has been to bend all the operations of the system to suit their convenience, have been successively advanced. The decline of one has had no other effect than to give birth to another, equally slender in its structure and evanescent in its duration. I shall therefore adopt no theory, but avail myself of such facts as are known; and without confining myself to one system of organs, shall bring to my aid the support which can be afforded by other organs, in adding clearness, and, I hope, more correctness to our opinions upon this obscure and intricate subject.

In commencing to speak of the action exercised upon the animal economy by medicinal substances, it is necessary to present to your view the various parts of the body to which it is customary to apply them. These are, 1. The Stomach and Intestinal Canal; 2. The Blood Vessels; 3. The Skin; 4. The Olfactory Nerves. Other parts are occasionally resorted to; they are the extensive surface forming the ærial passages of the Lungs, the interior of the Mouth, the Urethra and Bladder, and in women the Vagina.

First. Their impression upon the stomach and intestinal canal. As the stomach is the receptacle of all that is taken into the system—as it is endowed with so large a share of nervous energy—as its connections are so numerous and extensive, it must be obvious, that impressions made upon it, will be greater in degree than upon any other of the divisions I have mentioned. The stomach is possessed of powers which place it—I might say, could they be insulated—above those of any other organ of the body. These it derives not only from the important offices it performs, but from its seat and connections. The nerves it receives from the brain and splanchnic ganglions, not only augment its sensibility to a very considerable degree, but favour the transmission by sympathetic connections, of medicinal influences to every part of the body. Intimately connected with the head, the heart, the lungs, the stomach seems to divide with these organs the impressions which medicinal agents make upon it. Not only in a physiological point of view is this organ of the greatest importance, but it is no less so in a pathological. Not only is it affected in most diseases, but when diseased itself, derangement of the whole system ensues. Hence pains of all kinds succeed, in the head and limbs, with heat,

nausea, loss of appetite, anxiety, and these symptoms constitute a disease which appears to affect the whole frame.

The two properties of the stomach upon which the impressions of medicines are made, are its sensibility, and irritability. By the former is meant that condition of the stomach which is fitted to have peculiar effects produced upon it by the action of other bodies, and which seems to lodge in every part of the nervous system. And that condition of the stomach by which certain parts are fitted to have certain motions of contraction excited in them by an impulse made upon the parts themselves, is called its irritability. I would therefore conclude, that the peculiar effects of substances in general, and of those substances we call medicines, depend upon their impression on the sentient and irritable parts of the stomach. But what is the nature of this impression? Is it merely an increase of the vital energies of the part, or does a change take place in their actions? That an increase of the energies of the organ takes place, is obvious from the phenomena which ensue. The capillary vessels become enlarged and distended with blood—the temperature of the part is increased—the secretions emptying into the organ are all augmented to a considerable degree—the muscular fibre is stimulated to contractions of a more vigorous and active character. This impression, it may be remarked, is not the same in all cases. It varies according to the quality of the article. It is different when excited by alcohol, by opium, by mercury, by jalap. It is modified in every variety of manner according to constitution, habit, the situation of the part, the nature of the stimulant, the state of disease. We cannot therefore decide upon the exact nature of the impression—we only know that it is one of a decided character, consisting in an increase of the vital energies of the part, and that from them very important effects are derived in the treatment of diseases.

I may next inquire, whether to an increase of action produced by the impression of medicines upon the stomach there is not also a change of action? That a change ensues might be inferred from the circumstance, that medicines act upon the organized tissues of the body; these tissues form the organ, and execute the functions which are recognized as performed by that organ. A medicinal substance producing a change in the state of the tissue, in like manner produces a change in the movements of the organ to which this tissue belongs; the function therefore which the organ performs, is executed in a different manner, and with particular modifications.

To render this point more clear by examples, I will state that emetic substances act upon the mucous coat of the stomach. This, with the muscular coat, contributes to the formation of that organ, and from them are produced the functions or phenomena which appertain to it. The emetic, therefore, producing a change in the movements of the organ, its functions are performed in a manner different from what is usual, or are in other words changed. There can hardly exist a doubt but that such a change takes place in the

example just given, and the effect would be still more striking if the medicine instead of being taken during sickness, was administered to one in health. Many other examples might be furnished in which the disturbance of the organ is not so apparent, yet judging from the effects which follow the impression of the medicine, there would be as little hesitation in the conclusion. Such, in short, is the irritable nature of the internal surfaces that every impression is attended with some change. This change, according to the manner in which it is made, may either remove or bring the organ back nearer to the state of health, and it is only by such sanatory efforts being made, either locally or generally, that we can even expect to restore the organ or system which has been deranged in its action, by the influence of morbid causes.

In considering the actions of medicines upon the stomach and alimentary canal, regard must be had to their secondary as well as immediate effects. The remarks I have made must be considered as referring to the latter. It is proper, therefore, that I should say a few words upon the *secondary* operations of medicines. These I need scarcely state, follow, as consequences of the impression of medicinal substances upon the alimentary canal. They are of infinite importance, and it is frequently to obtain their full influence on the system, that medicines are administered. It is to them that we are to attribute the relief which takes place in the developement, progress, and effects of disease—to them that we are frequently to expect the mitigation of some symptoms, the removal of others, and the entire change which is effected in the actual condition of disordered structures.

To illustrate these remarks, by the action of several classes of medicines. The primary effects of emetics are the impression of the article upon the mucous coat of the stomach, the inversion of that organ with the upper portion of the duodenum, and the evacuation of their contents,—the secondary, the change which has taken place in the distribution of the fluids, the relaxation the system undergoes, the diminution of action, the reduction of the disease.

The operation of cathartics equally illustrates the above views. The effect of their impression is an increase of all the intestinal secretions, the serous in particular becoming augmented in a considerable degree, with those of the pancreas, liver, mucous glands, etc. From all these sources the discharges become very considerable, and the operation on the constitution, or the secondary effects, are exhibited in the dimished force and fulness of pulse, the reduction of inflammation wherever situated, the removal of pain, a more equal circulation of the fluids, the secretions more regularly performed—in short, the system under the influence of this new irritation of the intestinal surface becomes essentially altered in its actions. These views may be further confirmed by considering the action of various other classes of stimulants, narcotics, antispasmodis, epispastics, in all of which the secondary effects of the articles are of the utmost consequence in our treatment. These effects in some of the classes, as for instance

the stimulants and even the narcotics, follow their administration so promptly, that we cannot readily draw a distinction between the first and second impressions; but though prompt, an interval may be conceived, since in every instance the action is first exerted upon the sensibilities of the stomach, from thence it is extended to the brain, and from thence to the system at large. The organs sympathising with the brain in the strongest degree, exhibit the influence of its action strongest—the heart becomes soonest excited and the increase of the circulation, the first evidence of its excitement. The nervous system is therefore the channel through which we most readily operate upon the general system, but it is not the only one.

The Blood vessels or the circulation afford another. Few subjects have undergone greater discussion than that of the Introduction of Medicines into the Circulation. The opinion that they entered the circulation, originated with the advocates of the Humoral Pathology, a doctrine which prevailed at different periods to a considerable extent, and of which the celebrated Boerhaave was the most zealous advocate. This doctrine attributed all morbid phenomena to the disordered condition of the fluids or humors of the body, and attempted to explain the progress and changes of diseases by certain fermentative or digestive operations of the humours. According to their several conceived conditions was the nature of the remedies employed;—they were denominated from the effects they were supposed to produce. Thus they were antacids, and antalkalies, diluents, demulcents, inspissants, with others, as phlemagogues, hydragogues, cholagogues, etc., according as any of these principles prevailed, or any particular object was to be accomplished. Many of these terms are still retained, though employed in a sense widely different from what prevailed during this very imrpefect state of Pathology.

However erroneous were many of the conclusions drawn from morbid appearances, and which were adduced in support of this doctrine,* still there are many facts in the production of diseases which cannot be explained otherwise than upon an altered, and I may say diseased condition of the fluids. The experiments of Dedier and Couzein prove that the blood and bile are morbidly affected in the plague. Dr. Francis Home practised the inoculation of measles with the blood of morbillous patients, in several instances with complete success. The communication of the small-pox to the fœtus in utero is inexplicable on any other ground. In the Memoirs of the London Medical Society, a case is related by Mr. Turnbull, of a lady who was inoculated in the seventh month of her pregnancy. Nine days after the eruption she received

* The occurrences adduced in support of this doctrine, were—the formation of chalk stones after inflammatory gout, the expectoration of purulent and mucous sputa in consequence of inflammation of the lungs and the bronchial passages, and the buffy coat which is formed upon the surface of blood drawn in inflammatory diseases. These occurrences were adduced as the strong supports of this doctrine, and were supposed to be the peccant matter of the system which was eliminated and expelled in this manner. They are explained at present by a morbid action of the vessels of the part, on the system generally.

a fall, and in a few days after was delivered of a dead child, which was covered with variolous pustules in a state of suppuration. The matter was proved to be variolous, from its communicating the disease to several persons who were inoculated with it. One or two instances of a like nature are related by Dr. Hosack. It is also well known that the lues venerea is communicated from the mother to the fœtus in utero. If then the poison of contagious diseases can circulate in the sanguiferous system without injury, why may not medicines also pass into the system with impunity?

The principal argument advanced against the introduction of foreign substances, is the change which all substances undergo, before entering the circulation. It is said that the glands, so commonly met with in the course of the absorbents, assimilate the fluids conveyed by their vessels, and prevent the passage of any foreign substance. Plausible as this statement may seem, the blood is however a very heterogeneous fluid, and were it my province I could satisfy you fully on this point. I am however to prove, that medicines, notwithstanding the above objection are frequently conveyed into the circulation, and though many authorities could be adduced on this subject, I shall content myself with the experiments of Magendie, as repeated and confirmed by Drs. Laurence and Coates of Philadelphia. These experiments prove very satisfactorily that foreign substances are admitted into the circulation, and that by three several channels, viz.: the branches of the vena portæ, the œsophogeal veins, and the lacteals. The article they experimented with was the Prussiate of Potash. This article, they observe, has advantages in inquiries of this kind, as being at once more easy of absorption, and of exposure by chemical means, of all the different substances they had tried. It was introduced into the alimentary canal of different animals, and after sufficient time had elapsed, it was tested in the thoracic duct, in the blood, in the urine, and found to exist in these several fluids.

Experiments made with solutions of the Sulphate of Iron injected into the abdomen, and the cellular tissue of cats and kittens, evinced when the fluids of the thoracic duct, or the blood, or the urine, were tested with the Prussiate of Potash, the presence of iron. They likewise observe in their experiments with Camphor, that there is positive evidence that it may and does pass through the system of the blood-vessels. In two experiments with Assafœtida, this substance pervaded the whole system in a short time. They remarked, however, that the smell of assafœtida predominated in the mucous surfaces. From these experiments there can be no hesitation in admitting the introduction of foreign substances into the circulation.

Further discoveries have been made, and it was distinctly proved, that artificial chemical changes can take place in the fluids while they continue to circulate in living vessels, and the ordinary actions of life go on. To prove this point, a solution of the Prussiate of Potash was thrown into the abdomen, and a solution of the green Sulphate of Iron into the cellular tissue, in order to try whether the well known result of their admixture,—the Prussian Blue, would be pro-

duced in the vessels. This, however, did not take place, and the experiment was repeated, and varied, by throwing the Sulphate, as being of more difficult absorption into the abdomen, (where the process of absorption goes on with more facility,) and the Prussiate into the cellular membrane. On performing this, they were gratified by the striking result of a distinct and beautiful blue in the thoracic trunk and its contents, and in nearly the whole substance and surface of the lungs. These viscera were preserved in spirits. Thus, they add, not only foreign, but a pulverulent substance could present its unnatural stimulus, circulate through the vessels, and could accumulate in the lungs, without preventing the actions of life, and without occasioning coagulation of the blood. The experiments of Magendie, as confirmed by these gentlemen, whose character for talent and veracity entitle them to our highest confidence, may be considered conclusive on this subject.

We have, then, from the experiments of these gentlemen, the foundation laid for future researches, and for enlarging our ideas upon the operations of medicines. Their experiments will have contributed to form a new era in physiology, and will tend to form new and more correct views of the operations of medicines. They have opened to us other channels by which foreign substances may be introduced into the circulation, besides the lacteals—have proved to us, that these substances are introduced into the circulation, and in a shorter period of time than could have been anticipated—and that they could exist there as chemical substances, without having their nature altered and animalized by the action of the vessels through which they have entered the system. These are points of primary importance in the investigation of our subject, and will doubtless operate powerfully in removing the prejudices which have long been entertained relative to the admission of foreign substances into the mass of circulating fluids. Hereafter, when we hear of sympathy, applied as it has been as the rationale of every change produced by the action of active agents upon the body, we shall listen with astonishment, and wonder at the credulity of the times.

Besides these articles, there are various others of the introduction of which into the circulation, the most sceptical cannot but be convinced. Of these are Potash, Soda and Nitre, which are carried into the circulation, and which may be detceted in the urine. Let any person, says Dr. Paris, take several doses of Nitre, taking care that the bowels are not disturbed by the medicine, and he will find, by dipping some paper into his urine, and afterwards drying it, that it will deflagrate upon being inflamed, and indicate the presence of Nitre.

I might multiply facts and authorities to a greater extent, and not only relate results derived from an examination of the blood, but from the milk, the saliva, the urine, and the bones. Thus the urine is often coloured by taking large doses of Rhubarb or of Saffron; it is not only coloured, but acquires a peculiar odour from Asparagus. We sometimes discover in the perspiration the effluvia of volatile

substances, as the Oil of Lemons, and other matters which have been ingested. The pulmonary exhalation is frequently affected with the odour of Garlic, of Onions, of Alcohol, of Æther, of Camphor. The colouring matter of Madder is found in the excretions, and particularly unites itself to the bones.

We discover in milk, the bitterness of many plants, the acrimony of others, the fœtor of others, when the animals which furnish it have fed upon them. These effects necessarily follow from the admission of foreign substances into the circulation. They have been proved to be admitted by the experiments I have detailed to you, and I might greatly multiply their number, but conceive that a single experiment detailed by an unbiassed individual, and conducted upon philosophical principles, worth a hundred others, the authors of which are unknown and their prejudices and views still more so. I shall go on to state that not only foreign substances may be introduced into the circulation, but that they may be injected into the veins, and produce effects similar to their introduction into the stomach. Thus we are informed by Haller, that a poison or medicine injected into a vein will produce certain determinate effects—as vomiting in the stomach, purging in the intestines, and drunkenness in the brain. From experiments made by Mr. Milman it appears, that solutions of Tartarised Antimony injected into the jugular vein, have produced effects similar to those produced by their introduction into the stomach. He dissolved 15 grs. of Tart. Antimony in half an ounce of warm water, and injected it into the left jugular of a full grown terrier. In two minutes he vomited profusely, and appeared greatly distressed and debilitated. In twenty minutes violent vomiting and purging commenced—he became very weak, his stools passing involuntarily. In thirty-five minutes he expired. Solutions of Gamboge and Scammony produced the same effects as if they were introduced into the bowels. Effects corresponding to the nature of the article have followed from injecting solutions of Opium, Nitre, and other substances, and they have lately been employed in the treatment of diseases. Magendie has injected warm Water into the veins of a patient afflicted with Hydrophobia, and solutions of Opium have been employed in Tetanus. The following case was taken from the Philosophical Trans. Abridg. Vol. iii. p. 234. We have injected by a siphon about 2 drachms of a laxative medicine into the median vein of the right arm of three patients in the Hospital of Dantzic. One of the patients was a lusty, robust soldier. He, when the purgative liquor was infused into him, complained of great pain in his elbow, and the little valves of his arm did swell so violently that it was necessary by a gentle compression of one's finger to stroke up that swelling towards the patient's shoulder. Some four hours after it began to work, not very troublesome, and so it did the next day, insomuch that the man had five good stools after it. The other cases are similar in their results.

From the details I have given you, founded upon the experiments of very distinguished individuals, there cannot exist a doubt, that

active substances may be introduced into the circulation in their original state, and that so far from being productive of ill consequences, they may be made subservient to beneficial purposes. The advantages we derive through this channel in the operations of medicines have not sufficiently been enlarged upon by medical writers. It is my firm belief that many articles of moderate and feeble powers of action, those the operation of which is so gradual as to be necessarily continued for a length of time—those whose action is exerted upon organs removed from the centre of the system, as the kidneys, bladder, skin, lymphatic glands, genital organs, exert a beneficial effect through the medium of the circulation. In these cases not only are the substances taken into the calculation, but the blood itself is changed, and by this means great changes are effected in the solids of the body. This is especially the case with some if not most of the tonics, particularly the preparations of iron; it is the case with all those articles termed Alteratives, whether of the vegetable or mineral kingdom, and it is particularly the case after long courses of mercury. In the last case the blood is observed to be not only more fluent, but of a darker colour than it appears to be when taken from persons in health.

I am aware of the objections which may be made to the view that I have taken, and that it may be urged that the changes in the fluids can only be effected through the solids. This I shall admit in part, though not exclusively. Action and reaction are mutual—and while changes are effected through the solids—others, I maintain, are impressed through the medium of the fluids. The animal system is a complex structure, consisting of solid and fluid parts whose influence upon each other is constant and mutual, and whose individual integrity is equally essential to the support of the general fabric. It is reasonable to conclude from such a view, together with the positive evidence there exists of the admission of foreign substances into the circulation, that the fluids may become morbidly deranged and involve the solids in disease, and that through either impressions may be made of a character calculated to obviate or correct these derangements.—*Medical Recorder.*

Subject Continued.

It may be observed, that all the Natural substances which are medicinal are not equally susceptible of absorption. They are not all taken up with the same facility by the vessels which perform this function. The experience of Tiedeman and Gmelin proves, that the metallic salts, those of iron, of mercury, are expelled in the largest proportion with the fœcal discharges—whilst the odour of assafœtida, of camphor, or musk, is not very sensible at the termination of the small intestines and in the large. The substances which are administered dissolved in a fluid, those which are presented to the orifices of the absorbents, united with the serum which is exhaled from the

surfaces to which they are applied, are absorbed very rapidly, and with a facility which would not readily be conceived.

The saline preparations are readily absorbed, insomuch that infants at the breast are operated upon by saline medicines given to the mother.

The colouring matter of rhubarb, saffron, madder, etc. is readily taken up.

The Medicinal substances, on the other hand, which are given in a dry or pulverulent state, those the principles of which do not readily unite themselves to the fluids which moisten the mucous surface, enter with difficulty into the channels which ought to convey them to the mass of blood. Cinchona in substance an article of this description, Magnesia, Jalap. The absorption of these substances is therefore difficult—they traverse the intestinal canal, and are to be found in the large intestines. It sometimes happens, however, that a greater or less quantity of these articles penetrate into the system and are found mixed with other substances. The absorbents, as you perceive, are elective in their operations—or, to use the fashionable word of the day, they are eclectics.

I shall now offer a few considerations upon the conditions of the surfaces favouring or retarding absorption. In the first place, it is necessary that the articles designed to be absorbed be closely applied to the mouths of these vessels. If the application of the substance is not immediate, it is excluded in a great measure from the system.

Secondly. The absorbents do not exhibit equal activity in every part of the intestinal or mucous surfaces. There are parts where their action is prompt, active, and very powerful; and there are others where they are inactive. The practitioner ought therefore to consider the condition and the physiological activity of the surface to which his medicines are applied.

Thirdly. The absorbing surfaces should not be in a diseased state, since this will modify necessarily the exercise of their action. Would it be possible to derive the same advantages from a surface in a state of relaxation, or which has its vital powers impaired, or otherwise irritated, as from a healthy surface?

Fourthly. The general condition of the system will also much impede the absorbent action. Magendie has shown that a state of plethora retards this function. He has shown at the same time that depletion from the blood vessels has restored this action to all its energy. This is an important consideration in the application of our medicines, since it proves that we cannot calculate upon the effects which depend upon the absorption of a medicine, when administered in a disease in which the pulse is strong and full, in which the blood is carried with energy into the extreme vessels; at the same time it will be seen that it is only necessary to reduce action, to deplete the vascular system, to restore to the absorbents their due degree of activity. These remarks become useful in the therapeutical application of those articles, which depend upon their introduction into the circulating system, before they become efficient. They show the

impropriety of endeavouring to obtain the curative operations of medicines, in all conditions of the system, and the necessity of studying its various states, ere we can expect the same results. Thus it is admitted generally, that the preparations of Mercury are introduced into the system, yet all practitioners will admit the difficulty in many instances of affecting the salivary glands, the test of their action in highly excited states of fever.

Having fully considered every point connected with this interesting division of my subject, I proceed to another. According to my arrangement I am to consider what action medicines exert through the medium of the Skin.

The whole cutaneous surface seems to be endowed with some sensibility to impressions, and as it possesses an intimate connection with the stomach and alimentary canal, the liver, and most of the other organs, it might be considered as one of the widest avenues to the introduction of diseases, and to the operation of remedial measures. Accordingly, it has long been the received opinion, that medicines applied in this manner were absorbed by the lymphatics, and thus conveyed into the circulation. But though such was the conclusion on this subject, I have no hesitation in stating, that I think it was embraced without due consideration; and as the subject has been examined within the last few years, with much accuracy and attention by several distinguished persons, I shall briefly relate the experiments upon which the opinion I have delivered has been founded.

The first experiments in opposition to the doctrine of Cutaneous Absorption are those detailed in a Memoir by Mr. Seguin of Paris, which were read before the Royal Academy of Sciences as early as the year 1792. In this memoir the author contends, that while the article is entire, the skin does not absorb air or water.

Dr. James Currie was the next writer on the subject. His experiments and observations, as far as they go, are very satisfactory in disproof of the absorption of water by the skin—(See his *Treatise on Cold Water.*) In the year 1788, while at Buxton, he experimented on the effects of Bathing on the weight of the body. He was weighed before entering the bath very accurately, and after remaining immersed for half an hour or more, he was weighed on coming out, when he found his weight rather diminished than increased. These experiments he repeated in baths raised to the temperature of 82° Fahrenheit, without any increase of weight being produced.

To these experiments it might be objected that the vessels of the system were full, and that no absorption would take place; yet that if the body was wasted from a want of proper food through the stomach, the plastic powers of nature would be employed to supply the defect, and to excite an absorption through the pores on the surface. To prove that this does not happen, Dr. Currie relates very minutely a remarkable case of Dysphagia, where death was the consequence of inanition, notwithstanding that the patient was placed in a bath of milk, and every other such method to support the system

was employed. The patient on different occasions stepped perfectly naked upon Merlin's balance immediately before immersion, and again immediately after it, the body being previously dried. The weights were never moved. The result was surprising, for Dr. Currie could not distinguish the slightest variation in the weight of the body, though the beam would have detected a single drachm and though the immersion had continued for an hour.—*Currie's Medical Reports.*

These facts are very strong in themselves against any power of the absorbents of the skin to take up water or other nutritive fluid. But though this point may be considered as settled by the experiments of Dr. Currie, it may still be questioned whether medicines may not be taken up by this channel and carried into the circulation, since it has been an opinion not only among the ancients but among the most celebrated physiologists of the present time. It is known that tobacco applied to the skin produced sickness and vomiting, that opium produces sleeps when externally applied; and these effects were all explained upon the supposition that the substances were absorbed and carried into the circulation. The experiments of Seguin and Currie seem to have directed a spirit of philosophical investigation to the functions of the skin, and the subject has been carefully examined in this country in a manner highly creditable to the several gentlemen so engaged. These gentlemen were, Drs. Klapp, Dangerfield, and Rousseau, who in a series of well conducted experiments, have determined that the skin has no power of absorption in its natural condition—and that if it does ever absorb, it is only in paticular situations.

The articles for their experiments were such as produce a characteristic impression upon some of the fluids of the body. Spirits of Turpentine was one of these, and its presence in the system is denoted by its communicating to the urine the smell of violets. The manner in which the experiment was conducted was as follows:—

The hand or foot was immersed in a vessel containing Spirits of Turpentine, and kept in it for an hour or more. At the expiration of this time it was removed, and in the course of a few hours the urine was found to be impregnated with the smell of violets. From this experiment it is evident that the Spirits of Turpentine was taken into the system, and that the test of its presence could be detected. It was, however, doubtful whether the Turpentine was conveyed through this channel or another suspected source, which was the lungs. To ascertain this point, the experiment was varied in some degree. A jar filled with Spirits of Turpentine was inverted over a mercurial trough, in such a manner that none of the fumes of Turpentine could escape. In this situation the hand and wrist were introduced into the jar of Turpentine, and kept there for an hour or more. It was then withdrawn, well washed, and in the course of an hour, the urine was attended to, but there was not the slightest smell of the odour of violets to be detected. The conclusion therefore which would follow from this experiment would be, that as in one instance the presence or Turpentine was detected in the urine when

a part of the body was immersed in it, and while the fumes of Turpentine circulated in the atmosphere; and that in the other instance when a part of the body was equally immersed and the fumes prevented from rising, there was no test of the presence of the article in the system, that its introduction in the former case might be attributable to the vapour of Turpentine being carried into the lungs in the ordinary process of respiration.

To render the point certain, another experiment was instituted. A glass vessel containing a quantity of atmospheric air was inverted in quicksilver; three or four ounces of Spirits of Turpentine were introduced into it, and agitated with the air contained in the vessel in such a manner as to intimately mix the vapour with every part of it. A glass tube was then used, one end of which communicated with the air in the vessel and the other end was taken into the mouth, and in this manner the air highly charged, was inhaled, without suffering any of it to come in contact with the skin. Upon examining the urine an hour and a half after this inhalation had taken place, it was found imbued with the smell of violets, and the smell was still stronger a few hours afterwards.

Similar experiments were made with various other substances—as Camphor, a strong infusion of Garlic, a decoction of Asparagus, without any test being discovered of their absorption by the skin. These experiments may be regarded as very nearly if not entirely decisive, and they clearly disprove cutaneous absorption in the healthy and undisturbed condition of the skin.

Besides, the structure of the skin is opposed to such a belief. For while it is admitted that the exhalents of the skin pierce the epidermis, and come in contact with the external air, the mouths of the absorbents terminate under it and are covered by it. By examining the skin with a microscope, it is discovered to be of a squamous texture, resembling in its arrangement the scales of a fish, and it is under these scales that the mouths of the absorbents commence. While it remains unirritated and entire no absorption takes place. When absorption does take place, the article must be forced by mechanical irritation under the epidermis; and it happens that in particular parts of the body where the skin is thin and delicate, as the inside of the arms and axillæ, the thighs and genitals, absorption takes place very readily; or where this is not done, the epidermis has been destroyed by injury or disease—or if sound, the article is of an acrid nature, which first erodes the tegument and comes in contact with the mouths of the absorbents.

The experiments of M. Seguin confirm the above opinion. He dissolved in the water of the bath in which he made his experiments, substances which produce a specific effect upon the system, by which absorption might be ascertained. He employed the Per chloride of Mercury, in solution, on a number of venereal patients, and while the epidermis was entire, he never perceived a single instance of salivation, or even amendment to their complaints. But when the epidermis was destroyed, as in ulcers or the itch, the specific effects of mercury

on the system were soon produced. It is unnecessary to state that the doctrine of cutaneous absorption is a subject of doubt and discussion among physiologists, many still asserting that it does take place. In a note to Meckel's Descriptive Anatomy, it is even stated that Lauth, Jr. has succeeded in injecting the cutaneous lymphatics with quicksilver; but as no details have been been furnished, neither has the work reached this country, I have not changed the opinions I have delivered on this subject. These opinions have been confirmed by those of Beclard in his Descriptive Anatomy, who observes, that in the experiments and observations in favour of this absorption, it may have taken place by respiration as well as by the skin. In other cases in which the epidermis has been softened, altered, or abraded by continual applications to its surface, or repeated rubbings, absorption is no longer cuticular, but of the same kind as that which takes place in the mucous membrane, or by inoculation, when the matter is carried through the divided epidermis into the corpus mucosum, and even into the dermis, both parts being eminently absorbent. When this is done, there remains a small number of facts which show, that certain substances are absorbed by the skin through the epidermis in its entire state, but that this membrane is truly an obstacle that very often prevents the absorbent power of the external tegument.

Having shown that the supposition of absorption by the skin in a natural state, and the effects upon the system which were derived from this source, were gratuitous, it remains for me to point out in what manner impressions attributed to this source, are communicated to the system. These, as I have already hinted, are in some degree by the lungs, but they are also in a very conspicuous manner by the *olfactory* nerves. The influence which these nerves exerted over the system, had been obscurely hinted at by former writers, and the practice so general of applying amulets round the neck, and other customs among the common people may have had its origin in these opinions so vaguely delivered. To the industry and ingenuity of Dr. Rousseau, we are indebted, for reducing to a certainty what was only speculation, and opposing by experiment what had formerly been a subject of conjecture.

For this purpose, he employed a number of articles which were known to produce the most unfriendly effects upon the system—as Tobacco, which we know when applied to the skin in the form of a cataplasm produces vomiting; Ardent Spirits, the fumes of which when inhaled produce intoxication; and other articles of a like nature, could by a variation of his experiments either excite, or prevent these effects from taking place.

In order to test the effects of Tobacco, a stout Irishman unapprised of the intention of this experiment, was hired for the purpose. His nose was made impervious with lint secured by adhesive plasters. A bath of a strong decoction of Tobacco having been previously prepared, he was put into it, and remained in it up to his navel for one hour and a half without evincing the least symptom of nausea, or

any other uneasiness, whereas the bystanders called to witness the experiment laboured under such a degree of nausea as to he put to the necessity of leaving the room, and some of them suffered from severe vomiting. A child seven years of age was plunged up to the neck, and remained in a bath of the same kind for two hours, his nose being secured, and suffered so little inconvenience that he ate cakes.

A lady of a delicate constitution, extremely prejudiced against the smell of tobacco, having been repeatedly sickened by the breath of gentlemen chewing this vegetable, was induced to try the experiment. She first convinced herself, that when her nose was closed there was nothing nauseous. A quantity of tobacco leaves having been put into a large pan with a gallon of water over a chafing dish, and suffered to boil for some time, she breathed the fumes through her mouth, holding her nose with her fingers for half an hour, without experiencing the least nausea. Similar experiments were made with the fumes of Ardent Spirits, and the results were conclusive. The vapour from the liquor being inhaled for an hour or more with the nose secured, without any other sensation than a smarting of the throat occasioned by the fumes. The same experiment repeated the next day without the same precaution, for half an hour, produced so much giddiness that the person begged to be excused, declaring that he felt so giddy he did not think he could stand, and actually staggered in going to a chair.

From these experiments we have strong reasons for concluding that the vapour of volatile substances, and of many other applications which are made to the skin, instead of exerting their action through the organ, have their effects impressed upon the system through the medium of the olfactory nerves. These experiments are highly interesting in a practical point of view, as well as illustrative of the utility of many applications to the nostrils in common practice—as volatile substance in syncope, and applying a handkerchief, or piece of fine cloth, or gauze, before the organs of respiration, when passing through swamps or other offensive places, so as to intercept insalubrious particles which are mingled with the air breathed—since it is highly probable that it is from the impression of these particles upon the Schnciderian membrane of the nares, fauces, and also upon the delicate passages of the lungs, extended to the brain, that a foundation is laid for disease.

The other surfaces to which medicines are applied will not at this time be considered separately, but will be treated of when speaking of the articles which act upon these surfaces, in the course of the Lectures.

The consideration of the Modus Operandi of medicines would be incomplete, were I not to say a few words upon their sympathetic action, a subject so much enlarged upon by the Solidists.* You are

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* The Solidsits are that class of physicians, who refer all changes in the system to the immediate influence of the solidum vivum or living solid. They are, as

aware that even at the present time Profs. Chapman and Caldwell have attempted to explain all the operations of medicines by the influence of sympathy. After the details and experiments I have laid before you, the absurdity of such an opinion must be manifested. Still, however, I would not wish to be understood as rejecting the sympathetic actions of medicines, but on the contrary would state, that through this channel many of the changes which take place must be explained. I have already alluded to the subject, but before concluding will make a few other remarks. The origin of the term. The term *sympathy* is inappropriate in medical phraseology. It is itself a term of vague and indefinite character, and is more properly applicable to the interchange between mind and mind, than to impressions of a corporeal nature. It is used however in both senses, and in a medical point of view has reference to the changes occurring in parts of the body remote from each other, through the medium of the nervous system. That a connection exists in physiological relation between the different parts of the system, numerous facts in health and in disease could be adduced. To enter into their details would be outstepping my limits, my province being to adduce examples of such medicines as have their actions exerted through this channel.

The medicines which extend their influence to the system, by means of sympathetic connections, make an impression more or less considerable upon the part to which they are applied. They change at first the vital operations of the gastric organ, and give to the nerves of this part a new action, which is extended to the whole cerebral system. That such is the case, will be obvious by causing a person to take a portion containing Laudanum. The changes which I have represented as succeeding, are soon exhibited, and it is then that we observe spasmodic actions to subside which exist in remote parts. The medicinal substance makes an impression upon the surface which receives it, and it is this impression which excites the sympathetic actions. From this point it may be said to go out the changes, which are to be propagated to all other parts of the system. Effects similar in many respects may be said to attend the introduction into the stomach, of ardent spirits or other stimuli. A local impression being first produced, and this becoming extended through every part of the system. Upon similar principles we explain the action of Bark in arresting an approaching intermittent when given before the expected paroxysm, or Digitalis in speedily reducing the action of the pulse. Examples might be furnished from other classes.

It is always to the cerebral and nervous systems that we should apply for an explanation of the transmitted impressions of medicines from one part to another. All new or unaccustomed impressions excited in the organs of the body, are extended to the brain, and from thence to the rest of the system. All the parts of this great system

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may readily be conceived, directly opposed to the Humoralists, and may be considered as dating their existence as a distinct sect from the time of Hoffman, who flourished in the beginning of the eighteenth century, 1730.

have an intimate relation—the brain with the spinal marrow and ganglions, these with each other, and through their diversified ramifications with the whole organized structure. Strictly speaking, therefore, every article taken into the system, whether medicinal or otherwise, excites this extended chain of action, and therefore those attached to the doctrine of sympathy, might argue that any thing operates by sympathetic action. To maintain, however, that there is but one action common to medicines, *i. e.* Sympathy, is to contend against all the discoveries which have been made in physiology, in the action of the absorbents, and of the numerous facts which have been discovered on this subject, and not only betrays ignorance, but violates all the rules of true philosophy.

When wishing to avail ourselves of the advantages to be derived from sympathetic influences, it is important to consider the extent of the impression which the agent makes upon the part of the body to which it is applied, and to study the relations which this part maintains with the rest of the system. As every agent is not equally adapted to bring into action the play of the sympathies, so neither is every part of the body to which the agents are applied alike capable of exciting them. As I shall point out hereafter, some parts are infinitely better adapted for exciting sympathetic actions than others. Not only is *the part* to which they are applied of importance, but *its condition* should also command our attention. Thus when the sensibility of the gastric surface is enfeebled or torpid, the sympathetic effects of medicinal agents are less marked, and are produced with more difficulty. Is the same surface inflamed, and therefore more sensible? The sympathetic effects of medicines are more prompt and more intense. The condition therefore of the Gastric surface will modify very considerably the effects of our medicines, and should be carefully considered when they are administered. Destroy the sensibility of this surface, and the effects of our agents are alike destroyed. M. Dupuy has introduced into the stomach of a horse, after dividing or placing a ligature upon the eighth pair of nerves, two ounces of Nux Vomica rasped fine, and made into a bolus, and no effect has been produced. The same quantity given to another horse, which had not undergone this operation, has caused death in a few hours, preceded by convulsions and Tetanic spasms. It is evident, therefore, that with medicines acting upon the nervous system, and with others which are absorbed before their effects are manifested, the actual condition of the vital parts to which they are applied must be considered of infinite importance. It is this which modifies the action of our remedies. Their impression is always the same; their operation would therefore be uniform, were there not countervailing causes chiefly arising in the state of the parts, to which they are applied, which renders feeble, partial, or inert, or violent, dangerous, or painful the means we make use of. Complaints are frequently made of the uncertainty of our remedies. Where they are of a good quality, their effects are the same. They are modified by the vital condition of the part to which they are applied, on the

general system,—and the anxiety of the physician should be exhibited in studying their morbid conditions, and either adapting his remedies to the state of action, local or general, or adapting the constitution (a more difficult task) to the remedy. The former can only be obtained by a knowledge of the pathological derangements which are caused by the disease, or connected with it, and which can only be acquired by the study of pathological anatomy—and the latter by attending to the various indications pointed out by the pulse, the temperature, the secretions, the sensations, etc.

References.—*Barbier's Traite Elementaire; Currie's Medical Reports; Caldwell's Theses; Cyclopedia of Practical Medicine.*

Upon the Advantages to be Derived from a Combination of Medicines.

The present subject is as important as any that will be brought before you, but it is one upon which little has been written. The ancients have left us scarcely any thing; and it is here and there only, that it is alluded to, without any definite directions, or any reasons assigned for combinations of this nature. The attention which has been paid to this subject is altogether of modern date, and though something was done during the close of the last century, in a very interesting paper by Dr. Fordyce, to arrange and systematize which had been furnished by experience and observation, yet it is to the exertions of a very recent writer, Dr. Paris, that the few and scattered principles which were known, have been collected together, and with the aid of genius been made to assume a scientific form. It may be matter of some surprise, that such an undertaking should have been reserved for this period; and acknowledging as we do, the beneficial operation which results from a union of medicines, that such facts as were known, should only now have been embodied. I am at a loss to assign any reasons for this neglect, particularly as the combination of medicines has for a very long time been practised. The prescriptions of the ancient physicians which have come down to us, contain a great number of medicines united together. Of this nature was the celebrated Theriac and Mithridate, remedies which contained from forty to sixty ingredients, and which were supposed to be efficacious against poisons and a great variety of diseases.

The Theriac is still employed by the French physicians. The general composition consists of a mixture of excitant with narcotic substances, in the proportion of a grain of the latter to a drachm of the compound. It is directed in doses of x. xx. or xxx. grains, as a gentle stimulant to the organs of digestion. It is thus employed as a Stomachic, and is also recommended in diarrhœas, dysenteries, and in colics.

The Mithridate in Pharmacy was a composition in the form of an electuary. It was formerly a capital medicine in the shops of the apothecaries, being composed of a number of drugs, among which were opium, myrrh, ginger, saffron, cinnamon, etc. It was considered cordial, opiate, stimulant, and alexipharmic. It takes its name from Mithridates, king of Pontus, who is reported to have so fortified his body against poisons, with antidotes and preservatives, that when he had a mind to despatch himself, he could not find any poison that would take effect. The recipe of it was found in his cabinet written in his own hand, and carried to Rome by Pompey.

These articles are not mentioned for their utility, but to illustrate the extent to which medicinal combinations were practised.

The same disposition seemed to have existed among the Romans, as may be seen by referring to Celsus, and to have been extended to the Arabian physicians. The practice was continued even to the last century, and we find in the writings of Dr. Huxham, a great variety of articles united in one formula, and some of his prescriptions are extant, which contain from one to two hundred ingredients. The utility of such multifarious compounds has been so much doubted within the last few years, that we may be considered as having gone into the other extreme, and instead of mixing medicines, have been often satisfied to exhibit them singly. The purport of these remarks will be to show, that by combining medicines, the energy of our practice can be much increased, (not but that many indications may be fulfilled by employing single substances,) but by uniting them to a proper extent, greater activity will be afforded by the compounds, not otherwise possessed, and in some instances we may give rise to remedies of entirely new powers. Dr. Ferriar observes, that though it may appear fanciful to many persons, yet he has been led by observation to suspect, that there exists in the relative effects of medicines, something similar to the harmony of colours and sounds; and that the impulse requisite to the living powers of the body, which cannot be produced by a single impression, may be afforded by a concurrence, or succession of impressions, in some degree dependent upon each other.

The division which I shall make in treating of this subject will be, first, to consider the benefits derived from the union of Substances of a Similar Nature, and then, the benefits from the union of Substances of a Different Nature. Before proceeding to treat of either of these divisions, it may be proper to consider what is the constitution of a formula consisting of more than one article. In every compound formula we distinguish, most commonly, a *base*, an *auxiliary*, a *corrective*, and a *form*, under which it is exhibited. By the *base* or *basis*, is understood the medicinal substance which prevails in the formula—that of which the action is principally remarkable, which excites the physiological phenomena in a manner most apparent, and which in short distinguishes most of the effects which follow the use of the medicine. To determine the ingredient which forms the base of a pharmaceutical preparation, we are not to con-

sider merely the bulk or the dose of the medicinal substances which enter into its composition; but the comparative activity proper to each of them. Often the substance which enters into the mixture in the proportion of a few grains is the base, because it gives energy to the action of the other substances, and it is to its influence that we perceive the effects derived from the mixture.

The *Auxiliary* is a substance mixed with the formula to augment the activity of the base, to give more intensity to the effects which it is capable of exerting. The auxiliary ought always to conform in its properties with the principal ingredient of the compound in which it enters. It is necessary that their impression upon the vital organs should be of the same nature and have the same character, that joining its action to that of the base, it may give to the medicine more extended and important effects.

The *Corrective*, or corrigens, is an ingredient in a pharmaceutical compound, which has for its office to moderate the too great activity of the medicinal substances, among which it is placed. It becomes necessary, when these from their action are likely to produce unpleasant effects, or when carried too far would prevent the intended action, and defeat the objects of the exhibition. The last circumstance is the *form* under which the medicinal substances are best exhibited.

The prominent features of every compound formula being thus noticed, I shall proceed, first, to consider the advantages derived from the union of substances of a Similar nature. That a union of these substances gives greater activity to the compound than they possessed in their single state, is proved in a variety of instances. We will consider the effects of this union in promoting the action of Purgatives. All purgatives have not the same effect, though they all produce more frequent and more copious evacuations from the intestines than take place in health. Let us examine into the manner in which the differences of their operation may be so united as to result in the formation of a more useful formula. For example, Sulphate of Potash, or Soda, or Magnesia, operate more quickly than Aloes, Rhubarb, or Jalap. These last medicines, however, occasion an evacuation of fœculant matter, while the former most commonly occasion discharges of serous flúids. If an evacuation is wanted sooner than would take place from employing aloes, rhubarb, or jalap, at the same time an evacuation of fœculent matter, it would evidently be better to mix any of these saline preparations, with the rhubarb, jalap, etc. than to use the last alone, or either of the salts alone. Such a mixture is, therefore, found to produce a quicker evacuation, and at the same time a more fœculent one, than when any of these medicines are given separately. That such is actually the case, the experience of every practitioner testifies, and many will concur with me in the beneficial operation of the Sulphate of Potash, (as being more agreeable than the other salts,) in conjunction with Jalap or Rhubarb. By this union the action of the Jalap is quickened, its griping tendency obviated, and a smaller quantity of the substances is sufficient. This example will furnish us an instance of the basis of a prescription and

its auxiliary. The Jalap being the more active article, is entitled to the former consideration; the salt is the auxiliary, as it augments the activity of the base. Similar beneficial effects result from the union of Jalap with Calomel—of Senna with Salts. It is upon the union of several articles of a similar nature that we explain the activity of sea water, of several mineral waters, as the sum total of these ingredients in a given quantity being much smaller than we should have supposed. Sea water and mineral waters owe their activity to the number of ingredients they contain in connection with their free dilution. The proportion of the active articles is so very small, that it is only by their combination that their peculiar effects take place. Gamboge combined with Aloes, forms a compound exempt from the objections arising from the too rapid solution of the one, and the slowness of the solution in the other. In like manner combinations of Rhubarb and Sulphur, or other articles, are more effectual in keeping the bowels free of fœculent matters in fevers, than either of them exhibited singly. These examples may be extended, and doubtless your experience will suggest to you the beneficial effects of a union of medicinal forms as pertinent as any I have mentioned. The remarks offered are applicable to laxatives, and equal advantage arises from mixing several of them together. When one laxative is employed, and in a sufficient dose, it is apt to produce sickness and pain in the bowels, and it is uncertain in the degree of its operation. When several are mixed together, they are much less apt to produce these effects, and are much more certain in their operation. For instance, Manna, when given alone in a sufficient dose, produces considerable sickness and uneasiness in the bowels, excites colicky pains with a disposition to acescency—yet combined with Senna, Cream of Tartar, or the Sulphate of Magnesia, it forms a pretty active and by no means unpleasant medicine. The truth of these observations is strongly illustrated by the following combination:—12 drachms of Cassia pulp are equivalent in purgative power to 4 ounces of Manna; yet if we give ʒviii. of the Cassia pulp with ʒiv. of Manna, we obtain double the effect of a full dose of either.—*Paris' Pharmacologia.*

From the tenor of these remarks it is obvious, that a union of several similar remedies will produce a more certain, speedy, and considerable effect than an equivalent dose of any one. This is so uniformly the case that it is established as a law in relation to pharmaceutical operations. We will consider its application to other classes of medicines. Among Emetics, we will find that the union of Ipecac. with Tart. Antimon. affords a more efficient medicine than either alone. Ipecac. more certainly produces vomiting than Tart. Emetic, the latter not unfrequently passing downwards and affecting the bowels; by mixing them, therefore, the certainty of emesis is secured, while from the greater energy of the antimonial preparation, more copious discharges are produced, and a crisis of the disease more speedily effected. In like manner in cases of poisons being swallowed, it is better in order to produce vomiting quickly to mix the Sulphate of Zinc and Ipecacuan than to employ either of them alone. The Class of

Tonics will furnish us many illustrations of this law equally satisfactory. Medicines of this class, as the cinchona, cascarilla, the several species of Carduus, chamomile, the rinds of fruits of the orange kind, the gentians, and many others, agree better with the stomach and tend more to strengthen the system when mixed together, than when any one of them is employed. The utility of this practice seems well established, though we are at a loss to explain the changes which take place among the medicinal compounds.

I shall detain you with one other example of the utility of a combination of substances of a similar nature. The instance to be adduced is among that class of medicines called Alteratives. The articles belonging to this class are possessed of properties very analogous, being stimulating, subtonic, and diaphoretic. They are very numerous, and are resorted to in protracted affections, in impaired conditions of the system, in obstinate ulcerations, and local diseases generally. They are termed Alteratives, since from their long continued use they seem to alter the condition of the solids and fluids, and by their tonic impressions improve the vital energies, and promote the process of secretion in the various parts of the body.

The articles of this class are not only derived from the Vegetable kingdom, but some of the most powerful are obtained from the Mineral. This class of medicines I have had frequent opportunities of employing, and consider them very valuable additions to the Materia Medica. Useful as they are occasionally found to be when given separately, from repeated trials I am satisfied that their good effects are greatly increased, and rendered more certain by combination. Upon this principle some of the oldest and most popular formulæ have been established, as the Lisbon Diet Drink or Compound Decoction of Sarsaparilla, the Syrup of Sarsaparilla as given in the French Codex, and the Sirop de Cuisinier. To which I may add a preparation originally made in imitation of Swaim's Panacea, but which I have found to possess properties much superior, and the particulars of which I shall relate at a future period.

The remarks I have made, apply to the union of articles of the Vegetable kingdom, but they are rendered more striking by uniting those of the Vegetable and Mineral kingdoms. Swaim's Panacea owes its efficacy to the union of vegetable and mineral alteratives, since it has been found to consist of Corrosive Sublimate or Perchloride of Mercury, added to a concentrated decoction of Sarsaparilla and other alteratives.

The observations which have been made upon these classes, might be extended to all the rest of the Materia Medica.

It should be observed, however, that through the application of this law, that of uniting articles of a similar nature has been advocated, and its utility supported in a variety of instances, yet it is only designed that it should be practised within moderate limits. By multiplying these ingredients to an unreasonable extent, we would, instead of rendering the compound more agreeable to the stomach, excite disgust, and "so reduce the dose of each constituent as to fritter away

the force and energy of the combination." Before concluding this division, I will further illustrate the utility of the principles, by a very familiar example, furnished by Dr. Fordyce. In the preparation of food, when the object is to make the stomach bear a large quantity, without exciting sickness by adding spices to it, it has been the uniform practice of all nations never to employ one spice alone, when two can be procured, and even to mix a greater number together. Pepper alone, ginger alone, cinnamon alone, garlic alone, or any other spice or stimulant alone, would not render any kind of food capable of being retained in the stomach and in so large a quantity, as when these spices or stimulants are mixed together.

The second division of my subject consists of the union of substances of a different nature. A combination of medicines of this description, though the principles upon which they are regulated are more obscure, furnish us with the best formulæ for contending with disease, and for alleviating distressing symptoms as they exist. They are often extemporaneous in their formation, and many of the most favourite compounds have been the result of accidental mixtures, originating in particular states of disease, or the experience of the individual. Combinations of this nature enlarge and extend the sphere of our remedial operations, and are subservient to many useful purposes.

1. They enable us to contend with several symptoms of a disease, or produce two or more different effects at the same time, in a manner which is not oppressive to the patient.

2. They are further useful in promoting the operation of particular medicines.

3. They, in some instances, give rise to compounds of entirely new forms.

These beneficial effects are both illustrated by particular examples. Under the first head I would observe, that in cases of severe diarrhœa, where the object is to check the morbid discharges from the intestines, at the same time to relax the vessels of the surface, we combine an astringent and diaphoretic medicine. In this case we may employ Tormentil, or Kino, or other article to act as an astringent upon the intestines, and small doses of Ipecac. to relax the vessels of the skin. These two operations being accomplished, the disease readily yields. We effect the same object by the administration of the Dover's Powder, which is probably as useful a compound as could be selected in this particular disease. The Opium in this instance often exerts an astringent joined to an anodyne operation, and the nausea excited by the Ipecac. tends strongly to divert the current of morbid action from the intestines to the surface.

Another instance of the same mode of action, is the once much famed composition of Dr. Moseley, called the Vitriolic Solution, which consisted of the Sulphate of Alumina and Potash, and the Sulphate of Zinc; their combined operation resulted in a diminished secretion from the bowels, and an increased discharge from the surface. The utility of combinations with a view to produce two or more effects, is

illustrated in cases of severe spasm of the bowels. When the object is to lessen pain and muscular contraction, and to excite free discharges from them, the union of Opium with Calomel in large doses, in such cases is more beneficial than any remedy which is employed. In the treatment of Dropsies we have often two indications to fulfil—to evacuate the water, and to support the strength of the patient. Hence the necessity of combining stimulating cathartics with active tonics; and under these circumstances I have often derived great advantage from the union of the Crystals of Tartar with an infusion of Quassia Wood. In the same disease, when it has been of long duration and depleting remedies become necessary, stimulants are required to support the system under their operation. Here a solution of Gamboge in Sulphuric Æther will be found to promote our intentions very fully.

These examples illustrate the point under our consideration, and though their number might be increased, and the practical benefits derived from a more extensive combination pointed out, yet other objects remaining to be brought to your view, I can only allow to myself a rapid survey of the whole. I regret this the less as these examples will be presented to your notice at a future period.

2. The next advantage derived from the union of different medicines, is the change which takes place in their composition by which their operation is promoted. This change consists often in an increase in the solubility of the substance by the vital energies of the stomach and intestinal canal; and it is probably owing, Dr. Paris observes, to the diversity which exists in the solubility of the active elements of purgatives, that so great a difference occurs in their operation. To this it is owing that some cathartics operate as emetics, and that others exert but little action upon the small intestines, but have their whole force expended upon the colon and rectum. It is probably owing to this circumstance that some articles are more liable to produce griping, and other uneasiness in the bowels, from the principles of their activity refusing to be softened, or otherwise acted upon by the energies of the primæ viæ. From the foregoing I would inquire, whether many substances now considered inert may not be rendered active, and the activity of others increased, provided more attention was paid to medicinal combinations? The subject is obscure and still in its infancy; but it will always continue in these states, provided the intimate mixture of medicines and their effects are not more attended to. I cannot but hope this notice will not be lost upon you. That the insolubility of medicinal substances is changed by a union with others, a few examples will sufficiently illustrate. Aloes, which we know passes through the bowels, and exerts its action upon the rectum, has its solubility increased, and its powers of action quickened, by being combined with Gamboge. The purgative property of Senna, residing in a bitter extractive matter, which is comparatively insoluble, and on that account probably liable to produce griping, has these effects corrected by being combined with Salts, or an Alkaline Salt. Infusions of bitter vegetables have their virtues im-

proved by the addition of Soda or Potash, which operate by rendering the bitter principles of more easy solution and consequently more efficient.

3. The last of the objects to be considered in the combination of medicines, is the formation of compounds of entirely new powers. This is effected either by a mixture of such substances as exert an antagonizing operation upon each other, or it is the result of chemical actions, altering and newly blending the different principles of the compound. As an instance of the first, I would mention, that the preparation usually called Dover's Powder affords an example of the union of two substances producing effects different from either. The narcotic operation of the Opium is obviated by the tendency of the Ipecacuanha to produce relaxation of the surface; and the diaphoretic operation of this last, is augmented by the stimulus of the Opium giving excitement to the action of the heart and arteries—the result, therefore, is a diaphoretic of great power and extensive utility. As instances of the chemical actions producing new products, I may mention the change produced in colour, and properties, by the union of an alkali, as the Carbonate of Soda with Rhubarb—the formation of an Acetate of Zinc from the union of the Super-acetate of Lead and Sulphate of Zinc, a product supposed by many to possess properties superior to either—the neutral mixture, as it is commonly called, or the Acetate of Soda—the black wash formed by the union of Calomel and Lime-water. To these may possibly be added many important and interesting illustrations from a more extended knowledge of vegetable chemistry. Such are a few of the facts, which have been collected together, upon the subject of Medicinal Combinations. They are calculated, I trust, to direct the attention to its consideration in a greater degree, than has generally been done, and to prove in many instances the utility of employing compound, rather than single prescriptions. These remarks become the more necessary, since in the view of the late Dr. Rush, but a very few articles were considered necessary to contend with every form of disease—and that armed with Calomel, Opium, Tartar Emetic, and a Lancet, physicians could encounter all the ills to which flesh is heir.

References.—*Some Observations upon the Combination of Medicines*, by G. Fordyce; *Paris' Pharmacologia.*

On Bloodletting.

Previous to my entering upon the consideration of those agents, which, acting upon the several organs of the body, promote their secretions and thereby lessen the mass of blood, it may be useful to bring to your view the effects which are often derived by the immediate abstraction of blood from a vein. In this respect I shall be extending the list of agents commonly comprehended under the Materia Medica. No apology is required for this innovation, as it has

always been a matter of surprise, that in the various treatises upon this subject, comprehending the enumeration of the many remedies for controlling or modifying diseased actions, so important a remedy as bloodletting unquestionably is, should have been overlooked. Combining so many advantages, from the promptness of its operation, its effects upon the system, not only in abstracting from the quantity of the circulating mass, and a consequent abatement of activity in the sanguiferous system, but by the impression it makes upon the brain and nerves, and upon the lymphatic vessels, it comes to be ranked among the most important of our remedies, the one which can with safety be appealed to in emergencies which threaten the overthrow of the animal fabric, or the derangement of its structure and functions. For these reasons I shall review the several states of disease in which it becomes applicable, with the circumstances and conditions of the system which render its employment safe and proper. It is only with the consideration of Bloodletting as a remedy that I shall endeavour to engage your attention; the very interesting speculations upon the subject of the blood, with the manner of performing the operation, must be detailed to you from other chairs.

The art of bleeding may be traced back to the remotest antiquity, and seems to have been common among the Egyptian, Arabian, Greek, and Latin physicians, even at a time when Anatomy had never been, or but little cultivated. The Greeks boast that Podalirius, the son of Esculapius, was the first who practised bleeding, soon after the siege of Troy, and it is even probable that it was practised before this period. How it came to be adopted, can not be known at this distant time. Pliny, indeed, supposes that physicians first learned this operation from having observed the Hippopotamus draw blood by pushing sharp reeds into its body. But this is very improbable, as there is but very little analogy between the artificial opening of a vein with a lancet, and the random wounding of an animal by friction against a broken reed. However the practice originated, mankind were soon convinced of its importance, and it has, I need not inform you, been continued with an increase of advocates to the present day. The most distinguished of these have been Botallus, De Haen, the celebrated Sydenham, Pringle, our countryman Rush, Dr. Armstrong, whose strong powers of reasoning place him in close alliance with the earlier recorders of disease, with many others who have added the tribute of their approbation to its beneficial operation.

With these preliminary remarks, I shall proceed to the application of bloodletting to diseases.

This remedy is undoubtedly the most direct means of diminishing the quantity of fluids in the system, and consequently of lessening the vital energies. To abstract that fluid, which is the immediate pabulum of life, cannot, it is obvious, be a matter of indifference to the constitution;—if it be the most powerful means of influencing the vital actions, so it is the most dangerous when improperly employed;—if it is the most effectual mode of diminishing excitement, it is

consequently the most apt to induce extreme debility. A cautious consideration of many circumstances is therefore necessary in determining upon its propriety. These considerations become the more necessary, when the nature and character of disease are duly contemplated. They consist, for the most part, in certain determinate actions, which, unless early arrested, have a strong tendency to run their course. This is particularly the case with the febrile affections generally, and it is in such cases that the propriety or impropriety of bleeding is more especially manifested.

Bloodletting, in its operation, is either *palliative* or *curative*, and is directed in disease as one or other of these objects is to be accomplished. This distinction should be kept in view, particularly in the management of Febrile or Inflammatory affections. For the curative operation used in the commencement of these diseases, and carried to a considerable extent, the subtraction of a large quantity produces such a change in the constitution as frequently to arrest the course of a febrile affection, or lay the case open to the action of other powers which restore health quickly and often completely. Thus employed, it has often been found extremely advantageous, and though the quantity necessary to produce this effect might often be thought dangerous, yet employed with judgment and discrimination, bad effects will seldom ensue. Indeed it is matter of surprise to what extent it may be carried in the concentrated forms of disease, particularly when the head is affected, without any ill consequences. In the Island of Barbadoes, Dr. Jackson asserts, that in the febrile affections of 1813 and '14, the quantity abstracted at one time was rarely less than 3 pounds, frequently 4 or 5, sometimes 6. The vein was even sometimes reopened at a short interval, the blood allowed to flow to the extent of 4 pounds additional, amounting in all to *ten pounds* in twenty-four hours. It is unnecessary to say, that such practice is not generally advisable, and I am glad to say that it is not often called for; but I have introduced it to show to what extent depletion by this channel can be practised, and in some forms how necessary it is to push it to the greatest extent, if we ever design to arrest the course of disease. To effect this object, one large bleeding is more beneficial than several small ones. Small bleedings diminish violence and avert the destruction of organic structures; they do not prevent the diseased action from proceeding through the regular process of what is termed coction, to a constituted period of formal crisis; but as prevention is the professed and proper object of the physician, the decisive means, if they are at the same time the safe means, are those which ought to be adopted.—*Jackson.*

The utility of this practice will appear upon a slight examination of the subject. Disease consists not only in increased, but disordered action. This action is not only exhibited in the increased celerity of the circulation, but this increased momentum of the blood, serves to produce still further disturbance in the action of the organic systems. By removing a portion of this fluid, we not only withdraw the means by which the impetus is afforded, but we abstract so much of a

stimulating principle by which action is kept up. It is therefore properly preliminary of cure, or so prepares the way, that healthy action may be restored by other means. "The time when it should be employed with this view, is obviously of the utmost importance. If practised within six hours from the invasion, and before the disease has attained its acme—if conducted with the energy necessary to give effect to the purpose—the disease is either arrested, or is so much crippled in its progress that it readily yields to the means so commonly resorted to, to restore the healthy train of actions. If practised later, its effects are less decisive but still salutary: it is not to be depended upon, but it is not prohibited, and it is occasionally useful even at still later periods."—*Jackson.*

The *Palliative* or *Auxiliary* operation becomes necessary, when the curative cannot be pursued. This practice, which is most frequently followed, is not without its advantages, and is particularly useful in conducting the disease to a safe issue. When employed before organic derangements have taken place, it is frequently more decidedly remedial, and more certainly beneficial, provided the powers of the system can sustain the operation, than any other single means we can employ. It is of this treatment I shall enlarge upon more particularly, and which I shall chiefly keep in view, in the present lecture. It is the least hazardous for those setting out in their career of practice, and until long experience has accustomed them to the various grades of action, to be familiar with the phases of disease, and the capacity of the system to sustain strong and powerful impressions, the practice which I would recommend. It is time, however, to enter upon the details of its employment to diseases.

OF ITS UTILITY IN YELLOW FEVER.

In this disease, the opinions delivered are more contradictory than could be desired; but since unanimity cannot be obtained upon this, or any other subject, I shall consider the evidence of men who have been most distinguished in our profession. By Dr. Rush, and other physicians of Philadelphia, it was employed in conjunction with purging with very considerable success in the Yellow Fever of Philadelphia, in 1793. Its effects were beneficial in the highest degree, and he has described at length the obvious advantages which resulted from it. These were, a reduction of the force and frequency of the pulse, checking in many cases the vomiting which occurred in the beginning of disease, and lessening the difficulty of opening the bowels. It removed delirium, coma, and obstinate wakefulness—lessened muscular debility, and eased pain. In particular it is stated, that when used early on the first day, it frequently strangled the disease in its birth, and generally rendered it more light, and the convalescence more speedy and perfect. It should not, however, be indiscriminately employed, but judgment and care be exercised, and the practice pursued only in the early stages. It is probably owing to inattention to the stages, that the contradictory accounts upon this subject have originated, since it is obvious, that the earlier it is

employed in a disease which runs through its course with so much violence and rapidity, the more beneficial will be its effects. Dr. Jackson speaks of its great utility under these circumstances. Drs. Moseley and Pinckard are equally favourable to this practice when similarly pursued.

As far as I can judge of the utility of bleeding in this disease, it would appear, that when the sick were visited early after its accession, that when the subjects were of a robust habit, such as is the case with foreigners previous to their being climatized—that bloodletting was undoubtedly of considerable utility. Under these circumstances, it diminished the turgescence of the blood vessels, moderated the action of the heart and arteries, controlled the unequal distribution of the blood in the several parts of the body, and, by lessening the excitement of the brain, tended strongly to the relief of its sympathetic derangements—as gastric uneasiness, muscular pains, with the distressing restlessness, and jactitation of the patient. In some instances, a speedy crisis of the paroxysm ensued, and in all great relief was afforded. Carried to the extent of producing faintness, by suddenly diminishing the excitability of the system, the various secretions were renewed, and the patient has fallen into tranquil and refreshing sleep. It is not to be supposed that a cure is to be effected by this means only, but along with it, depletion by the bowels, and the full exercise of the antophlogistic treatment.

The quantity of blood to be drawn in this, and other diseases, with the frequency of the repetition, will depend upon a variety of circumstances and the judgment of the practitioner. It will be connected with the temperature of the weather, the strength of the predisposing causes, the constitution of the patient, and other considerations which can better be determined by an inspection of the case, than by a description. In this and nearly all acute diseases, it should be carried to the extent of producing a positive impression—as it is only from the cerebral and nervous energies being reduced, that beneficial effects can result. When the remedy is employed to this extent, it will be found productive of more decided advantages, than any other evacuation.

Where the state of excitement forbids the employment of venœsetion, its topical abstraction is highly to be recommended. Of the consequences of fever, none are more striking than the unequal distribution of the fluids, with the state of oppression of particular organs. The brain and nervous system, are particularly and violently affected in this disease, and doubtless many of the symptoms which are exhibited in the progress of the complaint, have their origin, in the strong and unequal conflict which this organ sustains. Lessening these determinations by cupping, or what is preferable, by opening the temporal artery, and allowing a free evacuation of blood, the action of disorganization is arrested, and great and effectual relief is afforded. I have on several occasions where general depletion by the lancet has been inadmissible, had recourse to this local detraction of blood, and always with the happiest effects. In dismissing

this subject, I shall repeat, that it is to the earlier stages of the disease that it is best adapted, though circumstances may occur in its progress which will render it useful. The time, I repeat, when bleeding is performed in this and other diseases, is obviously of the utmost importance. The physician, in the first stage of fever, armed with his lancet, is, in the language of S. Smith, to his patient what the fireman with his engine, before the flames have had time to kindle, is to a building that has taken fire. At this early stage, the former can check inflammation with almost as much ease and certainty, as the latter can prevent the flames from bursting out. While the physician, who is called to treat inflammation in the latter stage of fever, is in the position of a man, who arrives with the apparatus for saving the house, when its stories have been already consumed, and its roof has fallen in.

As may be supposed, in the Simple Continued, Intermitting, and Remitting forms of fever, bleeding is often required; and in the latter particularly it may be found necessary to begin with opening a vein, and to repeat the bleeding, according to the urgency of the symptoms. The operation may be performed during the remission, though it is better in the height of a paroxysm, and the remission is observed to come on sooner and be more complete. The earlier, too, in the disease it is performed, the better, as by a prompt and efficient use of the remedy, the progress of the disease may be arrested, and this with greater probability of success, as the disordered condition of the vascular system has existed but for a short time. The pulse should be observed sensibly to yield to the evacuation, the blood being allowed to flow until it becomes feeble, small, and a disposition to faint, or actual fainting, be produced. By this method of proceeding, its open character is subdued, and with it the constitutional affections—or its concealed dispositions made manifest, and thus readily point out the means to be pursued. When bleeding is delayed to a more advanced period, more caution should be observed, for though the morbid actions may be reduced, the powers of the system may be so prostrated that reaction will become impracticable, and the remedy, from being ill-timed, become more destructive than the disease.

In Remittent Fevers, complicated with determinations to the Hepatic system, the remarks which have been made upon Bleeding in fevers generally, are particularly applicable.

This is a very common form of fever, in the low and marshy districts of our country, and is familiarly known by the name of Country Fever. In these cases, I believe that the use of the lancet in the beginning of the disease is of the utmost importance:—not only its early, but sometimes its free use during the disease. By an early recourse to it, the severity of the paroxysm is much mitigated, and if carried to the extent of reducing the pulse, or disposing to syncope, a copious secretion from the surface is produced, with great and essential relief to the symptoms. By it we obtain relief of many symptoms, as headache, irritable stomach, restlessness, pains in various parts. By it the action of cathartic or other medicines is

promoted, and by it also those determinations, and organic derangements prevented, which so often render the cure imperfect, rendering the life of the patient a continued struggle to produce health, or obviate disease.

The effects of bloodletting, I would wish to observe in this disease, (for it may be the only opportunity I shall have to offer my views of treatment,) are very powerfully supported by the affusion of cold water. The adoption of this practice, seems as a substitute for continued bleedings, without its exhausting effects. A proper employment of it reduces the pulse 10 or 20 pulsations the minute, lowers excitement of the skin, relieves pain, and counteracts determinations to particular organs. It removes delirium, tranquillizes the patient, induces sleep, and promotes many of the secretions, particularly of the skin. A single effusion is, however, not sufficient, but it must be continued every two hours, or oftener as the excitement demands. Thus pursued, I have had a patient immersed six or eight times during the day, and with the most delightful effects. In short, my directions are, to place a large bathing tub in the room, and require of the attendants to place the sick person in the bath whenever the excitement rises; whenever he complains of heat, restlessness, confusion in the head; whenever there is muttering or other symptoms.

Manner of using the cold effusion.—With these means, evacuants of a mild character are to be employed; they are generally saline, combined with an infusion of Serpentaria or Senna, and so administered that six or eight evacuations are obtained in the twenty-four hours. By these simple remedies, continued perseveringly, the utmost relief is afforded, the progress of the disease greatly mitigated, convalescence is proportionably rapid, and since its adoption I have not to my recollection lost a single patient with country fever, as it is called.

Medicines administered at intervals of two or three hours, are not sufficiently prompt to contend with the disease. Strong impressions are required, to prevent those derangements of particular organs from taking place, which result in congestions, and particularly those congestions of the brain, which are so often exhibited in the concluding stages, and which when established, all the stimulants which can be applied, are insufficient to overcome. Hence the patient sinks, not because the stimulants are not sufficiently powerful, but because the brain has sustained such lesious from previous excitement, that its energies cannot be renewed. It is to prevent these derangements, in the early part of the disease, that the practice I have recommended should be directed.

It is, however, in Inflammatory diseases and affections, properly so called, that the great superiority of this remedy is manifested. Here the blood vessels chiefly are disordered, and the evacuation is made directly from them. The impression, therefore, can be more instantaneous, and its action extended at once to the seat of the affection. In these cases it will be obvious, that the earlier it is employed, the better, especially in affections of the chest and abdomen, where from the great vascularity of the parts, the progress of the inflammatory

action is extremely rapid, and the injury done to organs so essential to life often becomes irreparable. Here, then, the importance of attention to time is apparent, and it illustrates the propriety of this direction in the former diseases. But this is not the only direction which should be held in remembrance—the quantity which is drawn, and the suddenness with which it is effected, are highly important. According as these are attended to, will be the strength of the impression made. The quantity to be drawn will depend upon the state of the pulse, the degree and seat of the inflammation,—the age, habit, and constitution of the patient; but the effect may always be increased by drawing blood from a large orifice, by abstracting a large quantity at the beginning, and continuing it, until the pulse is reduced, or a disposition to fainting brought on. By pursuing these directions, it has been observed that less blood was expended, than according to the usual method pursued of removing 10 or 15 ounces at a time—because (as Armstrong observes) one, two, or at most three, bleedings answered, whereas under the other mode, the operation has frequently to be repeated four or five times.

By pursuing these directions, the temporary weakness is greater, but the patient gradually recovers, and his strength is restored to a certain degree. It is, therefore, best adapted to our views of fever, which are to reduce the present strong action of the arteries, without occasioning permanent weakness. We may obtain a positive effect, *i. e.* faintness and general relaxation, without exhausting the powers of life, by drawing blood while the patient is in an upright position; and this practice may very properly be pursued with delicate constitutions labouring under high arterial excitement, or in cases where it is desirable to secure the consequences of free depletion without its exhausting operation. Let it, however, be distinctly understood, that in practising bloodletting, the effect to be obtained, or the impression made upon the system, is to be the measure of what is drawn, rather than the apparent quantity. This rule is enforced by the authority of Dr. Armstrong, and it is one which cannot too strongly be urged upon you. It will curtail the progress of inflammatory affections, and in most cases bring them to a speedy crisis. As there are few cases which will withstand two or three operations carried to the extent of producing faintness or fainting. It will save pain to your patient, and result in much satisfaction to yourselves.

It may not be amiss to state some of the quantities which, during the existence of morbid excitement, the system will support without any ill effects being experienced. I witnessed a case of fever in the summer of 1824, in which 4 pounds were drawn at once. Mr. Cline drew 320 ounces in twenty days from a patient in St. Thomas' Hospital, London, who laboured under a contusion of the head. Haller, in his Elements of Physiology, has recorded instances of loss of blood which would appear incredible. From all that we can observe, it would seem that the system accommodates itself readily to the abstraction of blood, and that it is quickly regenerated.—Vide *Rush's Defence.*

It may be useful to bring before you some of the more common Inflammatory affections, in which the utility of bloodletting is manifested. In Pneumonia and Pleurisy, it is the remedy chiefly to be depended upon, freely and early employed. The directions which have been given should be fully attended to, and the quantity drawn be regulated by the degree of inflammation present, and the vigour of the constitution. In this disease, it is particularly proper to continue the flow of blood until a remission of the pain takes place, or until a disposition to syncope is induced. We are not to stop the bleeding until one or other of these effects are produced. It will often happen, that with a reaction of the heart a renewal of the pain takes place. This is no proof that the remedy has been improperly used; but on the contrary, a reason for repeating the operation, which in many cases may be done in a few hours, or on the same day. It will be particularly required, if syncope comes on from constitutional peculiarities, and before sufficient depletion has taken place. Under these circumstances a repetition of the operation will be better borne. The period during which the disease has existed will form no objection to the practice recommended; though it must be obvious, that it will be better borne, and the effects be more beneficial, according as it is done at an early period. But it may be practised at any time, only more caution is required, and a due consideration of all the circumstances connected with constitution, age, etc. When general bleeding has been pushed to a proper extent without being beneficial, the local abstraction of blood, as will be mentioned, may properly be resorted to.

In Dysentery, the utility of bloodletting is often very conspicuous. It is not to be understood that every case of this disease will require the practice here recommended, for it will often subside under very opposite practice. But when there is much inflammatory action, as evinced by an excited state of the arterial system, augmented heat, pain and soreness of the abdomen, with severe bearing down efforts, bleeding will be found of the utmost service, and this not only from the relief it affords, but by causing the system to be more readily acted upon by purgative medicines, shortening the disease, and lessening greatly its tendency to become chronic.

Of the utility of this practice, there is not wanting the authority of names in its support. Sydenham was a great advocate for bleeding in this disease, and Sir John Pringle frequently employed it in the dysenteries which appeared in the armies to which he was attached. It is not, however, the only means to be pursued, but a combined system of action must be adopted, in which, without availing ourselves of any one remedy, the conjoint agency of others may be brought to our assistance. Premising, therefore, our management of acute cases of dysentery with bloodletting, we shall find its effects greatly supported by Cathartics, Opiates, Calomel, etc.

In Phrenitis, arising from local injury of the brain, or unconnected with fever of any peculiar type, the advantages of bloodletting, or rather its superiority to all other means, are very conspicuous. Pur-

gatives, and even nauseating doses of emetic substances, are very important auxiliaries, but bloodletting has a more decided control over the symptoms than any other measures. In this disease, Vs. is therefore indispensable, and it is not unusual to observe every exacerbation in the progress of such a case, denoted by increased restlessness or delirium, together with an increased frequency of the pulse, of perhaps ten, fifteen, or twenty pulsations in a minute, regularly subside after the loss of even six or eight ounces.

In Ophthalmia, the great importance of this species of depletion must be particularly obvious, as well as the necessity for early and decisive measures.

The notice of this last disease furnishes me with an opportunity of pointing out and illustrating the utility of Vs. upon a very important system of vessels,—the Capillaries. No one can doubt the very important part these vessels perform in Inflammatory diseases—constituting the seat of inflammation. It must be obvious, that there is no course more effectual to take off the impetus of blood sent by these vessels to the head, to relieve vascular tension, and to deplete immediately from the diseased part, than the remedy of which I am speaking.

The supply of blood sent to these vessels being diminished, as well as its impetus, these vessels, by their powers of contraction, are enabled to empty themselves by their own force, and by the same power to resist the return of an excessve load. In Ophthalmia we have exhibited to our view, the action which takes place in other parts while in a state of inflammation. The very minute vessels become enlarged and distended with blood, and to their excessive action the train of consequences which succeed are to be attributed. In this disease, or Ophthalmia, I have seen more benefit from a few ounces of blood taken suddenly, and a tendency to syncope brought on, in its removal, than by an active course of cathartics of two days continuance. In short, an inflamed eye, which is as red as scarlet before bleeding, in a few minutes is essentially improved in its appearance, and a repetition of the remedy will frequently remove it. From what has been said, the same remark will hold good in other inflammatory cases.

There is yet one other form of fever in which the good effects of bloodletting are frequently manifested—the Puerperal state of fever. Different views have been maintained respecting the pathological character of this complaint, and much contrariety of practice has resulted. From an attentive consideration of the symptoms and appearances upon dissection, little doubt can exist but that it is decidedly inflammatory. The pain, tenderness, fulness of the abdomen, the quick pulse, preternatural heat, headache, thirst and vomiting, with the post mortem examinations, strongly evince an active and malignant state of inflammation, extending with great rapidity from one order of parts to another. Under these circumstances, the treatment to be pursued consists in the exercise of the antiphlogistic remedies, and bloodletting is of indispensable utility. It should be drawn early, and freely, and the testimony of many distinghished practitioners

is decidedly favourable to its utility. Such, however, is the rapidity of the inflammatory action, and such the malignancy of its course, that it is considered unsafe to resort to this evacuation after the disease has been established thirty hours. The insidious nature of inflammation is in no disease better exemplified than the present. It is often obscure in its beginning, insidious in its progress, and rapid in its termination; hence it is apparent how necessary is a prompt recourse to bloodletting on the very first accession of the disease. For in many instances the continuance of increased vascular action for a very short time, places the patient beyond the reach of our remedies. A hesitating or undecided practitioner, who takes a few hours only to make up his mind respecting the course he is to pursue, may often thus doom his patient to an irretrievable fate. The importance, therefore, of a thorough consideration of all the circumstances which should lead to so important an operation as bloodletting, cannot too sirongly be enforced upon you; and this more especially, as there is a tact which cannot be inculcated by any rules, and is often, only to be acquired by actual practice and attentive observation.

In thus considering the importance of bloodletting, as a remedy in the several forms of fever, I would not be understood to recommend it to the exclusion of other active remedies. Purgatives are excellent auxiliary means, and are of the greatest service in correcting the deranged state of the intestinal canal, which proves a source of irritation and keeps up the morbid actions. They often fulfil indications which bloodletting cannot, and are, therefore, not to be overlooked. I have wished to call your attention to the present remedy, which is probably too often neglected, and have endeavoured, through the whole of these remarks, to enforce its importance, its promptness, and its power in subduing morbid action.

Objections have been urged against the lancet upon which it may not be improper to make a few general remarks. It has been urged against the practice, that Dropsies and Anasarcous Swellings are frequent consequences of its employment, and the dread of the disease has often operated greatly to the disadvantage of the patient. When these effusions succeed the attack of acute diseases, I am more disposed to think that they have oftener followed as the consequences of those diseases, for which it was necessary to bleed, than as the effects of the remedies employed. They arise, as Dr. Rush observes, in most cases, from the want of sufficient bleeding in inflammatory diseases. And again, if ever bleeding kills, says Botallus, it is not from its excess, but because it is not drawn in sufficient quantity, or at a proper time. I repeat, therefore, that where these effusions arise, they rather proceed from our ill-directed efforts at treatment, and from the diseased action being allowed to exhaust itself. Those means which are best calculated to subdue this action, are the best adapted to prevent and cure such dropsical affections. In this manner we may account for the success attending the employment of bloodletting in those dropsies, resulting from the application of cold, or from other causes, when an inflammatory disposition exists.

Bloodletting has been objected to in fevers, as tending to increase the debility which exists. Every practitioner must be aware, that in cases of high arterial excitement the great apparent weakness arises from the oppression of the system from an overloaded state of the circulating vessels. (Whether or not the depression which exists proceeds from the pressure of the blood upon the nervous fibrillœ which are in contact through the whole system with the vascular ramifications, and which pressure is occasioned by the increased action of the heart and consequent increased impetus of the blood—still the fact is evident.) Bloodletting, by relieving this state of the vessels, tends greatly to revive the strength and energies of the body, and this effect must have been frequently noticed. Cases no doubt exist, in which the powers of life are so much exhausted, that a single evacuation by the lancet would terminate fatally—but these cases can never be confounded with those described.

It has also been objected, that the practice of bloodletting renders its habitual employment necessary. For the refutation of this and other objections to the practice, I refer you to Dr. Rush's Defence of Bloodletting.

The utility of bloodletting might be further illustrated by the recital of various other diseases, in which it is so much resorted to, and its efficacy so well established. These cases will be fully detailed to you by the professor of the practice, with the states of the pulse, and the appearance of the blood upon being drawn. My object has been to call your attention to this mode of depletion, which is the most powerful practised—to enforce its operation in a few instances, and the extent to which it should be carried to derive its beneficial effects in the fullest degree.

Before dismissing this subject, I shall briefly detail the immediate effects of this remedy on patients labouring under disease.

The first is, a reduction of the force and frequency of the pulse. The pulse is more sensibly affected by this means than any other that is practised; from being hard and frequent it becomes slow and soft. Of its influence in this respect many examples may be given, but I will only state, the pulse has been reduced from 112 pulsations in a minute to 64, and the effect so long continued, that at the expiration of twenty-four hours it did not exceed 84 pulsations. Its influence on the pulse in other respects, is equally remarkable—from being small it gradually expands after the operation, when slow it is quickened, when strong and hard, it becomes soft.

2. The sudden removal of delirium, is another effect which frequently succeeds this operation.

3. The relief of pain, is another remarkable consequence of Vs. It is often so immediate that patients, after having been harrassed for a long time, have sunk into profound sleep soon after the arm has been tied up.

4. It reduces the temperature of the surface by lessening the excited state of the circulation, and by inducing such relaxation of the surface as causes perspiration speedily to break out. With this change, the

respiration becomes less hurried, the countenance becomes more clear, calm, and intelligent, and the sense of thirst is greatly abated.

5. Bloodletting promotes the operation of cathartic medicines, in some instances so quickly, that the patients have demanded the close stool before the blood has ceased flowing. This effect of Vs. has been often noticed, and it has been resorted to with this particular view, in many instances with great advantage.

The last effect I shall mention of the drawing of blood, is its tendency to induce sleep. The rest thus procured is often of the most grateful and refreshing nature, since it has not been obtained by such means as could harrass the patient with a train of morbid symptoms, but by reducing excitement, by lessening pain, and restoring the secretions to their usual state. The consequence is, he awakes refreshed, invigorated, and his healthy feelings in some degree restored.

Such are the more prominent effects of bloodletting. Without being an enthusiast I would inquire, whether such results have not been witnessed by every practitioner? If such is the case, how important are the benefits conferred, and how much more speedily will morbid excitement be reduced by this means, than by the wear and tear, as it were, of the intermediate organs, which other modes of practice not unfrequently produce! Be cautious, and before having recourse to it, consider well all the symptoms and appearances presented to you, and you must be pleased with its effects.

References.—*Poliniere Sur les Emissions Sanguines; Armstrong on Typhus Fever; Jackson on Fevers; Welch on Bloodletting.*

Local Bloodletting.

Under this division will be comprehended Leeching and Cupping.

This method of drawing blood, I need not observe to you, is often attended with the happiest effects, and at the present time is very extensively employed in Europe, in the treatment of diseases. The researches of the French physicians, and the pathological opinions which have arisen from them, has caused this local detraction of blood, and particularly by leeches, to be held in the highest estimation, and from this circumstance, in connection with the utility of the practice, your attention may properly be directed to them.

Of the Genus Hirudo, there are several species, the principal, or that used in medicine, is the Hirudo Medicinalis. It is characterized by an oblong body, very contractile, having each extremity capable of being expanded into a fleshy disc, by which it adheres to the body with a kind of suction, similar to a cupping glass. A triangular mouth situated under the anterior extremity, armed with three very sharp, strong teeth, and a sucker at the bottom, by the assistance of which it draws blood from the wound it inflicts.

Leeches have for some time past been in use in the practice of physic, for evacuating the vessels of a part labouring under inflammation. Their employment, however, seems to be by no means so general, as their importance demands. This depends upon a variety of circumstances, chiefly the expense of obtaining them, in those situations where they are not to be had, or are of an inferior quality.

It would be an endless task to enumerate the variety of medical and surgical cases, in which leeches may be used with advantage. In all inflammatory affections they are frequently of considerable service, but it is as an auxiliary rather than primary remedy. In all acute cases, and particularly of important viscera, general bleeding should be used to break the force of the disease, and after sufficient reduction, local measures are resorted to, to prevent a further expenditure of the vital powers, and they act with peculiar advantage at this time on the part diseased.

In inflammations about the throat, in the abdomen, thorax, cranium, or in the limbs and superficial situations, the benefit derived from the application of leeches, can often be obtained by no other means. To particularize some of these examples—In Cynanche Trachealis, or Croup, the application of leeches will very properly precede the employment of blisters; and in Quinsy, when deglutition has been quite obstructed, and repeated venæsection has proved unavailing, they have been known to afford very great relief.

In inflammation of the pulmonary organs, local bloodletting is often employed with very great advantage, and leeches applied to the thorax may be considered as acting locally on the lungs. The close sympathy uniting the thoracic viscera, with the skin, explains satisfactorily the effects of these local bleedings on the Parenchyma of the lungs. They exercise beneficial effects, not only by the depletion which follows, but also by revulsion, deriving the fluids from these parts, by the excitement given to the Intercostal and Superficial arteries.

In inflammation of the Trachea, and in that very common affection, Bronchitis, in conjunction with other means, they are often very advantageous. In the painful, irritating cough, which accompanies the latter affection, the frequent pulse, difficult expectoration, leeches applied above the superior part of the Sternum, in the pit formed by the intermediate space, between the Sterno-cleido Mastoidei muscles, they will be found highly serviceable. In this place they act almost immediately on the inferior part of the trachea.

When the Parenchyma of the lungs is affected, and when the Stethescope indicates some degree of hepatization, they are often beneficial.

In inflammations of the abdominal viscera, leeches are much and very properly employed. When applied to the Epigastrium, in inflammations of the stomach, they operate in the most powerful and direct manner on that viscus, and in inflammation of the intestines in the vicinity of the part affected. The flow of blood from the punctures may always be increased by washing them with warm water,

and if necessary by applying cupping glasses. The effects of their employment, might be still further increased by covering the part with fomentations, emollient poultices, etc., removing them as they become cold.

In diseases of the eyes, joints, and testis, as well as in inflamed hæmorrhoidal tumors, the relief which they speedily afford, is acknowledged by most practitioners.

In numerous instances of extravasation of blood under the skin, ecchymoses, contusions, etc., they are frequently applied with great benefit.

In all cases of local plethora, or congestion, short of inflammation, so commonly attendant upon organic affections, especially of the heart, or large vessels, they are also useful. These local congestions are most conspicuous about the head, threatening or producing apoplexy, and leeching becomes an important preventive check.

In infants of tender years, and persons who have a particular dread of bleeding, in cases where the practitioner is fearful of venturing on general bloodletting, leeches may often be tried with greater safety.

In phlegmonous inflammations of superficial parts, their utility is so obvious, that I need say nothing upon this subject; but in erysipelatous inflammations, their value, though less known, is equally considerable. The practice is common in the French hospitals. In using them, it is most proper not to apply them immediately upon the inflamed surface, as the bites of these animals have, on many occasions, put on this species of inflammation; but they are directed to be placed upon a sound part, two or three inches from the diseased.

When the erysipelas spreads extensively, and penetrates deeply, the inconvenience alluded to should be considered slight compared to the gangrene, or sloughing which threaten the part, and the leeches in consequence must be applied directly over the inflamed membrane. When thus used they should be scattered over the surface.

Latterly the use of leeches has been extended from the external, to the internal surfaces, and their employment in this manner has been attended with effects highly gratifying. To illustrate their application in the latter cases—It has been observed that in Ophthalmia, more benefit has been derived from a single leech, or a couple, applied to the inflamed conjunctiva, where it covers the lower eyelid, than by a dozen to the temples. So powerful is its operation, that a chronic inflammation of the eye which had continued five or six weeks, was immediately relieved, and by a second application of them, was in two or three days completely removed. The practice is perfectly safe, and according to the reports of Mr. Crampton, the most powerful we possess of speedily reducing inflammation. Useful as it is, it is not to supersede the other active measures which are necessary in lessening increased action.

The manner of applying them to the conjunctiva.—The patient should be placed with his back to the light, in order that the lower eyelid may be everted without exciting pain. A leech or two, rather

below than above the middle size, should be allowed to fix upon that part of the inflamed membrane, which covers the Tarsus, taking care that it fastens neither upon the ciliary margin, nor upon the eye itself. The leech fixes and fills itself in this situation, much more quickly than upon a cuticular surface, and this observation is equally true with respect to all internal surfaces, for which it is observed they have the strongest appetency.

Leeches have also been applied to inflamed Tonsils. A single thread of silk is passed through the body of the leech, at about its lower third—the ligature being made fast to the finger of the operator, it is introduced into the mouth, and its head directed by a probe, is brought into contact with the inflamed tonsil. The animal fixes itself to the part in an instant, and in less than five minutes being gorged with blood, falls upon the tongue and is withdrawn. Relief soon follows, and the part continuing to bleed for three or four hours, the inflammation is greatly reduced.

Leeches are also applied to the internal surface of the nostrils, in affections of the head, connected with undue determination of blood to the brain, or with the suppression of an habitual epistaxis.

These remarks comprise the practical applications of this article. Something may be said of the manner of *using* them.

The part to which they are to be applied, should be first washed with soap and water, so as to remove the matter of perspiration, and the skin should be wiped dry. The leeches are to be placed on with the fingers, either one by one, or all of them together, by being placed in a tumbler, covered all over except one edge with a piece of linen, and applied close on the spot to be bled. As they will not stick to the glass, or the linen, they are in some measure forced to attach themselves as the surgeon wishes. The leeches should generally be suffered to fall off the spot spontaneously. If forcibly separated, the teeth which penetrate the skin, and which swell when inserted, are apt to be torn off, and when this happens the wound is very likely to inflame, and the animal is rendered useless.

When the patient's weakness, or any other circumstance requires them to be more speedily removed, they may easily be made to drop off, by sprinkling them with a little salt or snuff. Such as fall off spontaneously, may be used a second time, for they remain possessed of their teeth, and to prevent them suffering from their engorgement, they should be put into a weak solution of salt and water, which causes them to discharge the blood. Such as are carefully attended to, may be used five or six times.

The number to be applied, will vary with the exigency of the case, and the age of the subject. For an infant of very tender age, from three to six—as years advance the number may be increased to thirty, forty, or sixty.

The quantity of blood drawn by each leech, will depend upon the quality. A single French leech, it is said, will draw half an ounce of blood. Ours do not take so much, but the bleeding from the punctures is often very considerable. The majority of American

leeches take from two to three drachms each, which is the quantity calculated upon in a prescription for their employment.

REFERENCES.—*Johnson on the Leech; Poliniere Sur les Emissions Sanguines.*

CUPPING

Is another method practised, for abstracting blood from a part, and is resorted to when to the loss of blood it is also desirable to excite much irritation on the skin. For this purpose it is better adapted than leeches, and therefore it can only be employed where the skin is sound, or be applied to parts distant from the diseased. It is to this power of deriving the fluids to the surface, which cupping possesses in a high degree, that we must ascribe its superiority in many cases over leeching, while it is obvious, that in other instances this last has advantages which are almost peculiar. In local inflammatory affections, inasmuch as blood drawn immediately from the part, will afford most relief, leeches are decidedly preferable. In deep seated affections, over which the skin is sound, it has been considered a matter of indifference by what means blood was drawn from the part, though from what I have said, a preference should be given to cupping. At present, leeching is the method of abstracting blood to which physicians are most partial, and as it is less painful, and more blood can be drawn by them with convenience, they may maintain their rank; but cupping is a good substitute, and a very valuable agent.

The diseases to which this remedy is adapted, will correspond with those which have been already mentioned under the head of leeching. They may, however, be enumerated, and are as follows:—headache, delirium, phrenitis, the various grades of madness, vertigo, in all tendencies to apoplexy,—in inflammation of the eyes, and inflammatory affections of the chest,—in asthma, dyspnœa from various causes, etc. Cups are applied to the temples, to the scalp, the back of the neck, along the spine, to the chest, and in various other situations. The operation is very simple, but to acquire dexterity much practice is required.

It is performed in the following manner:—the skin being softened by means of a sponge and warm water, a small bell-shaped glass vessel, or other material, having the air previously exhausted, by being held over the flame of a lamp, or by burning in it tow, or paper, is immediately applied to the part. The edge of the cup must be accurately adapted to the skin, and no substance, as hair, should be interposed, otherwise the external air will fill up the vacuum and the cup will not adhere. The adhesion of the cup to the skin, or in common language the suction, which takes place, depends upon the pressure of the air upon the surface of the exhausted cup, and from the absence of the same pressure upon the skin—it swells, and rises in the cup, the vessels are enlarged, and become very red and turgid. When this state has continued a few minutes, the cup is removed

and the scarificator is applied,—the depth of the lancets being regulated by the vascularity of the part, and the quantity of blood desired. When a sufficient quantity of blood has collected in the cup, it is removed by gently introducing the nail of the fore finger under the edge, by which means the air is allowed to rush in, and the equilibrium being restored, the vessel falls off. The skin and the edges of the wounds being washed of the blood, and the coagula which have formed, the cup is again attached by the same means, and then removed, until a sufficient quantity has been drawn. When the operation is completed, the wounds made by the scarificator are anointed with a little sweet oil or simple cerate.

When a cupping glass is applied alone without scarifying the part, the operation is called *dry cupping*, and is employed to produce speedy irritation on the skin for the relief of oppression, shortness of breathing, or pains about the thorax and abdomen, etc. Cups may be made of tin or copper. Small tumblers may also be employed for the same purpose.

Lately Dr. Barry has recommended the application of cupping glasses to poisoned wounds, with a view of preventing the absorption of the venomous matter. The experiments which were performed to illustrate their utility, were as follows:—Wounds were made upon the back and thighs of full grown rabbits, and when the blood had ceased to flow, two or three grs. of Strychnia, in powder, or ii. or iii. drops of Hydrocyanic Acid were introduced into the wounds: then, after intervals of three, five, and ten minutes, a cupping glass was applied to the wound, which was renewed as often as it fell off. No symptoms of poisoning occurred in these animals; but if on the contrary, this precaution was not taken, they all died. On one occasion Dr. Barry waited until the animal became affected with convulsions, nevertheless he succeeded in saving it by these experiments.

M. Lannec has repeated these experiments, and has verified their results. Six drops of Hydrocyanic Acid were poured into a little wound made in the thigh of a rabbit—the cupping glass was applied for twelve minutes, and the animal showed no signs of having been poisoned; but when it was taken away, convulsions came on so suddenly, that it was thought to be dead—but a fresh application of the glasses restored it to its former state of tranquillity. The same effects ensued upon removing it again, and it was only half an hour after the introduction of the poison that it could be removed with impunity. Another rabbit, treated with the same quantity of acid, died in two minutes.

Other deadly poisons, as Arsenic, the Upas Tieute, etc., have been employed in the same manner, and when the glasses were applied no poisonous symptoms appeared, but were soon produced if they were not.

Dr. Barry in studying the phenomena of the venous circulation, was astonished that the pressure of the atmosphere, was either left out, in the enumeration of its causes, or considered merely as a secondary agent. Atmospheric pressure he believes necessary. Absorption

he does not look upon as a vital function, but as a physical effect, dependent on the same cause, as the venous circulation, *i. e.* atmospheric pressure. Hence he concluded, that as the circulation and absorption are dependent upon atmospheric pressure, if this could be removed as by forming a vacuum, absorption would be prevented. Hence the various experiments instituted with this view, and in performing them the most deadly poisons were employed. The results were in many instances surprising, the action of the articles upon the system being suspended or excited, by the application or removal of the cupping glasses.

The experiments of Dr. Barry have been repeated by Drs. B. Pennock and Rodrigue, and his statements fully confirmed. They differ from him, however, in the explanation given of their mode of operation, and attribute to pressure only the good effects derived from their application. They tried pressure simply, without exhausting the air of the glasses, and found the same results to take place. They attribute, therefore, the good effects which follow the use of the glasses to pressure, which acts by interrupting the action of the absorbents, and paralysing the nerves.

NOTE.—The treatment I would pursue in bites of venomous reptiles, is, the application of a ligature above the affected part, and the employment of suction by the mouth. This method I would recommend, in cases of poisoning, or suspected poisoning from animals, as more prompt, more effectual, and, I think, perfectly safe. Inasmuch as it can speedily be practised, it is superior to excision or caustic. If there are no ulcers in the mouth no apprehension need be entertained, for should a portion of the saliva impregnated with the poisonous matter be swallowed, no injury would result, since from the experiments of Orfila, the poison of the Viper may be introduced into the stomach with perfect safety.

MATERIA MEDICA.

Divided into aliments and medicines—Definition—Brief account of the various plans of arrangement which have been pursued—First in point of time and simplicity is the *alphabetical* arangement of medicines—remarks upon it.

Another mode was founded on the class of bodies or kingdoms, to which the different substances belonged.

Another upon an investigation of the sensible and most obvious qualities of the medicinal substances.

Another upon the medicinal operation of the article upon the system.

A fifth, into classes, according to the systems of the body upon which their action is exerted.

The arrangement preferred, will be as follows—with remarks in explanation.

Materia Medica.

THE Materia Medica is commonly considered as divided into Aliments and Medicines.

This division, though not always followed by systematic writers, is certainly correct, and may be made productive of much practical utility. The subject of Aliments has been overlooked by Dr. Chapman, and some reflections made, calculated to place this division not in the most favorable or important point of view. In this respect I differ very essentially from such respectable authority, having always considered a well directed diet, one of the most important adjuvants to medicine, and in some cases, indispensable for a full restoration to health. For though you need not be informed of the solid qualities of beef and mutton, of the delicacy of poultry, or the flavour of game, and so on, yet you should all be acquainted with the kind of diet, which will suit different disorders, and more particularly, how to direct the regimen of your patients in such a manner, as to shew yourselves not unmindful of their comfort, and of the very essential aid, which is to be furnished to your medical treatment from this source. For these reasons I shall devote several lectures to the subject of Aliments, and though it is usual to commence with their consideration, I shall defer it to the conclusion of the course.

Of the Materia Medica Propria.

By this term is meant, as I have observed, that department of Medical science, which teaches the knowledge of remedies, or the substances employed in the cure of diseases. The subject diffuses itself very extensively. Under it is considered, the Natural and the Chemical History of the different articles, and the method of preparing them for use—the application of these articles to diseases, their doses, and the best modes of administering them.

Previous to the consideration of these points, it will be proper to treat of the Classification of so extensive, and multifarious a list of remedies as this branch comprises. The importance of a good arrangement, in facilitating the acquirement of knowledge, is too well known to require any comments in this place—a good system of science being like a fine building in architecture, where from the skill of the architect, the various rough and heterogeneous substances, which enter into its composition, are so ordered, each in its proper place, as to present to the eye, a uniform and harmonious whole—so in the Materia Medica, the confusion which would arise, from so large a number of articles being irregularly treated, yields at once to the simplicity, order, and ready comprehension afforded by a judicious Classification.

The great improvers in Medicine, as in other branches of Science, seem to have been desirous of associating together, things, which in their nature, appear to have an obvious connexion. No branch of Science, affords a more manifest foundation for associations, than that which treats of the different articles employed for the cure of diseases. To this probably it is owing, that the distribution of Medicines into

classes, is at least as ancient as the first medical writings now extant, perhaps as the art of Medicine itself. From the prevailing passion for novelty, as well as from attempts at improvement, it might readily be imagined, that during a period so extensive as that in which Medicine has been practised, many different distributions would be formed, and of course a variety of general terms introduced for expressing them. That you may form some idea of the various distributions which have been made, and of the difficulties to be encountered on this subject, I shall bring before you, a few of the various methods which have been proposed.

The first in point of time, and simplicity, is the alphabetical arrangement.

From this however it is obvious, that we can derive no information, with regard to the specific virtues of various substances admitted into our catalogue of the Materia Medica.

Another mode of arrangement is founded on the class of bodies, or kingdoms, to which the different substances belong; and thus we obtain three general divisions, of Animal, Vegetable, and Mineral Substances. This method of classification, is liable to the same objection as the former, as it is too general, indiscriminating, and uninstructive.

Another method proposed, is that, to which we are led by an investigation of the sensible, and most obvious qualities of medicinal substances, and they are considered, as they are acid, or alkaline, acrid, astringent, aromatic, glutinous, unctuous, bitter, emetic, or cathartic. This mode is also too vague, and inappropriate, to admit of general application. For some substances have no discriminating, sensible qualities, others possess several so nearly similar, that it is difficult to refer them to one class, in preference to another: and others again, resemble one another in their sensible qualities, and yet are very different in their effects on the human frame.

Other arrangements have been made, founded upon the medicinal operation of the articles upon the system. This method must be considered the best for Classification, as well as to present to our view the predominant characters of such a variety of articles, as the Materia Medica comprises. It is evident, that medicines ought to furnish the characters, which serve to unite, or to separate them; and what characters can be preferable to the effects, physiological, and practical, which they excite. It is the impression that a medicine makes upon the organised tissues,—it is the results which follow their application upon these parts, which must determine its place, in a methodical distribution of medicinal agents. In executiug an arrangement founded upon this principle, however, various methods have been pursued. While the outline has been admitted, the filling up has presented pictures as various as the persons who have been engaged. Dr. Cullen, in pursuing this plan, has arranged the articles as their operation is exerted upon the solids and fluids of the body, and has distributed the various substances into twenty-three classes. Dr.

Darwin comprehends them all under seven classes. While Cullen's classification has been thought too diffuse, Dr. Darwin's is much too contracted, and adapted only to his own exceptionable system of Pathology.

The arrangement into Classes, has within a few years been the order pursued by most writers on the Materia Medica. They have differed from each other, in the number of these classes, and a few distinctions of but little value. Of late it has been usual to arrange the articles of the Materia Medica, according to the Systems of the body, and to treat of them, as their action is exerted upon any of these systems.

The following arrangement will be pursued in these Lectures—

1. To speak of those medicines which irritate the Stomach and Duodenum—This division comprising Emetics.

2. Those which irritate the internal surface of the Intestines—This division comprising, Cathartics.

3. Those which increase the natural operations of the Intestines, without exciting irritation—Laxatives.

4. Those which destroy or counteract morbid Substances, lodged in the Alimentary Canal—Anthelmintics—Antacids.

5. Medicines which promote particular Secretions—

a. Of the Skin—Diaphoretics.

b. Of the Kidneys—Diuretics.

c. Of the Uterus—Emmenagogues.

d. Of the Salivary Glands—Sialagogues.

e. Of the Bronchial Passages—Expectorants.

6. Medicines which strengthen the organised Structures—Tonics.

7. Medicines which in strengthening also restrain excessive discharges—Astringents.

8. Medicines which lessen the energy of the nervous and muscular systems—Narcotics—Antispasmodics.

9. Medicines Incertæ Sedis, i. e. those whose action is not well determined, and which cannot with propriety, be arranged under any of the foregoing divisions.

In this proposed distribution, there are as many classes of medicines as are sufficiently determined by their characters, and by the phenomena which are proper to them. Each division represents a particular medical property, which is discoverable in all the natural substances comprehended under it. It is not to be understood, that this property is the same in all the different substances:—experience proves that each has not the same degree of energy, but it is sufficient to jnstify the alliance which is made, that each exerts the same organic operations, and that the substances of each class, produce an action bearing considerable resemblance to each other.

But though the plan proposed is as good as any, yet it is not without objections—the principal is, that some substances being possessed of various powers, their proper places are not easily ascertained, and they must necessarily be considered under different classes—instances

of which may be given in Calomel, Tartarized Antimony, and others. The former acts as cathartic, sialagogue, alterative, and hence a repetition becomes unavoidable, and to render its history complete, it must be considered under each of these classes. Tartarized Antimony being emetic, cathartic, diaphoretic, and expectorant, according to the doses in which it is given, it becomes necessary to recur to it, when considering the separate medicines which are arranged under these several heads. But as there is no mode of classification, without some objections, I shall pursue this method, as being least objectionable, observing that I shall treat of every article more particularly, under that head in which its powers are most conspicuous, and that when from a difference in its preparation, or its exhibition, other properties are discovered, it must again be considered, under such other divisions, as correspond with the virtue specified.

It should be observed, that though I have made a classification of medicines, into Emetics, Cathartics, Diaphoretics, Emmenagogues, Tonics, &c., it is not meant to be understood, that the medicines of these classes, act in any of these modes uniformly and invariably. The contrary is too often the case. From causes to be referred to the states and conditions of the organs attacked, the same remedies exhibit often the most opposite effects—thus a Cathartic will often prove Emetic, and the reverse.—A Febrifuge increase Fever, a Tonic will add to the existing debility—Antispasmodics aggravate the affections they were designed to remove.

It must be evident, therefore, that in this arrangement, nothing can be considered absolute; but that the operations of Medicines, will be modified by the condition of the organs or system, to which they are applied. In prescribing an article with a view to a determinate end, it is important, that the condition of the part or system be as accurately known, as our present state of Pathology will admit—that the nature of the impression made by each medicine, as well as the force of that impression, be also known, with the modifications to be pursued, as relates to age, sex, idiosyncrasy, climate, season—that the preparation be such, as to furnish all the results that may reasonably be expected, after all the foregoing knowledge has been obtained; and lastly in what shape, or what states of combination, the medicinal agent produces the most powerful and beneficial effects. Upon some or all of these subjects, it will be my duty to enlarge; and as much as in my power, to afford you just, reasonable and proper views, upon the action of Medicines, so that without extolling them unduly, on the one hand, or depressing them unnecessarily on the other, present you such changes, either in the body to be acted upon, or the agent, as will secure, or defeat, the intentions we may have in view.

Pursuing the arrangement proposed, I shall consider under the first division

Division I.

Medicines which irritate the Stomach and Duodenum.

This comprises those articles termed Emetics.

In commencing any of the divisions, the following is an abstract of the leading objects which will be considered:

1. A definition of the class.
2. The direct effects of the class, and the changes induced in the system by these direct effects.
3. The effects of the class, in the cure of Diseases, and practical remarks upon its use in particular diseases.
4. Directions to be observed in the use of the class.

The history of the particular articles.

1. The Natural History.

Under this head will be considered its Natural Family—sensible qualities—chemical analysis.

2. The Medical History.

The preparation of the article.

1. For a convenient form.
2. For preservation.
3. For external use.

Combinations of the article.

1. For augmenting its virtues.
2. For correcting its active powers.

Lastly—The Adulterations.

EMETICS.

By Emetic Medicines are understood substances which excite vomiting independent of any effect arising from the mere quantity of matter introduced into the Stomach, or of any nauseous taste, or smell, or of any acrid, or narcotic power—but by a specific impression upon the stomach itself. The importance of this class of Medicines must be known to all of you, exercising, as it does, an immediate control over the operations of so essential an organ as the Stomach. For as vigour of body, and a free exertion of the intellectual powers, depend upon the healthy state of its functions, so in disease its disordered secretions, or the morbid matters it contains, tend greatly to depress and enfeeble them. The beneficial tendency of this provision which evacuates the morbid contents of an organ, or changes its secretions, must be apparent. Emetics were therefore so much celebrated among the ancients, that Hippocrates even recommended them to the healthy, if they wished to remain so, and advised their frequent repetition.

Upon the employment of Emetic Medicines, several prejudices have commonly existed, which it would be proper to correct before I proceed further. It has been supposed by some, that vomiting was an unnatural operation, and one therefore which ought to be considered hurtful. Vomiting is an operation of the stomach, to which nature often has recourse to expel offensive matters—it may therefore be considered salutary, and one which may with propriety be imitated by art, with this great advantage, that bile or irritating substances

lodged in the stomach, or duodenum, can with greater facility be evacuated in this manner, than through a convoluted tube of more than 30 feet in length. Accordingly it will be found, that the operation of a single Emetic, will evacuate more offensive matter from the stomach, with more certainty, as well as more immediate relief, than a course of mild medicines will do, of several days duration. Another objection to Emetics, is, that they are weakening remedies, and will exhaust the patient too much. This objection will also appear equally unfounded: for the weakness which occurs in the early stages of disease, does not arise from real exhausted strength, but from the nervous system being depressed, in consequence of the action of morbid substances upon the stomach, and which is extended over the system. Any degree of languor, or weakness, produced by an Emetic, cannot be so mischievous, as suffering the morbid cause to continue in action. Whatever therefore will evacuate it from the system, so far from weakening, will restore strength, and this fact all of us must have experienced, either as relates to Emetics or Cathartics.

*The Immediate Effects of Emetics, and the Physiological phenomena following their employment.**

An Emetic substance scarcely arrives in the Stomach, than it manifests its character. It irritates this organ; it excites an increase of vitality in the mucous membrane, the blood penetrates it, the capillary net-work existing upon its surface is more apparent, and the surface becomes more red and more sensible. These effects are extended to the duodenum, and the same organic phenomena excited. This increase of the vital energies of the Stomach is only of short duration. If the irritation caused by an Emetic, was of long continuance, it would cease to belong to those operations which are considered sanatory, it would partake of the action of disease. But the impression is soon effaced, without leaving any traces of its effects, within a very short time after they are administered. To these effects of an Emetic, others quickly succeed. It is important to particularize them.

1. The Serous exhalation, which in a natural state, moistens the interior of the Stomach, is soon increased to a considerable degree. The great increase of this secretion cannot be doubted, when we recollect the quantity of this fluid, which is often discharged by persons under the operation of an Emetic. Darwin relates the case of a man who had only drank a pint of fluid, and yet discharged by vomiting, six pints of this Serous substance.

2. The secretory action of the mucous follicles of the Stomach is also increased a considerable degree. The thick, ropy, viscid matter which is rejected by vomiting, is the consequence of their great activity.

3. Emetics increase the secretory function of the liver, and the

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* Vide Barbier, Traite Elementaire.

abundant discharge of bile is the consequence of their operation. It is impossible to believe, that the quantity of bile frequently ejected, could have existed in the Stomach, or duodenum, previous to the taking of the Emetic. The secretion of this fluid, is often excited by the medicine taken, and is the result of the exercise of its influence upon the animal economy. The irritation which the Emetic substance makes upon the surface of the duodenum, is extended by the Ductus Communis Choledochus to the liver, it excites its vital operations, causes a flow of blood, to this organ, and in consequence an increased secretion. Particles of the Emetic substance, may also be absorbed by the branches of the vena portæ and carried to the liver, and add another irritant to this organ. It is probable too that the compression the abdominal viscera undergoes in vomiting, might by acting upon the gall bladder, promote a discharge of its contents, and thus increase the quantity evacuated. The fluid being poured in the duodenum, is by the action of this organ transferred to the Stomach, and from thence discharged by its contractile efforts.

It is easy to conceive, why bilious matter is not thrown up, when vomiting takes place, immediately after an Emetic is swallowed. The irritating operation of the article, has not been extended to the duodenum, neither has the liver been affected by the same action. But when the operation has not been prompt, biliary matter is always mixed with the contents of the Stomach.

The Pancreas partakes also of the irritating operation of Emetic articles, its secretory action is equally accelerated after their use. The action of the Emetic does not cease with these effects. The muscular coat of the Stomach and duodenum feels the influence of this new irritation. By its contraction the contents of this organ are expelled, and we have all seen how violent and severe it is in many cases, being so complete as to reject the smallest quantity of fluid which had been swallowed. Connected with this subject is the change which has taken place in the regular and accustomed operations of this coat. Instead of proceeding in its regular waving motion from the Cardia to the Pylorus, its action is completely inverted, and the contractions proceed from the Pylorus to the Cardia. Various attempts have been made to explain the inverted operation of this organ, but no satisfactory reason has been assigned, and will probably ever remain among the inexplicable operations of the system, which while operating for our benefit, their essential nature we are unable to explore. It is not always produced by the operation of irritating agents upon the Stomach, since it often occurs when the system is depressed and debilitated from local and general causes, as after syncope, or in injuries of the brain.

After the remarks I have make, little doubt would be entertained by you, that the evacuation of the Stomach was the result of an active operation of this organ. Magendie, the most distinguished physiologist of the present day, maintains that the Stomach is passive, and that vomiting is occasioned by the pressure of the abdominal

muscles and diaphragm upon it. An opinion, so much at variance with the received impressions, excited the attention of physiologists to an investigation of the particular actions, excited by an Emetic. The experiments of Magendie have been repeated by Mr. Harrison in his Gulstonian Lecture before the College of Physicians, and while the importance of the action of the diaphragm and abdominal muscles has been acknowledged, the contractions of the Stomach were also considered necessary to effect the expulsion of its contents. The impression which seems to prevail among the leading physiologists of the day, founded on a variety of experiments is, that in vomiting contractions of the Stomach do take place, but that for these contractions to be effectual, the resistance of the diaphragm and abdominal muscles is required or something in its stead. The experiment has been made of giving an animal an Emetic, and dividing the abdominal muscles. It was then observed that while contractions took place, yet all the efforts of the organ were useless to eject its contents, until the hands were applied in the place of those muscles, when the Stomach being forced against the resistance made, vomiting was instantly accomplished. It is therefore decided, that the Stomach undergoes contractions, but that to effect its evacuation, the aid of the diaphragm and abdominal muscles is required. Such would be our conclusion from the uniformity which take place in this operation—the diaphragm becoming contracted and fixed, the ribs drawn down, the abdominal muscles drawn inwards, so that the Stomach is pressed on all sides by voluntary muscles, its own contraction is all that is required, and is what does take place to expel its contents.

The action of vomiting considered in a Physiological relation is not what ought chiefly to interest us. It is the actions which it excites in various parts of the body—it is the changes which are produced in the exercise of its functions, which are important to be known. We need only recur to an individual under the operation of an Emetic, to be convinced that the influence which it exercises upon all the organs, is of a very powerful character. This leads me to consider

The general effects of Emetics.

1. Upon the brain and nervous system.

The impression made upon the nerves of the Stomach, is soon extended to other parts of the system, to the brain, spinal marrow, sympathetic nerves and ganglions. To the excitement thus produced, are we to attribute the movements which take place in the other systems of the body, and the impression which is often made upon the morbid actions which exist.

2. Upon the circulation.

The pulse under their influence is considerably and variously affected. Under the feelings of nausea it is more frequent and smaller, with vomiting it is much augmented in volume, determinations take place to the brain to a considerable extent, as evinced by the redness of the face, swelling of the jugulars. The minute system of vessels,

or the capillaries, have likewise their action increased and blood is sent to them to a large extent. To this state succeeds diminished action, languor in the intellectual and bodily functions, with a disposition to sleep.

The secretions are excited.

Expectoration is promoted—the contraction of the diaphragm and abdominal muscles with their alternate relaxation, variously agitates the motion of the air in the lungs and bronchia, and thereby promotes expectoration.

Emetics also act as Diaphoretics—there is a consent between the vessels of the Stomach and the surface of the body, so that the several states of them are mutually communicated to each other. The action of an Emetic exciting nausea, with a copious effusion of the fluids of the Stomach, a relaxation of the vessels of the skin takes place, with an increase secretion from the surface.

Emetics increase the power of the Absorbents, as it is known that buboes in a state of suppuration, and other swellings, have been dispersed by their operation. This effect may be explained by the nausea excited reducing arterial action, and by a peculiarity of the absorbent system, Dr. Chapman observes, its functions are most active when the arterial is most depressed.

Emetics also act upon the Kidneys—but this may be considered an indirect result of their operation. For if the absorbents are excited to activity, there appears no difficulty in accounting for the action of the kidneys, for if water be absorbed, it must be discharged, and that through the kidneys.

Rules to be observed in the administration of Emetics.

In all diseases where much Plethora is present, or when the habit tends to it, and where the condition of the patient requires at the same time an Emetic, blood-letting ought always to precede it, lest the strong effort of vomiting should rupture the distended vessels of the head, and thus bring on apoplexy, or a discharge of blood, from other parts of the body be produced. In addition, vomiting seems of most use, which is excited immediately after bleeding, for the inconveniences of a plethora are then avoided, and the salutary effects of the Emetic are more certainly obtained, especially if the disease is a Fever, which requires the aidof both.

2. When the necessity is urgent, and a quick operation is desired, a large dose of the most active Emetic must be given.

3. In ordinary cases, it is best to give them in divided doses. Thus 4 or 5 grains of Tartarized Antimony may be dissolved in 4 or 5 table spoonsful of water, of which 1 table spoonful may be taken every 10 or 15 minutes until vomiting is excited. Then encourage it with tepid drinks, chamomile tea, &c.

4. If the operation of an Emetic is too violent, the best means of checking it is Laudanum in large doses, fomentations to the stomach, and sinapisms to the feet. If these fail, an anodyne enema and a

blister to the stomach, or what would be preferable, a cataplasm continued as long as it could be borne. Sinapisms to the feet are very powerful in allaying the inordinate contractions of the Stomach.

In irritable conditions of the Stomach, whether brought on by Emetics or other causes, there is one direction which I wish particularly to impress upon you, viz. the absolute necessity of administering medicines and drinks in the smallest possible quantity. In this condition, the common people administer a variety of substances and to an unlimited extent. The thirst being urgent, drinks are freely taken, but from the irritable state of the Stomach, they are thrown up as freely. The best direction is to give as little as possible—a mouthful or table-spoonful will be sufficient to moisten the mouth and throat, more will be rejected—sometimes entire abstinence is best.

5. Do not allow the apparently inactive state of the Stomach to induce you to augment the dose of an Emetic to a preposterous extent. Remember, as Dr. Paris observes, that although the Stomach may be unable to void its contents by vomiting, it may, nevertheless, retain its sensibility, and be therefore liable to inflammation. A case is related of a Practitioner attempting to excite Emesis in an epileptic patient, by a large dose of Sulphate of Zinc, which produced inflammation of the Stomach, and a fatal termination. When the Stomach resists the action of one article carried to a reasonable extent, the best practice would be, to have recourse to another.

The great importance of this class of remedies, will excuse my entering a little into detail, in its application to diseases.

Application of Emetics to Diseases.

They are adapted to a great diversity of cases. When we consider the extensive surface which the Stomach and Intestinal Canal presents to the variety of irritating matters which are daily introduced into them, from the combined sources of extraneous articles of food, and the occasional morbidity of their natural secretions, it is no way surprising, that the primæ viæ are observed to be that part of the system, where we meet most frequently with those irritations, which produce, and keep up diseases. In addition to these sources of irritation, it happens from the affinity which subsists between the surface of the body and the Intestinal Canal, that when the general perspiration is checked, by some external occasional cause, as by the application of cold, the natural secretions into the cavity of that Canal are increased, which secretions when allowed to remain there, so as become acrid, re-act again upon the system, and thus add to the general exciting causes.

It is in the various grades of Febrile action, that Emetics will often be found to exhibit their best effects. These diseases are always connected with symptoms, which mark a departure from the healthy condition of the primæ viæ—as impaired appetite for food, weight at the precordia, and abdominal distension; with nausea, thirst, and furred tongue. Here then we see the propriety of having early re-

course to Emetic medicines, which by speedily evacuating the Stomach of its morbid contents, tend strongly to dissolve the paroxysm of fever. Accordingly, they should be of on active nature, such as while they evacuate freely, should make such an impression, as to dissolve any morbid associations which may have been formed, and which keep up, and prolong disease.

They are not necessary in every case of fever. When the disease has been preceded by a meal, which oppresses the Stomach, they should be administered immediately. They should also be administered when nausea oppresses the patient, and when this is supposed to depend upon bile, or other irritating fluid—when there is an unpleasant taste in the mouth, and when the tongue is furred—when headache exists, and there is reason to believe that the general derangement of the system, proceeds from this source. Under these circumstances they may be administered with the greatest advantage. They are absolutely contra-indicated in Febrile diseases, when there is determination to the Stomach, and intestines. This determination is indicated, when the Stomach is irritable, with occasional vomiting of thin fluids, or frequent retching—when the tongue is red—when pain and soreness exist in the epigastric region, upon pressure being made.

In the Bilious Remitting, and Intermitting Fevers, of our country, they are often indicated, and may be had recourse to with the happiest effects.

In Intermittents, their operation is sometimes remarkable, not unfrequently putting a stop to the disease, without the employment of any other medicine. They have been recommended for the purpose, not only of cleansing the primæ viæ, but of preparing the Stomach for bark. Judging from my experience, I should speak favourably of the practice, as I have witnessed a more prompt operation of the bark after this preparatory process, than when it was not pursued.

Emetics are useful as Diaphoretics.

I have spoken of the utility of Emetics in Fevers as evacuants—but they are subservient to other valuable purposes. Among them may be mentioned the removal of the morbid stricture of the vessels of the skin, which may be considered as the principal accessory cause of uneasiness. Accompanying this morbid stricture, there is either an increased evolution, or a morbid retention of heat, which adds greatly to the irritation, and excitement of the nervous and arterial systems. Emetics therefore not only by their impression upon the Stomach, but by determining the circulation to the extreme vessels, contribute very much to produce diaphoresis, and thereby is opened a channel, by which the superabundant heat is carried off.

In many of the deranged conditions of the Alimentary Canal, Emetics are extremely valuable. In Dysentery and Diarrhœa, they are very advantageously employed, for their Diaphoretic operation. With the skin, the Alimentary Canal possesses an intimate connection, and in most of the affections of the latter, the functions of the former will be found in a deranged condition. The skin is unques-

tionably the principal excretory organ of the body, and from the experiments of Sanctorius, much the larger portion of the ingesta, are carried off by this channel. Accordingly, when its secretory functions are suppressed, morbid action is excited in other parts, and disease ensues. Emetics then relieve the stomach and bowels, and by the excitement they produce, determine the fluids by a revulsive operation into other parts of the system, and particularly dispose to a renewal of the excretory functions of the skin. The utility of this practice is confirmed by Dr. Moseley and Sir John Pringle. Dr. Cleghorn was in the habit of giving the Pulv. Ipecac., in combination with Vitrum Antimonii Ceratum, in such doses as to empty the intestines as soon as possible. The cure may then be completed with small doses of any of the diaphoretics, as Ipecac. with Opium, Dover's Powders, dieting, &c.

In Diarrhœa, the same remedies will also, often prove serviceable.

In Dyspepsia, Emetics given occasionally, are productive of great benefit in the early stages of the disease. They should not, however, be repeated too often, as they would weaken and otherwise impair the tone of the Stomach. Their effect is to remove the acid contents of the primæ viæ, and to promote the intestinal secretions.

Emetics emulge the biliary ducts, and promote the biliary secretion.

In obstinate constipation—The general practice in this disease has been, to have recourse to Mercury, until salivation is induced, after the usual evacuating medicines have been carried to a sufficient extent, without success. This is most commonly successful, and its good effects seem to depend upon its exciting the biliary secretion, by which the bowels are stimulated to a discharge of their contents. Emetics produce the same effects. They emulge the biliary ducts, and cause a more copious discharge of bile—while by their febrifuge and relaxing operation, they remove the Fever, the inflammation, and the constrctioin, which constitute the most dangerous as well as distressing symptoms that attend a constipated state of the bowels. Dr. Hosack relates several cases of persons subject to attacks of obstinate constipation, who could only be relieved by Mercury, carried to the point of salivation, after V. S. Cathartics, blisters, the warm bath, and enemata of Tobacco had been employed without success. Yet these persons in attacks, equally violent as those which required the above treatment, have been promptly and effectually cured by Emetics, which excited free and copious vomiting.

Emetics act as Expectorant and revulsive Remedies.

In most of the diseases of the Thorax, Emetics are highly recommended—particularly in some of the acute affections. In Pneumonia Notha, after the inflammatory action has been subdued, or when the congestive state of the lungs exists, in a high degree from the beginning, Emetics in repeated, but small doses, are more useful than any other remedies we can employ. Their utility in equalizing the circulation, is particularly obvious in this disease. Here the blood, driven as it were, from the smaller vessels, and from the surface, is accumu-

lated in the larger vessels and in the lungs. To such a degree is this organ oppressed, by the degree of congestion, that Dr. Rush has termed the disease an apoplexy of the lungs. Emetics in such cases restore a more equal circulation, and with the discharge of much mucus, the patient experiences much relief.

In the Typhus Pneumonia, which pervaded so large a portion of our country, several years ago, and which deprived us of several ornaments of society, Emetics, judiciously administered, were found very beneficial. It was, Dr. Potter observes, a novel spectacle to those who were accustomed to unsheath the lancet, in almost every thoracic affection, to behold a pnuemonic Fever removed by the incantation of a single Emetic.

In Asthma, given before the formation of the paroxysm, they very often suspend the attack. After the disease is formed, full and free vomiting, does much to effect the solution and bestow relief. From the extreme difficulty with which the blood passes through the pulmonary circulation, the large vessels in the neighbourhood of the heart are tumified and enlarged, the extremities are cold, and shrivelled, the pulse is frequent, quick, and often small, a distressing cough is present, and an accumulation of mucus takes place in the bronchia, which from its viscidity, and the inability to expand the lungs, cannot be expectorated. Under these circumstances Emetics appear to exert a centrifugal power. The concussion the system undergoes by the action of vomiting, drives the blood into the remote parts of the body; by the nausea they produce, spasm is relaxed, and expectoration by the rapid passage of the air in the lungs, through the bronchia, is promoted.

In Pertussis or Hooping-cough, they are very effectual remedies, in the first stage. If the symptoms are violent, they should be repeated daily, and sometimes twice a day, at least in children, for older persons cannot bear the repetition so well. The antimonials are commonly preferred, but some employ the Vitriolum Album, upon the supposition, that it is both Emetic and Antispasmodic. Dr. Fothergill recommends the antimonial preparations, and declares, that the practice of emptying the Stomach frequently, has been the means of affording most relief.

In Cynanche Trachealis, or Croup, Emetics are indispensable, and are equally successful in the inflammatory and spasmodic forms. Of the Emetics used, the Tartarized Antimony is to be preferred, from the certainty of its operation, and the permanency of its effects. With proper views of the Pathology of this complaint, we may approach it with as much confidence of success, as any other to which the infant state is subjected.* In its commencement it is purely inflammatory, but accompanied with spasmodic affection of the Trachea. In mild cases, they afford much relief to the symptoms, and

* Chapman's Mss. Lectures.

they may be repeated during the whole course of the disease, whenever from increased excitement, or when from an increase of the secretion of the larynx and bronchia, any aggravation of the symptoms is experienced. In some attacks however, other measures become necessary, not only to arrest the morbid actions which are going on in the larynx and bronchia, but to render the system susceptible to the operation of these agents. The insusceptibility of the Stomach, to Emetics, is often exhibited in this disease, in a remarkable degree, insomuch that the largest doses of the most powerful, are often insufficient to occasion its evacuation. Blood-letting will be required, and it should be resorted to whenever the excitement calls for it, or whenever the Stomach cannot be roused by such doses of Emetic substances, as it is prudent to employ. The obstinacy of this organ, to be acted upon by these agents, is connected with the general excitement of the system; and if a single bleeding be insufficient to renew its susceptibility, another will, and it should even be carried ad diliquum animi. This will rarely be found to fail, and the effect of the remedies conjoined, is often salutary, in the highest degree. We should not, however, discontinue our treatment with the evacuation of the Stomach, but large doses of Calomel will be required to operate upon the bowels. The cure will then be completed, by giving a decoction of the Polygala Seneka. "The neutrality, which in common practice, is followed between the patient and the disease, seems to depend upon incorrect notions of the pathology of the complaint, and an idea that children cannot support such evacuations. The fact is children possess a remarkable tenacity for life, and they even appear capable of supporting bleeding, and other evacuations, better than adults. There is no doubt, that they have endured, what has destroyed persons more advanced in life—they have been found with their mothers buried under a hollow cone of snow, the latter dead, and the other still preserving life. They resist contagious diseases better than adults, they recover more rapidly from surgical operations, and when their systems have been reduced by evacuations of any kind—from these facts, we should consider the condition of no child, absolutely hopeless."*

In the various anginose affections, Emetics are of great utility. They, in my opinion, are particularly well adapted to the commencement of these diseases, and in my practice, I have derived more benefit from their use, than from any other species of evacuants. These diseases, strange as it may appear, are often intimately connected with the disordered condition of the Stomach. This connection will not appear more singular, than various other diseases, which are admitted to have their origin in that organ—thus aphthæ in children, are referred to the state of the Stomach and Alimentary Canal, and various exanthematous disorders, have a similar origin. Emetics then,

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* Chapman's Mss. Lectures.

are not only useful by evacuating the Stomach, but they reduce inflammation by the nausea they excite, and by the new determinations they produce.

In Cynanche Maligna, they are of use, in bringing off a considerable quantity of acrid matter, which by getting into the bowels, might induce a Diarrhœa—an affection to be avoided by every possible means, as always adding to the debility, and endangering the life of the patient.

In Cynanche Laryngæa, one of the most distressing forms of anginose disease which you will ever witness, not only from the sufferings of the patient, but the great mortality which attends it, Emetics are often highly beneficial. Dr. Armstrong speaks of them in the highest terms, and states, that in five cases of this disease, he had exhibited the Tartarized Antimony, and sometimes combined with Ipecacuanha, in repeated doses, until free and frequent vomiting took place. No circumstance of his professional life, he says, ever gratified him more, that the great and sudden relief which the vomiting afforded—in reality it removed all the urgent symptoms at the time, and being excited as soon as the slightest signs of stricture of the larynx returned, at last completed the recovery.

Diseases in which most of the above effects of Emetics are combined.

Emetics in many of the diseases of the head, have been thought beneficial. The connection which exists between the brain, and the condition of the Stomach, would render such practice, often judicious and safe. We know that there exists, a considerable sympathy, and that one responds with promptness, to the derangements of the other. The existence of pain, though severe to be borne, is a happy result, arising from our organization, since it admonishes us of the approach of disease, and bids a recourse to such means, as Providence has appointed for our relief.

The sick head-aches of the studious, and the delicate female, connected as they are with acid eructations, nausea, are often effectually relieved, by mild Emetics. To these may be added, head-aches, and vertiginous affections, which have often similar connections, and are terminated by the same means.

In an anomalous species of headache, occurring after blows upon the head, they have afforded much relief. I was acquainted with a gentleman, who in a rencountre, received a severe blow upon the head, with a wound of the scalp. The wound healed very favourably, but in a short time, the gentleman was affected with violent headaches, insomuch that he thought the bones of the head would be torn asunder. The anti-phlogistic treatment was carried to its fullest extent by Dr. Physick, without benefit, the scalp was divided by a crucial incision, with only temporary advantage, at last, recourse was had to Emetics, and with very great effect.

The common impression, that Emetics cannot be resorted to, in cases of severe headaches, and vertiginous affections, is altogether

unfounded—experience proves the contrary, and every day convinces us, that the brain supports the operation of Emetic medicines, under these circumstances, without injury. Witness the apoplectic state of intoxication, and let me ask, is it not wonderful, what a degree of compression, and determination of blood, the brain will sometimes support, and yet return to the healthy exercise of its functions.

In the apoplectic state of intoxication, an Emetic will effect much in restoring the patient to his senses. Not only in the apoplectic state, will relief be afforded by their use, but in the excited state which precedes collapse. Here when persons are noisy, quarrelsome, incapable of being controuled, breaking and destroying every thing within their reach, vomiting will put an end to all these irregular actions, and if effected by an active Emetic, (here prefer a solution of Tartar Emetic in water,) the person by its operation is soon made more rational, and falls into a sound sleep. The beneficial operation of this practice, with its influence upon the moral faculty, in exciting disgust, should be a reason for subjecting every drunkard, to this treatment.

In apoplexy, they have been recommended by the physicians of Europe. Their use in this disease, should be regulated with caution, and directed with judgment. In Idiopathic Apoplexy, that is when it arises from the general fulness of the system, I doubt if they could be safely resorted to, from the known tendency of the operation of an Emetic, to drive the blood to the superior parts of the body. But when the disease is symptomatic, or dependant upon the condition of the Stomach, which sometimes happens, they may be resorted to with advantage. In this case, it usually succeeds to a debauch, or from eating a very full meal, and under these circumstances their use is strongly indicated. Their administration, will with propriety be preceded by V. S., in order to reduce the volume of the blood. "That apoplexies frequently arise from this cause, I need only refer to the numerous instances of sudden deaths, that are mentioned in the daily papers, nothing being more common than the statement, that such a one dropped from his chair, after eating a full meal. The effect of a full meal, distending the Stomach, seems to act by pressing upon the aorta descendens, and obstructing the free expansion of the lungs, by which means, the arteries of the head become turgid with blood, and the disease produced."—*Fothergill.*

To remove therefore, this determination to the head, active Emetics are indispensable, and they should be carried to the extent of free evacuation, for in proportion as this takes place will be the relief afforded.

In Epilepsy, there has existed a great variety of opinions respecting their utility. There are many cases in which this disease may be traced to derangement of the Stomach and intestines. This is rendered probable by the circumstance of its recurrence; it being observed to make its attack in epileptics, upon any irregularity in diet—to occur very often among children who are much indulged, and that its

attacks were seldom renewed, without either an habitual indulgence in eating, or a neglect of necessary exercise. It is therefore probable, that the state and condition of the Stomach, and Intestinal Canal, are greatly concerned in the production of this disease. We know that the irritation from worms, often excites this complaint, and why not irritation from the morbid or undue quantity of the contents of the Stomach. That such is the case, we infer from the relief afforded by an Emetic, administered during the paroxysm, either in moderating its violence, or bringing it to a close. Whatever doubts may exist as to the propriety of giving an Emetic, during the paroxysm, most practitioners concur in their utility, previous to the fit, when from any particular symptoms, this can be foreseen. Dr. Eberle states, that in a child who had been eighteen months affected with occasional epileptic convulsions, he had succeeded in removing the disease entirely, by a long course of Emetic remedies, administered every third day.

There is one other form of disease, which may with propriety be placed under this head, in which Emetics are useful:—the Convulsive Diseases of Children.

These affections are always alarming, and with those of tender years in a more especial manner. They originate in various causes, often dentition, sometimes as a consequence of Fevers, and very often from irritating matter in the Stomach. When neither of the above causes exist, I am led to suspect the latter, and direct my treatment accordingly. I have been called to several cases, in which my suspicions have been fully verified. In one instance, the little patient had been eating freely of ground-nuts, and in others, the food of the preceding day remained undigested, having undergone the acetous fermentation, to a considerable extent. In these cases, the paroxysms have only been relieved by evacuating the Stomach and bowels, and no article is so well adapted, as Ipecacuanha, in the first instance, followed by the free administration of Castor Oil. In the alarm which these occurrences always excites with mothers, and the attendants, a variety of remedies are resorted to, with little effect. The warm bath, frictions, mustard plasters, volatile substances of various characters, assafœtida, &c., which are all resorted to, on these occasions, are only of secondary importance—Relieve the Stomach and bowels, and the convulsions speedily subside. There is no article so safe and effectual as Ipecacuanha given freely, since its operation is intended to be two fold, to evacuate the Stomach, and to cleanse the bowels.

In many of the forms of Mania, Emetics have been favourite remedies, but they should not be employed, without some discrimination. In the acute states of the disease, which is denoted by great loquaciousness, flushed cheeks, wild and inflamed eyes, &c., their employment would only aggravate these symptoms, by increasing the the determination to the brain. On the contrary, our remedies should be of such a nature as would divert action from that organ. Nauseating doses, may with propriety be resorted to, as a means of

diminishing action, and producing relaxation. But in chronic Mania, and in another species of derangement, Melancholia, employed in these cases, as a chronic remedy, and repeated every other day for weeks, I have known productive of the most beneficial effects. In these affections, the Stomach is generally very torpid, and requires large doses. Not only is the Stomach insensible to impressions, but the whole system, insomuch that cold, parturition, &c., produce but little inconvenience or distress. With these views strong antimonial Emetics have been employed, with the happy effect of rousing the patient from that state of mental and physical torpor, with which he is oppressed, restoring sensibility, and renewed susceptibility to the impression of remedies.

In Mania a Potu, Emetics have been strongly recommended. We owe this practice to Dr. Joseph Klapp, of Philadelphia, who was induced to make trial of Emetics, from the opinion that the disease was gastric in its origin. This he inferred from the nature of the substances ejected from the Stomach, the appearances upon dissection, and the effects which follow their operation. This disease afflicts persons who have long been addicted to the intemperate use of ardent spirits. If from contrition for the past errors of their lives, or from an attack of sickness, they are suddenly deprived of their accustomed stimulus, derangement very generally follows. The treatment which was formrely pursued, and is still, by many practitioners, is the employment of opium, in very large quantities, in order to excite sleep, (the symptoms subsiding soon after sound sleep can be induced,) and the use of a cordial, and stimulating regimen. Under this plan of treatment, the patient is gradually restored, but the cure is often tedious and protracted. Dr. Klapp, from observing the effect which accidental vomiting produced in a case of this nature, was induced to make a trial of Emetics, and much success followed their use. This practice was introduced by Dr. Klapp in the Pennsylvania Alms House, at the time I was a resident student in that Institution. Patients, who were admitted in the highest state of excitement, with every characteristic mark of the disease, as well as others, under the milder shades which it assumes, were speedily tranquilized under the operation of the Tartarized Antimony. If the administration of one Emetic was not sufficient to enthrone the reasoning faculties, a repetition of them, provided the strength would admit, seldom failed. The consequences of the operation of the Emetic, was a discharge of thick, viscid, and glairy matter, a removal of the usual tremor, the pulse becoming fuller and more frequent, and the patient soon falling into a sound sleep, from which he commonly awoke restored to reason, and to himself. As, however, he will complain of weakness, from the evacuations he has undergone, it will be proper to administer moderately stimulating drinks, which confirm the cure. The Stomach, in this disease, loses its susceptibility to the action of medicines in a very great degree, insomuch that I have known a scruple of Emetic Tartar exhibited, before vomiting was produced.

It should therefore be given in doses of 2 grains, every 15 minutes, until it operates. It must, however, be observed, that this plan of treatment is not adapted to all cases. In some the constitution is so much broken down, by excessive indulgence, that it would be prostrated under this practice, and I would caution you against its employment. Where, however, the strength of the pulse, and the vigour of the constitution will admit of it, you will find its effects extremely satisfactory, not only more speedily restoring the patient than by the the stimulating plan of treatment, but in rendering the system much more alive to the operation of stimulants.

In Hæmorrhages, Emetics have been employed.

In Hemoptysis, they have been recommended by several physicians, particularly by Dr. Roberson, of Dublin. The practice I should not consider safe in this affection, and would strongly dissuade from any attempt to check the discharge of blood, by a recourse to these means, and hemorrhages from other organs are more effectually controuled by other remedies.

In some local diseases, Emetics have been recommended. The state of nausea, with the diminished action of the heart and arteries, and the muscular relaxation which precedes the operation of Emetics, would entitle them to an attentive consideration in the treatment of obstinate Dislocations. It is well known to you that this state of relaxation has been attempted by other means, as by venæ sect., baths, cathartics, and by local application to the parts. Cases may occur in which one or any of those means would be objectionable, and recourse may be had to the administration of an Emetic. I should consider it decidedly more advisable, than any other of the proposed methods of procuring relaxation, as the object is obtained to as full an extent, without impairing the general health of the patient. All that is to be done is, after ineffectual attempts at reduction, to continue the extending and counter-extending bandages in their situations and to administer 4 or 5 grains of Tartarized Antimony. The patient, will soon complain of a desire to throw up, and shortly after of a disposition to faint. With this sensation approaching, the muscles which had before been hard and tense, become soft and flaccid, when a slight force applied will succeed in reducing the luxation.

There are some other local complaints, in which Emetics have been employed with good effects, these are Hernia Humoralis, and in the suppurative stage of Buboes, &c.

The catalogue of diseases is still incomplete, in which Emetics may be advantageously used. I have only selected the most important, and from the principle being so fully pointed out, on which their good effects depend, I suppose you can be at no loss in determining upon their propriety or impropriety. There are certain states of the system in which they should be used with caution—These are during the latter months of pregnancy, or when hernia, or prolapsus uteri exist.

Individual Emetics.

The articles in this class, have been variously arranged by writers on this subject.

The division which I shall adopt, and which is recommended by its simplicity, is into the Vegetable and Mineral Emetics. Of the former class, no article is more deserving attention than the Ipecacuanha.

Family Rubiaceæ. Calycocca Ipecacuanha.*

Natural History—The genus of plants from which this root is derived, was not well ascertained, until Professor Brotero, published in the Linnean transactions, a description of the plant, accompanied with a plate. It was then distinctly ascertained by the botanists, that the genuine Ipecacuanha of the shops, is the root of a Pentandrous plant, the Cephaelis Ipecacuanha of some, and the Calycocca Ipecacuanha, of other Botanists.

The Natural History of this plant, was for a very long time involved in much doubt and obscurity. For nearly one hundred and fifty years after its properties were known, its characters were undetermined. Linnæus, in his 3d volume of Amenitates Academicæ, gave it as a specific name, to a species of Euphorbia, which grows plentifully in this country. He afterwards gave the same name to a species of viola.

Decandolle also fell into the same error, and says that there are three species of viola, which produce the white Ipecacuanha.

In the year 1781, Mutis, then travelling in South America, sent a specimen in full flower to the younger Linnæus, who judged it to be a species of Psychotria—a genus formed by his father, for two or three plants that are native of the East and West Indies.

In 1763, Dr. Woodville was favored by Sir Joseph Banks, with a specimen preserved in spirits, which had been sent from Brazil—a drawing taken from it was engraved and published in his Medical Botany. It was without a flower, but as its root was entire, there was no doubt of its being the real plant. Its genus still remained in a state of uncertainty, for Dr. Woodville was of opinion, that he could not follow the authority, on which Mutis received his information. We are therefore much indebted to Professor Brotero, for his satisfactory monograph on the subject, which was read before the Linnæan Society in 1801, and from an engraving in the Linnæan Transactions, the drawing which is exhibited is taken.

Botanical description.—Root—simple or a little branched, roundish, from 2 to 4 inches long, 2 or 3 lines thick, irregularly bent, brown without, divided into numerous prominent, unequal rings, of an acrid bitter taste, but scarcely any smell.

Stem—shrubby, sometimes creeping at the base, about the thickness

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* The word Ipecachuana is derived from the Peruvian—Ipi, root, and Cacuanha, the name of the district in which this particular root was first discovered—so that the name simply means the root of Cacuanha.—*Thompson.*

of a quill, giving out roots at the knots, and producing one or two new stems, about half a foot from each other.

Leaves—from 4 to 8, near the summit of the stem, opposite, spreading, 3 to 4 inches long, 1 to 2 broad, entire, deep green.

Flowers—aggregate in a solitary head, peduncled, terminal and rather drooping.

Florets—sessile from 15 to 24, inclosed in an involucrum, 4 to 5 leaved.

Calyx—5 cleft.

Corolla—monopetalous, with 5 acute recurved segments.

Stamens—five.

Style—thread shaped—germ, egg shaped.

It is a vivacious plant, which flourishes in moist, and shady places, in the woods of Brazil, of Pernambuco, Peru, and other parts of South America. The roots present in their external appearances, and their chemical composition, varieties, which have caused them to be distinguished into several sorts. Two varieties are found to exist in the shops of the Apothecaries, the ash, or grey, and the brown Ipecacuanha, and it is commonly thought that they are derived from distinct plants. The one, the Calycocca Ipecacuanha, and the other the Psychotria Emetica.

The researches of M. Merat have shewn, that these roots are derived from the same plant, the Calycocca Ipecacuanha, and the distinctions observed, depend probably upon the nature of the soil in which it grows, or the time of the year at which it is collected. As it is received, it is a *small wrinkled root*, variously contorted, and marked, externally brown, and internally white, having a faint smell, and a bitter, slightly acrid taste.

The root consists of a cortical, and medullary part; and from experiments it appears, that it is in the former chiefly, that its Emetic qualities reside.

Ipecacuanha was brought into Europe, about the middle of the 16th century, but it did not come into general use, until about the year 1686, when Helvetius under the patronage of Louis XIV. introduced it into practice, and was rewarded by his patron, with £1000 sterling for the discovery.

Chemical History—To the researches of Pelletier and Magendie we are indebted for a complete analysis of this article.

They have discovered in Ipecacuanha, the existence of ***Gum***, starch, an extractive matter, an oily matter which possesses great acrimony, and of a penetrating odour, which acts with activity upon the tongue and palate, but which does not occasion vomiting.*

They have also discovered a *new principle* to which the term ***Emetine*** has been applied, because in it resides the emetic property of Ipecacuanha. When it is dried it assumes the form of transparent scales of a reddish brown color—it has scarcely any smell, its taste is a little bitter, sometimes acrid, but not nauseous.

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* In this oily matter the peculiar odour of Ipecacuanha resides.—*Pereira.*

Exposed to the air, it undergoes no other alteration but that of deliquescence from absorbing moisture.

It dissolves in water, without any alteration in its properties, but acetic acid is on its best solvents. The analysis therefore, of the Cortical part of the ash or grey Ipecacuanha, presents us with the following principles and their proportionss.

Emetine, 14 parts—oily matter, 2 parts—gum, 16 parts—Starch, 18 parts—ligneous matter, 48 parts—loss, 2 parts—100. The analysis of the woody part, affords only 1–15 of Emetine, in 100.

Analysis of Emetine—Carbon, 64–57—Hydrogen, 7–77—Nitrogen, 4–30—Oxygen, 22–95—99–59.

Preparation of Emetine—The powdered Ipecacuanha is treated with æther, in order to dissolve the fatty odorous matter of the Ipecacuanha, and when this solvent has ceased to act, the powdered substance is itself exhausted by means of Alcohol. The alcoholic tincture is then evaporated in a sand-bath, and the extract dissolved in cold water, when it abandons some wax and a little remaining fatty matter. It remains now only to macerate it with some Carbonate of Magnesia, which deprives it of the gallic acid, and then to re-dissolve it in alcohol, and evaporate to dryness. The Emetine thus prepared is not entirely pure, but undergoes other processes to bring it into this state, being then white, pulverulent, unalterable by exposure to the air —the former article bearing the same relation to the pure, that brown sugar does to chrystalized white sugar.

Operation of Emetine—Emetine is much more active than Ipecacuanha, and possessing few of the disagreeable qualities of that article, may on all occasions be substituted for it with advantage. In dogs and cats, half a grain to 3 grains introduced into the stomach, produced vomiting, followed, sometimes with great disposition to sleep, and return to health, after a longer or shorter lapse of time. In larger doses, as ten grains, the vomiting is repeated, and the animal instead of returning to a state of health, after the soporific effect is over, dies ordinarily in twenty-four hours.

Upon the human subject, 4 grains in two doses, taken at an interval of quarter of an hour, produce full vomiting, which is followed by a marked disposition to sleep.

The application of Emetine is the same as Ipecacuanha, and when given to excite vomiting, it will be proper not to administer it in a single dose, as the Emetine being very soluble, and not adhering to the coats of the stomach, it would be thrown up at the first vomiting, which would then cease.

It will be necessary to give it in repeated doses, and the best form is to dissolve 4 grains in ℥iv. of water, sweetened with syrup, and to which some aromatic water may be added. It has been recommended by the French Chemists, as a substitute for Ipecacuanha, on account of its more pleasant taste, its small bulk, and its ready solubility in water, and on these accounts the discovery of Emetine, is a valuable one, this article possessing in a concentrated state the properties of Ipecacuanha.

Solvents of Ipecacuanha—The active matter or Ipecacuanha, is extracted by several menstrua, by proof spirits, by wine, by vinegar. By boiling, the strength is lost, the active matter being dissipated; and that it is of a volatile nature is proved by this circumstance, that if a decoction be made, while the substance loses its strength, yet the fluid is not impregnated with it.

With wine, is formed the neat preparation, the Vinum Ipecacuanhæ of the Dispensatories, and it is sometimes substituted for the powder. It is well suited to children, and is often resorted to in their cases.

The strength of the powder is much impaired, by exposure to the light and air.

The application of Ipecacuanha to Diseases.

Ipecacuanha is the most important of the vegetable Emetics, both for its mildness, efficacy, and the promptness of its operation. It is less powerful than the preparations of antimony, and not so speedy in its action as the Sulphate of Zinc.

It is therefore adapted to a variety of cases in which neither of these preparations could properly be employed, and produces effects, which could not be obtained from any other Emetic we possess. It evacuates the contents of the Stomach, without extending its action beyond this organ, and is therefore well adapted to cases where it is necessary to free the stomach from impurities, and when the diminished strength of the patient would forbid the risk of active Emesis taking place.

It is also from the mildness and certainty of its operation, well adapted to the diseases of children.

In full doses, however, besides evacuating the contents of the Stomach, the action of the duodenum is inverted, and discharges of bile are produced.

The activity of Ipecacuanha is proportioned to the largeness of the dose, though in a less degree than other Emetics, owing to the bulk and partial insolubility of the powder, a great portion is thrown off with the first efforts to vomit.

Its action, however, is much increased by combination with Emetic Tartar or Calomel.

It should be understood therefore, that when full and frequent vomiting is required, not only to evacuate the Stomach and duodenum, but to break up morbid associations, and to bring other parts of the system into sympathetic actions, we must have recourse to other Emetics, and particularly the mineral.

But it is not only as an Emetic that Ipecacuanha is prescribed: it is advantageously employed in a variety of diseases.

In the complaints of the Alimentary Canal, it has been much celebrated.

It was originally introduced with the character of an almost infallible remedy in Dysentery, and other derangements of the Intestinal Canal, and it probably has not lost reputation by time.

In these cases, after the contents of the Stomach and bowels have

been freely evacuated, it almost always produces good effects, in small doses, either alone, or in union with opium. It has been said to be particularly adapted to those cases where there is a great discharge of blood, but it is useful in any form, especially if there is much pain and tenesmus.

Of its modus operandi, we are not more informed in this instance, than in others connected with the operations of medicines. Different opinions are entertained, but the most plausible is that of Dr. Moseley, who thinks that it acts by its sudorific operation, by which the fluids are determined to the surface. Whatever the theory may be upon this subject, of this I am certain, that in most cases the union of Ipecacuanha with small portions of opium, relieves the griping and tenderness of the bowels, promotes perspiration, checks the discharges of blood, and is upon the whole, one of the best combinations in this deranged state of the Alimentary Canal. It should not be resorted to, until the bowels have been well evacuated, and arterial excitement has been subdued.

In Diarrhæa, either in the recent or chronic stages, it is also equally efficacious, employed in the same manner, and with proper attention to regimen, most cases will be found to yield.

In habitual Diarrhæa accompanied with great weakness and irritability of the bowels, Ipecacuanha will be found to succeed after other remedies have failed.

In these cases, it is recommended to begin with doses of 1½ to 4 grs. in the morning. This will sometimes act as an Emetic, with biliary evacuations, sometimes it proves Cathartic, and gives a few motions downwards—at night an anodyne should be given, if there is nothing to forbid it.

The Ipecacuanha is to be repeated or omitted the next morning, according to its operation the preceding day—if it has been considerable it should be omitted till the morning following, but the anodyne is to be repeated at bed time. A few doses, with proper attention to regimen, is commonly sufficient to restrain these discharges. In this manner, by its evacuating operation, it cleanses the Stomach by vomiting, or the intestines by acting as a purgative. It does more—it acts a Diaphoretic, the perspirable matter being thus discharged by those emunctories through which it ought to pass, and the bowels relieved of a quantity of acrimonious fluid, the presence of which aggravates, if it is not the most frequent cause of such complaints.

In Dyspepsia it has also been recommended very highly. It is to be given in such doses as will not excite any painful sensations of nausea, but sufficient to produce a slight action upon the Stomach, by which its viscid contents are separated and expelled from that organ.

There are some people who can take to the amount of two grains without nausea, and others who cannot take more than a third or fourth part of a grain. It is therefore proper to begin with a small dose, and to augment it gradually (if it is necessary) to the point at which the action of the remedy begins to be felt. Some persons pre-

fer giving the Tincture of Ipecacuanha, in doses of a few drops 8 or 10 drops, 2 or 3 times a day.

The effect of this medicine is in some degree alterative, as it promotes the secretion of the gastric juice, and excites the action of the Stomach, two objects of considerable importance to be gained in the treatment of this disease.—*Memoir by M. Daubenton.*

Ipecacuanha has been employed in Hæmorhages of every description. In Hæmoptysis it has frequently been employed in nauseating doses, and it is said to be equal, if not superior, to the Sac. Saturni in these cases—care must be taken, however, that vomiting is not excited, otherwise bad consequences would be likely to ensue.

I am aware that vomiting has been recommended by some physicians in this disease, and has in some cases been known to put a stop to the further discharge of blood; but in others it has increased the hæmorrhage to a great and alarming degree, and the possibility of such an accident, should render us cautious in the use of the remedy.

In Uterine Hæmorrhage this medicine also exhibits good effects. Given in small doses of half a grain every half hour, it has succeeded in the hands of Bergius and others in restraining severe discharges of blood from this organ. The operation of Ipecacuanha, is more intelligible in restraining Hæmorrhages than in other cases, and that without attributing to it astringent or antipasmodic properties, as has been asserted by some writers. It seems to act by exciting nausea, which when produced, has a great effect in diminishing the action of the heart and arteries, and lessening the impetus of the blood.

To this we may add its equalizing the circulation and exciting a discharge from the cutaneous vessels. In these Diseases it is employed in doses of half a grain to 2 grains, every 3 or 4 hours, either alone or combined with opium.

Besides these diseases, Ipecacuanha exerts an action on the Mucous membrane of the Bronchia and Fauces, which renders it of service in Catarrhal and Pneumonic disorders, and in the different states of these complaints, it exerts a diversified and seemingly opposite action, not only promoting expectoration in cases where the mucous membrance is inflamed and dry, but likewise serving to restrain the secretion when it is inordinate and excessive.—*Bigelow.*

In Asthma an Emetic affords great relief, and this not only from the benefit which the mechanical operation of vomiting would produce, in enlarging the cavity of the Thorax, removing the congestion of the lungs, and expelling the viscid mucus which collects in the Bronchia and Trachea, but from an antispasmodic operation exercised by the article itself. This last mode of operating I cannot admit, though supported by the authority of Akenside, the poet as well as physician. From a frequent trial of it, in these cases, I do not think that it possesses any advantages over other Emetics, which I have employed for the same purpose.

It was the practice of the same gentleman, to continue the Ipeca-

cuanha, in doses of 4 or 5 grains every morning in the intervals, to excite nausea, with a view to a permanent cure. This practice I have imitated, though not in as large doses, and with effects which have been highly gratifying. It was administered after other means had been unavailing, in doses of a grain, combined with Liquorice powder, every two hours during the paroxysm, and in the intervals, night and morning. By this means the paroxysm has been much moderated, and the patient been able to resume his duties as a mechanic. In another case now under treatment, in which the disease had continued for several months resisting a variety of remedies, the Ipecacuanha in similar doses night and morning bids fair to accomplish more than has yet been affected by other means.

Ipecacuanha combined with opium, and a portion of the Sulphate of Potash, forms the very valuable Diaphoretic called Dovers Powders. United to purgative medicines in nauseating doses, it gives to them greater activity, and may occasionally be joined with them, when the determination to the surface is also required.

Incompatible Substances.—The substances which weaken or destroy the powers of Ipecachuanha, and therefore called Incompatible, are all Vegetable Astringents, as infusions of galls, green tea, &c., the vegetable acids, as the acetic.

It may not be improper to notice the action of Gallic acid upon the active principles of Ipecacuanha. This acid precipitates Emetine from its solutions either aqueous or alcoholic, and contracts with it an intimate union, which changes its nature, and takes from it its Emetic property. In those cases therefore, where it has been given in too large a dose, and where it exerts violent effects, nothing is easier than to destroy its activity, it being only necessary to administer a decoction of galls, or a strong infusion of green tea.

Messrs. Pelletier and Magendie, have tried upon themselves the power which this decoction possesses of neutralizing the activity of Emetine.

The same means are of course sufficient, where it is necessary to blunt the effects of Ipecacuanha.

The powder and solution are the forms of exhibiting Ipecacuanha. The former is the most energetic, although the vinous solution is both active and convenient.

The medicinal operation of Ipecacuanha, varies with the dose. Thus 10 to 30 grains, act as an Emetic—1 to 4 grains, as a Diaphoretic, in smaller doses as the one fourth to half a grain, Alterative and Expectorant.

Combined with opium its Diaphoretic property is increased as already observed.

Upon the Doses of Medicines.—I may make this general remark, which I hope will be recollected, whenever the subject is alluded to, that large and small doses of medicines are merely relative terms, and should never be understood as denoting absolute quantities, for what would prove a large dose in one person, might prove trifling in

another. I have had occasion to give as much as ℥ss of the tincture of Digitalis, in twenty-four hours, and this continued for several days, before its effects upon the system were produced. Dr. Cartwright, in the Pneumonia Biliosa, of Natchez, has employed the Tartarized Antimony, with great advantage, but has found it necessary to administer from 16 to 20 grains in divided doses, before its effect was produced on the system.

The general rule of conduct, ought to be derived from the sensible effect of our practice. Every dose of medicine, however large, is too small if it stop short of the usual sensible operation on the constitution. This is to be the rule in the use of medicines—the system is to be placed fully under their influence, and when this has been done without effect, the remedies must be changed for others. Were this general rule more closely attended to, we should not so often complain of the inertness of our means, or the obstinacy of diseases. Disease and Debility are kept up by what is called cautious practice. Practice which is regulated rather by the quantity of prescribed medicines, than by the effects produced.

Adulterations of Medicines.

While upon this article, I shall take occasion to put you on your guard in selecting medicines, and to remind you of the unpardonable adulterations, too frequently practised. There are perhaps few articles upon which ingenuity has been more exercised, to impose upon the credulity of mankind, than the present. Of the various substances which have been sold for Ipecacuanha, I will merely mention a few. The roots of the Gillenia Trifoliata, the Euphorbia Ipecacuanha, and the Phytolacca Decandria, or Poke, have all been sold for this article. The roots of Sarsaparilla, have been powdered and combined with the Tartarized Antimony in imitation of the Ipecacuanha.

The frequency with which these adulterations are practised renders it necessary to mention to you, that it is not advisable to purchase large quantities of any medicinal substance in powder, and as frauds are often committed in a manner to elude detection, I would advise that whenever it is practicable, to procure as many of your medicines in the root as is possible. I could inform you of adulterations of other articles, which would excite surprise to a great degree, particularly in the common article Peruvian Bark. In Gray's supplement to the Pharmacopœia, may be seen a recipe, for the formation of a factitious Peruvian Bark, consisting of Peruvian Bark, Mahogany saw dust, and oak saw dust ground together. Powdered Gypsum has been sold for Cream of Tartar. In Boston, the occupant of a wind mill was indicted for grinding Gypsum into Cream of Tartar.

I shall therefore on all occasions point out to you the frauds which are committed with medicines, and by presenting you with the best specimens of the article treated of, so familiarize you with their sensible properties, as to enable you to discover villainy, in this most foul of all its practices.

Nearly allied to Ipecacuanha in its properties and uses, is the native article, the *Spiræa Trifoliata, vel Gillenia Trifoliata* or Indian Physic.

It grows plentifully in various parts of the United States, and in the upper districts of this State, flowering in June and July. The root is the only part employed, though the stems possess the same properties.

DESCRIPTION OF THE PLANT.

N. Family Rosaceæ.—Class Icosandria, Di-Pentagynea.

Calyx—tubular, campanulate, border 5 toothed.

Corolla—partly unequal, petals, 5.

Stamens—20, and small, styles 5.

Leaves—ternate, lanceolate, serrate, stipules, linear, entire.

Stem—herbaceous, 1 to 2 feet high.

Root—perennial, small, slender, and irregular, divided into many parts, and furnished with an infinity of small fibres. The roots resemble in structure, colour, size and taste, though indistinctly, the common Ipecacuanha of the shops.

They generally run a little distant from, and sometimes very near the surface of the earth, in various directions, similar to Ipecacuanha.

They are composed of a cortex or bark, and ligneous substance.

The cortex or bark is made use of in medicine, and the Emetic property resides principally in this part, though the ligneous matter is not without activity.

The root, the part used, is best given in powder, when it will prove a certain and manageable Emetic, and at the same time perfectly safe in its operation. True it is, that it will not produce those convulsive contractions, which arise from the Mineral Emetics, but in mild cases requiring the employment of Ipecacuanha, it may with advantage be substituted.

As it is nearly allied to the Ipecacuanha in its character and operation, it may be employed in the diseases, in which that substance exhibits its good effects.

It has been experimented with by different individuals, and by Dr. De La Motta of this city, and found equal to Ipecacuanha, in its Emetic operation, and its application to the ordinary diseases in which that article is useful.

The dose of the Gillenia, is 30 or 40 grains of the powdered root, which gives to Ipecacuanha a decided superiority, the bulk being a great inconvenience. This objection may be obviated by combining a grain or two of Tartarized Antimony with 15 grains of Gillenia.

Family Euphorbiæ.—Euphorbia Ipecacuanha, Ipecacuanha Spurge, is another of the Vegetable Emetics, with which our country is enriched. It grows well in the Middle and Southern States, and is peculiar to this country. The root is the only part used, and before we were better acquainted with the true origin of the officinal Ipe-

cacuanha, was supposed to be the plant from which that drug is obtained.

Euphorbia, general character.—Nearly all the plants of this genus are remarkable for their activity, when applied to the human system, not only acting upon the Stomach and Alimentary Canal, when taken internally, but producing redness, tumefaction, and excoriation of the skin, when applied to the surface. They all abound with a milky fluid, which is discharged very freely when the plant is broken.

Euphorbia Ipecacuanha—Is a low tufted plant, growing in sandy soils, in the Middle and Southern States, found in considerable quantity in Colleton and Edgefield Districts. The root is large proportioned to the size of the plant, and runs very deep into the earth.

The stems are numerous, erect and procumbent, forming large branches on the surface of the ground.

The leaves are inserted on the joints, opposite, sessile, smooth.

The flowers are solitary, on long peduncles or foot-stalk, from the forks of the stem.

The Euphorbia Ipecacuanha, is the most active of any of the Vegetable Emetics I have enumerated, differing from them in having its action extended to the bowels, and operating as a cathartic with a considerable degree of activity.

The testimony in support of its Emetic powers is sufficiently ample, Drs. Bigelow and Barton, considering it a safe, certain, and manageable Emetic, applicable to most of the cases in which medicines of this kind are called for.

The dose is from 15 to 20 grains. If the first does not operate, it may be repeated, but it does not admit of frequent repetition, since violent effects are sometimes apt to ensue. In this respect it differs considerably from the officinal Ipecacuanha, which admits of being administered in repeated doses, and of being accumulated in the Stomach, until its specific effect is produced, without any injurious consequences resulting.

Euphorbia Corollata.—Of the same genus, and related to the foregoing in its effects, is the plant I present you.

Its character is as follows—

Root, large, branching.

Stems numerous, frequently growing to the height of 2 or 3 feet.

Leaves are scattered and sessile, oblong and obovate.

The stem divides at the top of the plant into a large five rayed umbel, supported by an involucrum of as many leaves. The rays of the umbel are divided into two or three branches, supporting flowers. Upon breaking the branches, there flows out a milky fluid which possessess very acrid properties.

The root is the part used, and it is equally as active as the Euphorbia Ipecacuanha, and might be employed advantageously as an Emetic.

The dose of the powder is from 15 to 20 grains. It also frequently has its action extended to the bowels, operating upon them as a ca-

thartic. These articles, besides their Emetic properties, are used for other purposes.

In small doses of from 8 to 10 grains, they operate upon the bowels, and in smaller doses, as 2 or 3 grains, as a Diaphoretic, combined with opium, or the antimonials.

I have employed these articles for their evacuant and Diaphoretic operation, and am satisfied that they may with safety and advantage be employed for these purposes. On several occasions I have had recourse to them, and consider them fully entitled to the consideration of the profession. Even should they not be employed, every physician should be instructed in their properties, and when occasion requires, know the substitutes he can apply to in case of need.

In concluding these articles I would recommend them to gentlemen practising in the country, little doubting, that with the precautions I have mentioned, they will be found valuable, and good substitutes for the Ipecacuanha. Their operation seems exactly proportioned to the quantity taken, and the vomiting is not checked as in Ipecacuanha, by the powder being thrown off in the first efforts of the Stomach.

Besides these articles, there are a variety of other plants which may be used as Emetics. It would be tedious to enter into their particular consideration. A simple enumeration will be sufficient, and among them will be found plants which are familiar to you.

They are, Sanguinaria Canadensis, or Blood root; Lobelia Inflata, Indian Tobacco; Aralia Spinosa, Prickly Ash; Eupatorium Perfoliatum, Thoroughwort; Stylingia Sylvatica, Queen's Delight; Erythronium, or Snake leaf; Phytolacca, Decandria, Poke.

Upon the *Lobelia*, as much has been said of its virtues of late, a few remarks may be made. The common name by which it is known is Indian Tobacco.

It is a biennial plant, and is found growing in most parts of the United States. The family of the Lobelia's is a very extensive one, and medicinal properties of great value have been ascribed to several of them. Some of the family are characterized by their very striking and beautiful appearance.

The *Lobelia Cardinalis*, is probably one of the most showy and conspicuous flowers in our woods, and by being introduced into gardens, the care bestowed upon its cultivation is returned, in the greater number of flowers formed upon it, and their more brilliant appearance.

The *Lobelia Inflata*, is the most active of any, and may be considered among the most useful of our indigenous medicines. It is a small plant varying in height from six inches to two feet.

The root is fibrous.

Stem erect, much branched, angular.

Leaves are scattered, sessile, oval.

Flowers in spikes, each one in the axil of a small leaf.

Corolla, bluish purple.

It exudes a milky juice upon being broken, and is found growing in the mountains and upper counties of Carolina and Georgia.

The properties of this plant, are Emetic, Diaphoretic, Expectorant, and in some degree Narcotic. When taken in the form of infusion or tincture mixed with water, it has an acrid pungent taste—when swallowed it is followed by a sensation of roughness in the throat, with a prickling which continues some time. This impression being of a stimulating character fequently excites a copious secretion of salivary and mucous fluids, with hawking and a more free expectoration. In the Stomach nausea is excited, and when in large doses, vomiting frequently succeeds.

As an Emetic it is not distinguished by any peculiarity of operation which would render it particularly worthy of attention. On the contrary by its pungent irritating action upon the Stomach, and the violent effects which sometime follow its use, it becomes a more exceptionable article than many which are employed, and which I have recommended.

This article from its Expectorant, Narcotic, and often Emetic operation, is frequently very useful in Asthmatic affections. Few diseases, without being dangerous, are more distressing. In my practice I have a dozen patients disposed to this affection, and from the exposure many of them are obliged to undergo, with every great change in the weather, attacks in some are brought on. Persons so pre-disposed become, I may say, living barometers; every change of weather is sensibly felt, and where the comforts of life do not abound, paroxysms of Asthma frequently succeed. I have had occasion to try various remedies—venæ sect., Emetics, Cathartics, opiates, antispasmodics, pectorals, counter-irritants—and though great relief is afforded by some, and often all of them, yet it is often effected with considerable expense of the vital powers. This is a great objection in many cases, since the system is often much enfeebled by the frequent recurrence of these paroxysms. I have for several years past, employed the Lobelia, and have derived more benefit from its use than from any other single agent. It has appeared to shorten the paroxysm, in some instances speedily, in others more slowly, and has even appeared to prevent their recurrence in others. In one case in which the disease continued an unusual length of time, threatening thus to become habitual, I had a fair opportunity of experimenting very freely. A variety of articles were employed with but temporary benefit, at length the lobelia was given, and without any inquiries being made of the comparative efficacy of the several means which had been used, the observation made by the patient was, that he had been more relieved by the Lobelia than by any thing else which had been tried.

In the severest paroxysm which I have ever witnessed, complete relief was afforded, and the subsequent paroxysms greatly mitigated by a compound as follows—

Tincture Lobelia.
Compound Syrup of Squills.
Simple Syrup of Squills, each equal parts.

A dessert spoonful was given every 10 minutes during the paroxysm, until relief was afforded. The patient has had no return of the disease for nearly a twelvemonth.

Forms of exhibition—It may be given in powder, in tincture and in infusion.

In Powder, the dose is from 20 grains to a teaspoonful, as an Emetic.

The tincture should be prepared afresh every half year, as it loses much of its activity, by being long kept. The recent plant should be preferred. The dose of the tincture will vary from a teaspoonful to a tablespoonful—when designed as an Emetic, to be repeated every 10 or 15 minutes—when its expectorant operation, every hour or two.

The Infusion is rarely employed—with sugar or treacle a syrup may be formed, which may be advantageously used in the catarrhal affections of children, and in threatened croup. This preparation will be found more active than Squills, and more readily taken.

In thus presenting you with various articles possessed of Emetic properties, I hope that their consideration will not be deemed useless. Many of them I admit are very inferior to the Ipecacuanha, but as this article is often adulterated, is purchased at a high price, and may not be in your shops when wanted, it becomes highly necessary that you should be acquainted with the substitutes about you. Many of these articles if more experimented with, would I have no doubt be found more valuable than they at present are thought to be, inasmuch as the doses would be better determined, the circumstances under which they should be used, &c.

To assist you several works, as Bigelow & Barton, and Rafanesques' small work on Botany, may advantageously be referred to.

Family Solaneæ.—Nicotiana Tabacum, Tobacco, is the next article of which I shall treat. This substance is not commonly placed under this class, as it possesses so many other properties—being Narcotic, Errhine, Sialagogue, Purgative, as well as Emetic. Possessing the latter property in a considerable degree, it may be proper to consider it under this head.

Natural History.—Tobacco was not known in Europe until after the discovery of America, and was first imported about the year 1560, as some say, by Sir Francis Drake.

The Spaniards who gave it the name Tobacco, took it from Tobaco, a province of Yucatan, where they first found it, and first learned its use—or according to others, it derived its name from the Island of Tabago or Tobago.

The French at its first introduction among them gave it various names, as Nicotiana from John Nicot the Ambassador of Francis II. in Portugal, who brought some of it from Lisbon, and presented it to

Catharine de Medicis, as a plant of the new world, possessing extraordinary virtues.

Previous to its introduction into France, it had been brought into England by Sir Francis Drake, and the custom of smoking in England is ascribed to Sir Walter Raleigh. Its power to excite a train of pleasing reflections, as well as to calm the agitations of our nature, depends upon the Narcotic principle which it possesses.

Chemical History.—Besides various principles, Tobacco contains a peculiar proximate one, upon which the properties of the plant are supposed to depend, and which has been called Nicotin. Vauquelin considers Nicotin as approaching the volatile oils in its properties—it is colourless, has an acrid taste, with the peculiar smell of Tobacco—and occasions violent sneezing. The Medicinal activity of Tobacco resides in this volatile part. Water, wine, alcohol, are therefore solvents for the medicine. Long boiling dissipates its activity, so that the decoction and extract are weak preparations.

The oil may be obtained by distilling the leaves, and separating it from the top of the water, upon the surface of which it will be found to float. This oil was found to destroy the life of cats and kittens and other animals almost instantly, in the small quantity of two drops, either by applying it to the tongue, or injecting it into the rectum.

Medical History.—Tobacco is a well known drug, of a Narcotic quality, which it discovers in all persons even in small quantities when first applied to them. A small quantity snuffed up the nose has produced giddiness, stupor, and vomiting, and when applied in other ways in a large quantity, there are many instances of its more violent effects, and some of its proving poisonous. In these instances it operates in the manner of other Narcotics.

Along with this quality it possesses also a strongly stimulant power upon the whole system, but especially upon the Stomach and intestines, so as readily, even in small doses, to prove Emetic and purgative. It has been used as an Emetic, and said to be particularly adapted to evacuate poisons, which produce a torpor of the Stomach, and which therefore requires some violent medicine to act upon it. As it possesses no peculiar good qualities, and as its operation is commonly attended with much sickness, it has not, nor is it likely ever to come into practice with physicians.

Externally applied, in the form of Cataplasm of the moistened leaves, it often rouses the Stomach and occasions vomiting. In this manner it has been employed with complete effect, to expel an inordinate quantity of laudanum, taken with a view to suicide, when other Emetics had failed. The cases, however, in which it is most commonly used is in obstinate constipation of the bowels, and in Strangulated Hernia, as an Enema, and the manner of preparing it is as follows—

Fol. Nicotiana, ʒi.

Water. ℔i.—simmer for a short time.

One half to be used, and the other in an interval of half an hour, if necessary. It overcomes the obstruction, by the extreme relaxation it produces, and by its cathartic operation. It must, however, be used with caution, as several lives have been lost by too strong an infusion being thrown into the rectum.

The smoke of Tobacco has been used for the same purposes, introduced into the rectum, and it is very powerful, owing to the activity of the volatile part of the medicine. It possesses some advantages over the Infusion, being milder and therefore more safe.

Tobacco has also been employed, by Dr. O'Bierne, in the treatment of Tetanus, and much success is said to have followed its employment. I am unable to furnish any details of the method pursued, the work not having reached this country.

The manner in which Tobacco is used, is in the form of Enema, thrown into the colon, by means of a flexible tube introduced into the rectum. His practice he details in his work upon Defæcation, and presents a list of twenty cases, eleven of which recovered. He adverts to the disease in the horse, in the treatment of which, his method in the hands of the veterinary surgeons, had been attended with success.

United with Cerate in fine powder, it has been employed for its nauseating and relaxing operation in other Spasmodic diseases.

In Cynanche Trachealis, or Croup, it is applied in the form of a plaster, to the upper part of the sternum. Cases of this disease have been treated after this manner and with very happy effects. Employed at the very commencement it has succeeded in arresting the complaint, and in conjunction with other means, has on other occasions been instrumental, by exciting vomiting, to aid in very materially relieving the patient.

Besides these diseases, it has been employed in Dropsies, as a Diuretic, and by some Physicians it is stated, with considerable success. The manner in which it is used I shall speak of hereafter.

The poisonous effects of Tobacco are more likely to follow its employment as an Enema, than as an Emetic.

When an accident of this kind occurs, it is proper to know that the Infusion or the Tincture of Galls throws down the Nicotina and renders the Infusion of Tobacco inert, and consequently should be instantly administered.—*Thompson.*

Family Asphodeleæ.—Scilla Maritima or Squills–Is a large bulbous plant belonging to the Lilly family, which grows on the sea coast, and of which the bulb only is employed in medicine. The bulb increases to a considerable size, and is composed of Tunics or coats inclosed one within the other. The exterior is covered with scales of a brownish colour, the interior tunics are white and fleshy, the exterior being sometimes tinged with red, without any perceptible odour, but abounding with a juice, viscid, bitter, and acrid. The scales are

found in the shops separated the one from the other and dried. By drying the root it loses much of its acrimony, but it is still a very active medicine.

It is brought to us from the shores of the Mediterranean, and is a native of Spain and Italy, and from its growing in sandy soils on the sea coast, it has the name of Maritima.

The recent root is less active than the dry, in consequence of its containing a considerable portion of watery juice, which escapes in the process of exsiccation.

Analysis of Squills.—M. Planche has discovered Tartrate of Lime. According to Vogel it contains when dried, gummy matter, a principle very bitter and acrid, which has been called Scillatine, and which is the essentially active principle—tannin, citrate of Lime, a sweetish substance.

By. M. Tilloy it has been thought that the Scillatine of Vogel is not an immediate principle, but a mixture of uncrystallizable sugar, with a matter essentially acrid and bitter. It is white, transparent, of a resinous fracture, deliquescent, soluble in water and alcohol. It is obtained by subjecting the expressed juice to the action of alcohol, and in decomposing the alcoholic solution by means of the acetate of Lead. It is not used in medicine.

Medical Uses.—The root of the Squill appears to have been known as a medicine in the very early ages of Greece, and was employed by the Egyptians in dropsy, under the name of the eye of Typhon. It has well maintained its character ever since, and is deservedly held in great estimation.

The Squill possesses many and diversified powers, being not only Emetic and Purgative, but Diuretic and Expectorant, on which account it is employed in many cases.

In large doses it stimulates the Stomach and proves Emetic, but it is seldom used for this purpose, and its place is better supplied by other articles.

In smaller doses its Diuretic properties are obtained—but I shall speak of these under that head—with its application to diseases.

Squill yields its active properties, to water, vinegar, ardent spirits. The preparations in most common use are the powder, vinegar, and oxymel of Squills. The mixture of acid with the Squills renders the taste of Squill more supportable, and adds to its Expectorant properties.

Dose—Of the Powder, as an Emetic, is from 8 to 10 grains.

Mineral Emetics.

Having completed my description of the Vegetable Emetics, I shall next proceed to the second division, or those derived from the Mineral Kingdom—and at the head of these must be placed the preparations of Antimony.

Antimony is a ponderous brittle mineral, or semi-metal, of a bluish white colour, of a shining surface, and striated texture. It is seldom or never found pure, but combined with sulphur, and is obtained from mines in Hungary, Germany, France, and England. The best is said to be brought from Hungary. Antimony, called Stibium by the ancients, receives its name from Basil Valentine, a German Monk, who gave it, as tradition relates, to some hogs, which after purging, it greatly fattened—thinking in like manner to feed his brother monks, all of them perished by the experiment—hence it was called anti-monk, and by corruption Antimony, from anti-monos.

The preparations of Antimony, like most other active articles, found their way into the practice of medicine with great difficulty. Basil Valentine in the sixteenth century, 1576, first brought them into credit as internal medicines, and soon after published a work, setting forth their uses and their applications. From their occasional violent operation and the dangerous consequences which followed their injudicious employment, they fell into disrepute, and were denounced by the Medical Faculty of Paris as poisonous. They were, however, revived by Paracelsus, and by him employed as powerful and efficacious remedies. After this they were alternately received and rejected, until by the labours of Hoffman, and still more Cullen, and Fordyce, they became established in regular practice, and are now ranked with the most valuable articles the Materia Medica affords.—*Parrs' Medical Dictionary.*

Antimony in its native state, existing as a sulphuret, to which the term crude Antimony is applied, exerts very little action, upon the human system.*

To render it active it has been submitted to a variety of operations by the chemist, the consequence of which is, that the preparations of this article have been multiplied to considerable extent, and its pharmaceutical history is well understood. Differing as these preparations do in degrees of strength, they are characterized by a considerable uniformity in their action. On this account, I shall glance cursorily over them, and will only employ your time in commenting upon the most important.

Preparations of Antimony.

Antimony existing in its native state, combined with sulphur, owes its inertness upon the system to the large quantity of this article which enters into union with it. It is obvious that when this is separated to a certain extent, (for when wholly separated as in the state of regulus, it is insoluble in the juices of the Stomach,) the more active it will become, and accordingly the different preparations from crude Antimony, depend upon the different proportions of sulphur which they contain, and the different substances employed for its separation.

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* If the Stomach be acescent, it operates with violence—when there is little or no acid present, it produces scarcely any action upon the system.

The different means in use, to give activity to Antimony, are—

1. Trituration.

2. The action of heat and air,—of these preparations none are retained in practice.

3. By the action of the Alkalies.—Under this head is the Kermes mineral. This is prepared by boiling a solution of Potash, on Sulphuret of Antimony, for a certain length of time;—(three hours)—the liquor when strained and allowed to cool deposits a red colored powder, and is known by name of the Kermes Mineral, or the Sulphuretted Hydroguret of Antimony, containing 2 proportions of Antimony, and 3 of Sulphur, called also a Sulphuret of Antimony, and a Sub. Hydro. Sulphate of Antimony, according to the French.

Nearly allied to the Kermes, is another preparation, commonly called the Golden Sulphur of Antimony. It is prepared in nearly the same manner as the former, except that the precipitate from the strained liquor, is thrown down when the mixture is warm, by diluted Sulphuric acid, which becomes of a light or orange coloured powder, being termed in the shops Sulphur Auratum Antimonii, or the Sulphuretted Sub Hydro Sulphate of Antimony. These preparations coincide nearly in their action upon the human system, except that the former containing less sulphur, mnst be given in smaller doses than the other. These medicines are little known in England and this country, but in France and other parts of the continent of Europe they are much employed.

MEDICAL PROPERTIES AND USES OF THESE ARTICLES.

Given in small doses they exert a considerable influence on the coats of the Stomach, producing nausea, and promoting considerably the secretions of the skin and lungs.

The action is often extended to the Alimentary Canal, and a purgative operation frequently follows their employment. Hence at a proper period they are valuable in inflammatory affections of the lungs, in pneumonic complaints, and in catarrhs, either of an acute or chronic character. I have on several occasions had recourse to these articles, and can with confidence recommend them to you, as remedies upon which dependance is to be placed in diminishing morbid excitement, and by determining to the surface, allaying that irritation of the lungs which excites and provokes coughing.

I have on several occasions relieved very distressing coughs by the use of this article, rubbed up with a solution of Gum Arabic, ʒss to ℈ii. with a ℥vi. of the solution. The nausea it excites diminishes action, and determines to the surface, while the pulmonary secretion being augmented, expectoration is more easily performed. With its use other means are necessarily conjoined, as venæ sect. before or during its employment, evacuants generally, regimen, and confinement to bed, the surface kept warm.

Treat all Pulmonary affections, even mild ones, as important, and you will less seldom err, from too much than from too little caution. Recollect that most diseases commence with irritation of function, and pass often rapidly into derangement of structure.

They are useful in Febrile affections, and may well be substituted for the Pulv. Antimonials, being not only more uniform in their operarion but decidedly more energetic. The usual dose for the fulfilment of the above purposes, is from ii. to iij. grains.

In large doses as from vi. to x. grains, it operates as an Emetic. These are the principal preparations with the Alkalies.

4. By the action of Nitre on Antimony we obtain the Crocus Antimonii, and the Calx Nitrata. The former is so violent in its operation, that it is wholly rejected in the practice of Physic, and the latter is superseded by the more valuable article the Pulvis Antimonialis.

Preparation of the Pulvis Antimonialis.

It is prepared by exposing the Sulphuret of Antimony and hartshorn shavings to a white heat for a certain time. The animal matter, and the Sulphur of the Antimony are driven off, leaving an oxyd of Antimony, with Phosphate of Lime, which combined together form the Antimonial powder of the shops, or the oxide of Antimony with the Phosphate of Lime.

These are the principal preparations from the Sulphuret of Antimony.

With the oxydes of Antimony united with acids, so as to form salts, there have been many preparations in use,—but few are employed at the present time. The most important is the Emetic Tartar, a compound of oxyd of Antimony, Tartaric acid and Potash.

Antimonium Tartarizatum.—Is the most valuable of all the preparations of Antimony. Its chemical history is involved in some doubt, and is still unsettled. It is stated in the various dispensatories to be a triple salt, consisting of Tartaric acid, oxide of Antimony, and Potash, and which therefore ought to be termed a Tartrate of Antimony and Potash. It is obtained by boiling Bitartrate of Potash with protoxide of Antimony, in a glass vessel for a quarter of a hour, and setting the liquor by to cool. In this process the excess of Tartaric acid in the Bitartrate, is saturated by the Protoxide of Antimony, and by evaporation and crystalization a triple salt, Tartrate of Antimony and Potash, is procured. It is of a white colour and a taste slightly styptic and metallic. It is sufficiently soluble in simple menstrua, and as it is almost entirely insipid and the requisite dose is in almost all cases comparatively small, it may be given (to children) where it would be difficult if not impossible to get down any other medicine.

As an Emetic it is distinguished by the promptness, energy, and certainty of its operation. It excites the Stomach into forcible and long continued efforts to discharge the whole of its contents, and by its action being extended to the duodenum, its contents are thrown into the Stomach, and large evacuations follow its employment. The operation of Antimony is also extended to the Alimentary Canal, and hence it often proves considerably purgative, this effect taking place either when the dose has been greater than necessary, merely to pro-

duce vomiting, or when the Stomach has escaped the action of this powerful medicine. Antimony appears to promote almost all the excretions, and to quicken and stimulate the action of the absorbent vessels. From its operation upon these several parts of the system, it is preferred to all other Emetics, doing more to break up the morbid associations which are formed in diseases, to relieve the Stomach of its offensive contents, and to effect a solution of fever, than any other article with which I am acquainted. It is therefore at times adapted to the commencement of the continued fevers of our climate, in which when liberally and properly administered it does much to bring the disease to a crisis at the onset.

In Intermittent, Remittent, and continued Fevers this medicine is therefore properly resorted to in the early stages. The first object of the practitioner is to arrest the febrile action if possible, in its very commencement. This is accomplished by the use of such remedies as have the power of exciting a considerable shock or commotion in the system. One of the most efficacious of these means, when they can be employed, is the use of Emetics, which possess this great advantage, that they may be employed at any period of the paroxysm. If an active Emetic, (the best I consider is the Tart. Antimony in combination with Ipecacuanha,) be employed during the continuance of the *chills* and free vomiting is excited, the cold fit is often speedily terminated and a general glow accompanied with a degree of perspiration is produced. If the Emetic is delayed until the *hot fit* has commenced, its operation is frequently followed by a free perspiration, as well as relief to all the concomitant symptoms, and the fever, especially if aided by other means, is frequently interrupted in its progress. Should it fail in bringing about a crisis of the fever, the Antimonial preparations may still be continued during its progress in very minute doses. Whether they should be carried to the degree of producing *nausea*, has been a subject of controversy among very distinguished physicians. With Dr. Cullen, Emetic Tartar was a favorite medicine in fevers, and he always recommends it, when speaking of it, in nauseating doses. By Drs. Fordyce, Balfour, and others, this practice has been condemned, and it is maintained by these gentlemen, that it produces the most decided advantages, when it produces the least sensible effects upon the Stomach. Nausea is so unpleasant a feeling, that few patients will be found to submit to a repetition of the medicine which is sure to produce it, and if from the experience of these gentlemen, the Tart. Antimony is found to operate beneficially, without the actions of the Stomach being disturbed or nausea produced, it will be removing one of the most considerable objections towards its employment.

Did the sickened state of the patient, Dr. Chapman observes in his Therapentics, operate in the beneficial way contended for, then the utility of the medicine should be proportioned to the effect thus created, and a variety of other nauseants, infinitely more powerful and lasting in their impressions, as the Digitalis, Tobacco, and Squills

ought to be preferred. But this is contradicted by experience, and Tart. Antimony, will be found beneficial in proportion to the impression which it makes. This impression would seem to depend upon the power of the medicine in moderating the action of the heart and arteries, and upon the exercise of this power its good effects seem to depend. To such a degree is it exercised that Dr. Balfour has not hesitated to attribute to it a sedative and febrifuge action and this independent of the production of nausea.

Upon the principle of moderating the action of the heart and arteries, the Tart. Antimony, has been applied to other diseases, and especially the Phlegmasiæ. In Pneumonia, after depleting measures have been carried as far as the strength of the patient will admit, without subduing the disease, this medicine given in small doses so as not to excite nausea, or discontinued when it does, will be found efficacious in relieving pain, increasing the freedom of respiration, exciting perspiration, and subduing the remaining inflammatory symptoms, more effectually, and without further expenditure of the vital powers, than venæ sect., or the usual depleting measures. In these cases I have employed it with the utmost advantage, given in small doses frequently repeated, under the circumstances I have specified, and always with the happiest effects.

In Catarrhs, Chronic Coughs, employed at a proper period, there is no article which exercises a more salutary influence. By it an impression is exerted upon the disease infinitely to be preferred to that produced by mucilaginous drinks, cough mixtures, anodynes, &c. which are so often resorted to, and which are frequently so unavailing. These remedies allay present suffering, while the morbid action still progresses. The Tart. Antimony strikes at the root of the evil.

In Phthisis Pulmonalis administered in the same manner, advantage is often derived, and I have known the cough allayed, sleep induced, and the distresses of the patient quieted when anodynes disagreed or failed in their effects.

The same practice is useful in Rheumatism, either chronic or acute, in cynanche tonsillaris, in hernia humoralis, in ophthalmia, in chronic hepatitis, and a variety of other inflammatory affections. The strength of the mixture to be employed is half a grain or less to the ounce of water, or two grains to ℥vi. of water, and a tablespoonful taken every two hours, or at longer intervals, according to circumstances. In none of these cases is it intended that the employment of the Tart. Antimony should set aside the usual depleting remedies, in the early stages of the disease, but when they have been carried to a sufficient extent, the administration of small doses of this article will be found very advantageous.

Such is the practice which is usually pursued in the employment of this article.

Within a few years an entirely new course has been recommended in its administration. Rasori, an Italian, and the founder of the new Italian system of medicine called the counter stimulant, has

given it in very large doses in diseases. It is necessary I should particularize the doses; the quantity would never be conceived of by you, He employed it to the extent of 20 grains to ʒi. in the twenty-four hours, without exciting repeated vomiting or excessive evacuations, as one would think probable, but on the contrary with the happiest effects. Under this free administration of the article, the Stomach and Intestinal Canal are affected as by its ordinary use, with vomiting and purging, the pulse softens in a remarkable manner, it becomes less frequent and less forcible, the cutaneous secretion is abundantly increased, insomuch that the skin is constantly moist and even wet, and inflammatory action in the lungs or other internal organ by this revulsive operation upon the surface, is speedily removed.

The same practice is pursued in inflammatory rheumatism, dropsies, &c. In some instances relief was obtained by the evacuations (when first used) from the stomach and bowels, and afterwards by the pores of the skin. In other instances, though large quantities had been taken, no evacuations followed, and under these circumstances, the good effects resulting, have been attributed to the impression which this medicine makes upon the system, allaying irritation, and lessening the excited action of the heart and arteries.

Lastly the Tart. Antimony has been much resorted to in the chronic affections of the skin and superficial ulcerations. Desault recommends it to be given in small doses so as to affect the bowels, though to produce any decisive effects, it must be long and perseveringly employed. In Herpes, Lepra, it may also be found useful. It is given alone in minute doses, or combined with some other article which has a determination to the surface, as guaiacum or sarsaparilla.

Applied to the surface of the body, Tart. Antimony exerts an action which is somewhat specific. This consists in the production of a vesiculo-pustular eruption upon the skin, resembling in some degree the variolous, the pustules upon breaking discharging a good deal of matter, and a small ulcer succeeds which is slow in healing—the sensation produced in the part by the appearance of the pustules being compared to the continued presence of caustic. Thus a powerful and permanent stimulant action is excited, which has been taken advantage of in curing formidable and deep-seated affections. The efficacy of this application has been considered by the late Dr. Jenner in a dissertation on the influence of pustular eruptions in certain diseases incidental to the human body. Many obstinate chronic cases are detailed by him as cured by an application of the Tart. Emetic in the form of ointment. The diseases in which it was most successfully used were Mania, Hypochondriasis, Pulmonary affections, Rheumatism, Hooping-cough, &c. In these cases, the ointment is rubbed over the diseased parts, or as near to the seat of the disease as is possible.

In Rheumatism especially, the application has been much employed, and it has been said to be a remedy of great efficacy. In recent cases the first or second application has often removed the complaint,

but in those which occur, by far the most frequent are of long standing, in which it may often be necessary to persevere in the frictions for three or four weeks. Upon the eruption making its appearance it must be discontinued until the soreness is removed, when it may again be applied, with the effect of renewing the crop of pustules, and so on until a cure is effected.

In Phthisis Pulmonalis the application is made to the chest, and in Mania to the scalp. The connection between cutaneous eruptions and internal diseases has not escaped the observation of many physicians, and I may even add the notice of unprofessional persons. Epilepsy, Mania, Delirium in Fever, Phthisis Pulmonalis, &c. have all been observed to be removed or excited by the recurrence or recession of cutaneous eruptions. The consent between the skin and lungs is particularly manifested in the effects of repelled itch, small-pox or measles, which seem to fall immediately upon the breast.—*Huxham.*

It is then from analogy, that the practice of exciting artificial cutaneous eruptions, in any of the above diseases is established, and the testimony of Jenner, a name which can only be uttered with reverence and gratitude, is strongly in support of its utility. Thus have we opened a wide field for observation, and the application of our remedies,—if any interest has been excited in the remarks which have been made, it will be renewed with infinite pleasure and profit, by reading the very valuable paper of Dr. J. on the subject.

The ointment is directed to be made of the following strength, viz. Tartarized Antimony, ʒi., Lard, ℥i., to be well mixed. This is to be applied by friction in the neighborhood of the part affected, and to the inside of the arms. The friction is continued once or twice a day, for two, three or four days, according to the sensibility of the skin, when a crop of pustules takes place, and in many cases with great relief to the symptoms. The reason of the greater relief afforded by Tart. Antimony than by Cantharides is, that it not only vesicates, but it produces diseased action of the skin itself, by deeply deranging its structure, and in the ulceration extending beneath its surface.

Of the forms in which the Emetic Tartar, is exhibited.—It is readily dissolved in cold water, but more so in warm. The dose as an Emetic is from ij. to v. grains, and it is best given in divided doses, (as some persons are more readily affected by it than others,) at intervals of 10 or 15 minutes, until vomiting is excited.

Another form in which this medicine is employed, is dissolved in wine, constituting the well known preparation, the Antimonial wine of the Dispensatories. This was formerly made by dissolving the glass of Antimony in wine, but it was often found to be uncertain in its operation, the strength of the solution varying with the degree of acidity of the wine, its power being in proportion to the oxide which the tartaric acid of the wine dissolved. It is now prepared by dissolving ℈ii. of Emetic Tartar in ℥ii. of warm water, and adding to this ℥viii. of white wine. An ounce of the wine contains grains iv. of the Tartar and is a dose.

In preparing the Antimonial wine a considerable portion of insoluble matter is frequently observed in the bottom of the vessel, which upon examination proves to be Super Tartrate of Potash and Tartrate of Lime. These precipitates are more abundant in the powder of Emetic Tartar, hence its greater cheapness than that purchased in the crystallized form.

The Antimonial wine is a favorite preparation. It is often given to children, and is prescribed occasionally at a very early period of their existence, though in most cases I should prefer the Ipecacuanha. As it may sometimes be necessary, the following are the doses in which it should be administered. To infants at the birth, when it is given to relieve difficult respiration, the dose should not exceed one or two drops. At any period during the year, provided they have attained the age of three or four months, the dose for the purpose of vomiting is 10 or 15 drops, to be repeated at short intervals, according to the urgency of the case. In our employment of the Antimonials in the diseases of children, we cannot be too cautious, as I have known the 32–100 part of a grain given to a child within the week to operate very powerfully.

Tart. Antimony used in the form of Enema, has been recommended by several physicians as a powerful remedy, and said to be applicable to a great diversity of cases.

From the relaxation produced by the action of this medicine upon the muscular fibres, not only of the bowels, but the whole system—injections with this article have been recommended in obstinate obstructed bowels, in bilious colics, and in othor spasmodic diseases. In these cases, 8 or 10 grains of the Emetic Tartar dissolved in water may be used as an Enema, and it will in most cases succeed very well. If it does not, we have only to increase the quantity and repeat it in 30 minutes. I have never had occasion to make trial of this injection, but it is recommended by several physicians. By Dr. Chapman its use has been suggested in Tetanus, and for his reasoning upon the subject I will refer you to his Therapeutics.

Taken in an over dose into the Stomach, it excites the most alarming symptoms—they are incessant vomiting, cramps and pain in the Stomach, muscular contraction of the limbs, cold sweats, great prostration, &c. The remedies which should be employed in this state of the system, are flannels wrung out of hot vinegar, or spirits, to the epigastrium. If this does not succeed, laudanum must be resorted to—at first in moderate doses, repeated every 10 minutes, which may be increased to ʒi. or more, for it should be observed that pain modifies the operation of Narcotics upon the nervous system, so that large doses may be exhibited without any unpleasant consequences—cataplasms of mustard should be applied to the epigastrium, and if necessary to the extremities, the warm bath. In this irritable state of the Stomach, the drinks taken should be small in quantity, as any degree of distension produced by them will certainly renew the contractions of this organ and the expulsion of the article taken. To

these may be added the infusions, and decoctions of bitter and astringent vegetables. For instance, it has been observed that ℥i. of the decoction of yellow bark is capable of completely decomposing ℈i. of this salt, and of rendering it inert. Accordingly, its immediate exhibition has been recommended, when an over dose of this salt has been taken. An Infusion of Galls will have the same effect, and rhubarb is also an incompatible substance. The operation of these articles in decomposing the Antimonial salt is the following. All the substances possessed of astringent properties, contain gallic acid. This acid unites itself to the oxyde of Antimony, and forms with it a new compound, which has no Emetic properties;—Gallate of Antimony.

I have thus concluded what was necessary to be said on the employment of the Tart. Antimony. It is a preparation particularly valuable, and deserving your attention, and I cannot but consider it one of the most fortunate discoveries which Chemistry has added to the Materia Medica. It is unquestionably one of the most active and efficacious medicines which we possess, and were I to sum up its powers in a few words, I would say it was ipse agmen, a host within itself.

Sulphas Cupri—Sulphate of Copper.—In continuation of the subject of Emetics, I shall speak of some other mineral preparations. Copper affords us several very powerful Emetics, but the only one in use is the Sulphate of Copper. It is obtained by evaporating waters which hold it in solution. Such waters are to be found in Copper Mines, where the Sulphuret of Copper, by exposure to air and moisture is converted into Sulphate. Sometimes it is produced artificially, by calcining the native Sulphuret of Copper, and exposing it in a humid state to the air, the metal becomes oxidated, and the sulphur absorbing oxygen is converted into Sulphuric acid, and the Sulphate of Copper is formed. This is then dissolved and crystallized.

Copper in its metallic state exerts but little action upon the system. A remarkable case in illustration of this fact is related (by Dr. Paris) of a young woman, who swallowed six copper pieces, with a view of destroying herself. She was attended for two years, by several physicians, for a disease which was considered visceral, but it was the effect of the mechanical obstruction occasioned by the coin. After some years had elapsed she voided them, and then confessed the cause of her protracted disease, during the whole of which no symptom arose which could in any way be attributed to the poisonous influence of Copper. When poisoning occurs from Copper, it proceeds from the want of cleanliness in the use of Copper vessels, by which they are suffered to become coated with the green carbonate, but more frequently it happens from vinegar being allowed to stand in such vessels until verdigris is formed.

Sulphate of Copper is distinguished by the promptness and activity of its operation. In a large dose it has succeeded in expelling Narcotic substances, after other Emetics, particularly the Sulphate of Zinc,

had been used without effect. In these cases where the irritability of the Stomach has been greatly impaired, and the patient nearly in a state of insensibility, it has produced instantaneous vomiting, when given to the extent of 10 or 15 grains, dissolved in water. As it is sometimes very violent in its operation, even in small doses, it is not much employed in general practice. It may be beneficially employed in certain cases.

In Cynanche Trachealis it has been extolled as being more decidedly efficient and speedy in its operation than any other Emetic. From the insensibility which exists in the Stomach to impressions in some of the stages of this disease, I should suppose it a remedy well adapted to these cases, and that it may with great propriety be resorted to, after milder means have failed of producing Emesis. By a German practioner* it has been recommended as an excellent remedy in this disease, especially after V. S. In slight cases he begins with giving from a quarter to half a grain every two hours. In those cases, however, where there is much stridulous breathing, denoting inflammation of the larynx or bronchia, 3, 4 or more grains are administered, to excite vomiting. By so doing the lymph is not only expelled from the trachea, but also the further secretion of it is prevented, so that the patient is much relieved, aud even cured. After copious vomiting has been produced, the medicine is to be given in small doses in conjunction with Digitalis. In support of the utility of this practice, it is affirmed that it has been employed with the greatest success, during a period of ten years, in a great number of children affected with croup, without losing a single patient in that time, notwithstanding the disease was often at its height when first called. This is certainly speaking of the remedy in very strong terms, and the practice pursued is worthy of your attention. Such is the relief afforded by frequent and free discharges from the Stomach, and such the power of Emetics in producing new determinations of the circulating fluids, that their value cannot be too highly appreciated.

Upon this article I need not dwell very long, it does not exert any very considerable curative operation, neither do I know of its being applied to any cases in which the Tart. Antimony or other preparations may not be used with infinitely more advantage. Some physicians are partial to it as an evacuant of the Stomach, and as it is conveniently administered in the form of pill for this purpose, it might on some occasions be found useful.

Besides its Emetic properties the Sulphate of Copper may be so exhibited as to prove a valuable tonic. In minute doses as the quarter or eighth of a grain, it has been employed as a useful auxiliary to bark, in the management of obstinate and protracted Intermittents.

As an Escharotic it is well known, a weak solution being employed as a wash for indolent and foul ulcers.

The dose of the Sulphate of Copper, as an Emetic, is from ij. to v grs.

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* Dr. Hoffman.

Poisoning from the Salts of Copper.—This is not a very common occurrence, in consequence of the great care taken in the use of copper vessels, and the general knowledge which exists upon the cautions to be observed. They may, however, be taken either accidentally or by design.

The symptoms excited are the same as those produced by arsenic, or corrosive sublimate;—violent colic pains, vomiting, and purging, the eructation of a matter containing verdigris, sometimes salivation, a small pulse, and blueness about the eyes, jaundice, a copper taste in the mouth.

Morbid Appearances.—Chiefly signs of Inflammation. The Stomach is of a green colour, its inner coat excessively inflamed. Ulceration, and the contents of the Stomach to be found in the sac of the peritoneum.

Treatment—After experiments with various substances, Orfila has ascertained that the best is Albumen.

Operation of Albumen on the Salts of Copper—Has the property of precipitating solutions of Coppery Salts, reducing them to the state of an oxyde, and of forming an insoluble compound with the oxyde.

Sugar is recommended as superior to Albumen.

The efficacy of Sugar in counteracting the poisonous effects of Copper is confirmed by the practice of Fishermen in the West Indies. At certain seasons in the spring and summer, the eating of certain kinds of fish is extremely dangerous, the symptoms produced being those of a very violent character, such as attend the most virulent poisons. Various causes have been assigned respecting this poison. The opinion entertained very generally is, that the sea impregnated with Copper renders the fish poisonous. To counteract the poison of the fish, the juice of the sugar cane has been found very effectual. So perfectly are the fishermen convinced of the fact, that they never hesitate to eat of the suspected fish, provided they can procure the juice of the sugar cane—they bruise the cane between two stones, and express the juice, which they immediately drink, without further preparation.—*Sigmond's Lectures.*

The operation of Sugar upon the Salts of Copper, is to reduce them to the state of a Protoxide.

Sulphas Zinci—Sulphate of Zinc.—Zinc is another of the metals from which we obtain a valuable Emetic preparation. It is found in combination with different minerals, in various parts of the world, in England, Hungary, Germany, usually united with Sulphur, forming the ore called *blende*, which is a Sulphuret of Zinc.

Sulphuret of Zinc found native, is of a dark or black colour, confusedly crystallized. It has some resemblance to the Sulphuret of Lead, but is distinguishable from it by several characters, particularly its less shining and metallic surface, and its greater hardness. In its metallic state it exerts no sensible action upon the system, and to be

rendered active it undergoes certain chemical changes, by which it acquires different degrees of activity.

The preparation to which I shall call your attention is the Sulphate of Zinc. It may be prepared by the immediate union of its principles, by dissolving Zinc in Sulphuric Acid diluted with water. But most of the White Vitriol of commerce is obtained by exposure of the Sulphuret of Zinc to air and moisture. The metal thus become oxidized and the Sulphur acidified, and by mutual action a Sulphate of Zinc is formed. *It is in the form of white masses grained like sugar, often spotted with yellow.* It has a pretty strong acrid, styptic, metallic taste, and is soluble in twice its weight of water. In this state it is not a pure article, but contains Sulphate of Iron, and sometimes Sulphate of Copper. The Sulphate of Zinc, is separated from these, by dissolving it in water, boiling it with the oxyd of Zinc, which precipitates the Iron and Copper—the solution is then evaporated and crystallized.

This is the only Emetic preparation, and it is not commonly employed in cases in which an Emetic is indicated, but it is especially had recourse to as it operates speedily and with much force, in cases where it is of importance that the contents of the Stomach should be immediately evacuated, as when poisons have been taken. The dose under such circumstances is from 20 to 40 grains, but in ordinary cases, 10 or 15 grains repeated until vomiting is excited are sufficient. Possessing no advantages over other Emetics, and being extremely harsh and unpleasant to the taste, its use was limited to few diseases, until Dr. Moseley, a distinguished writer on the diseases of the West Indies, introduced it into notice. By him it was extolled as an Emetic, in the highest terms, and the language he employs is more that of an enthusiast than an experienced practical physician. As an Emetic, he says that it is in all respects safe and innocent, possessing advantages over all other nauseating and Emetic substances whatever, which are that the patient is not harassed with its operation, for that it is never violent, generally instantaneous, and as suddenly over, always leaving the Stomach invigorated. Neither, says he, does it produce spasms in the bowels, nor any nervous affection.

It is the basis of the preparation known by the name of Moseley's Vitriolic Solution, and as this is the form in which it is applied to diseases, the following is the mode of its preparation.

R. Vitriol. Album,	ʒiii.	Let them be mixed in a mortar. The cochineal is first to be rubbed fine, and the alum and vitriol are then to be added and triturated. The water is to be poured on, and the whole set by to settle.
Sulphat. Alum.,	ʒi.	
Cochineal, grains	iij.	
Water,	℔i.	

In this solution the proportion of either the vitriol or the alum, may be augmented or diminished according to circumstances, that is, when evacuations are required, the quantity of alum may be diminished, or even entirely omitted,—and when great astringency is required the quantity of alum is to be increased and the vitriol to be

diminished. The dose is from a tablespoonful to a teaspoonful, according to the age and strength of the patient, which is to be taken every morning, fasting, in some cases to be repeated every six hours. The solution is very unpleasant to the taste, but it cannot be improved in this respect, at least without impairing its virtues.

The vitriolic solution has been applied by Dr. Moseley to several forms of Intestinal disease. In Dysenteries, Diarrhœas of long standing, in Colica Pictonum. In Pulmonic affections, when respiration is performed with difficulty, and when expectoration is to be promoted, as in catarrhal coughs and hooping cough, in Phthisis Pulmonalis, it has been recommended in the highest terms.

The Vitriolic Solution to the best of my knowledge is not much employed in this country, and I do not recollect having ever used it. The diseases in which it has been employed, having been found to yield in most cases, to other forms of practice. I wish not, however, to say any thing which may discourage you hereafter from making trials with it yourselves. Fashion, be assured, exercises its influence even in our department, and because an article is not in vogue its merits are overlooked. Such, however, is the diversity of organization, temperament, and condition of the human frame, that a variety of remedies is often called for; what has succeeded in one case has no effect in another. You should therefore be made acquainted with the diversities of practice suited to the same disease, hereafter convenience, necessity, and more particularly the pathology of the complaint, may direct your choice. Operating as this medicine commonly does, as a mild nauseative and Emetic preparation, it may be considered well suited by these effects to the management of the several diseases I have mentioned. For further particulars, in the employment of the Solution, I refer you to the work of Dr. Moseley, on the Diseases of Tropical Climates.

The Sulphat of Zinc, has been recommended in cases of Angina Pectoris. In this disease when the peculiar and characteristic symptoms have existed in a very strong degree, and after the usual remedies were unsuccessfully employed, recourse has been had to this medicine, and it is said with very good effects. It is given in small doses as a grain morning and evening, with a quarter of a grain at bed-time, increasing the quantity as the Stomach will bear it. The dose may be increased to two and a half grains, and several cases are related, as restored by this medicine.

With the nature of this complaint, many of you are probably well acquainted. It consists in an organic derangement of the heart, either of its valves or arteries, or of some irritation of the cardiac nerves, giving rise to pain; so that originating in such causes, it is not probable that a few grains of this substance will exercise much influence on the disease, neither should it be depended upon. Other means more effectual should be kept in view, as blood-letting, diet, rest, counter-irritants, and it is only after they have been effectually tried, can any advantage be expected from the Sulphate of Zinc.

From the utility of Emetics in some diseases of the Thorax, this article has been employed in Asthma, Pertussis, &c. Emetics are useful in these cases by retarding the approach of the paroxysm, promoting free expectoration, and producing a determination towards the surface. It is on this account that Ipecacuanha and Squills have stood foremost in the list of remedies for these diseases, a considerable time, and this undoubtedly from the good effects observed from their nauseating and Emetic operation. By some practitioners the Vitriol Alb. is preferred to these medicines, not only as it affords relief by its Emetic operation, but being also antispasmodic.

A brief consideration of the Pathology of Asthma will render the benefits to be derived from Emetics more striking. The immediate cause of the distressing symptoms experienced, is attributed to a spasmodic affection of the bronchia, or a morbid thickening of the mucous membrane lining the bronchia, such as occurs in coryza, or cold in the head as it is termed, the nostrils being stopped up as it were, from the thickening of this membrane. The consequence of this state of the parts, is an obstruction to the free ingress and egress of air in respiration. The air being obstructed in its free passage into and out of the lungs, expectoration cannot be performed, or only with difficulty. The mucus secreted by the bronchial passages being retained, adds much to the embarrassment of the breathing.

The freedom of action in the lungs being interrupted, the blood circulates with difficulty, it is accumulated in the lungs, and adds to the existing distresses of the patient. The functions of the lungs are imperfectly performed, hence the lividness of the lips, face, and of the ends of the fingers, the coldness of the surface, &c. The point from which this train of evils proceeds is that state of the solids giving rise to the production of spasm. Emetics then by their impression upon the system and the production of nausea, favour relaxation of the muscular fibre, the air in the lungs being variously agitated, during the action of vomiting expectoration is promoted, and the fluids of the body by the diversion given them, are directed from the internal to the external parts of the body. Thus the congestion of the lungs being relieved, their functions are better performed. Of the several Emetics which by occasioning vomiting, effect these salutary objects, the Vitriol Alb. has been recommended, since it has been supposed to exert in addition an antispasmodic operation. This opinion, though supported by Akenside, is not confirmed by practice, and in my employment of this article I have not experienced greater advantages from its use than from any other Emetic.

Division II.

Medicines which Irritate the internal surface of the Alimentary Canal.

CATHARTICS.

This division of the Materia Medica is probably the most useful and important of any which will engage our attention. It is more extensively applicable to diseases, is resorted to on a greater variety of occasions, and is of very essential benefit in controuling and subduing the morbid operations of the system. On this account I will enter particularly into the consideration of the effects and operations of this class of medicines.

To form a just idea of the operation of Cathartics, it will be necessary to consider with a little particularity the effects which follow their administration.* As soon as they are exhibited the appetite and all desire for nourishment is destroyed, nausea succeeds, an uneasiness is experienced in the Stomach, which is occasionally increased to a considerable extent, with a sensation of heat and restlessness. As they proceed down the intestinal canal, the action of this organ is increased, a rumbling motion is frequently felt, and the abdomen has an uneasy sensation of distension.

The pulse is small and irregular at this period, and other symptoms denoting a disturbed state of the system generally, as frequent heats and chills, the skin dry, with an increase of the animal temperature. These symptoms are relieved by the evacuations taking place, which are repeated in an indeterminate number of times, and which present considerable varieties in quality and quantity.

The effects described will vary according to the nature and activity of the purgative employed, sometimes much distress is excited, and at others little is felt.

In explanation of these effects it will be readily perceived that they have their origin in the action of the Cathartic upon the surface of the Intestinal Canal, and that most of the phenomena excited, are derived from the impression of these substances upon this surface. It will also be perceived that there are certain general symptoms produced, which prove that this impression is extended to all parts of the system. Cathartics therefore exercise a *local* and a *general* action. I shall offer some remarks upon each, but before I proceed it may be useful to take a cursory view of the structure of the Alimentary Canal, as it is from the consideration of its various functions that we are made particularly sensible of the benefits conferred by these medicines.

The Internal surface of the Intestinal Canal is lined by a delicate membrane thickly studded with small follicles, which secrete a viscid mucus, and from this circumstance has been called a mucus membrane. To the Intestines there is sent a liberal supply of blood vessels

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* Vide Barbier, Traite Elementaire.

which penetrate into their texture, and are distributed in an infinite number of minute ramifications. These vessels become very apparent upon any irritating substance being applied to them, they become red as if injected, and from them is poured out an abundant supply of serous fluids. To the fluids derived from these sources must be added those derived from the glands, as the liver, and pancreas, which have their ducts opening in the duodenum, along which irritating impressions are conveyed to their respective glands, giving to their secretory functions increased activity.

Exterior to the mucus membrane there exists a muscular coat formed of circular and longitudinal fibres. It is this coat which occasions the vermicular motion with which the Intestines are animated. Excited by the action of Cathartics these fibres have their contractions increased, the peristallic motions become quickened, and the contents of the bowels are urged on with some degree of rapidity to the rectum.

That Cathartics operate by a local impression upon these parts, and that it is of an irritating nature hardly requires to be proved. It is however illustrated very fully when those of a drastic character have been exhibited. It is then shown that the action which is excited is of an inflammatory nature, the dejections become bloody, with distressing griping pains, the abdomen is tender to the touch, and if the texture of the Canal is deranged death ensues.

Orfila has proved that many natural productions, which are employed as Cathartic medicines, are capable of inflaming the Intestines of animals to which they have been exhibited, and that they cause injuries similar to those of the more acknowledged poisons. The irritation, however, which is necessary to excite a Cathartic operation is not of such intensity, and does not excite such distressing symptoms. It is an irritation, moderate and gentle in its effects, and a cathartic agent is one endued with the faculty of exciting this particular action.

The *effects* therefore or the physiological phenomena which follow the administration of a Cathartic medicine, are an increase of all the vital energies of the Alimentary Canal. The capillary vessels which form a net work, become more apparent and distended with blood, and the serous exhalation which in a natural state moistens the interior of the Intestinal Canal, is excited to a more copious secretion. The mucus follicles which are spread over the surface become very active, and furnish in a short time a very abundant discharge. The action of the Purgative does not cease here, but the several ducts which terminate in the Duodenum have this action extended to their organs and they are excited to pour out their fluids more freely.

While these operations are progressing, the muscular fibres of the intestines are also stimulated, and the peristaltic motion increased by which their contents are quickly propelled and discharged.

From this view of the operation of Cathartic medicines it must

be obvious how important is the subject upon which we are engaged and how extensive in its application to diseases. In diseases where plethora is to be removed, and the preternaturally increased action of the vascular system diminished, Cathartics next to venæ sect. may be considered as the most prompt and powerful means we can employ.

They are valuable in another point of view.

By their stimulant action exerted upon the several parts I have mentioned, they not only are evacuants, but they act powerfully in equalizing the circulation. The essential principle of disease is unequal excitement, and too great an accumulation of fluids in one part of the system, at the expense of another. Our duty is to rectify this state of the circulating system. Cathartics are, for this purpose, our best remedies, inasmuch as by evacuating one set of vessels, an afflux of fluids is determined to these parts, and relief is afforded to other parts of the system. Hence their utility in diseases of the head, the determination of the fluids in the vessels of the abdomen. which supply the intestines, being increased by purging, the quantity and impetus of the blood, in the vessels of that part of the system are proportionably diminished.

The degree in which these effects are produced, are influenced by the nature of the article which we employ, hence this class has been divided into *Eccoprotics*, *Drastics*, and *Hyper-cathartics*. This division I consider objectionable, because the too last are converted into each other by an increase or diminution of the dose.

The simplest arrangements is into Laxatives and Purgatives.

By Laxatives is meant such substances as operate mildly without exciting any general affection of the system, without stimulating in any great degree the vessels of the Intestines, and hence they merely evacuate the contents of the canal.

Purgatives are more stimulating, they occasion an influx of fluids from the exhalent vessels, and from the neighboring secretory organs, they even extend their stimulating effect to the system in general, and if taken in too large a dose excite much irritation, and even inflammation upon the surface of the Intestines.

In both of these divisions, the articles which produce these effects may be considered as substances which resist the digestive process, or whose nature the gastric juice cannot change, which irritate the surface of the Intestines, and afford nothing to be acted upon; they become therefore medicines by compelling the bowels to revolt, if I may so say, upon what they cannot overcome.

Besides these differences which arise from different degrees of activity, Cathartics will present other varieties in their modes of operation, according to the part of the Alimentary Canal upon which their action is directed. This difference will probably be connected with the nature of the article itself, and will depend upon the peculiarity of its stimulus, or the readiness with which it undergoes solution in the bowels. Dr. Paris has so well expressed the idea I wish to convey, that I shall avail myself of his language. It is easy to conceive

that a medicine may act more immediately and specially upon the Stomach, small or large intestines, according to the relative facility with which its principles of activity enter into solution. That those which are dissolved before they pass the Pylorus, are quick and violent in their effects, and liable to affect the Stomach, as gamboge, while some resinous purgatives on the other hand, as they contain principles less soluble, seldom act until they have passed out of the Stomach, and often not until they have reached the colon; while others still less soluble have their action upon the rectum. These views will be best illustrated by examples of medicines, which have an influence upon different parts of the Intestinal Canal.

Calomel for instance operates upon the upper portion of the Intestinal Canal, as exhibited in the biliary evacuatious which follow its use. Gamboge when given alone, on account of its ready solubility, has its action upon the same portion of the Canal, hence it sometimes, as well as Calomel, exerts an Emetic operation. Jalap and many other Cathartics have an action upon the small as well as large Intestines, and aloes and hellebore pass through them, and have their action principally upon the colon and rectum. This want of action, would seem to be connected with the slowness with which it undergoes solution. In short those substances we have called Emetics, seem also to owe the peculiar effects which follow their use in having their operation upon a portion of the Alimentary Canal still higher, viz. the Stomach.

Cathartics differing in the degree of their action or irritation, as well as the parts of the Intestinal Canal upon which they operate, it follows of course that the evacuations produced by their use will be different. Some will simply remove the contents of the bowels, others will produce an increased discharge of bile, while others by stimulating the exhalents particularly, will produce an increased secretion from these vessels, and a discharge of watery passages.

The qualities of the evacuations being different according to the purgative employed, it becomes necessary to give some explanation of certain terms which have been much employed in Therapeutics.

From a consideration of the different qualities of the evacuations, the ancients applied to particular articles specific powers, and hence employed certain expressions to designate them, these were Hydrogogues, Cholagogues, Phlegmagogues, &c., or medicines capable of causing a discharge of water, bile, phlegm. The idea which was attached to the term Hydrogogues, was not such as I have explained, as medicines which had the power of augmenting the exhalation of the Intestines, but they were considered as remedies which had the faculty of removing by a special virtue, a morbid serum which existed in the system of the sick, and which was to be expelled downwards. The Cholagogues they conceived searched out in the body of the patient, bile which was depraved, which had fixed itself upon organs essential to life, which caused pains, and which supported the fever. These evacuants expelled the humor, and health was restored. The

Phlegmagogues carried back to the secretories of the Intestines a pituitous matter which had been thrown upon the lungs, head, &c.

These terms originating in erroneous views of pathology, and the operations of medicines, are yet supported by actual appearances. All that we would understand by them however, is, that certain purgative substances have a tendency to act more upon one part of the Intestinal Canal than upon another, and in consequence of this determination the appearance of the evacuations are different. Upon what this peculiarity in the action of Cathartics depends, our experience is not sufficiently extended to determine.

My remarks have hitherto been confined to the action of Cathartics upon the surface of the Intestinal Canal, and the consequences which result from their irritation.

I now proceed to consider the effects of their operation upon the system generally.

An attentive consideration of what passes in the system, while under the operation of a Cathartic, exhibits important changes upon parts distant from the Alimentary Canal.

These general effects may depend upon the particles of the purgative substance being absorbed and carried into the circulation, but it is principally to the connection which the surface of the Intestinal Canal maintains with other parts of the system.

It is known that Cathartics have a considerable influence upon the pulse. The pulse during and after the operation of a Cathartic is smaller and more frequent than in health, and when spasmodic pains arise commonly denominated Cramps, it, also becomes unequal and intermittent.

The secretions are materially deranged while some, those at least emptying into the Intestinal Canal are increased, others as the urine and perspiration are diminished.

The animal functions experience a like disturbance—muscular motion is impaired—the sensations appear vague and imperfect—the intellectual functions are slow and difficult—the inclination to sleep is irresistible. We ought to attribute to irritation of the Intestines, many of these symptoms, to regard the thirst as resulting from the intestinal excitement of the purgative, the cramps as the effect of the impression made upon the nerves of the Intestines, and extended to those of the legs—the feebleness of the function of perspiration as resulting from a diversion of the cutaneous excitement, and an increase of that of the primæ viæ. The sleep which attends purgation often appears itself caused by the increased determination which takes place to the digestive system, resembling that which accompanies the process of digestion.

The degree in which these effects will be experienced, will be influenced by the character of the article employed. When of a drastic nature, all these effects will be experienced in the individual case, and the system will not only be slow in returning to the usual exercise of its healthy functions, but a degree of enteritis may be produced

which will give rise in its turn to other and characteristic phenomena. When the article employed is of a mild nature, the system soon returns to the nominal exercise of its functions,—perspiration and urine are renewed, the pulse becomes more vigorous and strong, the desire for nourishment is restored.

Such are the circumstances most worthy of consideration in treating of the operation of this valuable class of medicines, and upon which we are led to reflect upon their utility, not only as depleting remedies, but as exerting new changes in the system at large.

Operating thus extensively they are highly useful in those states of the system attended with much excitement, but their employment has been objected to in diseases attended with debility.

You have been informed that purgatives are depleting remedies, that they act by increasing the secretions of the bowels, and in their operation hurry off the chyle so as to preclude its entering the circulation. From these considerations they ought to be used with caution in cases attended with much debility, but they ought not to be rejected altogether, because by their use the bowels are urged to expel their contents, by which their functions are in some degree restored, the appetite and digestion are too often improved thereby, and the patient so far from being weakened is placed in a condition to be nourished and strengthened.

Cathartics have been objected to in diseases of some continuance, and in debilitated cases from another consideration. It has been said that as in such states but little food is taken, there can be little occasion for regular alvine discharges, neither ought they to be expected.

In all diseases, however, it should be observed, that some portion of nourishment is taken, which will contribute to the formation of feculent matter. Yet in Fevers another supply is derived, not only from the abundant secretion of different organs, but from the excrementitious fluids which are poured into the Intestines. Under these circumstances it is easy to perceive the importance of attending to the condition of the bowels, since independently of solid matter being taken into the Stomach, fæces are formed, which from the heat of the body, soon become acrid and irritating, and thus render the necessity of attending to the state of the primæ viæ extremely apparent.

Before proceeding to the application of this class to diseases, I shall in a very condensed manner, speak of the general objects accomplished by these medicines, as you will then be satisfied of their influence upon the animal economy, and of the great aid they afford in the practice of physic.

1. In the first place they serve to evacuate the Intestines, and to carry out of the system the substances they contain. It is hardly necessary to point out the importance of this operation. In a state of health, its interruption deranges considerably the exercise of the digestive functions, occasioning pain in the head, oppression, general uneasiness, &c. In disease it is still more necessary that the first

passages should not retain for any time, their fæculent contents, nor the excretions poured into them from various organs. For these substances by being confined in the bowels loose their natural qualities, they excite much irritation, and give rise to various distressing affections.

2. In the second place, the irritation which these medicines excite upon the internal surface of the Intestinal Canal, augments the secretory action of the liver, pancreas, mucus follicles, and at the same time a considerable discharge of serous fluid. From these several sources, the abdominal viscera are relieved from that turgescence of the vessels which has been called congestion, and the good effects of which are seen in a number of diseases.

3. In the third place the vital forces are determined during their operation towards the abdomen, the blood circulates with more activity in these organs, there is more warmth, and more sensibility than under ordinary circumstances.

The great afflux of fluids towards these parts, exercises a derivative or revulsive action in regard to the head, the chest, and other parts of the body, and thus it is that a very salutary influence is frequently exercised.

4. In the fourth place the strong impression made upon the nerves, expended upon the surface of the Intestinal Canal, is extended by means of the great sympathetic, to the brain, the spinal marrow, and by a necessary consequence to all parts of the body. It is to this operation that we are to attribute very frequently the important results produced by these medicines—the actions often excited in remote parts—the alterations which take place in the secretions—the renewal of action—the change in short which the whole system undergoes.

Lastly. The impression which these medicines make upon the organic tissues when their administration is not followed by alvine evacuations, but when their particles are absorbed ought also to be taken into consideration.

These diversified operations entitle this class to be considered as Alterative medicines of great efficacy, and fully illustrate the very necessary aid they afford, in diseases of almost every description.

Rules for the administration of Cathartics.

A few rules upon the administration of Cathartics will close what I have to say upon their general operation.

1 Cathartic medicines should be exhibited late at night or early in the morning, when circumstances are not very urgent. It would seem that during sleep the bowels are not so irritable, and consequently not so easily acted upon, while by suspending the influence of the imagination it renders it less liable to be rejected.

2. In cases of Fever, where it is necessary to consult the quiet and ease of the patient, it is important that the exhibition of Cathartic medicines should be so timed that their effects may be expected during the day.

3. Cathartic medicines should be exhibited upon an empty Sto-

much as we prevent their being rejected, and secure a more easy and effectual operation.

4. To promote the action of these remedies, as well as to obviate griping, warm diluents are to be freely taken after the first discharges, as chicken water, gruel, tea, &c.

Practical application of Cathartics.

The application of this class of medicines is so general, that I cannot state a case of derangement of health, in which they may not be employed with some advantage.

The Intestinal Canal is subject to so many irregularities of combination and action—its sympathies are so numerous and extensive—its functions so various and complicated, that the necessity frequently recurs of attending to its state and condition. It is, I may say, the sewer of the system, into which all the useless, foreign, and putrescible materials are collected, into which the fluids of the body after having served their offices, and the excretions of the several glands, are emptied.

From all these sources, it becomes engaged either in the production of disease, or instrumental in keeping up its activity. My time will only allow me to speak of the most important diseases in which they are used, and I can only dwell upon them in a cursory manner.

In Fevers of every variety they are indicated.

In these cases, they operate as evacuants and remove the remote causes, when they depend upon vitiated matter in the bowels.

In Fevers the action of the bowels is always diminished, from which a state of fullness, restlessness, and anxiety is produced, which serve to aggravate the symptoms—Cathartics relieve this condition of the system, diminish and equalize arterial action, and stimulate the exhalents. They are useful in every stage of Fever—Given in the Incipient stage, they not unfrequently check its progress—during the course of the Fever they relieve symptoms, and so far from diminishing, often increase the strength of the patient.

In Intermittents they are much used. In the early stage advantage is gained from Emetics, but Cathartics are also useful.

In Remittents they are equally useful, and more frequently necessary. They are employed daily to evacuate the bilious matter, and to bring down the force of the arterial system. The secretions are in almost every case of Fever changed from a natural and healthy state, to a condition which renders them additional causes of irritation to the already excited system. Cathartics therefore become necessary and important throughout the whole course nearly of all acute diseases, for the purpose of removing these additional supporters of Fevers.

In our highly bilious grades of Fever, and in Yellow Fever, they are invaluable.

To any one who considers the increased quantity and the vitiated quality of the Intestinal Secretions in these Fevers, the necessity of immediately discharging them will be sufficiently obvious; and ac-

cordingly most physicians are anxious to excite discharges from the bowels as soon as possible.

These matters are often so acrid as to excoriate the rectum, and the skin immediately surrounding the part. Proofs are not wanting of this extreme acrimony in these cases, and instances must be familiar to most physicians. Dr. Physick's hand was inflamed by the acrid matter found in the gall bladder, and primæ viæ, in dissections made in the Yellow Fever of Philadelphia, in 1793.

Not only in these Fevers is the utility of Cathartics established, but even in Typhus, or the weaker forms of Fever.

To Dr. Hamilton, the Medical community is indebted for the important advantages to be derived from regular alvine discharges in this disease.

The presence of Typhus is marked by the following symptoms, (Hamilton,) viz. loss of appetite, thirst, sickness, white or loaded tongue, disagreeable taste of the mouth, and most commonly by constipation of the bowels. To these succeed languor, head-ache, debility, and inaptitude for the usual mental and bodily exertions—morbid affections of the surface of the body, of the sanguiferous system, and of the different secretions soon succeed, to which in the advanced stage are added delirium, subsultus tendinum, and singultus.

The treatment consisted in weak antimonials preceded by an Emetic and purgative in the commencment of the disease—but the condition of the bowels was little regarded in the after periods of the disease. The results of this treatment were extremely unsatisfactory, and upon having recourse to a stronger antimonial preparation, Dr. H. was soon convinced that its good effects were commensurate with its operation upon the bowels. The fæces were generally black and fœtid, and in proportion as they were discharged the low delirium, tremor, and subsultus tendinum which had prevailed, were abated, the tongue which had been dry and furred, became moister and cleaner, and the creeping pulse acquired a firmer beat.

The practice now adopted is the rejection of Emetics and glysters in this Fever, while reliance is placed upon Purgative medicines for the purpose of ensuring regular alvine discharges. With this view Dr. H. prescribes active doses of medicine, and gives them every other day. Since adopting this practice we are assured that there is less need for stimulants in the treatment of this disease, and that it is much more manageable. The practice became general in England and even upon the continent—but in the United States the Typhus gravior and mitior of Cullen, rarely occurs, so that the efficacy of the practice recommended is seldom tested.

The importance of the principle should still be kept in view, and even in the low forms of disease, the necessity of attending to the condition of the bowels should never be overlooked.

In advocating the utility of Cathartics in Febrile diseases, it is proper to state to you, and even to admonish you, that in many instances they are abused or injudiciously employed. The remarks

that I can make, must of necessity be very limited—practical views will be fully unfolded to you from another quarter—to me, alone, belongs the Therapeutical applications of Medicines, and the cautions to be observed.

I. Cathartic Medicines, then, are abused, or injudiciously employed when active or drastic articles are continued after the stercoraceous and acrid secretions of the bowels are discharged—Under these circumstances, with the contents of the bowels, the mucus secretion, which lines and protects the tender surface of the internal membrane, has also been removed; and the continuance of active articles can have no other effect than to wound and irritate this surface, to excite griping and distressing pains, followed by a frequent desire to evacuate the bowels—with small, thin, serous passages, attended with a painful and distressing tenesmus. The stercoraceous and offensive secretions from the bowels being removed without subduing the disease—it will be proper to discontinue these medicines, and excite some other secretion into action. When further evacuations are required, it will be advisable to excite them *by milder preparations*, as they will most commonly be found better adapted to the condition of the vital powers, and fully capable of carrying off the secretions which have been poured into the Intestinal Canal. I could depict to you the bad effects of a contrary practice, and have seen patients suffering under all the symptoms I have mentioned, the passages consisting of little else than thin serous discharges, with flakes of mucus floating in the fluid. The continuance of these medicines, under these circumstances, not only irritates the mucus surface to a considerable extent, but I will not go too far in stating, that instead of subduing, will be found to increase the Fever. You would hardly credit me were I to relate the extent to which I have known cathartic medicines pursued in febrile affections of an acute character. I have known from twenty to thirty evacuations excited from the bowels in twenty-four hours, not only from adults but in children. This practice is entirely wrong, it is absolutely destructive. You might almost question how such a number could be produced. The fact is undeniable, and it is adduced to show the pernicious extent to which these medicines are carried, and against which I warn you. These successive discharges are procured, not by two or three doses of active medicines, which are proper enough in the commencement of diseases, but by a continuance of the same medicine every two or three hours, for twenty-four, thirty-six, or forty-eight hours, and sometimes the whole course of the Fever. However excited, whether by Calomel alone, or its combinations, whether Jalap and its combinations, or whether simply oleaginous articles, the practice is to be deprecated in the highest degree. I should be glad, if it were possible to give you definite rules on this subject. I can only state to you what has usually been my course.

It is, when called to a patient laboring under acute disease, to remove as much as possible all apparent sources of irritation. If ne-

cessary, venæsection is practised, if not, the condition of the Alimentary Canal, as affording many sources of irritation, and having a more extensive influence upon the system than any other channel, is attended to. The stercoraceous and offensive contents of the bowels being removed, which is commonly done with half a dozen evacuations, with the continuance of the disease, I attempt the renewal of some other secretion—the skin, or urinary organs, and combat symptoms as they arise. When the condition of the bowels re-requires attention, which will be in twenty-four, or thirty-six, or forty-eight hours, to excite discharges by the same medicines, if it can be borne, and if not, by a milder article, always keeping the same object in view, a renewal of secretion, or a change of secretion, and combating symptoms as they arise. The resources of the Materia Medica are quite sufficient in by far the greater number of cases, if we only apply them properly, judiciously, cautiously. You will hear various and contradictory opinions as to the means by which this is to be accomplished—listen to them all and judge for yourselves. Having found a mixture of error and truth to exist in systems and doctrines, I take advantage of the fact, judge for myself, and pursue an eclectic course.

II. Drastic or irritating Cathartics are injudiciously, nay, improperly employed, in diseases attended with an inflammatory condition of the mucus membrane of the alimentary canal. When speaking of the physiological operation of these articles upon this surface, the remarks then made will render it unnecessary to enter into details—it is evident that they will exasperate all the symptoms. While on the contrary, from the milder articles, the most beneficial consequences must result.

It seems to me, that in a subject of such importance, it might be advisable to particularize some examples in Febrile diseases in which the precautions I have mentioned should be observed, as well as the symptoms which lead to a knowledge of this inflammatory state.

Without entering into the disputed question, whether Febrile diseases originate in an inflamed condition of the mucus membrane of the Alimentary Canal or not, I shall only observe to you, that Febrile diseases are often attended with a considerable determination to the abdominal viscera, and among the organs affected, the Stomach and Intestinal Canal frequently participate largely in these determinations.

The symptoms which characterise this condition of these organs, are nausea, irritable stomach, vomiting of fluids taken, pain upon pressure, costiveness. When to these are added redness of the tongue, either pervading the whole surface, or confined to the edges or tip, or when with this state, it is coated with a thick fur,—when thirst exists, and the pulse ranges from ninety to a hundred pulsations in the minute, we may be assured that abdominal inflammation exists, and under these circumstances, active medicines of an Emetic or Cathartic character, will be improper. Depletion by the lancet, should

be preferred, until these symptoms are abated, fomentations to the abdomen, warm cloths, and the mildest medicines employed—calomel, for instance, followed by castor oil—Evacuations from the bowels being effected by this course, the utmost relief will be afforded, and the patient will have reason to rejoice in the prudence, judgment, and discrimination of his physician. A contrary practice will but subject him to much and severe uneasiness and distress.

Utility of Cathartics in Inflammatory Diseases.—The great utility of Cathartics is not only exhibited in removing offensive matters from the bowels, in depleting the chylopoietic viscera, and exciting a new and more healthy action,—but by the irritation they excite upon the serous vessels, and the mucus follicles, a copious secretion takes place from the extensive surface of the Alimentary Canal, and they become important remedies, as evacuants to the system generally. Hence their great importance in the treatment of Inflammatory diseases, and in the diversity of cases in which arterial excitement is to be moderated or reduced.

In affections of the *Lungs*, as Pleurisy, and Peripneumony, the employment of Cathartics has been condemned by some practitioners, apparently upon theoretical grounds—yet it will be found that free evacuations from the bowels, conduce, like blood-letting, to diminish the general and local inflammatory action, and by a revulsive operation to determine from these organs.

In inflammation of the Peritoneum and Intestines.

The first object in these cases is to overcome the constipation with which such Inflammatory diseases is commonly so frequently attended. This object is accomplished by all the means resorted to to reduce inflammation—as venæ sect., leeches, fomentations, evacuants by the bowels. The last by exciting secretions from the whole surface of the Intestinal Canal, are not the least important. We know that secretion is an ending of inflammation, and is frequently the spontaneous mode of relief to the vessels of an inflamed part. The secretions excited by Cathartics are very considerable, furnished as they are from so many sources. If care therefore is observed in their administration, that is to say, if the stimulus of the article is adapted to the excitability of the part, very beneficial effects will follow. From inattention to this circumstance, the use of Cathartics has been objected to in Enteritis, on the ground that they act as stimulants, and that stimuli applied to its seat must increase inflammation. The conclusion against Cathartics on this ground is not legitimately inferred —for though their operation is stimulating, yet as they restore secretion, which is almost always diminished in inflammation, they are when employed at a proper period, and of a proper quality, agents to which we should have recourse, in order, as it were, to effect resolution.

The constipation of Intestinal Inflammation is generally attended with vomiting, and almost every thing is rejected which is taken into the Stomach. It is common therefore to regard Cathartics as almost

useless, to attempt the reduction of inflammation by bleedings, and afterwards to give Cathartics. This is practice that cannot be relied upon altogether—for though it is proper to bleed, and often freely, and use revulsives, yet we ought not to be satisfied until the bowels have been evacuated. It is true some perseverance is required, the medicine being often rejected as soon as taken, yet it is right still to persist, for although much will be thrown up, some will be retained. The quantity retained accumulates in proportion as it is repeated, and at last, with the aid of enemata, stools are produced, at first small in quantity, but afterwards more copious. With the accomplishment of this object the vomiting ceases, the tension of the abdomen is relieved, and the soreness diminished. This effect gained, it is seldom necessary to resort to bleeding afterwards—the bowels, under the continued use of mild Cathartics, recover their disposition to healthy action.

Although the constipation attendant on Intestinal inflammation is in general overcome by the above means, there are cases in which they have failed; and the disease has in such appeared rapidly approaching a fatal issue. Under these circumstances Calomel becomes a very important remedy, given in doses of 10 grains every 4 or 6 hours, to the extent of producing salivation, and as soon as this has taken place copious stools have quickly followed, and a favorable convalescence has afterwards been maintained by Cathartics of a mild character.

Of the utility of this class of medicines in Dysentery, you must have had opportunities of witnessing. There are few diseases less indebted to the natural efforts of the constitution for a cure, and in which the beneficial operations of this class of medicines are more conspicuous. The disease often has its origin in the irritating and vitiated nature of the contents of the bowels, and the first step is to remove these, by the employment of such purgatives as produce a full and speedy operation. As the secretions which are poured into them are perhaps in all cases in a vitiated state, purgatives must occasionally be employed throughout the whole disease. In resorting to this class of medicines, it is proper that the inflammatory condition of the mucus membrane lining the passages, be as little affected by the irritation of the process as possible. The irritation is sometimes so considerable that the patient conceives that his bowels are already too much griped and purged, and it might be supposed that any addition from a purgative substance would be hurtful. This reasoning is not correct, for by experience we are made acquainted, that by these means we remove a much greater irritation, the hardened excrements, and the morbid secretions, which actually cause and keep up the disease.

In Diarrhœas, Cathartics are also highly useful. This disease is frequently brought on by crude and undigested matter passing into the intestines, which by stimulating the excretions and the surface as they pass along, create a copious secretion of fluids, by which the constitution endeavors to rid itself of the irritation. Or it may be

produced by the morbid and acrid discharges of the liver and pancreas, and the multiplied combinations of chemical action, which are formed, when the digestive functions are not in a healthy state. . . Cathartics become useful in removing the crudities which exist in the bowels, and the utility of the practice is confirmed by general experience.

In Colic, a disease arising from such a variety of causes, it is not to be supposed, that a single agent will be sufficient to contend against it. I have known it speedily removed by the use of an Emetic, and at other times the irritability of the Stomach has been such, that the mildest Cathartic could not be retained. This symptom must first be relieved, and for this purpose, V. S. the warm bath, opiates, administered internally, and by enemata, must be resorted to. As soon as Cathartics can be administered, they should be employed to such an extent as to produce free evacuations from the bowels, and it is only with the accomplishment of this object, that permanent relief will be afforded. The best combination in these cases is Calomel and Opium, given in large doses, and followed up as soon as practicable with the liberal use of the Ol. Ricini.

There are various other cases of Intestinal derangement in which the good effects of this class of medicines is exhibited, but I shall defer their consideration until speaking of the particular articles best adapted to them.

Not only is this class of medicines of importance in the affections of the Alimentary Canal, but in those of the Chylopoietic viscera generally. Their use affords us the means of depleting from these organs, and by a continuance of the Cathartic according to circumstances, we are able first to alter, and then subdue the derangements which exist. The cases to which I allude are those numerous examples of deranged secretions, hepatic and intestinal, which though not reducible to classes and species, are frequently seen in practice. They are exhibited in the discharges of the patient, in a furred tongue, impaired appetite, feverishness, irritability of temper, and deranged sensations generally. In these cases, Cathartics are not to be used with the freedom which more acute cases require,—they are not to be employed for their evacuant, but their alterative action, and by pursuing this course with steadiness, for weeks, and even months, the happiest effects I have known to follow. It is in cases of this nature that the Blue Pill exhibits a very salutary operation. By its use, the action of the bowels has been kept up for weeks, and though there was commonly two or three evacuations daily, yet the patient without being debilitated, has been gradually relieved of the symptoms I have enumerated, and at the expiration of this period improved in health and appearance. It is probably from a similar action being kept up upon the bowels, that the mineral springs containing active purging ingredients as the Saratoga waters, afford such relief to patients labouring under visceral affections, and this independent of the benefits

which are attributable in all invalids to change of air, of scene, of diet, and the gaieties which these situations furnish.

Cathartics in these cases excite an action which is different from the existing one, and to this circumstance we are to attribute many of their curative effects. They induce a new action in the secreting vessels, which though it does not destroy, yet it greatly weakens the existing disease, and they may properly be considered alteratives.

Thus Rhubarb operates in curing Diarrhæa, and thus Cathartics operate generally in the affections I am considering.

In diseases of the Cerebal system, Cathartics are of the greatest service. Their good effects in these cases depend upon their operaing in three several ways.

1. Evacuating the blood-vessels.
2. Exciting irritation in parts distant from the affected.
3. Inducing a new action.

In Mania this class of remedies has been applied. The accession of this disease is often attended with symptoms strongly indicative of a deranged state of the chylopoietic viscera. The suffused complexion, and fœtid breath point out the disordered state of the Stomach and bowels—the tongue is tremulous, and covered with a white slime, the appetite is impaired or depraved—the bowels are constipated, and sometimes in an extraordinury degree;—but nothing is more remarkable than the fetor which taints the atmosphere of the patient. It is most offensive when the alvine constipation has been of longest duration. If the abdomen of a patient labouring under an acute paroxysm be examined, it will commonly be found tumid, especially in the region of the epigastrium. But whether this disease has its origin in gastric or cerebal derangements primarily, the treatment is equally obvious. The brain is highly excited, and the following symptoms point out the great determination which takes place to this organ. Inflammatory affections of the eye and other parts of the body, are known to subside upon the approach of this disease, and the pulse in highly excited cases, is frequent and small. The vivacity and strength of the patients perceptions, the increased energy of the imagination, his restlessness, his loquacity, all denote the brain to be in a highly perturbed state, and the action of its vessels greatly increased. The great insensibility to impressions, and to the actjon of medicines prove how much the equilibrium of the sensations is disturbed, and their concentration in the cerebrum. In whatever light, therefore, the origin of these diseases is considered, the great utility of this class of medicines is equally conspicuous. If from a deranged state of the Intestinal Canal, their great efficacy cannot be questioned,—if from excitement of the vascular system of the brain primarily, Cathartics by their depleting and revulsive action tend greatly to lessen and divert its effects. From the insensibility of the system to impressions, and the torpidity of the Stomach and bowels, the means we employ should be of a very active nature, and accordingly drastic purgatives are required. To show the influence of Cathartics upon the brain, no diseases so frequently alternate as Mania and bowel complaints.

In Epilepsy Cathartics have been employed with great success. This disease is connected with great mobility of the system—very often with irritation in the intestines. Thus it is produced by worms, by the sordes in dysentery, by poisons, by repelled eruptions, and very often by constipation of the bowels. The treatment, when connected with any of these causes, is not only to evacuate the bowels, but to continue the Cathartics from day to day unless imperiously forbid by circumstances. By this practice more cures have been effected than by any other, and I believe that in conjunction with other means, as attention to the state of plethora in the vessels, with a regular system of dieting, many cases may be effectually cured.

In the treatment of Apoplexy these agents are equally conspicuous. Employed before the accession of the disease, they are capable of preventing this distressing complaint, and they are suitable when it exists. This disease exhibits itself generally in an undue distension of the vessels of the head, and its proximate effect would seem to consist in compression of the brain, produced either by the distended blood vessels or an extravasation of blood. If effusion has not taken place, Cathartics are useful with other means, as general and local bleeding, with irritating applications to the extremities, to lessen this determination to the head, to dissipate this disordered state and to re-establish its freedom of action. The purging, to be effectual, must be copious, and produced by the most active medicines. Even when there is effusion upon the brain, producing the symptoms of compression, the action of purgatives upon the surface of the Intestinal Canal is always advantageous: but their power to contend against this state of the brain is unfortunately very limited. The consequences of Apoplexy are very various, and purgatives are frequently required to contend with them. With these remedies we remove the obstinate constipation which torments the sick and which announces a diminution of the nervous influence upon the intestinal structure. The Canal is in a state of torpor in these cases, and it becomes necessary to make a strong impression upon it, to excite its action. It is necessary to employ active Cathartics, and the doses must be increased to obtain alvine evacuations in a sufficient degree.

In Paralysis, as induced by the same causes as Apoplexy, the same remedies are equally beneficial. Active articles are effectual here, and as auxiliary, nothing is better than blisters or issues. To be effectual they must be applied to the back of the neck, the back of the ears, or what is preferable, the crown of the head.

In Hydrocephalus Internus, purgative medicines have been highly commended. Of late years this disease has been referred to the disordered condition of the alimentary canal, and the vitiated condition of its contents. In post mortem examinations of hydrocephalic patients, there has been found in the liver, the remains of great inflammatory action, and also proofs that undue irritation had existed in the alimentary canal. Mr. Abernethy declares, that in similar examinations of cases that had died with unequivocal symptoms of hy-

drocephalus, he found the brain perfectly healthy, the only diseased appearance being in the bowels. Other proofs might be adduced, but I shall content myself with remarking that whatever be the pathological views entertained, purgative medicines are among the most important of our remedial resources. They remove the remote cause of disease, and determine the flow of blood from the brain. They may from all that has been said of their application to disease, be considered as exercising a more powerful effect in lessening the action of the vessels of the head, than any other internal remedies we can employ.

I shall speak of the utility of Cathartics in Dropsies, with a view of bringing before you, the action of these medicines upon a system of vessels, to which allusion has not been made; these are the absorbents. The action of Cathartics in promoting that of the absorbents depends upon the copious secretions which take place from the surface of the intestines, occasioning a deficiency of serous fluids in the blood-vessels, and a consequent effort in the powers of the system to restore the deficiency which has taken place. But it is not only by this process that the fluids are evacuated—the action of these medicines is extended to every part of the body, they increase the energy of the absorbents, and they augment in this manner the discharge of urine. The practice of using Cathartics in Dropsies has been of very ancient date, and it probably may have been suggested by the occasional natural cure of Dropsy by a spontaneous diarrhæa. Hippocrates, in several parts of his writings, notices the salutary effects of such a diarrhæa in the beginning of Dropsy. However the practice originated there are certainly no means in our power of procuring a copious evacuation of serous fluids more effectually, than by the operation of purgative medicines, and none, perhaps, more successfully employed in the cure of Dropsy. The relief is generally in proportion to the quantity of fluids discharged, whence it is the custom to employ purgatives of the more active or drastic kind. The employment of them should be regulated, however, with some caution and discrimination. Where the constitution is obviously much broken by age, long continued disease, or intemperance, all violent operations and copious discharges will be detrimental; they will tend but further to weaken the body and to render it less able to support the ravages of a severe disorder. When the age, habit, strength and other circumstances of the patient admit of their use, they may be very beneficially resorted to. The form of dropsy to which they are most successfully adapted is ascites. The watery fluids discharged by purging in this state, are evacuated from branches of the same arteries which pour out water into the abdomen, and the stimulus of the purgative is most directly communicated to the absorbents of the abdominal surfaces. There are cases of dropsy attended with so much organic disease that purging alone cannot relieve them. The use of mercury is very beneficial in these cases.

I might thus continue to enumerate various other diseases in which

Cathartics are indicated, or afford relief—but the description would only cease with the detail of the diseases incidental to the human body, for there are few or none, in which beneficial effects do not follow their use. Having, however, pointed out the nature of their operation, with their positive and relative effects, and the application in the diseases of most common occurrence, I proceed to the consideration of the individual Cathartics.

Particular Cathartics.

In treating of this division, I shall pursue the same order as in the consideration of Emetics, arranging the articles of the class into Vegetable and Mineral Cathartics.

Family Euphorbiaceæ.—Of the vegetable the first that I shall treat of is the Oleum Ricini or Castor Oil. This is the product of a plant the Ricinus Communis or Palma Christi, a native of both Indies. It grows very well in most parts of the United States. The seeds are the part which furnish the oil, and in consequence of their being variegated with dark and light stripes, like the Ricinus or Tick, the plant has been called by the same name.

Description of the Plant.

Stem round, thick, purplish red colour, and rises to the height of 6 or 8 feet.

Leaves large and deeply divided into 6 or 7 lobes.

Flowers in spikes, male and female flowers separate—the males form the lower part of the spike, the female the upper.

Stamens numerous, styles three, capsules three celled, seed solitary.

Preparation of the Oil.—It is obtained from the seeds by expression and decoction. That procured by the former of these modes without heat, and denominated in the shops "cold drawn oil" is the best. It is limpid and destitute of smell and colour. The oil obtained by decoction is not so pure, it is more nauseous, dark coloured, sooner becomes rancid, and is more active in its operation.

It is prepared by decoction in the following manner. The seeds are bruised in a mill or mortar, thrown into a large kettle or boiler of water, and the whole is then boiled until the oil is separated, and floats upon the surface—an attendant skims it off as fast as it separates, and from time to time deposits it in a suitable vessel until all the oil is collected from the seeds. This is the red or Jamaica oil, and from its containing a portion of the oil of the shell, is more active than that obtained by expression. It should be observed that in the shell surrounding the pulp there exists an oily substance, extremely acrimonious, and which acts as an irritating Emetic and Cathartic.

The process may be improved by separating the husk from the pulp and boiling as above. The oil thus obtained would be of a lighter colour and less acrimonious.

By expression.—When this process is to be employed, the seeds are spread out upon platforms, or in an airy building, and the surfaces exposed to the atmosphere frequently changed. As the husk dries it becomes very brittle, and when perfectly dry, splits, and leaves the

pulp. When all the husk, by this means, has been separated, the seeds are collected into heaps, and when they are to be expressed, are first heated in an oven constructed as a bakers, carried to 110° of Fahrenheit. When sufficiently heated they are taken out and removed to a mill press, for the expression of the oil. The press is constructed like a cotton press, with a screw passing through a beam, turned by animal power, and the end adapted to a plug, which is accurately fitted to a cast iron cylinder. As the seeds are compressed the oil escapes through small openings at the bottom of the cylinder, and is conveyed off by a tube or pipe leading to a proper vessel.

In this state it is impure and contains much amylaceous matter. It is separated by several means—by rest the fecula or farinaceous matter will subside to the bottom of the vessel, and the fluid above become clear.

Or the surface of the oil may be spread over with chalk, sulphuric acid sprinkled upon it, and as it subsides it carries the impurities in the oil along with it to the bottom. The cake which remains after the separation of the oil, may be boiled, and from it a portion of inferior oil can be obtained.

An acre yields 6 bushels of seed.

From a bushel of seed a gallon and a half of good oil can be obtained, and half a gallon of inferior oil.

I have observed that the seeds must be separated from the husk which invests them, as it possesses a great deal of acrimony, and acts as an Emetic, and irritating Cathartic. Its effects in this way have been noticed by most writers on the Materia Medica.

Medical uses. Castor oil is probably one of the mildest and most extensively employed articles of the Materia Medica. It is so innocent in its operation, and at the same time so salutary, that it is administered without hesitation in the commencement of sickness, and is one of the substances most commonly resorted to before professional aid is required. It does not stimulate the bowels to any great degree, nor occasion griping, but operates gently, and where the system is but slightly disordered, it commonly is most sufficient to reestablish a healthy action. In the diseases of children it is particularly valuable, and to their cases the strength of its impression is peculiarly well adapted. There are few articles, which for common purposes could supply its place, and fewer still which in the hands of the common people, who interfere so largely in the diseases of this interesting portion of the species, can so safely be trusted.

It is not however to their cases that its use is limited, but in many of the intestinal affections of adults, it exhibits no less valuable and agreeable effects. As it does not stimulate the bowels very greatly, or gripe, it is admirably calculated to keep them open in sedentary and costive habits. To these cases it is well adapted, as the resinous Cathartics increase costiveness, and lose their effects by habit—whereas it is observed of Castor oil, that if it be frequently repeated, the dose of it may be gradually more and more diminished, and it

always leaves the bowels in a loose state,—having, in this respect, a great advantage over salts.

It is particularly suited to cases in which more irritating purgatives would prove hurtful, as in nephritic and calculous affections, after injuries, and surgical operations, in which the abdominal viscera are concerned.

In the various grades of colic, its use is too well known to need particular attention here—but we cannot trust to it when large evacuations are required, for it will insinuate itself through the intestines, bring with it only their more fluid contents, and leaving the indurated feces. When used in such cases it should be several hours after the exhibition of a dose of Calomel and Jalap. Thus exhibited, it promotes purging, and mitigates the harshness of the drastic medicines.

Castor oil is much used in the early stages of Dysentery. In these cases it lessens the griping and general distress, diminishes the tenesmus, and the frequent desire to evacuate the intestinal canal. I have commonly found that more benefit was derived from more active Cathartics, as Calomel and Rhubarb or Jalap. I have never observed that the action of these articles increased the irritation of the bowels, but on the contrary, by expelling the morbid contents, which milder medicines could not effect, the greatest benefit has been derived.

Castor oil is the basis of a formula called the Oleaginous mixture, which is much employed in the diseases of the bowels. It is prepared as follows—

℞. Ol. Ricini, ℥ii.
Saccharum Album, ʒiii.
Mucilage Gum Arabic, ℥i. to be well rubbed together, add slowly
Water, ℥v.
Laudanum, ʒss. to ʒi. Dose, ℥ss. to ℥i. pro re nata.

In place of Gum Arabic the yolk of an egg, or a thick emulsion of Almonds, or honey may be employed to promote a union between the oil and water. Thus prepared the taste of the oil is disguised, and we have formed a very useful mixture.

Besides these diseases, Castor oil is much used in hæmorrhoids, hæmorhages, calculus, and in the diseases of parturient women.

Modes of Exhibition.—This oil, though so valuable in many diseases, and capable of fulfilling so many indications, yet is often rejected, from the prejudices which exist against it, proceeding from its nauseousness, and the difficulty of swallowing it. It may be given floating upon Tincture of Senna, or peppermint water, or some other vehicle—it is sometimes given in coffee, or mutton broth, in tepid milk, in lemonade, or in any aromatic water, in the Comp. Tinct. of Senna. This last answers very well, as when blended with the oil by agitation, it conceals its qualities and increases its operation.

The dose is an ounce for an adult, and for the youngest child, under ordinary circumstances, a tea-spoonful. In urgent cases it may be increased to a great extent.

Adulterations.—This oil is frequently adulterated with Olive or Poppy oil. There is a peculiarity about Castor oil, (says Mr. Brande) which will serve to distinguish it from any other fixed oil, viz. its great solubility in highly rectified spirit—for instance ℥iv. of alcohol, will mix uniformly with any proportion of Castor oil, whereas it will not dsssolve more than ʒi. of Linseed oil. This then will serve to detect the adulteration.

Family Euphorbiaceæ.—Croton Tiglium.—The next article to be considered is Croton Oil, obtained from the seeds of the Croton Tiglium. This medicine which has lately been introduced as new, is an article the medicinal properties of which were long known. It will, in this instance, be observed that most of our new discoveries will turn out to be nothing more than the revival of ancient practice. So late as the year 1649 the plant was described in a work written by Jacob Bobart, and entitled, a history of the plants of the University of Oxford, and his account is said to have been very accurate. It was afterwards described by several other distinguished persons, as Linnæus, Bergius, and others, and the medicinal qualities of the plant fully explained. As it has lately been revived and introduced into practice, a short account of its history will be proper in this place.

The Croton Tiglium, (English term purging Croton,) is a native of the Island of Ceylon, but it has been found in Malabar, China, and the Molucca Islands. It is a small tree, seldom exceeding the height of ten feet, and is covered with a smooth bark of a greyish colour. The seeds of this plant, or the expressed oil of them, when taken internally, act as a very powerful hydragogue cathartic, and hypercatharsis is frequently produced. Given in the dose of a drop of the oil, or a single seed, it purges very actively, and in particular cases with such energy, as not always to be safe. It is said, that the natives of Ceylon, particularly the poorer classes, generally take one of the seeds for a dose. The effects of one of the seeds when chewed and swallowed, are thus described by Dr. Bigelow, in a note in his Sequel. It produces no immediate unpleasant taste, but when swallowed a sensation of heat came on in the fauces and throat—this feeling extended to the stomach and bowels, and in less than half an hour, a violent cathartic operation commenced which was repeated more than twenty times in three hours. When the oil is applied externally, it generally produces a great degree of local inflammation, which does not subside for many hours and sometimes days. The violent action which the oil produces, may be diminished by conjoining with it an aromatic, particularly any of the aromatic oils. Another mode of lessoning the action of the oil is by roasting or baking the seeds previous to obtaining the oil from them.*

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* Mr. Pope recommends a new method of preparing the Croton Tiglium, by which its efficacy as a Cathartic is unimpaired, while its acrid and irritating qual.

Croton oil is recommended incases where a very active cathartic is required, as in obstinate constipation, when there are no inflammatory symptoms to contra-indicate its use. I have no doubt that the oil may be used with advantage, if administered with caution.

In maniacal cases its use has been attended with success, and from its irritating action upon the stomach and bowels is doubtless well adapted to them.

By the natives of India it is used as a drastic cathartic in dropsy, and it is even said to be effectual in expelling the Tape worm. In this latter disease, judging from the nature of the article, and its effects I should be anxious to give it a trial. Where the tape worm has been expelled, it is by the drastic irritating quality of some article like the present.

The Croton may be given in substance, in the expressed oil, and in tincture. In substance it is most violent, and therefore is seldom used.

The oil may be given in the dose of a drop, which in particular cases, and under certain circumstances, may be augmented to two.

The following formula is a good mode of exhibiting it.

℞. Oil of Croton, 1 drop.
Oil of Caraway, 1 drop.
Confection of Roses, grains iv. To be mixed and formed into a pill.

The Tincture is made in the following manner.

℞. Croton seeds, bruised, ℈ii.
Alcohol, ½ pint.

Triturate the seeds thoroughly with a small part of the alcohol, then add the rest—digest for 10 days, and filter the mixture. The dose is ʒi.

Adulterations.—The Oil of Croton, from its high price, is frequently adulterated with Olive or Castor Oil.

External Application of Croton Oil.—This oil has been applied externally as the Tartar Emetic. It produces an eruption much more speedily, one which is not attended with such suffering to the patient, and one which is very effectual. The eruption produced by the oil bears a considerable resemblance to chicken pox, that of Tartar Emetic to small pox.

Ten drops of oil are rubbed over the part steadily, and by two rubbings an eruption will be obtained, but sometimes three or four are required. The appearance is that of a rash, with extended inflammation, uniform redness, and in the midst of this, there are many little vesicles about the size of a pin's head. Two or three may run together and be confluent, and then they will be large. They

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ities are obviated. These qualities exist in the husk or shell and the eye of the seed, the medulla being free from them. This is the part used by the natives of India as an ordinary purgative. The oil prepared from this part of the seed, may be given in substance, in pills or tincture, and is soluble in Æther and oil of Turpentine.

do not contain clear, but puriform fluid, so that they are sometimes between vesicles and pustules.

Thus employed it has been useful in Rheumatism, when other means had been unavailing.

In affections of the heart, it has also been employed by rubbing the skin in the neighborhood of the part affected. Dr. Short, a surgeon practising in the East Indies, has employed it in this manner, and with advantage.

It may be a useful article to restore repelled eruptions, scarlatina, measles, &c. Its external application has been known to produce purging.

Family Euphorbiaceæ.—Euphorbia Lathyris, or *Caper Tree.*—It is commonly found in Europe, on the borders of roads and cultivated places.

From the seeds of this plant, there is obtained by pressure, an oil which in common language is called oil of Spurge. It much resembles the Oleum Ricini, has the same colour, is a little less dense, has no odour and no bad taste. Its action upon the system is purgative, and its effects are sure and very prompt. It is said to be the most quick and safe of the newly discovered purgatives. It does not produce vomiting, nor colic, nor tenesmus, and it may be administered in cases where there is intestinal irritation.

It has been employed in Fevers, in Dysenteries, in anasarca when following Intermittent Fever, and in all cases where it is wished to purge lightly and with a small dose of medicine.

The dose varies with the age. That for children 2 or 3 years old is three drops—for adults, four to eight drops. It may be united with the paste of Chocolate, or syrup, or in a wine-glassful of sweetened water.

I have employed this article in costiveness, as an evacuant medicine, in two cases. In both instances three drops were given every two hours until 18 drops were taken in one instance, and 30 in another, with such little effect that it was discontinued. No unpleasant effects were produced from it, and the taste was not disagreeable.

It is spoken of in terms of considerable commendation in Magendie's Formulary, and it is possible that what was employed may not have been of a good quality. You may be more successful in your trials.

This oil may hold an intermediate state between the Castor oil and the oil of Croton.

Family Jasmineæ.—Olea Europæa—Olive Tree.*—This tree grows to the height of 30 feet.

Leaves firm, narrow, lance shaped, standing in pairs.

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* From Jasminum, one of the genera comprehended under it. This order is remarkable for the fragrance and elegance of its flowers.

The flowers are small, white, numerous, found in clusters near the footstalks of the leaves, flowering from June until. August.

With the fruit, all are acquainted, which when preserved adds much to the pleasures of the table.

Oleum Olivarum is the product of the Olive tree, a native of the South of Europe, and the north of Africa. It is cultivated in France, Spain, and Italy for the sake of the fruit and the oil expressed from it. The oil is obtained from the fruit by bruising, and pressure, so regulated as not to break the kernels of the Olive.

It is employed in diseases externally and internally. As an external application it has long been the custom in Italy to anoint the body with it in Fevers, and the practice is strenuously recommended by the physicians of that country. The effect of it when applied to the surface, has been, a speedy reduction of the force and frequency of the pulse. From some experiments made by a graduate of Philadelphia, it appears that its application at four different periods during the space of 6 hours, reduced the pulse from 72 to 52 strokes in a minute. The experiment being repeated several times produced the same results. Upon this principle can we not account for the practice of anointing the body with oil, so common among the inhabitants of hot countries. It is used in this manner by the people of Africa, and some parts of Asia—it is also a custom among the inhabitants of the Islands of the Pacific Ocean. But its use in fevers is not confined to Italy. We are told that it is employed at Grand Cairo and at Smyrna in the plague. Of its utility in fevers of great morbid excitement, there can be no doubt, from the sedative influence exhibited in the experiment above related, and as the remedy is innocent, and the prospect of service from it favourable, a few trials of it should not be neglected.

It has been employed externally in other diseases, particularly in Dropsy, and the success of the application in a number of cases, has been related by Dr. Oliver, in the 49th volume of the Philosophical Transactions. Friction was in every instance joined with it, and it is difficult to say, from the known efficacy of friction in Dropsy, how much is justly to be ascribed to the oil itself. Since, however, from a more just pathology of this disease, Dropsy has been considered not only a consequence of fever, but a febrile affection itself, may not the oil from its sedative effects upon the sanguiferous system, equalize the excitability, and restore to the lymphatics their natural proportion. In every instance in which it was used, the quantity of urine was increased.

Olive Oil united with lime water, in equal proportions, forms an excellent application to burns, being extremely soothing and pleasant; and it enters largely into the composition of various cerates for wounds. It is also applied to parts inflamed from the bites of venomous insects.

Taken internally it is a mild and pretty certain laxative, having all the properties of the former article without being so offensive. It

may be used in all the diseases in which Castor oil has been employed, and it is said to be decidedly preferable in cases of colic in children, and when poisons have been taken. It may be given in large doses, to children, a table-spoonful every hour, and in cases of poisoning to any extent. In obstinate constipation it has succeeded, after very drastic purgatives had been employed without success, and is therefore deserving of a trial before recourse is had to severer measures. Several cases are recorded of the utility of this article in obstinate constipation, and in particular after very severe remedies had been tried without effect. One reason of its efficacy is, that relying upon its mildness very large quantities are administered, and in this manner insinuating itself into the bowels, it gradually softens down the indurated feces, allays irritation, and by its stimulus being adapted to the excitability of the surface of the canal, may allow the feces to pass onwards, when more stimulating articles would excite contraction, and thus restrain them. For these reasons it should always be employed before resorting to the Tobacco injection.

Olive Oil has been recommended when the mineral poisons have been taken, but I believe it possesses no peculiar advantages, and that our hopes of correcting their operation must depend upon Chemical resources.

Family Jasmineæ—Fraxinus Ornus, or *Flowering Ash.*—Manna is the product of the Fraxinus Ornus, a tree greatly resembling our common Ash. It is a native of the Southern parts of Europe, particularly of Sicily and Calabria. In Sicily this species of Fraxinus is cultivated for the purpose of procuring the manna, and after acquiring a certain age, it yields a sweetish juice in considerable quantity, which concretes upon exposure to the air. The Ash is not the only tree which yields a fluid of this nature. Many others may be enumerated, as the Maple of our country, and in others, the Larch, the Walnut, &c. In all it may be considered as a part of the Sugar so universally present in vegetables, and which exudes upon the surface of a number of them. Although the Fraxinus yields this juice spontaneously, to which the name of Manna is given, yet incisions are made into the bark, in order to obtain it in a more considerable quantity. When these incisions are made, a whitish juice begins to flow, which gradually hardens on the bark, and in the course of eight days, acquires the consistence and appearance in which Manna is imported into this country. The different qualities of Manna, depend upon the different impurities which become mixed with the juice, and the circumstances under which it is obtained from the tree. That which exudes slowly is always more dry, transparent, and pure, and consequently more esteemed. In its chemical composition it consists of sugar, mucilage and extractive matter, to which its taste and other peculiar properties are owing.

Manna is well known as a gentle purgative, so mild in its operation that it may be given with safety under any circumstances It is

however, in some constitutions apt to produce troublesome flatulence, heart-burn, &c., on which account it is seldom used alone, but rendered more active by combination with some other cathartic of a more powerful nature, as senna, or salts, or both—Vide Formula in the Syllabus. Thus employed, its activity is increased, and at the same time it acts as a corrective, and lessens the irritating operation of other cathartics. It is therefore much employed for children combined with magnesia, rhubarb, salts or jalap. It is however a medicine less prescribed by physicians than formerly, though much in vogue with nurses.

Dose, ʒi. to ʒii.

When given to children alone, I direct as much as they will eat, which is usually about ʒss.

Family Leguminosæ.—Cassia Senna.*—The genus Cassia contains many species. They have been distinguished by modern botanists into Cassia Acutifolia—C. Obovata—C. Lanceolata. The first is the best Senna is a native of Egypt, it also grows in some parts of Arabia, particularly about Mocha—but as Alexandria has ever been the great mart from which it has been imported into Europe, it has long been distinguished by the name of Alexandria Senna.

The leaves are of an oblong figure, pointed at the ends, about a quarter of an inch broad, and not a full inch in length, of a lively yellowish green colour, a faint, not very disagreeable smell, and a sub-acrid, bitterish, nauseous taste.

The Senna Italica or blunt leaved Senna, is a variety of the Alexandrian species, which by its cultivation in the South of Europe, has been found to assume this change. It is less purgative than the pointed leaved Senna, and is therefore given in larger doses.

Senna which is in common use as a purgative, was first known to the Arabian Physicians, and the first of the Greeks by whom it is noticed, is Actuarius, who does not mention the leaves, but the pods. Mesue likewise gives a preference to the pods, as being a more efficacious cathartic—but the fact is the contrary, for it purges less powerfully than the leaves, though it has the advantage of seldom griping the bowels, and of being without the nauseous bitterness which the leaves possess.

The French Chemists in analysing this article have separated several principles, as follow—

Cathartine.
Fixed oil.
Volatile oil.
Albumen.
Yellow colouring matter.
Malate of Lime.
Acetate of Potash.

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* From Legumen, a pod.

The principal of these substances is Cathartine, an uncrystallized substance, which is said to purge in very small doses.

It is of a yellow colour, of a peculiar odour, a taste bitter, and nauseous, soluble in water, ether and alcohol.

Medical properties.—Senna is deservedly held in estimation as an active and sure cathartic. It is seldom given alone, or in substance, but combined with other cathartics, either to increase their activity or to lessen the irritating operation of its own action. The testimony in its favour is considerable. Dr. Fordyce in speaking of it says, that as far as he could judge from experience, it is the most certain stimulus to the bowels in producing purging, of any substance which he has ever tried. Dr. Cullen who was much opposed to it, admits that it is a very certain purgative, operating moderately and seldom to excess. The principal objection that is made, is its tendency to produce griping. I do not think that it exists in a greater degree in Senna, than in the other resinous purgatives, nor is it more difficult to obviate. Senna, though objected to by a great many physicians, I have uniformly found an active article, and by no means harsh or severe in its operation upon the bowels. I never employ it alone, because its active principle resides in a bitter extract, which is not very soluble. It is however sufficiently so, when united with any saline substance, to prevent any griping operation which would otherwise take place, and its activity is much increased. The manner of employing it is the following—

To an infusion of Senna prepared by pouring a pint of warm water upon ℥ss. of the leaves, I direct ℥i. or more of salts to be added, with ℥ss. of Manna.

The dose is a small tea-cupful every hour or two until it operates. Thus prepared it is an active and certain Cathartic, having succeeded with it, after Calomel, and Jalap, and other active articles had failed. It is not very nauseous—in general it agrees well with the stomach. In preparing the infusion of Senna it should not be allowed to boil, as the active matter is of a volatile nature, and it would be dissipated by the heat. The infusion will also spoil in 48 hours in warm weather, and by being exposed to the air, the oxygen combines with the extractive matter and forms a yellowish precipitate, which gripes violently, but does not purge. On which account, the infusion when prepared, should be kept in covered vessels.

There are no particular forms of disease to which Senna is adapted. It is resorted to, prepared in the manner I have mentioned, in removing costiveness, in cleansing the primæ viæ, and relieving thereby many of the constitutional derangements dependent upon these causes. In the advanced stages of disease it is also employed in small quantities, where we wish an alvine discharge without purging.

For children, an Infusion of Senna sweetened with sugar and with the addition of a little milk, given in the form of tea, is readily taken, and operates with much certainty.

There has been a number of official preparations of this article,

but the forms of giving it, which have been mentioned, supercede them all. There is one preparation, the Comp. Tinct. of Senna, which is occasionally useful by being mixed with cathartic mixtures, in adding to their strength. For the preparation of it I refer you to the dispensatories.

The dose is from ʒii. to ℥ss. in any appropriate vehicle.

This is the preparation with which I advised the Ol. Ricini to be taken, and while it is palatable, the strength of the mixture is increased.

There is yet another mode of using this article:—in the form of Enema. An infusion of the leaves is prepared stronger than when intended for its internal administration. In the quantity of a pint it is a very excellent and active article; if necessary a little salts or oil may be added.

Adulterations.—With the leaves of the Cassia Senna there is often mixed those of various other plants. For example

Coriaria Myrtifolia.
Ilex Aquifolium.
Buxus Sempervirens.

The adulteration takes place in the following manner. The leaves of Senna are collected twice a year, in August and September. The branches with the leaves are dried in the sun, and when fully dried, the leaves are stripped from the stems, and these last thrown away. They are collected by the poorer classes, coarsely pounded, and mixed with the leaves of other plants, and sent to Europe by the way of Alexandria.

The seeds obtained from pods, often mixed wth the oriental Senna, would, if planted, afford a very good substitute for the imported article.

There exists in this country a species of Senna, nearly allied to the foreign in all its properties, viz.—

Family Leguminosæ—Cassia Marylandica.—Description of the plant.

Stems growing to the height of 5 or 6 feet, round.
Petioles compressed, bearing 8 or 10 leafets.
Flowers growing in axillary racemes.
Petals five, bright yellow.
Stamens ten.
Fruit, a long pod.

It differs but little in appearance from the Senna of the shops, and from repeated trials of it, by practitioners in the country, it is found to be as safe and certain. It is said by some to be more apt to gripe than the imported Senna, a quality which may be in a great measure corrected, by infusing with the leaves a small quantity of liquorice root or any aromatic. In using it, the quantity employed is larger than in the preceding instance, about a third more, but the manner of preparing it and the dose are the same.

Family Juglandeæ—Juglans Cinerea.—The next of our native Cathartics is the Juglans Cinerea, or Butternut, also known by the names of Oilnut and White Walnut. This tree grows in various parts of the union, principally in the Northern and Middle States, also the western part of our State and the Western country. It is of considerable utility, not only for the purposes to which the wood is applied, but from the sap possessing a saccharine quality, and being furnished in considerable abundance. In the 3d volume of the Massachusetts Agricultural Repository is an account of an experiment made on this tree, by Mr. Gray. He states that 4 trees, the trunks of which were only from 8 to 10 feet in diameter, produced in one day, nine quarts of sap, from which was made one and a quarter pounds of sugar.

The inner bark of the tree, especially that obtained from the root, affords one of the most mild and efficacious laxatives we possess. An extract is usually made from the bark which is not only a more convenient, but a more active preparation, and was much used during the revolutionary war, when the more expensive medicines could not be obtained. In the trials that were made of it, it was found to be a valuable medicine—since that time it has fallen into neglect.

From numerous experiments with the article, Dr. Bigelow thinks that it is entitled to the consideration of a useful and innocent laxative. When fresh and properly prepared, it is very certain in its effects, and leaves the bowels in a good state.

In cases of habitual costiveness, it is to be preferred to more stimulating cathartics, and many persons whose state of health has rendered them dependent upon the use of laxative medicines, have given this the preference after a trial of a variety of other medicines.

The dose of the extract is from 10 to 30 grains, it is improved by combination with calomel in a dose of x. grains each. The extract is stronger when prepared from the bark in the month of June.

Family Podophyllæ—Podophyllum Peltatum, or *May Apple.*—It grows in every part of our country, and has attached to it a variety of names, as May Apple, Mandrake, Ipecacuanha, &c. Different parts of this plant are endued with different properties. The fruit is esculent—the leaves poisonous, and the root cathartic. The root is creeping and jointed, and when dry is bitter, and readily reduced to powder. Its taste is unpleasant, and when chewed for some time becomes intensely bitter.

Description of the Plant.

The stem is about a foot in height, is smooth, round and erect, dividing at top into two round petioles from 3 to 6 inches long—each petiole supports a large peltate palmate leaf, divided into 7 lobes. In the fork of the stem is a solitary flower. The flower is followed by a large ovate yellowish fruit, which is one celled—Class polyandria.

This plant is often confounded with another, the *Passiflora Incarnata*, Class monodelphia, pent.

The root of the Podophyllum Peltatum is one of the most efficacious cathartics which has been discovered in this country. It is nearly allied to Jalap, and might very well be substituted for it. In doses of 20 grains it is a safe and active cathartic, and may be used either alone, or in combination with calomel and the Cream of Tartar.

It has been particularly recommended in dropsy, to which disease it is well adapted by the large evacuations it produces, and it has also been employed in cases of Intermittent and Remittent Fevers.

The P. P. is less known to us than it deserves. Dr. Zollickoffer, a physician of Baltimore, who has been in the habit of employing this root for sometime, gives it a preference to Jalap. Twenty grains in the generality of cases, he says, will be sufficient to operate as a cathartic, but the dose may be increased to 30 grains, without its being attended with any drastic effects. It will never be found to give the least uneasiness to the patient, when it is combined with Calomel, in the proportion of 10 grains each. A watery extract may be prepared from the root, the dose of which is from 6 to 10 grains.

I have experimented with this article in a sufficient number of cases to determine upon its efficacy. It appears to act with considerable energy, and to be, as far as I may be allowed to judge, of more decided activity than Jalap—not being more liable than that article to produce griping, pain, or other irritating operation—Being readily obtained, and not liable to adulterations, it may with more certainty be resorted to, and in every respect may with great propriety be substituted for Jalap.

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*Family Convolvulaceæ.**—*Convolvulus*, or *Ipomea Jalapa.*—Jalap is a vigorous plant with a fusiform root, white, fleshy, lactescent, giving origin to a number of shoots, which run to a considerable height.

Leaves alternate, petiolated, subcordiform, acute, entire, or oftentimes divided into 2, 3 or 5 lobes, glabrous above, and of a violet structure beneath.

The flowers are solitary, axillary, and of a violet colour.

The Jalap root acquires a considerable size, but most commonly they are about the weight of a pound or less. They are found in the shops cut into hemispherical pieces, or round, about the size of two or three inches in diameter.

The plant is a native of South America, and is to be found growing in considerable quantity about the city of Xalappa in Mexico, whence its name is derived. It is also found in Vera Cruz.

The roots of this plant when dried, are of an oval shape, solid, ponderous, blackish on the outside, but grey within, and marked with

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* From convolvo, to entwine, to wrap round.

several veins, by the number of which, and its hardness, heaviness, and dark colour, the goodness of the root may be estimated.

The chemical analysis of Jalap present us with several principles. The most important are—a resinous matter, a gummy extract, a ligneous principle, several salts, &c.

The analysis of 500 grains of Jalap furnishes us with the following principles—Water, 24 grains—Resin, 50 grains—Gummy Extract, 220 grains—Starch, 12 grains—Albumen, 12 grains—Ligneous matter, 145 grains—Phosphate of Lime, 4 grains—Muriate of Pot. 1¾—Carbonate of Lime, 2 grains, &c.

The purgative property of Jalap appears to reside in the resinous matter which it contains, but it exists in different proportions in different roots. On this account, much irregularity occurs in the operation of this medicine—an ordinary dose frequently exerting a brisk cathartic action, and in another parçel a very feeble effect is produced. The difference in these results is explained upon the variations which often take place in their intimate composition. These are dependent upon the diversity of soils in which the roots are planted, on the state of the plant at the time it is dug up, or on the season of the year. The gummy part bears a considerable proportion to the resinous, but has little or no cathartic power.

Medical uses.—Jalap is unquestionably a very efficacious and safe cathartic, and as such was employed by the Mexicans, previous to the discovery of America. It was not introduced into Europe until about the year 1610. In point of utility, and the purposes to which it is applied, either according to the dose in which it is given, or its combination with other medicines, it bears the same relation to cathartic substances, that the Tart. Antimony does to the rest of the Emetics.

It is not so powerful as some others, but it can be resorted to in a greater variety of cases, and the readiness and facility with which it operates, with the beneficial effects which follow its use, justly entitle it to be considered as a very valuable article.

Jalap, however, is rarely given alone, but is combined with other medicines of the same nature, either with a view to quicken its operation, to obviate its griping quality, or to enlarge the sphere of its activity.

The cathartic, I greatly prefer for ordinary purposes, is a combination of the Sulphat of Potash with Jalap, in the proportion of 10 grains of each, united into a powder, and repeating it every two hours until it operates. To this may be added any aromatic oil, as cinnamon or anniseed to prevent griping, though this rarely takes place, and any addition of this nature often impairs its activity. Where free catharsis is required, I do not know a better formula. The action of the Jalap is much quickened by the addition of the Salt, and by being carried rapidly through the bowels, but little griping follows.

The doses are usually repeated two or three times before catharsis takes place, and from the free discharges which follow its use, it is

well calculated to excite and sustain an impression which greatly relieves the more prominent symptoms of disease. When we wish to deplete the liver, and promote discharges of bile, a few grains of Calomel may be added to each dose.

Combined with Calomel it forms a very useful and effectual purgative, and from its tendency to deplete the biliary system, and to produce powerful and free discharges from the bowels, it is much resorted to in the beginning of Fevers, or in other derangements of the system, It was the favorite formula of Dr. Rush, in the treatment of Yellow Fever, and in the bilious fevers of our country. The proportions which I prefer employing are 10 grains of Calomel to 15 or 20 of Jalap. This ensures free action upon the bowels, and prevents salivation.

The same combination was also recommended as an anthelmintic, and as a hydragogue, and from its efficacy in dropsy was called the Panacea Hydropicorum.

In the treatment of dropsies this combination has been superseded, and in the place of Calomel, the Bi. Tart. of Pot. is substituted. Given in the proportions of ʒii. of the Bi. Tart. of Pot. and 15 grains of Jalap, a very useful cathartic is formed, and from the exhalents of the intestines being excited in a considerable degree, very copious discharges are produced, with an abatement of the dropsical effusions in the cavities of the body. For by evacuating the serous portion of the blood, a demand is made to supply the expenditure from other parts of the system, and the absorbents are therefore excited to a more vigorous action, to supply the deficiency which the purging has produced. Combined with a few grains of Ipecacuanha its purgative properties are very much increased.

Triturated with hard substances, as the crystals of Tartar, or sugar, by which it is reduced to a very fine powder, it operates in much smaller doses than when taken by itself, and at the same time it is very mild in its action, and does not gripe. With sugar, especially, it becomes a very safe article for children, which in this form they will readily take, as the Jalap itself has not much taste.

I have already expressed myself upon the value of medicinal combinations, of the good effects of which, this article affords an excellent illustration.

The preparations of Jalap in use, are a tincture, resin and extract. They are prepared according to formulæ to be seen in the Dispensatories.

The Resin of Jalap—Its fracture is shining, its taste at first feeble soon becomes acrid and disagreeable. It is rarely found pure, being often mixed with resins of inferior value, especially the resin of guaiac.

The resin of Jalap produces the same effect as the powder, but in doses necessarily much smaller. The facility of administering it, in a small volume, and of disguising its taste, and especially the accuracy with which we can measure the quantity of this active principle, might cause it to have a preference in ordinary use to the entire root.

In small doses, it excites sometimes colic, and even hyper-catharsis. It is given in doses of 1 to 2 grains to children, and from 6 to 10 grains to adults, united to a powder of a softening nature, as Gum Arabic or liquorice root. It is also united with Calomel, but most commonly employed in the formation of bilious and cathartic pills.

The Tincture of Jalap is a popular preparation.

Jalapine.—Mr. Hume thinks that Jalapine exists in Jalap in the proportion of 5 grains to the ounce of the root. Mr. H. having sent a specimen to M. Pelletier, which he designated the Sulphate of Jalapine, that distinguished chemist, after various experiments upon it, concluded that the substance sent was not a salt, but a mixture of acetic acid and resin.

Adulterations—Jalap is sometimes adulterated with the Briony root, but it may be distinguished by its paler colour, and less compact texture.

Convolvulus Macrorhizus.—I have introduced this plant to your notice, not for its medicinal importance, but because it is the plant which has been described by several botanists as that which affords the officinal Jalap. The elder Michaux, a celebrated French Botanist, cultivated it at a small farm, in the neighborhood of this city, and specimens were sent by him to the Jardin des Plants, in Paris, where it was figured and described as the plant from which Jalap was obtained. Other botanists have also expressed themselves in similar terms, as Pursh, Persoon, Linnæus, &c. I have thought it right to present it to your notice, and by furnishing you with a drawing and the root of the plant, to form a comparison with the one described by Prof. Coxe, as the real Jalap, and by this means be convinced of the error which has existed on this subject for a long time. The error has been corrected, by the industry and patience of Prof. Coxe, in cultivating shoots sent him from Mexico, and from it an engraving with a description of the plant, has been given, in one of the No's. of the American Journal.

The following is a description of the C. Macrorhizus.

Leaves cordate, simple and lobed.

Root perennial, very large, when old weighing from 40 to 50 pounds.

Stem, twining about shrubs and fences.

Corolla, large, border obscurely 10 lobed, light pink, tinged on the inside with purple.

Not only are the external characters of these plants different, but the medicinal qualities are equally so. The late Dr. Baldwin, of Georgia, experimented with the root, with a view to its medicinal properties, and found that ʒvj. may be taken without any cathartic operation being excited.

In addition, the root contains a great deal of saccharine with a considerable quantity of farinaceous matter. Upon submitting it to analysis, it is found to contain so little resin as not to prevent its being used as an article of diet.

Convolvulus Scammonia, or *Scammony*.—It is the concrete juice of the Convolvulus Scammonia, a plant which grows in many parts of Asia, particularly in Syria. The root is the part which furnishes this substance, and it acquires a very great size. It contains a milky juice, which when collected, and allowed to become concrete, forms the substance of which I am speaking.

The following is the method pursued in procuring it. The earth being removed from about the root, the top of it is cut off in an oblique direction, about two inches below where the stalks spring from it. Under the most depending part of the slope, is placed shells or some other convenient receptacle, into which the milky juice gradually flows. It is left there about 12 hours, which time is sufficient for draining off the whole juice—this, however, is in small quantities, each root affording but a very few drachms. It is then allowed to become concrete, by exposure to the air and sun.

The scammony which we receive is far from being the pure juice. Those who collect it, to increase its bulk, make various additions, as meal, ashes, sand, or other impurities.

There are two sorts of Scammony to be found in the shops. That from Aleppo and from Smyrna. The former is the best, and it is brought to us in light spongy masses, easily friable, glossy, of different shades of colour, from grey or yellowish white to black. That should be chosen which crumbles most easily betwixt the fingers, becomes white on being united with water, and leaves little or no feces upon being dissolved. The Scammony of Smyrna is less valued,—it is more heavy, hard, and black, and is full of sand and other impurities.

The chemical analysis of this substance, by Bouillon la Grange, and Vogel, exhibits the following results—in 100 parts of Aleppo S. there are about 60 grains of Resin, 3 of Gum, 2 of extractive matter, 35 of inert vegetable matter, or an earthy substance. The analysis of the Smyrna S. exhibits less resin, and more earthy and foreign matters.

Properties.—This article is one of the strong stimulating cathartics, operating in general quickly and powerfully. It appears to have been well known to the Greek and Arabian physicians, and was not only employed internally, as a cathartic, but also as an external application for scabies, tænia, &c.

It has been used in cases of Dropsy, hypocondriasis, worms, and as a cathartic for ordinary purposes, and in many instances has been of decided utility. But it is sometimes unsafe from its violence, and at other times it exerts no action upon the bowels. This would seem to depend upon the intestines being lined with a great quantity of mucus, the medicine in this condition passing through, without exciting any action upon them,—but these different reports of authors may depend upon the variable quality of the drug.

The dose of Scammony is from 3 to 10 grains.

The general properties of this article are drastic and irritating, and

it is not possessed of any virtues particularly worthy of attention, or which may not be supplied by others that have been or to be mentioned.

Family Polygoneæ.—Rheum Palmatum.*—The next article of which I shall treat is Rhubarb. This name is applied, in Pharmacy, to the roots of several species of plants, of the genus Rheum. Three species have been considered as furnishing the true Rhubarb of commerce, and they flourish in the eastern parts of Asia, (from whence they are brought,) comprehending the Asiatic provinces of Russia, Tartary and China. Linnæus thought that the Rhubarb of commerce was furnished by the Rheum Undulatum, hence he has termed it Rheum Rhubarbarum. Again it was thought to have been derived from the Rheum Compactum. At present all naturalists agree in considering it as derived from the Rheum Palmatum—more recently from the Rheum Australe.

All the species of the genus Rheum are large herbaceous plants, having a thick compact root. Leaves radical, of a considerable size, petiolated, &c.

Two species are particularly distinguished—the Rhubarb of China, and of Russia.

The Rhubarb of China, called also Indian, Tartary, and Turkey Rhubarb, is received from China by the way of Canton. It is found in cylindrical pieces, of a dull yellow externally, and covered with a yellowish powder—marbled with hard veins, of a dull brick dust colour—its fracture is dull and rough—its odour strong and peculiar—its taste bitter—it is gritty to the teeth when chewed, which is attributed to the saline substances it contains—it tinges the saliva of an orange colour—it is heavy, and the powder is of a fawn colour. Each of the pieces is pierced with a hole, through which has been passed a cord, by which they are suspended to the branches of trees, that they may be dried more effectually. As the roots perform a long sea voyage before they reach us, it is not uncommon to find upon them black spots, and partially damaged from moisture. They are then readily attacked by worms. The merchants endeavour to conceal the defects, by stopping up the holes formed by the worms, with a paste made of powdered rhubarb and water. The fraud, however, is soon discovered. This species is less esteemed than the Russian, though it possesses active properties.

The Russian Rhubarb is produced from the same plant, and cultivated in the same places as the Chinese. It is only so called because it is transported from Thibet, Bucharia, and other places to Kiachta in Siberia, where it is sold to the merchants appointed for this purpose by the Russian Government. It is there examined with great care before it is conveyed to the capital of Russia, St. Petersburg. It is to the careful examination it undergoes, that the Russian Rhubarb is preferred, and sells higher than the Chinese.

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* Polus, many; gonia, angle. From the angular appearance of the stem.

Rheum Rhaponticum—Characters.—It is met with in pieces from 3 to 4 inches in length, and from 2 to 3 in thickness. In appearance it is less ligneous, of a pale colour, a taste mucilaginous and astringent, with a little of the gritty sensation upon being chewed. This species grows upon the borders of the Caspian sea, between the Volga and Uralian mountains. It was the species known to the Greeks.

Rhubarb of Europe.—Characters.—Large pieces, longer than they are thick—odour disagreeable and nauseous—taste astringent, scarcely gritty between the teeth.

Rhubarb, though it has been successfully cultivated in Europe and this country, still the roots in chemical composition and in their effects are not equal to those brought from their native climate. Their cathartic property is feeble, while they have more astringency. This difference partly arises from the age of the root. The English and French are commonly taken up after three years, in consequence of their decaying in the ground. The Eastern is not taken up until the seventh or eighth year of their growth. While the latter therefore possess a colour more fixed,—a stronger odour—a taste quite aromatic and slightly bitter—the former will be found to have a taste more mucilaginous and herbaceous, and evidently a less degree of strength.

Notwithstanding what I have said of the distinctive characters of the different species, it is very difficult to determine, by the appearance of the roots, their real characters or qualities. Much deception is practised in selecting and artificially preparing the roots, so that the same species will frequently be sold for E. India, Russia, or Turkey, and command corresponding prices. Dr. Paris states that inferior kinds of Russia, Chinese, and English Rhubarb, are artfully dressed up and sold under the name of Turkey, and he states that a number of persons in London, known under the name of Russifiers, gain a regular livelihood, by the art of dressing this article—by boring, rasping, and colouring the inferior kinds.

Culture of Rhubarb.—Our knowledge respecting the culture Rhubarb in its own climate, is far from being accurate. All that is known being derived from a company of Bucharian merchants, who possess a monopoly of the trade, and who are interested in keeping every thing secret which relates to the plant. Having obtained this monopoly (from the Chinese Government) they export the Rhubarb, on one side into Russia, and on the other into China.

It appears that the plant thrives best in light and sandy soils. The roots are collected twice a year, and those only are selected which have attained the age of 6 years. As soon as they are drawn from the ground they are deprived of their bark, cut into pieces, and suspended on strings, (in order to faciliate their drying,) in places well ventilated, but protected from the rays of the sun. The desiccation is a most important operation, for upon this in a great measure depends the qualities of the Rhubarb, and by this process it loses about four-fifths of its weight.

A second operation succeeds to this, and consists in cleansing the

roots afresh, dividing them into smaller pieces, and piercing them, not merely to suspend them in the air, but to ascertain that internally they were not damaged.

In Canton the root is purchased directly from the agents of this company, by the English and other commercial people of Europe, and it is proverbial that the article is not selected with the greatest attention to quality at this place. On the contrary the greatest care is bestowed upon that which is forwarded to Russia.

Chemical Analysis.—The Rhubarb of China has been the subject of considerable research to the chemists. The most recent analysis discovers the presence of a particular principle, which gives to it taste, odour and colour, and which is called Rhabarbarine. This principle is yellow, insoluble in cold water, soluble in boiling water, ether and alcohol—2 of a free acid, which Thompson has called Rheumic—3 of a fixed oil—4 of a small quantity of gum—5 of starch —6 of many salts.

The yellow colour of Rhubarb is much less destructible than many other vegetable yellows. Aquafortis and other acids which destroy the colour of saffron, turmeric, &c. makes no change on that of Rhubarb, or at most renders it only turbid. It resists the digestive process, and is observed in several of the secretions of the body. A few hours after it is taken it tinges the urine a high yellow colour,—it may be detected in the perspiration, and also in the milk.

Medical uses.—Rhubarb has been long known as a valuable cathartic, and it derives much additional value in being applicable to purposes, for which other cathartics are not adapted. It is not possessed of very active properties, but is gentle in its operation. On this account it is much employed in those cases of disease, where the patients are much debilitated, where the bowels are weakened by a long course of medicines, or when from constitutional peculiarities, other cathartics could not be employed. Being endowed with this most singular combination of medicinal powers, viz. an astringent with cathartic property, its virtues in many cases are much enhanced, and it becomes particularly useful in many of the forms of Intestinal disease. Its purgative quality is also accompanied with a sense of bitterness, which is often useful in restoring the tone of the stomach, when it has been lost, and for the most part its bitterness makes it sit better on the stomach than most other cathartics. From this view of the properties of Rhubarb, it may be supposed that it is not much employed in Febrile affections of adults, and where an impression is to be made upon the system. It is well adapted to the diseases of the alimentary canal, from simple costiveness, to the higher grades of diseased action, diarrhæas, and dysenteries.

In costiveness, depending upon feeble action of the alimentary canal, or upon the impaired energies of this organ, it is better adapted than the variety of remedies which are resorted to for this purpose, which most commonly confirm the disease they were designed to prevent. It is sufficiently purgative to excite a gentle action, at

the same time it does not impair the energies of the primæ viæ, but by its astringent and tonic properties, combined with the purgative, it establishes a habit of action, while it strengthens their functions. It is given in these cases in the form of a pill of 5 grains or more, at bed-time—or the root may be chewed, and the saliva swallowed. No practice is more to be deprecated than that of resorting to drastic stimulating pills, with a view of obviating a costive habit of body. The various nostrums for this purpose consist of little else, which being comprised in a small compass, gratify a reluctance so natural to taking medicine at the expense of the health. For, let it be observed, that though evacuations are excited, yet being purchased by the use of very stimulating substances, the bowels become insensible to minor stimulating impressions, and have at the same time their powers of action impaired. The article of which I am speaking is subject to none of these objections—while it relieves the bowels, it tends to produce more regularity, by strengthening and giving tone to its fibres. In this affection the utility of habit is strongly exhibited, and while under the use of Rhubarb, it would be advisable to solicit discharges at a particular hour every day.

In Dyspepsia the relief afforded by regular alvine discharges, is confessed by every one afflicted with that disease, and Rhubarb employed in the manner above mentioned is highly useful.

In Hypochondriasis, a disease which often has its origin in the impaired condition of the primæ viæ, the utility of regular discharges must be apparent. The slightest attention paid to the origin and progress of this disease, evinces a deranged state of the bodily health in general, and especially of the digestive organs, which having continued for a definite length of time, a state of mind gradually shews itself, distinguished by the following circumstances—languor, listlessness, a want of resolution and activity with respect to all undertakings, a lowness of spirits, sadness, timidity, and with respect to all future events a dread and apprehension of the worst, or of most unhappy occurrences, often upon the slightest grounds. Were it my province, I could illustrate by the progress of the symptoms the primary source of the mental derangements, but whether my views are admitted or not, the fact is established, that regular alvine discharges are of the utmost importance.

In many cases Rhubarb will be found amply sufficient for this purpose, and I have been assured by a gentleman of great respectability of this city, who laboured under this disease to a distressing degree, that nothing he had ever tried, afforded him more relief than discharges by the bowels, procured by taking small doses of Rhubarb.

Lord Byron mentions it of himself, that when a fit of the blue devils was impending over him, a spoonful or two of Epsom salts, always restored his spirits more quickly than the finest wines, and others have confirmed the truth of the remark by their practice.

In Dysentery the utility of cathartics is acknowledged, and Rhubarb by its mildness, is well calculated for the purpose of evacuating

the intestinal canal. It should be given in large doses and combined with calomel. The formula which may be employed is x. grains of Calomel and xx. of Rhubarb. In the more advanced stages of this disease the following compound may be used with advantage.

R. Pulv. Rhei, xxx .grs.; Pulv. Ipecac. x. grs.; Gum Opii. iv. grs.; Syrup, q. s.; ft. Pil. x. u. q. s. h.

This formula will be found ample in allaying the uneasiness, tenesmus, and griping which are so distressing.

In Diarrhæa, cathartic medicines become necessary to remove the crudities which have passed into the bowels. Rhubarb is much employed for this purpose, and is particularly well adapted, from the peculiarities which exist in its composition, uniting an astringent with a cathartic property, the former quality becoming apparent when the latter has ceased. On this account when evacuations are required, as most frequently occurs in the early stages of disease, Rhubarb is considered the most proper article to be employed. After the bowels have been evacuated, the same formula as advised in Dysentery may be resorted to.

The operation of Rhubarb, like that of Jalap, is quickened by the addition of neutral salts and calomel, the purgative powers of which it also reciprocally augments, so that a compound formed of smaller portions of Rhubarb and a neutral salt or Calomel, acts with more certainty, and quicker than large doses of either taken separately.

In the diseases of Children, Rhubarb is much employed—Combined with magnesia, in equal proportions, it forms a very common cathartic in their bowel complaints and other intestinal derangements. Combined with the alkalies, as soda or potash, it undergoes a change of colour, becoming red, and a very useful preparation is formed in the same diseases. It is particularly useful in those derangements which follow teething, when the bowels perform their functions feebly —when the passages are of a green colour, and the dejections are slimy and curdled. In these cases the compound exerts a gentle cathartic action, neutralises acidity, and exercises a tonic operation. The formula is as follows—

℞. Carbon. Pot. gr. xii to ℈i.; Rhei, ℈i to ʒss.; water, ℥ii. one to two tea-spoonsfuls every two hours, according to the age of the child, pro re nata.

In the treatment of these affections Rhubarb has been employed in a variety of ways, and every nurse professing to treat the diseases of children, has some favourite mode of preparing this article. They are generally hurtful by being combined with heating articles, with a view to dislodge wind, or some other fancied effect which is to be produced. The formula I have given, will be sufficient for most cases, and where something more stomachic is required, recourse may be had to the Tincture. It is prepared after the manner to be seen in the Dispensatories.

Rhubarb tea, prepared in the following manner—

℞. Powd. Rhub., ʒii.; Fennel Seed, ʒii.; water, 1 pint, boil until 1-3 is dissipated—the dose ʒss to ℥ss, two or three times a day for several days.

This is a valuable article in the early diseases of children, especially in colic, which occurs in the first three months. In this the child suffers night and day, and this preparation succeeds after anodynes have been administered in vain.

Officinal Preparations.—Ext. Rhæi Præcip.—Mr. Carpenter, a Chemist, in Philadelphia, has prepared an extract by precipitation. The specimen I present to you has been so obtained and in this form furnishes, in a concentrated state the properties of Rhubarb, separated from the ligneous and mucous portions, and bears a similar relation to the crude substance that Quinine does to the Peruvian bark. It is of a brownish red color, possessing a slightly styptic, pungent taste, soluble in water, and its odour that of the native Rhubarb. The process for preparing this article is tedious, and I do not think would be recollected by you if detailed, I shall therefore refer you to the 12th volume of the Philadelphia Journal of the Medical and Physical Sciences.

Sulphate of Rhubarb or Rhabarbarine.—This chemical principle discovered by M. Pfaff, and prepared by M. Nani, a distinguished Chemist of Milan, has been obtained from the Rheum Palmatum. M. Nani has described the process by which this article may be obtained in the Bibliotique Univer, February, 1823. He speaks of it as being active in doses of a few grains, and to possess advantages over Rhubarb, from the circumstance of its possessing uniform strength, while the different kinds of Rhubarb have qualities so very various, that in many cases the ordinary doses are not uniform. The high terms in which this article was spoken of, induced Carpenter to undertake its preparation, agreeably to the formula of Nani, and upon repeated trials by several physicians it was found by no means entitled to the commendations bestowed upon it, it being in short a very feeble substance, requiring to be given in a larger dose than the precipitated extract above described.

That it was not owing to any imperfection in the preparation was proved by a similar one from the factory of Pelletier being equally as feeble. In short, Rhabarbarine has more the appearance of an extract than any of the vegetable alkaloids. It is solid, dark brown, opaque, possessing the odour of Rhubarb, and a taste slightly nauseous and bitter, it is deliquescent and very soluble in ether and alcohol. As the process for manufacturing the Rhabarbarine is expensive and the products small, it is important that its true principles should be known. These are the most recent and important of the chemical preparations of that article.

Other preparations.—Rhubarb readily yields its virtues to water, proof spirits, and to wine, on which account the officinal preparations of this article are greatly multiplied. The most valuable of these may be seen in Chapman's Therapeutics, to which I would refer you.

All the Tinctures of Rhubarb are purgative and stomachic, but they are not generally used for the first of these purposes, on account of the strength of the menstruum, and are therefore more usually employed as adjuncts to saline purgatives, for giving them warmth, or to stomachic infusions in dyspepsia, flatulent colic, diarrhæa, the costiveness of old people, and of cold phlegmatic habits.

Dose of the powdered root from ℈i. to ʒi.

From ℈i. to ʒss, opens the bowels freely, and from vj. to x. grains may be given for a dose when its stomachic properties are required.

Rhubarb is often recommended to be toasted with a gentle heat, until it becomes friable, with a view to improve its astringency. This however is not effected, and its purgative property is destroyed.

Family Liliaceæ—Aloe Perfoliata—Aloes.—The next article of which I shall treat is aloes. This is the inspissated juice of the Aloe Perfoliata, a native of Africa, but which is also cultivated in America, Asia and Europe.

A tract of country about fifty miles from the Cape of Good Hope produces in great abundance the Aloe plant, and from this place much of the Aloes of the shops, sold under the name of Socotorine Aloes, is now imported.

The plant is also carefully cultivated in Jamaica and Barbadoes.

There are three varieties of the Aloes, viz. the Socotorine, the Hepatic, or Barbadoes, and the Caballine or Horse Aloes.

The Socotorine so called from being formerly brought from the Island of Socotoria, at the mouth of the Red Sea, is the purest and best, and was the only one used in medicine.

It is of a glossy surface, clear and in some degree pellucid in the lump, of a yellowish red colour, with a purplish cast, and when reduced to powder of a golden colour. Its taste is extremely bitter, accompanied with an aromatic flavour, and the smell not unpleasant.

The second species, the Hepatic or Barbadoes, is brought from the Island of Barbadoes, in the West Indies, and from the East Indies. It is in larger masses, of a light colour, has an odour much stronger and more unpleasant than the former, and a taste intensely bitter and nauseous.

The third, or Caballine, is distinguished from both by its strong smell. In other respects it agrees very much with the Hepatic, and is not unfrequently sold in its place.

The three kinds I have mentioned, differ in being the inspissated juice of different species of the Aloe plant.

Description of the Plant.

Root perennial, strong, and fibrous.

Leaves numerous, narrow, tapering, thick or fleshy, succulent, and beset at the edges, with spiny teeth.

The flower stem rises to the height of 3 or 4 feet, is smooth, erect, beset, towards the top, with bracteal scales.

The flowers are produced in spikes of a purplish or reddish colour,

Corolla monopetalous, and cut into 6 narrow leaves which separate at the mouth.

Filaments are six.

The extract is prepared in the following manner from the plant. The largest and most succulent leaves are cut off close to the stalk —they are immediately put into tubs, and disposed one by the side of the other in an upright position, that all the loose liquor may ooze out at the wound. When this is thought to be wholly discharged, the leaves are taken out one, by one, passed through the hand to clear off any part of the juice that may yet adhere or stick in the less open veins—the liquor is then put into flat-bottomed vessels, and dried gradually in the sun, until it acquires a proper consistency.

Chemical analysis.—This has been effected by Bouillon Lagrange, and others, who have discovered in this substance an extractive principle in a considerable quantity, which by some is termed a gum, and a resinous matter.

The former is intensely bitter, and possesses a faint odour, resembling in some degree that of Saffron, and the cathartic property resides chiefly in this substance—the pure resin having little or no purgative virtue.

Medical Uses.—Aloes is an article which has long been known in the Materia Medica, and frequent mention is made of it by the more ancient writers. By them it was held in much estimation, and there are few articles which have been combined in a greater variety of forms, or the different preparations of which have been more numerous. These, at the present time, have passed into disrepute, and the article meets with but few of those strong advocates, who were often extravagant in their commendations.

Given in doses from 12 to 20 grains, it makes a strong impression upon the alimentary canal, and often excites severe and frequently repeated colicy pains, very fluid dejections furnished by the exhalents, and the intestinal secretions, which this substance promotes.

Its action is principally upon the large intestines, and a feeling of warmth is felt in the fundament after each passage.

Taken in a dose of from 2 to 6 grains, the purgative operation of Aloes does not produce the same symptoms, but its irritating operation acts always in an obvious manner upon the surface of the intestines. It occasions, commonly 8 or 10 hours after it has been taken, one or more passages. If its use is continued for some days there is soon experienced the same warmth, and even burning in the inferior part of the rectum. It is upon this portion of the alimentary canal that Aloes has its action directed,—that it excites irritation, which is often considerable, and establishes a centre, if I may so say, towards which the fluids are directed. The purgative property of Aloes would alone render it useful in medicine. But there are advantages connected with the operation of this article, which proceed less from this quality, than from the property which it possesses of irritating the interior of the rectum, and of bringing to this part an

afflux of fluids. It is this derivative or revulsive power which deserves attention in the diseases of the head, chest, and of the organs situated in the upper region of the abdomen. To obtain this operation of Aloes, it is necessary to give it in small doses, from 1 grain to 6 grains, and to administer it morning and evening for some days. The following formula will be found applicable to various purposes.

℞. Powdered Aloes; Powdered Rhub.; Blue pill mass—each equal parts—made into pills of a convenient size, two of the pills to be taken at bed-time, and another in the morning.

Thus given it opens the bowels, and evacuates their contents without any uneasiness or inconvenience to the patient. In pains and heaviness of the head, in habitual giddiness and dulness of the mental faculties depending upon this cause, it affords much relief, and if it does not dissipate these affections, it at least renders them more moderate.

After an attack of Apoplexy, or other diseases in which the functions of the brain are injured, the sensibility of the system is impaired, and the intestinal canal falls into a state of inactivity, the bowels are constipated, Aloes combined as above mentioned is useful in stimulating the larger intestines into action, and in obtaining alvine evacuations.—*Barbier, Traite Elemen.*

In various affections of the abdominal viscera, connected either with derangements of their secretions, or enlarged and diseased structure, it is also valuable, not only from the moderate evacuations it excites, and which can be continued for days and weeks, but from its alterative operation.

In uterine obstructions Aloes has been much recommended. From its tendency to act upon the rectum, it creates a determination of blood to the pelvic viscera, and in this manner operates in languid and phlegmatic habits in exciting a renewed discharge of the catamenia. It becomes useful only when the system is in a debilitated state, and where there is inaction of the uterine organ. It is seldom used alone in this case, but combined with the Sulphat of Iron, Myrrh, and other articles, as in the combination called Hooper's Pills.

We may derive an argument in favour of the importance of this medicinal substance from this circumstance, that the compounds in which it entered in a large proportion, have enjoyed a great deal of celebrity. They are the Elixir of Long life—the Sacred Tincture—the elixir proprietatis—the pilulæ angelicæ, &c. The titles of these medicines excite some derision at the present time, but they also prove the value which was attached to these formulæ, inasmuch as they were employed in the general practice of physicians.

Aloes from the smallness of its bulk, and its activity, is very commonly employed in the formation of cathartic pills, and it constitutes the basis of most of the empirical medicines which are sold for this purpose, and as anti-bilious pills—for instance, Anderson's, Lee's, Hooper's, Dixon's, &c. &c., and its activity is doubtless much im-

proved by the combinations which are formed. See the different formulæ for these pills.

As patients sometimes prefer a pill, to other modes of administering medicines, the following formula you will find very useful and sufficiently active.

℞. Powdered Aloes, ʒi.; Powdered Gamboge, ℈ii.; Tart. Ant. gr. iv.; simp. Syr. q. s. mix and divide into xxiv. pills. Three of these pills are to be taken at bed-time, and two in the morning, if the first do not operate.

As a remedy for Ascarides, ʒi. of Aloes dissolved in a pint of water or milk, used as an enema, is very useful and deserving your attention—but more of this when we come to the consideration of Anthelmintics.

Notwithstandsng what has been said in favor of the use of this medicine, it has been objected to, from its supposed tendency to produce hæmorrhoidal affections. To this, however, I cannot subscribe altogether, as it is more probable that this complaint has originated in the costive habit which has generally existed some time before it is attended to, than to any action exerted upon the rectum. I have known a number of persons who have made use of Aloetic preparations for a long time, without these effects being experienced, and should conceive that where it does take place, the pre-disposition must have existed in a considerable degree. When the disease exists, it would be improper to resort to it, as from its known operation upon the rectum, it may add much to the irritation.

Aloes ought not to be administered during the menstrual discharge, nor in those cases in which there is much uterine irritation, and a tendency to discharges from the uterus, either more frequently, or in larger quantity than is natural.

Officinal preparations.—These have been very numerous, but at present very few are retained. The most important is the Tinct. of Aloes and Myrrh. The comp. decoction of Aloes. Pills of Aloes and Myrrh.

The dose is from 6 to 16 grains, but if taken daily it should not exceed 6 grains, as in larger doses, when the use of the medicine is continued some days, it is apt to produce symptoms of tenesmus.

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*Family Guttiferæ.**—*Gambogia*, or *Gamboge.*—This is the concrete, gummy, resinous juice of a tree growing wild in Cambogia, Ceylon, Siam, and Cochin China, and called by botanists *Stalagmitis Cambogioides.* The juice is collected in drops as it falls from the leaf-stalks, and young shoots, when they are broken from the tree, or by deep incisions in the bark. It is afterwards inspissated by the heat of the sun and moulded into cakes or rolls. It is of a deep yellow colour inclining to an orange, has no smell, and very little taste, but after remaining some time in the mouth, gives a slight impression of

* From gutta a drop, and fero I produce.

acrimony. It is readily dissolved in water, alcohol, and sulphuric ether, and affords one of the best examples of what is called a gum resin. According to the experiments of of M. Bracannot, it is composed of 20 parts of gum, and 80 of resin.

Medical uses.—Gamboge is a very powerful cathartic and operates too very often as an emetic. Given in a large dose, as from 10 to 24 grains, it exercises upon the mucous membrane an impression strongly irritating. The irritating action of this substance upon the mucous membrane is often extended to the muscular coat of the intestines, giving rise to undue, and severe contractions of the bundles of fibres which compose it, thus causing what are commonly called colicy pains.

Gamboge in its passage through the stomach often distresses this organ, from whence proceeds the nausea and vomiting which accompany its use. In a more moderate dose these effects are not so strongly exhibited.

In the administration of this article, where we entertain fears of its too irritating operation, it is very easy to unite with it, a powder of a softening or tempering nature, as the roots of mallows or liquorice, cream of Tartar, or Gum Arabic. Separating the particles of the Gamboge from each other, these substances act as correctives, and prevent an impression from being made upon the digestive organs, too great or too long continued.

From the active cathartic properties of this article, it has been much employed in fevers. It was much esteemed by the late Dr. Rush, and by him recommended in the treatment of Yellow Fever, with the view of bringing on an artificial cholera morbus. He considered this disease to partake of the character of a bilious affection, and on this principle the practice mentioned was established. It is now distinctly understood to be an inflammatory affection of the stomach and intestines, for which the less drastic cathartics are better adapted. It is therefore very properly abandoned in most of these cases.

In Dropsy, it has also been much used, combined with cream of Tartar, or Jalap; and in this manner it produces very copious alvine discharges. But it is too violent for the generality of these cases, which will not support the excessive and debilitating discharges produced by this medicine.

A very good cathartic in the advanced stages of this disease, is formed by dissolving this article in Sulphuric Ether,—its stimulus supporting the system under the rapid depletion which takes place by the bowels.

From its pecularly drastic effects, Gamboge has been much extolled as a remedy for worms, its operation being supposed sufficient to occasion their expulsion, or to remove from the intestinal canal the mucous which it contains, and which forms a nidus for their production.

It is a very useful practice to administer some anthelmintic medicine

before recourse is had to this purgative. The remedy of Madame Nouffer against the Tænia, furnishes us with a very useful article.

Giving ʒiii. of this medicine, or the male fern in powder, and a few hours after, when the worms have experienced its deleterious influence, a bolus, in which Gamboge is the chief ingredient, will be found very efficacious.—*Barbier.*

It is easy to perceive the advantages which will attend this practice, since in addition to the effects which follow a drastic cathartic upon the worm, we have added the influence which the fern itself is capable of producing. The Tape worm, in speaking of this article, is selected, as it is confessedly the most difficult to remove—with the other species, our success may be more conspicuous, as the milder cathartics are adapted to every purpose.

The usual dose of Gamboge is from ii. grains to xii. and it is commonly given in the form of pills.

Gamboge, as well as Aloes, enters largely in the formation of cathartic or anti-bilious pills, as they are called. The two articles modify the action of each other, and hence they are generally combined. When speaking of Aloes, I gave you a cathartic formula; a very good one is the following—

℞. Gamboge—Aloes—Calomel each ʒi. m. and divide into pills lx. ii. to iv. a dose.

The compound pills of Gamboge, which are often a convenient purgative, are prepared in the following manner—

℞. Gamboge powdered; Aloes powdered; Cinnamon, of each ʒi.; hard soap, ʒii., mix the powders, then having added the soap, beat the whole together until they are thoroughly incorporated.

The dose is v. grains to ℈i.

Family Cucurbitaceæ.—Cucumis Colocynthis*—Called also Coloquintida, and Bitter Cucumber—is a plant of the gourd species, growing in Turkey.

Description of the Plant.

Root annual.

Stems slender, trailing, scabrous, with short hairs.

Leaves petiolated, deeply and obtusely sinuated, green above, whitish, and clothed with short hairs underneath.

Flowers small, yellow, axillary, solitary.

Fruit, which furnishes the medicine, is of the size of an orange, divided into cells, abounding with pulpy matter, separated every where by cellular membrane, and including many oval compressed seeds. The spongy membranous part of the fruit is directed for medicinal purposes, the seeds being comparatively inert. To the taste it is nauseous, acrid, and intensely bitter.

Colocynth is a very active cathartic, and as such was well known to the Greek and Arabian physicians. It was frequently employed by

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* From cucurbita, a gourd.

them in different diseases, though not without an apprehension of danger from the violence of its effects, of which instances are related. To these I might add another, in which from the use of this article the most distressing effects were produced. These were severe griping and rending pains in the abdomen, particularly referred to the region of the epigastrium, with a sense of great internal heat, coldness of the feet and hands, and skin generally. To these were added severe muscular contractions of the hands and fingers, insomuch that they could not be employed. In short, an enteritis of the most violent character was produced, which only yielded to free V. S. warm bath, warm applications, anodynes, the oily preparations, &c. I must therefore caution you against using it in this state.

The preparation used, was formed by infusing one of the Cucumbers in a pint of spirits—the dose ʒii. to ℥ss The first dose not operating, a second was taken soon after, and with the effects described.

The diseases in which this article is recommended are, Mania, and Melancholia, in both of which very powerful medicines are required to rouse the sensibilities of the system, and it was in these cases that the ancients recommended it. It is used in various other affections of the brain, as in coma, and apoplexy, and from the powerful impression which it makes upon the intestinal canal, it no doubt operates favourably in relieving the undue determinations to this organ.

Colocynth, I would state, should never be given alone, but in the form of extract, with other articles, and in this manner only would I recommend it.*

It is considered by Dr. J. Johnson, in combination with calomel, as one of the most effectual purges we possess, for evacuating the bowels freely, and correcting the functions of the biliary system. The formula he recommends is as follows—

℞. Ext. Colocynth C. ʒi.; Proto chloride Mercury, xv. grains; Tart. Antimony, i. grain; Ol Carui, gtt. v., make into a mass, and divide into xxiv. pills. The dose is 1, 2, or 3 every night.

Another formula for the same purpose, and in all those cases where with the evacuant, we wish the alterative operation of cathartics, is as follows—

℞. Ext. Colocynth Comp. ℈iv.; Ext. Hyosciamus, ʒss.; Blue Mass, ℈i. m. and divide into xxx. pills,—ij. to be taken at bed-time.

Many attempts have been made to correct the virulence of Colocynth, by acids, astringents, &c., but these have not succeeded. The best method of abating its activity, without diminishing its purgative virtue, seems to be, by triturating it with gummy farinaceous substances, as the oily seeds, which without making any alteration in the Colocynth itself, prevents its resinous particles from cohering to the surface of the bowels, so as not to irritate or inflame them. My

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* In combination with other cathartics, it loses much of its violence, but retains its purgative energy.—*Wood & Bache.*

advice would be not to employ it, except as I have mentioned in the form of extract.

The dose of Colocynth in substance, is from 4 to 6 grains, and of the compound extract much the same.

The compound extract is prepared by digesting in proof spirit, Colocynth, Aloes, Scammony, and cardamom seeds, and afterwards evaporating the tincture to the proper consistence. This is a very certain and powerful purgative, and generally operates without much griping or inconvenience.

Momordica Elaterium—Wild, or *Squirting Cucumber.*—This is the Cucumis Agrestis of some, and the Momordica Elaterium of other botanists.

DESCRIPTION OF THE PLANT.

It is rank, rough, spreading, hairy, with round thick branches, destitute of tendrils.

Leaves, heart-shaped, rough.

Flowers, dull yellow.

Fruit, pendulous, eliptical, blunt at each end, two inches long, green, rough, with innumerable small bristles.

The plant is nearly allied to the cucumber and melon, and the fruit is the part used. When ripe, the fruit upon being touched bursts open with great force, and throws its contents to a considerable distance, hence the name Squirting Cucumber. It is a native of the South of Europe, and flowers in June and July. All parts of the plant are bitter and strongly purgative, but the dried acrid juice, or fecula of the fruit, known in the shops by the name Elaterium, is the only part now medicinally employed. The method of preparing it is the following—

The ripe wild cucumbers are cut up, and the juice pressed through a fine sieve, into a glass vessel. This is then set by to settle, until the thicker part has subsided. The thinner is poured off, and the thicker which remains, is filtered, covered with a linen cloth, and dried with a gentle heat. It differs in power according to the care taken in the preparation—for it sometimes happens, that the juice contains some portions of the fruit, which is inert, and which will lessen its activity.

From certain experiments of Dr. Clutterbuck, it appears, that the quantity of active matter contained in the fruit, is so extremely small, that only six grains were procured from forty cucumbers. The active principle is of a resinous nature,, and so heavy as to sink in water. To this the name Elatin is given.

Elaterium is a very powerful cathartic, and is classed among the most active of the Materia Medica. It ought therefore to be administered with great caution, and only when the milder preparations have failed.

It was much used by the ancients in cases of Dropsy, and by subsequent writers it has been highly commended. Its good effects in

these cases, depends not only in increasing the peristaltic motion of the intestines, but in augmenting the whole of the enteric secretions —so that the alvine discharges, resulting from the operation, far exceed in quantity those which are produced by any known purgative. Such is the powerful influence which this medicine exerts on the first passages, that doses from the ¼ of a grain, to one grain, taken night and morning, will induce and sustain a cathartic action, that will remove from the system, through the intestines, from two to four quarts of fluid, in the 24 hours.

Elaterium does not produce its full effects as a Hydragogue, until it has been taken for several days, when its specific or peculiar action becomes established, and will continue uninterruptedly, as long as may be judged right to persist in its use. Acting as it does thus powerfully in evacuating the effused fluids in the cavities of the body, it seems to exert no action upon the kidneys. Its cathartic operation is so intense and direct, as almost necessarily to confine its undivided power to that sphere of action.

In Hydrothorax particularly, it has been recommended by Dr. Ferriar. Its powers, he says, in removing serous accumulations in the cavities of the body, surpass those of any other medicine; and the astonishing relief it affords in the dyspnœa occasioned by Hydrothorax, or ascites, even in persons of the most advanced age, must place it in the first class of Hydragogues.

The sensible effects of Elaterium are severe and constant nausea, frequent stools, and in considerable doses vomiting. It does not uniformly increase the urine. Dr. Ferriar relates 15 or 20 cases in which this article was employed—in most of them, cures were effected, and in all great relief was afforded. It is really consolatory to find such testimony in favour of this article, in a disease so distressing, and usually fatal—but I regret that in my trials with it, I cannot confirm the above statement. I have employed it in two cases, but with no permanent advantage. The dose to begin with, is from 1-4 to 1-2 a grain in the morning, which may gradually be increased to 6 grains.

It has been suggested, that this medicine may prove an efficacious alterative remedy in obstinate diseases of long standing, but with what success it may be employed, has not yet been ascertained.

Carbo Ligni—Charcoal.—Is the carbonaceous part of vegetable substances, obtained by exposing them to heat, till the volatile parts are dissipated, and excluding the air sufficiently to prevent their entire combustion. This article has for some time been known in the Materia Medica, but for various reasons has not been held in the estimation which it probably deserves. Its properties are various. As a cathartic it has been employed by several physicians, but its virtues in this respect, have been more particularly considered by Dr. Daniell of Savannah, and by him spoken of in high terms, in cases where medicines of this class are required, and with particular good effects in obstinate constipation. It is given in these cases in very large

doses, a table-spoonful every hour or two. It has this particular good quality, that it will remain readily on the stomach, and in some instances seems calculated to allay irritability of this organ. For this purpose it has been employed, and has been spoken of very favourably, and particularly in that irritable state which attends the concluding stages of Yellow Fever.

It has been much used of late, in derangements of the digestive system, and much relief has been afforded by its use. Persons, in these diseases, who are distressed with head-aches, sore mouth, acid eructations, confined bowels, &c. have been much relieved. These complaints are of frequent occurrence with delicate females, who from feebleness of constitution, and sedentary habits, are afflicted with the above symptoms. A tea-spoonful of finely levigated charcoal, taken 2 or 3 times a day, in water or milk, I have found very beneficial, exerting the very favorable influence of removing these symptoms and keeping the bowels regular.

Mineral Cathartics.

Having completed the consideration of the Vegetable Cathartics, I shall next proceed to those derived from the Mineral Kingdom. These are but few in number, and the most important is the

Proto Chloride of Mercury, or *Calomel.*—It is also known by the names Sub Muriate of Mercury, Mercurius Dulcis, Aquila Alba, &c.

It is prepared by triturating together in a marble mortar, Perchloride of Mercury, and purified quicksilver. This is placed in a florence flask, or other vessel, sublimed with the heat of a sand bath, and washed with distilled water. The object of washing it, is to separate any portion of the Perchloride of Mercury or Corrosive Sublimate which it may contain. When first sublimed it is of a yellowish white colour, which deepens upon exposure to light. To improve its colour, and purify it further, it is again sublimed—reduced to powder, and again washed with distilled water.

It is without taste, or smell, and is nearly insoluble. Lime water and the alkalies decompose it, by abstracting a portion of chlorine, forming a black, or protoxide of Mercury.

Medical Uses.—Calomel is more generally used, and is adapted to a greater variety of cases, than all the other preparations of Mercury. It is unquestionably one of the most valuable articles of the Materia Medica. Under different forms of administration, it is Emetic, Cathartic, Sialagogue, Alterative, Expectorant, and Anthelmintic.

It is, however, more particularly as a cathartic, that I am to consider it in this place, and there is hardly a case, in which it may not be given alone, or in combination, so as to meet the several indications. It has too, the singular property of imparting force to the mild, and moderating the severity of the drastic medicines.

It commences its operation higher in the alimentary canal, than most other cathartics, and is well calculated by determining downwards, to relieve the stomach, and to deplete the liver and the other

chylopoietic viscera. Hence its value in Fevers, particularly in those called Bilious, when the secretion is greatly increased and apt to accumulate in the upper portion of the intestines, producing great anxiety, languor, and oppression. Calomel, therefore, by commencing its operation in the upper portion of the intestines, is well calculated to relieve these symptoms,

In the Bilious and other fevers of our climate, it is useful, not only by its cathartic properties, but by its disposition to correct the secretions of the liver, increasing them when deficient, and lessening them when in excess. It has too the valuable property of promoting the operation of other cathartic medicines, without exciting any additional irritation, or rendering them liable to act with violence. It is, therefore, combined with them with advantage, and greater benefits are derived, than from employing single medicines.

Combined with Emetics, particularly Ipecacuanha, it renders their operation milder and more effectual.

No cathartic is more easy of exhibition. From its small bulk, and its insipidity, it may be administered in many cases, in which other cathartics could not readily be employed. In irritable conditions of the stomach, when others would be rejected, this may be exhibited with the utmost advantage.

In the diseases of children it is highly useful, as it may easily be disguised, and in addition to the smallness of the dose, operates mildly, and with little or no danger of salivation. Dr. Chapman, in speaking of the use of Calomel in the diseases of children, is convinced, that its operation is milder on them, than on adults.

When long continued in diseases, it will salivate, and this whether it purges or not.

It is a common opinion, that to produce salivation its purgative effects must be restrained. This, in many cases, is correct, for salivation is retarded by the mercury's passing off by the bowels,—but it sometimes happens that patients are most easily salivated, whose bowels are most susceptible of its purgative operation.

The best rules that I can lay down with a view to prevent salivation are,

1. To avoid giving calomel in large doses on two successive days, without employing some other medicine, in order to remove it from the system.

2. It should never be given in frequent doses, when there is but little diseased action, for the system seems more susceptible of salivation when the excitement is not much above the healthy state.

3· Salivation is prevented by combining six or eight grains of Calomel, with about three times the quantity of Jalap, or some other vegetable cathartic.

These rules are of some consequence. Salivation is always painful, and very distressing to convalescents, and I am disposed to think, that the good effects of Mercury may be obtained without being carried to this extent. But I shall consider this subject more

at large hereafter. This is all that is necessary to be said as to the purgative property of this medicine. Under the head of stimulants, I shall again speak of it as an alterative, and in this capacity it exhibits no less invaluable properties.

The dose, as a cathartic, is from v. to x. grains. For children, from iii. to v. grains.

It is somewhat remarkable, that this medicine, though given in larger doses, has not its purgative effect increased. The late Dr. May, of Maryland, took eighty grains, without more than three or four evacuations, and with effects not more violent than from a dose of twenty grains. A large dose is also less liable to be rejected.

It should be exhibited either in pills, or mixed with some tenacious fluid, as syrup, or thick mucilage. From inattention to this circumstance, the calomel is often lost in compound powders, by its subsiding to the bottom of the spoon, or other vessel employed.

If calomel is ever violent in its operation, it is occasioned by the mixture of a portion of Corrosive Sublimate with it.

Sulphur.—Is a simple combustible substance, the product of volcanic countries. It is usually found combined with Iron, forming what is called Pyrites, and with various mineral substances. From these it is separated by exposure to heat, and the Sulphur which sublimes is collected. This is afterwards cast into moulds, and forms the roll Sulphur of commerce. For medicinal purposes, the sublimed Sulphur only is used, and this is prepared by heating in a sand-bath an earthen cucurbit, charged with roll Sulphur, and collecting the vapours in proper vessels placed round it, where it concretes. It is washed in boiling water, to remove from it any portion of acid which may have been formed during the process. It is of a bright yellow colour, but has little taste, or smell, and is very inflammable

Medical Uses.—Taken internally it produces effects which it is proper to distinguish. These may be considered as they relate to the alimentary canal, or the general system. Given in a pretty large dose, as a dram or more, it is a mild and gentle cathartic, having its action principally exerted upon the lower parts of the alimentary canal. From its mildness, and from its stimulating the larger intestines chiefly to a discharge of their contents, it becomes a useful article in costive habits, and with particular good effects in those afflicted with hæmorrhoids, as it promotes alvine discharges, without those straining or bearing down efforts which exert so bad an influence on these tumors.

It is usually combined with magnesia in equal proportions, and the preparation called Sulphur Præcip. or Lac Sulphuris, is preferred—a dram of each is sufficient for this purpose.

Given in smaller doses, and continued at an interval of several hours, it exerts an influence on the general system. It renders the pulse more frequent, and excites the cutaneous secretion. Sulphuretted-hydrogen gas, is evolved by means of the combination which

it forms, with the alkaline substances in the fluids of the body. This gas is exhaled from the surface of the lungs and the skin. The urine and milk also become affected with the same It is also well known, that pieces of gold or silver, carried about the person, become of a dark or black colour.

From its effects upon the general system, it has been employed in the treatment of Intermittent Fevers.

I have frequently employed this article in Intermittent Fevers, given during the intermission, and I think I may say, I have uniformly derived good effects. Its beneficial operation is soon manifested, and a suspension of the disease follows. Of many cases which have fallen under my notice, I do not recollect being unsuccessful in a single instance. In a little girl about 10 years of age, in whom the disease continued sometime, and refused to yield to emetics, frequently repeated before the paroxysm, to bark, and the Fowler's mineral solution, I had recourse to Sulphur, and the disease was arrested.

The dose is from ʒi. to ʒiii. 3 or 4 times a day, mixed with a little milk, or taken with brandy.

From the decided action which it exerts in the production of perspiration, its use has been extended to the treatment of Chronic Rheumatism Atonic Gout, Catarrhs, and other pulmonary affections, unattended with acute inflammatory symptoms. In the former case it is usefully combined with the Gum Guaiac, and in the latter with the Pulvis Antimonialis, or some other diaphoretic.

Sulphur was, at one time, much celebrated in arresting the progress of mercurial action, but, for this purpose, it is wholly insufficient; Salivation being a disease which after it is established, will run its course. Its progress may be mitigated by anodynes principally, and perhaps the use of blisters.

But it is principally in the treatment of the diseases of the skin, that this article exhibits its best effects. In these cases, its internal use is recommended as well as its external application to the diseased part. Thus in Scabies or itch, the ungt. Sulphuris, is rubbed on the skin, and the powder is taken in purgative doses—but, as the ointment produces a very unpleasant odour, other applications have been substituted, as Sulphuric acid mixed with lard, in the proportion of ʒii. of the former to ℥i. of the latter, or it may be employed in the form of wash, with equally good effects, in the proportion of a dram of the acid to ℥viii. of water.

Sir J. Pringle recommends the following formula, which will be found useful in speedily arresting the progress of the complaint.

℞. Flowers Sulphur, ℥i.
Powdered Muriate of Ammon, ʒi.
Lard, ℥iiss. m.

This quantity serves for four inunctions, and the patient must be rubbed every night. Although the itch may be thus removed, by the above quantity, yet it will be proper to renew the application, and

to rub the parts most affected for sometime longer, until a second or third quantity be also exhausted. It is also proper to subjoin its internal use.

The same ointment will be found useful in Tinea Capitis.

The usual dose of Sulphur is from one to three drams, it may be mixed with syrup, treacle or milk.

Besides this mode of employing Sulphur, it has lately been introduced as an external application in the state of vapour, in several diseases of the skin, and in chronic and long protracted diseases.

This mode of applying it, was introduced by Dr. Gales, of Paris, in the treatment of Scabies, upon the supposition that the disease had its origin in animalculæ, and that sulphur, applied in the state of vapour, in which state it was not sulphur, but sulphurous acid gas, would be more destructive to them than its simple application, and of course the cure would be completed in a short time. After trying several plans of applying the fumes of sulphur, subjected to many inconveniences, they have all yielded to the more convenient and efficacious method, of having a bath or fumigating chamber made perfectly tight, into which the sulphur is introduced, after having been volatilized outside. The patient being seated naked within, has his body completely surrounded by the fumes, the head being the only part freed from their action. Various forms of disease have been found to submit very readily to this operation—these are Scabies, Herpetic affections of one or two years continuance, which have resisted a variety of local applications—Herpetic ulcers, connected with a scrofulous habit—Paralysis, universal and partial—glandular swellings—chronic rheumatism.

The success which attended the application of the fumes of sulphur, was confirmed, by a report of a committee of the most distinguished physicians in Paris, and the beneficial effects which have been conferred upon the human species, by its introduction into camps and hospitals, has been truly great. The practice has been fully tested in this country, and the conclusions which have been formed have been nearly equally favorable. Upon the whole, we may consider this mode of applying sulphur, in cutaneous affections, and in protracted diseases, one of the happy discoveries of modern times, for ameliorating the amount of human suffering. The only inconvenience attending its use is, that the skin becomes much irritated after being employed several times, particularly about the scrotum and thighs, with a peeling off from the surface of the body, requiring its use to be discontinued, until the parts have recovered themselves.

The great advantages of sulphurous vapour baths have been pointed out very fully by Dr. Gales of Paris, Assalini of Naples, and De Carro of Vienna, and their utility is so generally confessed, that I cannot but hope the remarks made will be recollected—not only should they be borne of mind, but the manner of applying them, with the construction of the chamber.

Sulphur combined with the alkalies, forming Sulphurets, is another very valuable article in the treatment of cutaneous diseases. Thus combined, it forms the substance which was called Hepar Sulphuris, or Liver of Sulphur. It is used as a wash in Tinea Capitis, or Scald Head, a complaint very common among children, and often very obstinate. It forms one of the best applications in these cases, prepared as follows—

Sulphuret of Potash, ʒi. to ʒii.
Water, ℥viii. m.

The head is first to be washed well with soap and water, and the wash applied twice a day. I have seen some disagreeable cases cured speedily after this manner.

The Sulphurets are also employed in the formation of baths, in the treatment of other cutaneous diseases. In this form it is much esteemed at the present time, and we are indebted to Dr. Alibert for the important benefits which have been derived from its use. The practice is at present in much repute in Europe, being employed in the large cities of France, and in all the charitable institutions of that country. The bath is prepared in the following manner.

Take ℥ii. of the dry Sulphuret of Potash dissolved in ℥viii. of water.
To this is added of the Liquid Hydrosulphuret of Potash, ℥viii.
Also, of the Liquid Sulphuret of Lime, ʒviii.

Of this solution, ℥ii. are sufficient to give to an ordinary bath sufficient strength, and the quantity may be increased to ℥iiss.

Thus applied, it has been found of great utility in the treatment of Ring worms, herpetic affections, and of other obstinate cutaneous diseases.

It is not only in these cases that the baths of which I am speaking have been found useful—but their use has been extended to the treatment of Cachectic diseases in children, in enlarged and indurated conditions of the Lymphtic system, in scrofula, rheumatism, &c.

They exhibit a local action, which is very evident when the skin is in a state of disease. It gives to it firmness, and softness; developes its tone, and vital energies.

Besides these forms of employing sulphur in diseases, it is of considerable efficacy in the state of Mineral Waters. Sulphurous waters are very abundant in many parts of our country. They are generally clear when taken up, and emit air bubbles, which consist of the Sulphuretted Hydrogen Gas. Their smell is very strong, sulphurous and fetid, like that of a foul gun barrel—a taste nauseous and bitter, though it is remarkable that most persons soon become reconciled to it. These waters have been much celebrated in cutaneous affections in general, and in scrofula. They are applied externally in the form of warm bath, as well as taken internally. They have also been recommended in bilious complaints, dyspepsia, general want of action in the alimentary canal, and calculous cases. They are in short useful in all those complaints that require purgatives, and at the same time are benefitted by sulphur. These

waters are taken in the morning in the quantity of a pint and a half to four pints, at moderate intervals.

The officinal preparations of Sulphur, are the Sulphur Præcipitatum, Lac Sulphuris, or Milk of Sulphur. It is prepared by boiling fresh burnt lime and flowers of Sulphur, then filtering the liquor through paper, and dropping into it as much muriatic acid as may be sufficient to precipitate the Sulphur. Wash this repeatedly with water, until it becomes tasteless.

Carbonate of Magnesia.—This article was first sold as a Panacea, by a canon at Rome, in the beginning of the seventeenth century, under the title of Magnesia Alba, or Count Palma's powder. It was, for several years, a celebrated secret in the possession of particular persons, until the method of preparing it was made known by Lancisi, in the year 1717, and afterwards by Hoffman, in 1722. It is not found pure in nature, but exists abundantly, combined with many acids, and from these it is obtained by various processes.

It is most usually obtained from the Bittern which remains after the crystallization of common salt from sea water. The Bittern is heated, a solution of common pearl-ash is added, carbonate of magnesia is deposited, and afterwards separated from the liquor by a linen strainer. In this process, the sulphat of Magnesia in the bitter water, is decomposed by the carbonate of Potash; by mixing together concentrated and hot solutions of each—a double decomposition takes place.

Also obtained in a large quantity from the mineral called Dolomite, which is a carbonate of lime and magnesia.

Common carbonate of Magnesia, in its pulverulent state, is excessively light, and lies so loose, that a smaller weight of it will fill a bottle of a given size, than almost any other known powder. It consists of water, carbonic acid, and magnesia, in proportions somewhat varying. The quantities of each have been thus estimated. By calcination in a full red heat for about half an hour, both the water and carbonic acid are expelled, and the loss is estimated at about fifty-five per cent. When quite freed from water and carbonic acid, the magnesia that remains, is the magnesia usta, or calcined magnesia of the shops.

Magnesia is an article of much utility in medicine. Its purgative operation depends upon its meeting with an acid in the stomach, by which a neutral salt is formed. When no acid exists, it is nearly inert. On this account it is not a very certain medicine, but it is resorted to chiefly by those who are troubled with much acidity. It is under these circumstances a useful antacid, and a safe and mild laxative, in doses of one or two drachms.

The carbonate of magnesia, in consequence of the disengagement of carbonic acid gas, which takes place in the stomach, is productive of unpleasant symptoms, as flatulency, griping, and other uneasy sensations, especially in weak bowels. On this account the calcined

magnesia is preferred, and particularly when it is administered to children.

The calcined magnesia is prepared, by exposing the carbonate to heat for a certain time, by which the carbonic acid gas is expelled, and the article is in a state nearly of purity. By this process it is found to be equally purgative, when given in half its former dose. It is deprived by this process of the disagreeable qualities above mentioned, and acquires also new properties, which render it likely to answer some other important practical purposes.

By calcination, it is not only rendered incapable of generating air in the stomach and bowels, but it is qualified to absorb, or render fixed, that which it finds there, and which is produced sometimes in too great quantities in the process of digestion. With children, in whom acidity in the first passages frequently prevails, who are often distressed with cramps, and colicy pains, from the production of wind, this article is eminently useful, and for the reasons I have given should always be calcined, otherwise it may aggravate the symptoms it was designed to relieve. From it a valuable medicine is prepared called Dalby's Carminative, which from its efficacy and general employment should be known to you. The formula may be seen in the Dispensatories, or in Paris's Pharmacologia.

This you will find of great utility in relieving the griping pains, flatulency, and uneasiness to which children are subjected at a very early period of life.

Another formula of much advantage is one recommended by Dr. Dewees, in the colicy complaints of children. It is as follows—

Calcined Magnesia, ℈i.
Water, ℥i.
Tinct. Assafœtida, gtt. lx.
Laudanum, gtt. xx.

Twenty drops are a dose. If not relieved, to be repeated in an hour or two. This preparation is, I think, inferior to the mixture of carbonate of soda, or potash and rhubarb, mentioned a short time since.

Magnesia is very frequently combined with rhubarb, in the treatment of Diarrhæas and other complaints.

Besides these diseases, it has lately been introduced in the treatment of calculous complaints, and in some cases with great benefit. Of its use in these diseases I shall speak on a future occasion.

Dose for a cathartic is ʒss. to ʒii. Its most convenient vehicle is water or milk.

The habitual or long continued use of Magnesia, has sometimes occasioned distressing symptoms from its retention in the bowels. A remarkable instance is related, of a person who was in the habit of using this substance in large quantities for a considerable time—after his death, it was found accumulated in the colon, having undergone little or no change by the action of the vital powers.

Magnesia is an excellent article in cases, where the mineral acids

have been taken in a large quantity, either by accident or design. It combines immediately with the acid, deprives it of its acrimonious properties, and is converted into a saline substance by no means deleterious.

NEUTRAL SALTS

Are a class of medicines, intermediate in their operation between Laxatives and Purgatives. They are more powerful than the first, and less acrid and stimulating than the last. By their stimulus they excite the exhalent vessels of the Intestines to pour forth a large secretion, by which the contents of the bowels are reduced to a fluid consistence, and the general system depleted. From not exerting an action upon any particular viscus, they seem adapted only to evacuate the contents of the bowels, and to reduce the general tone of the system. Hence their utility in inflammation, or topical congestion; and from their effects in allaying action, and reducing the heat of the system, they have been called cooling medicines.

Of these the first in importance and power, is the Sulphat of Soda, or Glauber's Salt.

This article is prepared from the saline residuum of several chemical processes, particularly after distilling muriatic or hydrochloric acid, from chloride of sodium by sulphuric acid.

This is one of the most common and useful of the saline cathartics. It evacuates the bowels speedily, effectually, and without pain, heat, or inconvenience. It contains a large quantity of water of crystallization, from which it is separated by exposure to the air. By this means, it is reduced in bulk and weight, in consequence of which a smaller quantity will be effectual as a dose.

The objection to this saline preparation is, that while it is more active, it is more nauseous than the rest. There is no method of disguising its taste—it is less disagreeable by being taken in a little water, but it is also less active. The activity of saline medicines generally, seems to depend upon their being dissolved in a large quantity of water. It is upon this principle we explain the action of many preparations, as Seidlitz powders, sea water, &c. in which the active ingredients are largely diluted. The unpleasant taste of this salt is, however, said to be much diminished by holding brandy in the mouth previous to taking it. The usual dose is an ounce.

An excellent febrifuge mixture is prepared in the following manner

℞. Glauber's Salts, ℥ii.
Tart. Antimony, grs. ii.
Lemon juice or vinegar, ℥i.
Water, ℥viii. m. ℥ss. to ℥i. every two hours until it operates.

In this form it not only opens the bowels, but is diaphoretic.

Sulphate of Magnesia—Is found native, and in combination with Gypsum. It is also prepared by evaporating the water of Mineral springs, as Epsom springs in England, whence its name is derived.

But it is now principally obtained from the liquor remaining after the crystallization of Chloride of Sodium from sea water. The bitter water is boiled down, until on cooling, in clear and cool weather, it affords the Sulphate of Magnesia in acicular crystals, in the proportion of 4 or 5 parts to 100 of common salt, obtained from the same water.

This is a more pleasant medicine than the preceding. It is mild in its operation, and agrees better with the stomach, from its bitterness, than the other preparations. The remarks made upon dilution are applicable here. Dose, ℥i.

Sulphate of Soda is often substituted for this salt, which it may be made to resemble, by stirring it quickly at the moment it is about to crystallize. The fraud may be detected by adding to the solution of the suspected salt, a little of the Carbonate of Potash—if it is Sulphate of Magnesia, a precipitate of Carbonate of Magnesia will be formed, proportioned to the purity of the article, and Sulphate of Potash will remain. If Sulphate of Soda, no precipitation will take place. When it is necessary to aid the action of the saline medicines with other articles, the following preparation, known under the name of the black draught, may be employed.

Sulphat Magnesia, ℥ss.
Infusion Senna, C. ℥iss.
Tincture Senna, ʒi.
Syrup Ginger, ʒi., mix as a purgative draught.

Phosphate of Soda—Is a medicine lately introduced into practice. It is said to be less unpleasant in its taste, and to be a good substitute for the other neutral salts, particularly when there is any tendency to nausea. As it, however, possesses no particular advantages, I need not dwell longer upon it.

Preparation.—The usual process is to add Carbonate of Soda in excess, to the impure phosphoric acid procured from the decomposition of bone ashes by sulphuric acid. The solution is filtered, and crystals are obtained by slow evaporation.

Tartrate of Potash and Soda—Commonly called Rochelle Salt. It received its name from being introduced into practice by an Apothecary at Rochelle, whose name it long bore, Sal de Signette. It is formed by adding Soda to a solution of the Bi Tartrate of Potash, by which the excess of Tartaric acid is neutralized, and a triple salt, Tartrate of Potash and Soda, is formed. It is less agreeable than the Phosphate of Soda, but more so than the Sulphate. It requires to be given in a larger dose.

Sulphate of Potash.—This salt is called in medicine Sal Polychrest, and in the old chemical nomenclature, Vitriolated Tartar. It is formed by directly adding sulphuric acid to a solution of Potash, until the mixture is neither acid nor alkaline. This mixture, on evaporation,

affords crystals which are larger, and more complete, according to the slowness of the evaporation.

The taste of this salt is rather bitter, and it is not very soluble in water.

Sulphat of Potash acts as a gentle asperient, in doses of 30 or 60 grains. In the dose of ʒv. or ʒvi. it acts as a mild cathartic—though on account of its difficult solution, it is much slower than the preceding salts. It is, therefore, rarely given alone, but is employed in combination with other cathartics, the operation of which it greatly promotes. It is frequently united with Jalap, or Rhubarb, in small proportions, and a very useful and effectual cathartic is thus afforded.

Of the other Neutral Salts, as Bi Tartrate of Potash, Nitrate of Potash, &c. I shall speak under other heads, where they can more properly be introduced.

MINERAL WATERS.

Having thus given a general description of the principal saline preparations in use, it is proper to consider several other saline combinations, which though not generally employed, still require some attention. These are Mineral Waters, a form of exhibiting purgative medicines, not only useful, but agreeable.

The first circumstance to be considered, is the small quantity of active ingredients contained in any given water. The smallness of the quantity of active ingredients, is compensated by their number. Many of them, as sea water, and other mineral waters, containing three, four, or more, different salts. The activity therefore experienced, is the result of a law formerly mentioned, that the combination of two or more substances, of a similar nature, will produce a more powerful effect, than an equivalent dose of any one.

The next circumstance to be considered, is, their extensive dilution. That extensive dilution is of essential service, is proved by the little activity of these articles, when taken in a small quantity of fluid, compared with the essential benefit they produce in the form of great dilution.

It is true, that the force of impression on any particular part is thereby lessened, and dilution may therefore be carried to excess—but the circumstance of extent of sentient surface, acted on at once, will probably, in most cases, counter-balance this, and free dilution frequently promotes the general curative intention of mineral waters, as evinced in the very weak solution of a purging salt, which occurs in Cheltenham or other water.

The gaseous substances which are combined in a mineral water, are deserving of much consideration. The precise operation of these subtle agents, is not made known, but the effects of a gaseous water are more powerful, in proportion to the suddenness of the expulsion of the air, and therefore to the looseness of its adhesion to the water, with which it is combined.

Of the variety of Mineral Waters, I shall only speak of the most important, and such as are generally employed.

Of those simply saline, the first is the Seidlitz Water. I shall in this enumeration, mention only those mineral waters remarkable for their saline impregnations, and of which imitations are made.

Seidlitz Salt, is the product of a spring found near Seidlitz, in Bohemia, a country abounding in mineral waters of various descriptions. The water was long neglected by the inhabitants, on account of its salt bitterness, until it was brought into notice by the celebrated Hoffman. The taste of the water is very saline, and bitter, but not in the least degree acidulous or brisk.

The particular analysis will not be interesting to you; it will be sufficient to state, that a pint contains the following proportion of active ingredients.

Carbonate of Lime,	944
Selenite,	5–140
Carbonate of Magnesia,	2–622
Muriate of Magnesia,	4–567
Sulphate Magnesia,	180–497–total, grs. 193–770, or 3 drachms, 13½ grains.—*Bergman.*

From this analysis, it appears to be strongly impregnated with the Sulphate of Magnesia, and to this it owes its bitter, saline taste, and purgative property.

The identity of this salt, with that found in the Epsom spring, was ascertained by Hoffman, and as the Seidlitz water contains more of the active principle, the salt has been largely procured, by the usual processes of evaporation, and crystallization, and sold as the Seidlitz salt or powders. The effect which the water produces is in a high degree purgative, greater than might be supposed from the mere quantity of active matter.

A pint is generally a dose, and it has this advantage over the milder cathartics, that it operates without griping or any uneasiness.

This water is imitated artificially—the Seidlitz draught is composed of two different powders. One contained in a white paper, consists of

Tartrate of Potash and Soda, or Rochelle Salt, ʒii.

Carbonate of Soda, ℈ii.

That in the blue paper of Tartaric acid, grains xxxv.

The contents of the white paper is dissolved in the fourth of a tumbler of spring water, and the blue paper in the same quantity of sweetened water. They are united upon being taken, and swallowed during the effervescence.

Sea Water—Is the strongest in saline matter of all the natural waters which are used medicinally, and indeed of all the waters we are acquainted with, certain brine springs and salt lakes excepted.

Sea water by analysis contains several distinct salts, which when

reduced to English weights and measures, are in the following proportions.

An English pint contains as follows.

Chloride of Sodium,	241 grains.
Muriate of Magnesia,	65
Sulphate of Magnesia,	—
Muriate of Lime,	8
Iodine,	—
Bromine,	—

The foregoing results will vary in some degree, according to situation, that is whether obtained near the sea coast or not, in this latter situation it contains less salt.

Sea water seldom excites nausea, except to very irritable stomachs, or those to whom the taste is peculiarly unpalatable In the quantity of a pint, it generally proves purgative, especially when the stomach has not long been used to this medicine, and it is a property which this water possesses, in common with the other bitter saline waters, that it may be persevered in for a considerable time, and a daily increased evacuation from the bowels be produced, without debilitating the stomach and intestines, or impairing the digestive powers.

Sea water is not only used internally in various complaints, but also externally in the form of baths, particularly in scrofulous affections.

The powers of this remedy, in this disease, were brought into notice by Dr. Russel, and subsequent experience has confirmed the beneficial effects, which arise from its judicious use. When taken internally, it should be in such doses as will prove moderately purgative. A pint is generally sufficient, and this should be taken in the morning, at two doses, with an interval of half an hour between each.

It is often necessary to persevere a long time in the use of sea water, and it is a great recommendation, that such perseverance is seldom productive of bad consequences to the general health. Dr. Russell mentions a case, in which a pint of this water has been taken daily for two hundred mornings, without any interruption, which produced a continued course of moderate purging, yet the appetite continued all this time perfectly good, and the health improved.

Cheltenham Water is also saline, though it possesses chalybeate properties. A gallon contains the following principles,

Sulphate of Soda and Sulphate of Magnesia, grains	480
Chloride of Sodium,	5
Muriate of and Carbonate of Magnesia,	25
Selenite,	45
Oxyd of Iron,	5—555 grs.

Carbonic acid gas, a large quantity.—*Fothergill.*

From this analysis, it would appear to be possessed of several very valuable ingredients. It is decidedly saline, and the salts are for the most part of a purgative nature.

It is also a chalybeate, and if the analysis be correct, it is one of the strongest we are acquainted with. The Iron is suspended entirely by the carbonic acid, of which gas the water contains about an eighth of its bulk.

Cheltenham water will not keep well, without being materially altered, for the chalybeate part is soon lost, by the precipitation of the Iron, which takes place, even in the closest vessels, after a few days. In order to obviate these effects, and to reduce some of the most valuable parts of this water to a more convenient form for carriage and keeping, the purgative salts are procured on the spot by evaporation, and by crystallizing the residuum, which is sold under the name of Cheltenham Salts. It is, in fact, little more than a mixture of Sulphate of Magnesia, and Sulphate of Soda, and of this, the Cheltenham Salts, so common in the shops of our apothecaries, consists. A moderate dose operates effectually and speedily, as a cathartic, and in common with many others of the largely diluted saline waters, it acts in a very gentle manner, without occasioning griping.

A factitious compound is sold as a popular purgative under this name. It is formed by triturating together the following salts.

Sulphate of Soda,	120	grains
Sulphate of Magnesia,	60	
Chloride of Sodium,	10	
Sulphate of Iron,	½	

I do not know that as we receive the salts, whether they are capable of fulfilling any other than the above indications. Taken from the spring at Cheltenham, a small town in Gloucestershire, and from which this salt derives its name, it is endowed with more active powers, and is capable of being applied to a variety of cases. To persons labouring under hepatic derangements from long residence in hot climates, and also in scorbutic affections of the skin, it is very efficacious.

In our country, the principal saline mineral waters are those of Saratoga and Balston, in the State of New-York. From an accurate analysis they consist of the following principles. In a quart of the Balston spring water there is found

Carbonic Acid Gas,	60	cubic inches
Chloride of Sodium,	43	grains
Muriate of Lime,	4	
Muriate of Magnesia,	2	
Carbonate of Lime,	11	
Carbonate of Magnesia,	9	
Carbonate of Iron,	1	

Congress spring, at Saratoga, contains in the same quantity of water—

Carbonic Acid Gas,	66	cubic inches
Chloride of Sodium,	103	grains
Hydriodate of Soda,		
Bi carbonate of Soda,		
Carbonate of Lime,	27	
Bi carbonate of Magnesia,		
Carbonate of Iron,	½	
Hydrobromate of Potash.		Steel.

Upon these ingredients it may be proper to make some remarks.

The Carbonic Acid Gas is a very important one, that upon which it may be said the principal qualities of the water depend. All other ingredients which it contains, would be heavy and inert without the aid of this acid. Deprive the water of this principle, and almost all its virtues disappear. It is this which holds the Iron and carths in solution, gives to the water its agreeable pungent, subacid taste, and excites that exhilaration of spirits, which almost all persons feel who drink the water.

The next useful article is the Chloride of Sodium, or common salt. It is most certainly from this salt combined with the water, in a very dilute state, that the purgative quality of these waters is derived. That a substance with which we are so familiar, and which is almost necessary to life, should be so powerful a purgative, as the Saratoga waters are known to be, would appear surprising. But combined as it is with other substances, it sensible, and even physical properties are greatly altered and improved. In consequence of its combination with an excess of carbonic acid, daily evacuations, to a considerable extent, may be produced, without debilitating the stomach or intestines, but on the contrary, the health, appetite, and spirits are improved.

Another important ingredient is the Iron, which though small in quantity, yet equals that of any other spring in Europe. The operation of this article upon the system is familiar to you.

From this cursory view, the observation of Dr. Cullen upon mineral waters will appear striking. They often, he says, produce cures, which we in vain attempt to perform by the combinations in our shops.

The other salts though small in proportion, and their uses not very well defined, are doubtless of utility.

From a review of what has been said, it is not surprising that before the analysis of these waters was effected, and their operation described, they were considered specifics prepared by the hand of nature against those formidable diseases to which mankind were liable. With the lights which Chemistry has lent us, we can explain their effects, so as to exclude any thing mysterious, though, unfortunately, we cannot imitate them.

Diseases in which these waters are employed.—They are adapted

to all those which proceed from a disordered state of the functions of the alimentary canal, or from obstructions of any of the viscera, particularly of the biliary organs, whether occasioned by irregularity in living, or the vicissitudes of climate and season.—*References—Saunders on Mineral Waters—Bell on do. do.—Periodicals.*

ENEMATA.

Before concluding the subject of Cathartics, it may be proper to make a few remarks upon Enemata or Glysters. These, though humble means, are sometimes employed as substitutes for purging, and have been found to serve some important purposes. They are useful to evacuate the rectum, but principally to promote the operation of cathartic medicines, and in this respect their beneficial effects are best exhibited. When Enemata are employed as purgatives, it should be remembered, that they cannot pass higher up than the valve of the colon, and consequently they can only act upon the large intestines. Therefore, they can seldom entirely supply the place of purgatives by the mouth, which pass through, and excite the whole intestinal canal—but they act as topical fomentations, and very often induce ease and sleep, when other methods fail.

Enemata are prepared in various ways. The most common Enema is as follows—

Castor Oil, ℥i.
Molasses, ℥i.
Warm water, 1 pint.

To this may be added ℥ss. to ℥i. of common salt, or a pint of soap suds, with ℥ss. of common salt; or an infusion of Senna with salt; or an ounce of Antimonial wine in water; or a solution of Tartarised Antimony, 8 or 10 grains, to a pint of water. Any of these Enemata are sufficient for most purposes, and will either evacuate the rectum, or promote the operation of cathartic medicines.

The instruments commonly employed for this purpose, are a large bag or bladder and pipe, or pewter syringe. The former is very insufficient, and should never be resorted to, but from necessity. The syringe, when in order, answers for ordinary purposes very well. I present you with an instrument extremely well adapted for the ordinary purposes, and on other occasions, when we wish to overcome constipation by distending the bowels with fluids. It consists of a small cylinder, capable of containing four ozs. of fluid, furnished with valves so arranged, as to admit of fluids being introduced through one, and discharged through the other. It is, in short, when applied to the purpose I am describing, upon the principle of the forcing pump. Besides filling the bowels with any quantity of fluid, it has this great advantage, that it can be employed by the patient himself, when seated on a bench, in which an opening has been made, or may be introduced under the bed-clothes, and thus any exposure prevented The pipe is introduced into the rectum, and the end of the instrument placed in a basin of prepared fluid.

This instrument is also employed for evacuating the stomach of poisonous substances, and the gratifying results which have followed when laudanum or other substances have been taken, with a view to suicide, are such, that I may say, an instrument of this kind, should be in the possession of every physician.

When more powerful enemata are required, Tobacco, either in infusion or smoke, should be employed. The former is prepared by adding ʒi, of the leaves to a pint of warm water, and it is given in two portions. As distressing effects sometimes result from it, it is only to be resorted to in cases of emergency. I have witnessed an instance of the great depression produced by this substance, the patient being reduced to the last stage of exhaustion. To obviate these bad consequences, Mr. Earle has suggested that a suppository of Tobacco, or a segar, be introduced up the rectum, the symptoms, as they become distressing, may be allayed by its removal. The smoke is a more safe application than the infusion. An apparatus has been invented for this purpose, but as it is not always at hand, the following contrivance is a very good substitute. Take a common pipe, into the bowl of which tobacco is to be placed, and then covered over with a fold of linen, or other substance—the tobacco is to be previously kindled, and the pipe introduced into the rectum—a stream of air is directed upon the inflamed tobacco, which forces the smoke through the pipe into the rectum.

It is singular, however, that cold, or even iced water, has been recommended by Dr. Rush to overcome obstinate costiveness, and it is no less remarkable, that walking over a cold hearth bare-footed, or throwing water over the thighs and legs, has been productive of the same effect. This method has succeeded very frequently, and I have been informed by a very respectable practitioner of this city, that being called in consultation in a case of obstructed bowels, the method alluded to had succeeded very satisfactorily. Very large doses of active medicines had been exhibited, and a great deal of castor oil without effect.

Such are the circumstances most worthy of attention, upon the subject of enemata, with a view to their cathartic operation.

They are employed, however, for other purposes. The rectum is remarkable for its sympathetic connections, and with most of the viscera of the pelvis, this connection exists in a great and powerful degree. When, therefore, irritation of any of these parts is to be allayed, or of the system generally, we can direct our remedies through this channel, with great advantage. The enemata to be considered are of an Anodyne nature. These instead of containing much fluid seldom exceed a gill, and for this obvious reason, that they are designed to be retained. Two or three times the quantity of Laudanum is required, when thus used, as when it is given by the mouth, and it is combined with a solution of starch, flax-seed tea, &c. Take 60 or 80 drops of Laudanum, and from ℥ss. to ℥i. of flax-seed tea, or solution of starch. This to be employed and repeated as often as is necessary.

In irritable affections of the bladder or its neck—in the painful and spasmodic diseases of the uterus—and in the tenesmus of dysentery, they are very valuable. In irritable conditions of the stomach when every thing taken into it is rejected, or when from peculiar idiosyncrasy, anodynes cannot be given by the mouth, they are productive of the happiest results, and in any of these cases their beneficial consequences at a proper period of the complaint, should be kept in recollection.

While upon this subject, I may mention a few other specific purposes, for which enemata have been employed. As vermifuges they have a peculiar and local use, when the worms are lodged in the lower intestines, particularly as very highly stimulating medicines are required to dislodge these troublesome animals, which if given by the mouth might produce a great deal of inconvenience and irritation. I shall speak more on this subject hereafter.

Tobacco infusion is given by way of glyster in strangulated hernia, to bring on that extreme degree of faintness and relaxation, which is most favourable to the reduction of the hernia.

In uterine or intestinal hæmorrhage, astringent glysters, and particularly iced water, are sometimes of powerful use in checking these alarming accidents.

A solution of Assafœtida and other antispasmodics, are often resorted to in hysteria and other complaints, for which this class of remedies is employed. Nutritive enemata are sometimes had recourse to, when from obstructions in the Œsophagus, nourishment cannot be conveyed into the stomach. In a few days the capacity of the rectum is so much increased, that fluid nourishment, to a considerable extent, can be given, and if we judge from the fæces, which in these cases are of a good colour and consistence, digestion would appear to proceed regularly. But though life may be protracted by this means, yet, we may be assured, that no application of food to the inner surface of the rectum, can ever supply the absence of it in the stomach. For these vicarious actions of the system are always defective, whether arising spontaneously, or from the assistance of art.

In cases of sudden collapse of the system, following fevers, or other cases where prompt remedies are required, and the powers of diglutition fail, there is no part of the system to which stimulants may more effectually be applied than to the rectum. Under these circumstances enemata of turpentine, of brandy and water, half and half, may be employed with the greatest advantage.

Suppositories are substances introduced into the rectum to procure stools. They are chiefly employed in relieving costiveness in infants, as well as adults. The best article is a piece of hard soap, cut into a cylindrical form, an inch or two in length, or a piece of paper may be rolled up into a point at one end, moistened with oil and introduced. These are commonly sufficient to excite an operation, by the irritation they excite in the rectum, and as they supply the place of medicine, deserve some consideration.

Suppositories are often formed of opium, or a pill of opium may often be employed in those diseases in which anodyne enemata have been recommended, either for the purpose of acting upon the diseases of the rectum, or of the neighboring organs. They will often be employed by patients, to whom the use of injections is disagreeable, or when from the soreness of the rectum, introducing the pipe of a syringe would be very painful.

I have thus concluded whatever was necessary upon the subject of Cathartics. A class of medicines from which we derive more permanent benefit, by which we control the irregular determinations of disease, and can operate more extensively upon the deranged secretions, than with any other class of the Materia Medica. They are indeed powerful agents, and to know when to use them with vigour, and when to withhold them, is only the result of a perfect knowledge of the article and of the disease we are treating.

The Third Division of the articles of the Materia Medica, comprehending that class of medicines which increase the natural operations of the intestines, without exciting irritation, having been considered with the second, I therefore proceed to the fourth.

Division IV.

Embraces those means by which we destroy, or counteract, offending substances lodged in the alimentary canal.

ANTHELMINTICS.

By this term is meant such medicines as have the power of expelling, or destroying worms, situated in any part of the intestinal canal.

This includes an extensive variety of articles, which have been variously arranged, according to the peculiarity of their operation. Some of these medicines, act in the manner of a poison on these animals, others destroy them by a mechanical action, others by exerting a strong cathartic operation, and others, as chemical agents, in correcting that condition of the stomach and bowels, which appears to favour their generation and nourishment.

Each division has been made the foundation of an arrangement of this class; but as every kind of worm has its appropriate remedy, I prefer following the order of Dr. Chapman, in dividing them, according to the worm they are best calculated to remove; though it is still to be understood, that some of these articles are equally applicable to every sort of worm, and that they may be indiscriminately employed.

It is a fact, well known to physicians, that in the human body, there are found, occasionally, different species of worms. I shall treat of them as they differ in their habits, character, and structure.

They are divided in two general divisions—the round and flat worms.

Under the first division are included,

1. The Ascaris Lumbricoides, or the long round worm.

2. Ascaris Vermicularis, or Oxyuris Vermicularis—the maw or thread worm.

3. The Trichuris Vulgaris, or the long thread worm.

Under the second division is considered,

The Tænia, or Tape worm. Of this worm there are two species,

1. The Bothriocephalus Latus.

2. The Tænia Solium.

The Ascaris Lumbricoides, is of a round form, in length from ten to twelve inches, and its circumference equal to that of a goose quill.

They infest the small intestines, but more frequently the course of the jejunum, and ileum. Sometimes they are known to ascend through the duodenum into the stomach, and they have been seen to creep out of the mouth and nostrils. It happens but rarely that they descend into the tract of the large intestines, and then, only after the exhibition of vermifuges, or from other causes which increase the peristaltic motion. They, in general, are found in considerable numbers. In one instance I have known from sixty to seventy being expelled in a few days, and have heard of two hundred in the course of a week.

Their colour is at first transparent, and they appear as if they have been sucking water mixed with blood—this colour soon disappears, and they become at length of a light and opaque yellow

They are very feeble when they are voided, and soon die, in spite of all attempts to keep them alive.

This worm has been confounded by some with the common earth worm, the Lumbricus Terrestris.

The sexes of the Lumbrici are distinct, and they are oviparous, the ovula being discovered in the mucous surrounding them in the intestines.

All the intestinal worms are oviparous, and they produce a considerable number of eggs. If all these eggs came to maturity, the diseases from this source would be exceedingly numerous as well as dangerous. Fortunately, several occurrences take place, calculated to prevent their developement. In short, it has been remarked by Rosin, that it is difficult for these animals to be abundantly produced.

This arises from the continual action of the intestinal canal, by which the eggs are carried downwards, and expelled with the excretions. In addition, the different gases, with the alimentary substances found in the intestinal canal, are often very unfavorable to them, and suffice frequently to prevent their development, or to effect their destruction.

The uterus in this species of worm is very peculiar. It branches out into two large crura, which for the space of one or two inches

are continued of an uniform diameter. They then suddenly become diminished in size, and appear like opaque threads lying over, and embracing in a convoluted manner the intestinal tube in the middle. This convoluted apparatus is composed of very fine transparent membranes, which is distended with innumerable eggs.

It is these opaque threads which are visible through the transparrent covering of the worm, and which, in common language, are considered as so many young worms.

The worms of which we have been speaking do not infest the human subject only. They are to be found in the hog, horse, dog, cat, and other domestic animals.

2. The Ascaris Vermicularis, Ascarides, maw or thread worm, are on the contrary very small, being in thickness of the size of a piece of thread, and when full grown about half an inch in length.

They are most commonly situated in the rectum, and when there, frequently pass out per anum.

They are also met with in the cœcum and colon, and have been found in the stomach, whence they have been called maw worm.

In the rectum of children or adults, they are generally in considerable numbers, but when in other parts their numbers are less considerable.

When discharged, they are extremely vivacious, and it is probably from this circumstance that the term Ascarides has been employed, from the Greek word Askarizein, Saltare, to leap. The male and female are here also distinct, and not as generally considered hermaphrodite.

3. The Trichuris Vulgaris, or Trichocephalus dispar, or long thread worm.

This worm is of rare occurrence, and it is only within the last half century, that any notice has been taken of it, or any accurate description drawn. Its body when full grown, equals in breadth the sixteenth of an inch, and in length nearly two inches. From the head proceeds a kind of proboscis, which the worm protrudes or withdraws at pleasure.

The anterior part of the worm is small and capillary, forming two thirds of its length. It terminates in an acute point, where the mouth is situated. The posterior part swells out to a considerable size, and in the male is twisted round in a spiral form. In the posterior part is found the spermatic vessels convoluted, or folded back upon themselves, and which terminate at the extremity of the tail. In the male is a small transparent tube, or penis, and in the female is a kind of vagina.

These worms have been found in the intestinum rectum, in the inferior part of the ileum, also in the jejunum, mixed with their contents.

Of the flat worm, there is

1. The Bothriocephalus Latus—the Broad Tape worm.

It consists of a head, a chain of articulations more or less long, and a small round tail.

The head varies in size and shape from the Tænia Solium. It is oblong, and furnished with two, and sometimes four, oval fossets, or depressions, in the middle which is the mouth, or opening into the alimentary canal.

The articulations in this species are broader than they are long.

It is found in the small intestines of the inhabitants of Poland, Russia, Switzerland, and some parts of France, but it is not so generally met with as the Tænia Solium. It rarely exceeds in length fifteen to twenty feet, although they have been found longer.

The colour is generally a dusky white.

Another distinction of this worm is, that it seldom parts with its joints spontaneously.

Three, four, and even more of these worms have been found in the same person, but they seem to be peculiar to the inhabitants of the countries just mentioned, and where they prevail the Tænia Solium is not to be found, at least in the same subbject.

2. Tænia Solium—Common Tape worm.

It has been called the solitary worm. From this circumstance, a conclusion has been drawn, which seems well established, that the smaller the worm, the more numerous are they found to be, and the larger the less numerous: hence the above term, bestowed upon this species.

This animal consists of a head placed at the smallest extremity, and a chain of articulations more or less broad or long, which gradually enlarge as they advance, and at length terminate in a tail formed by a rounded joint. Each of these joints contain their proper viscera, and they are very easily separated from each other while the animal is alive. Each joint, when detached, has the power of retaining for a considerable time, its living principle, and is called, from its resemblance to the seed of the gourd, Vermis Cucurbitinus. The separated joints do not appear capable of retaining their situation for any length of time, but are soon forced down the intestinal tube, and at length creep out, or are expelled per anum.

It has been conceived that these Vermes Cucurbitinæ have the power of forming fresh joints, but this I do not consider probable—the head alone having this property. Their re-production too would appear to be very rapid, were we to judge from the number expelled from persons subject to the tape worm. Certain it is, that when the whole is voided, except the head, in a short time after fresh joints are generated, and the patient is as much troubled with the worm as before.

The Tænia is always found in the jejunum and ileum, occupying their whole length.

The small intestines would seem to be the natural residence of this worm and the Lumbricus. Should their residence be made uncomfortable, they are readily removed from the system, either by vomiting, when they creep into the Stomach, or with the discharges of the bowels, when they pass the valve of the cœcum.

They are mostly of a pale white colour, and are of a very great length, varying from ten to thirty, and it is said one hundred feet.

The origin of worms is still buried in much obscurity, and it is probable that the speculations which may be formed upon this subject, will never remove all the difficulties towards a satisfactory explanation. All that we know certainly, is, that whenever a nidus is formed, favorable to their production and growth, there we see them generated and supported.

Climate seems to have a considerable influence in the developement of worms. They are more frequent, all other things being equal, in moist and cold, or moist and hot countries, than under other circumstances.

Ascarides are very common in Holland. In certain parts of Switzerland, the Tape worm is of very frequent occurrence—women being more affected than men. To the moisture and heat which prevails about Grand Cairo, in Egypt, during the season of the inundation of the Nile, are we to attribute the frequency of this species of worm in that country.

Season also influences their production. Thus they are observed by all physicians to be more common in summer and in the autumn, than at any other period, especially in those countries where fruit and pulse are eat, and when the influence of this vegetable diet is not corrected by the use of fermented drinks.

That particular states of the alimentary canal give rise to them we are convinced of, from this fact, that the several species mentioned belong exclusively to the human system, and that when carried out of it they speedily die. They are found in robust, and in feeble habits; in children as well as adults, and in all climates; so that we are at a loss to determine the particular condition of the intestines, which favours their production.

They are most commonly found in children with weak digestive organs, and feeble constitutions, a state of body favorable to the production of mucous, which has been thought to serve as a nidus for their further developement and support. Hence it is that poverty in diet, and one consisting of crude vegetables, and unripe fruit, has been observed favourable to the production of worms, and hence they always abound in the low and poorer classes of society.

It has been long a disputed question, whether worms were harmless to the system, or whether they were in themselves a primary, or accessory cause of disease.

When we consider how universally worms are found in all young animals, and how frequently they exist in the human body, without their presence being suspected, we should be disposed to conclude, that they perform some essential and necessary offices in the animal economy. When we find them too existing in the robust, and healthy, without any interruption to the functions of life, we may venture on the assertion, that in a certain degree they are harmless. When too we consider the infinite order and mutual subservience of every part

of the natural chain of animated creation, and their adaptation to some useful purpose, we should be disposed to say that nothing was created in vain.

It is only, I believe, when their number is increased to such a degree as to disturb the regular operations of the system, i. e. producing such a degree of irritation that the natural sympathies are awakened, or probably from a misplaced situation of the worm itself, that disease is produced. Under these circumstances, the diseases will be found as numerous and diversified as the sympathies of the intestinal canal with the various parts of the body.

The whole train of nervous and convulsive diseases are excited by this cause, as chorea, epilepsy, convulsions, hydrocephalus, paralysis, and a variety of other nervous and convulsive affections. Besides these they have been said to produce pleuritic and rheumatic pains, dysentery, remitting fever, chronic and spasmodic cough, cynanche trachealis, &c.

Thus is exhibited a striking instance of the influence of one exciting cause, in bringing into action a variety of diseases, according to the predisposition of the patient. This, you observe, varies in different individuals, hence such a diversity in their diseases appears. In every individual, therefore, there are particular weak parts, which are less liable to resist disease than others, and hence upon any irritation being excited, the disease appears with most violence in such part. It rarely, therefore, happens in fever, that there is simple excitement alone, but most commonly pain in some particular organ is felt. This pain is only a proof that such organ is less able to resist the increased excitement than another. The same may be said in these cases. The irritation excited by the worm, brings into action the particular form of disease to which the system is predisposed. If they are capable of producing the various disturbances in the system, I have mentioned, they are capable of producing a fever, several cases of which I have seen in practice. I would caution the younger part of my hearers, that these cases are of less frequent occurrence than is commonly supposed, and that great mischief is sometimes done, by treating the disorders of children as worm cases which really are not so. Popular prejudice is too apt to attribute to the existence of worms the diseases of children.

Dr. Hunter, we are told, dissected great numbers of children, who had been supposed to die of worm fevers, and whose complaints were of course treated as proceeding from worms, in whom, however, there appeared on dissection, to be not only no worms, but evident proofs of the disorders being of a different nature.

This caution is of the more importance, when it is considered, that the symptoms commonly attributed to worms alone, may be produced by a foulness of the bowels. Hence I would introduce a practical remark which is of consequence, that in the treatment of such cases, practitioners should not rest satisfied in administering to their patients such medicines as are possessed only of an Anthelmintic quality, but

to join them with those which are particularly adapted for cleansing the primæ viæ, as it is uncertain whether a foulness of the bowels may not be the cause of all the complaints.

By pursuing this plan we obviate the dangers which may arise, from accumulations of acrid matter being retained in the bowels, at the same time, by combining a medicine of an Anthelmintic quality, we effect the expulsion of the worms should they really exist.

That worms, however, produce a worm fever I have already stated, and as it is not of very frequent occurrence, its symptoms may be mentioned in this place.

It has no regular symptoms by which it is distinguished.

It generally assumes a remittent character, the excitement never running very high—the faculties of the patient are not often much disturbed, but there sometimes exist considerable heaviness or drowsiness, often the reverse, with great fretfulness, the child being satisfied in no other situation than in the arms, and moving about. Occasionally there attends twitching of the muscles, or starting in the sleep, with a grinding of the teeth. Pain, we would suppose, exists particularly in the abdomen, from the cries of the child. One circumstance, alone, often leads me to suspect the origin of the fever, which is, its not being much affected by the depleting remedies employed in such cases; and notwithstanding their operation is carried to a proper extent, the symptoms continuing with a steadiness and obstinacy which would lead one to suspect some more dangerous affection. If, at this period, Anthelmintic medicines are employed, and under these circumstances, the Spigelia Marilandica is one of the best, not only from its anthelmintic properties, but its febrifuge, every symptom which had been previously so obstinate, will subside in the course of twelve hours, with the discharge of worms.

I have seen the same effect take place from four, twelve, twenty and sixty being expelled from the body. This effect I have so often witnessed that I have no hesitation in asserting it. From this statement, it is obvious that the symptoms are not produced by their numbers alone. They will be equally produced by a change of situation in the worm, the irritation of which is often alone sufficient.

The Lumbricoides, for it is to these I allude to particularly, being generated and inhabiting particular tracts of the intestinal canal, these parts, we may venture to suppose, are less affected by the irritation their presence produces than others.

When, from any cause a change of situation occurs, and they re move from their accustomed abodes, disease is often excited, and this, I have observed, is as considerable from the presence of a few, as from many.

The peculiar symptoms Dr. Chapman has described, as attending upon a worm fever, I have never seen in a single instance.

I conclude my general description of worms, and will proceed to speak of the articles adapted to their expulsion. The arrangement I shall pursue, will be, to consider under one head the articles best

adapted to a particular species of worm, as this appears to be the clearest order, I can adopt, recollecting, only, that some of the articles may be employed indiscriminately in all the different species.

Before proceeding to their consideration, it may be proper to point out the symptoms by which the presence of the Lumbricus may be indicated.

These may all in a greater or less degree be referred to intestinal irritation, and the symptoms which usually occur, are, pains in the abdomen, itching in the nose, nausea, vomiting, looseness of the bowels, slender intermitting pulse, epileptic convulsions. To these are added a pale and occasionally a flushed countenance—the eyes are dull and heavy, the pupils dilated or much contracted, there is tumefaction of the upper lip, and eyelids, the breath is fœtid, the sleep is disturbed, during which the patient grinds his teeth, or starts suddenly as if frightened. The appetite is variable, being sometimes suppressed, and at others exceedingly voracious, the abdomen is much tumified and hard.

The above are the most common symptoms usually met with. It is not to be understood that they all occur in the same case, but some of them will generally be present.* They may, however, all be absent, and nothing will lead to a knowledge of the existence of worms but their actual discharge.

References—Brera on Worms. Memoirs London Medical Society. Bremser Traité des vers Intestinaux.

PARTICULAR ANTHELMINTICS,

And the articles adapted to the expulsion of the Ascaris Lumbricoides.

Family Gentianeæ—Spigelia Marilandica or *Pink Root*, is a native plant, and is to be found in all the southern parts of the United States. The roots are perennial, with many fibrous branches, of a yellowish colour when first dug out of the earth, but becoming black when dried.

Description of the Plant.

Stem, herbaceous, six to twenty inches high.

Leaves, sessile, ovate, lanceolate, acute.

Flowers is a simple secund raceme, yellow within, crimson without.

Every part of the plant may be employed as a vermifuge, but the root is unquestionably the most active. For its efficacy as an Anthelmintic it has long been celebrated, and was first recommended in the Edinburgh Physical and Literary Essays, by the late Dr. Garden, of this city.

The reputation which it had acquired it well sustains, and most

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* In one case, which fell under my observation, no other symptom was present but a constant pain in the abdomen, and upon employing Anthelmintic medicines, twenty-five worms were discharged.

practitioners will agree in the decidedly beneficial effects, resulting from its employment in this species of worm. It is, without doubt, a poisonous and narcotic vegetable, and it is probably by virtue of this poisonous quality that it proves so beneficial in worm cases. It has been said to operate most favorably when it purges, and its good effects have been ascribed to this quality, but from long experience with the Spigelia, I am safe in saying that it seldom or ever purges, and that it is necessary to follow its employment with cathartic medicine. Its effects would appear to be of an intoxicating and debilitating character upon the worm, in consequence of which, by the peristaltic motion of the bowels being quickened, they are readily carried through the tract of the intestines, and finally expelled.

The Spigelia has been objected to, from its supposed tendency to produce drowsiness, violent pain in the forehead, and temporary loss of sight, with tremors, convulsions, and death. These objections appear to have been transmitted from one writer and practitioner to another, without a proper consideration of the subject.

Thus, Dr. Chalmer's in his History of the Climate and Diseases of South-Carolina, Page 67, says, that of all the vermifuges he is acquainted with, Indian Pink is decidedly the best, but it must be properly guarded to prevent drowsiness, violent pain of the forehead and eyes, and a temporary loss of sight, which often ensue from the use of it; nay, it affects the nervous system to such a degree, that convulsions supervene, as happened to two lusty children in one family, of seven and five years of age, owing to the too free use of this plant, before its properties were well known to us.

To this catalogue of the dangerous and deleterious effects of this medicine, I can only add, that after an extensive use of it, in every variety of constitution, and at every period of life, I have never known these effects to occur in the degree described.*

In confirmation, I may add, that Mr. Home, who performed a number of experiments with it, says, that in none, not even in those cases where the bowels were confined, did it produce vertigo, dimness of sight, or convulsions, as we have been told, nor did it excite any of the effects of the narcotic poisons. I would not wish to be understood as asserting that these effects never take place, the fact has been stated by several very respectable writers, and we are to consider the occurrence as taking place, though, I believe, it is more rare than is commonly supposed.

We have the authority of the late Dr. McBride, that its narcotic effects are seldom or never attended with danger, and that some physicians consider them an evidence of the favorable operation of the medicine.

The symptoms commonly subside in the course of about twenty-four hours, leaving the patient as well as before taking the Pink Root.

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* Except in one case where an exceedingly strong infusion had been given.

It has been said, that the deleterious effects observed in the employment of the Spigelia, do not depend upon the root itself, but upon a small vine which entwines itself about the plant, and to which all its bad effects are to be attributed. The opinion, however, is wholly without foundation.

The Spigelia Marilandica is used as an anthelmintic in powder or infusion. Of the powder, from five to ten grains may be given to a child two years old; and to an adult ʒss. to ʒii. combined with calomel, or any other purgative, and, thus combined, its narcotic effects are never observed.

I prefer, however, the infusion.*

In this form it is much more efficacious, and it is proper to pursue the administration of the infusion for thirty-six hours or two days, when a cathartic should be given, either mercurial or castor oil. Given in this form it rarely fails to bring away worms, if there are any present, and the success which has followed its use, has long satisfied me that it is one of the most valuable anthelmintics we possess.

The Spigelia Marilandica enters into the composition of several quack medicines, the most celebrated is Leman's, which is a compound of Spigelia and Senna, with a little of the leaves of Savin, perhaps only to disguise it.

This compound is very efficacious, and is said to produce none of the nervous effects that have been mentioned of the Spigelia Marilandica.

Besides its anthelmintic property, the Spigelia is well adapted to some of the febrile diseases of children, unaccompanied by worms, especially in the insidious remittent, which so frequently lays the foundation of dropsy in the brain. Here it seems to exercise an excellent febrifuge property, and its employment will afford very satisfactory results.

Dr. Chapman is satisfied that every practitioner who has largely used the medicine must have seen it do good in the febrile affections of children, though no worms are brought away.

The Spigelia loses its activity by being long kept, and should not be employed after it has been gathered longer than a twelve-month.†

References.—Thompson's Inaugural Dissertation, 1802. Essays and observations, Physical and Literary, Vol. I. page 386.

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* The infusion is prepared by pouring a pint and a gill of boiling water upon two drachms of the roots, and simmering down to a pint. This is sweetened with molasses, and may be given in doses of a wine-glassful in the twenty-four hours. Thus prepared, it is more readily taken by children, than the powder, which being light is very bulky, and therefore with difficulty swallowed.

† If you prefer giving the powder, I would advise you to prepare it yourselves. That which is met with in the shops is often very old, and prepared from the plant after the roots, which are fine and delicate, have been broken off, and the article from not being saleable, is pulverised.

Family Meliaceæ—Melia Azedarach—Pride of India—Poison berry tree.—This tree which has become naturalised in the States of Carolina and Georgia, was originally introduced from the Island of Japan in the East Indies. By whom it was brought into this country I have been unable to learn, but that it is well adapted to our climate, its luxuriant growth and the universality of it, abundantly testify. It has for some time been in repute, for its medicinal virtues. Among these are the strong anthelmintic powers which it possesses, in the expulsion and destruction of the Ascaris Lumbricoides. Of its efficacy in this respect, the late Dr. Barton spoke in very high terms, and considered it so valuable an anthelmintic that it deserved to be introduced into general practice. Dr. L. Kollock of Georgia, also speaks of it in similar terms, and considers it a vermifuge of great efficacy. Of this article I can say but little from my own experience, being so well convinced of the virtues of the Spigelia, that I have seldom resorted to any other. It is, however, very much employed by the planters of our state, and their opinions of its utility fully corroborate the above statements—they even declare that it has exhibited good effects, after the Spigelia has failed. The root, or what is better, the bark of the root is employed, and is best exhibited in the form of decoction.

The following are the directions for preparing it.

The outer covering of the root is to be scraped off, and about four ounces of the bark of the fresh root, is boiled in a quart of water, until it acquires the colour of strong coffee, or until it is reduced to a pint. Of this half an ounce or an ounce may be given every two or three hours, until it operates, which it does both by vomiting and purging. Where this effect is not intended, it is commonly given in the quantity of a tea-cupful for several evenings, and a cathartic is then exhibited. The cases to which it is best adapted are those of the common round worm, or Lumbricus intestinalis. Whether it is equally efficacious against the Tænia or tape worm, I am not sufficiently informed. It has been said to be also useful in this species.

This article, like the Spigelia, is a good febrifuge medicine, in those affections usually denominated verminous fevers, but where no worms are voided.

Michaux, the celebrated French botanist, states, that the pulp which invests the stone of the fruit, when pounded with tallow, proves a good application in cases of Tinea capitis in children.

The following interesting facts respecting the use of the Berries of the Pride of India, proving their utility as an Anthelmintic, were communicated to me by a friend. Two negro girls were placed under his care, in a very feeble state of health, so much so that they were not thought likely to live. To general emaciation was added tumid and enlarged abdomen of a considerable size—skin hard, unperspiring, and the whole appearance unhealthy. Worms were suspected, and from the strong anthelmintic properties of all parts of the tree, it was supposed that the berries would be endued with simi-

lar powers, while their use would be more agreeable and convenient. Accordingly they were collected when ripe and juicy, and the girls were directed to eat a gill of the berries before breakfast, rejecting the stones. They were directed to increase the quantity to a pint or more during the day. The taste of the fruit is a bitter sweet, not disagreeable, but which improves so much upon the palate that after a while they become agreeable.

This course was continued a fortnight or three weeks, when my friend was informed by one of the girls that a substance was discharged from her to which she called his attention. Upon inspection it proved to be the Tænia or tape worm. The plan was continued, and soon eighteen feet more were discharged, and soon another portion, about seven feet in length. Other portions of a few feet, and a foot until it was presumed the whole had been removed. The health improved, the tumid abdomen subsided, and the patient restored to health.

The other girl discharged a large number of Lumbrici, and recovered.

Family Chenopodeæ—Chenopodium Anthelminticum—Jerusalem Oak.—Characters—Leaves, oblong, lanceolate, sinuate, dentate, racemes naked.

Root, perennial.

Stem, herbaceous, erect, furrowed, branching, four to six feet high.

Leaves alternate, nearly sessile, glabrous, strongly veined.

Flowers in axillary, leafless spikes, which towards the summit of the branches become densely crowded.

This plant is a native of Buenos Ayres, but grows in various parts of the United States, and in the neighbourhood of this city. It is said to be an excellent anthelmintic, and this property resides in every part of the plant, but the seeds are the most powerful. It is employed in several ways. Either the juice is expressed from the leaves and given in the dose of a table-spoonful morning and evening, upon an empty stomach, or more commonly the seeds are powdered, and a table-spoonful is given, enveloped in honey or mucilage. The dose to be repeated for several successive days.

From the seeds, however, there has lately been extracted an oil, which has been much recommended in cases of worms. It is said by Eberle to be an exceedingly active vermifuge, and that he has succeeded in many cases in expelling numbers of Lumbrici with it, after various other anthelmintics had been tried in vain. The oil is the preferable form for its exhibition, and after being employed for several days it is to be suspended, and a cathartic administered. If worms are not discharged, recourse must be had to the oil again.

The dose for a child under two years, is five drops, mixed with a good deal of sugar or mucilage, and from two to five years, from five to ten or fifteen drops; for an adult, from twenty to thirty drops.

The principal objection to this article is its extremely unpleasant odour and taste, which are so tenacious as to remain for several hours. Could it be dispossessed of these qualities, it might be introduced into more general practice.

Family Leguminosæ—Geoffræa Inermis—Cabbage tree bark.—This tree, of which the bark is used as a vermifuge, is a native of Jamaica and the other West India Islands. It has lately been introduced in the Materia Medica, and is spoken of by the physicians of the West Indies as an anthelmintic of great power and efficacy, but is little employed by the physicians of this country.

Dolichos Pruriens—Cowhage.—The dolichos is a climbing plant, growing in great abundance in warm countries, particularly in the West Indies. It has pods, thickly beset on the outside with stiff hairs, which, when applied to the skin, occasion a most intolerable itching.

This medicine has been much used in the treatment of worms, the part employed being the hairy spiculæ, scraped from the pods and mixed with syrup. They are supposed to act mechanically upon the worms, but occasion little irritation to the surface of the primæ viæ, as it is protected by a mucous covering.

Mr. Bancroft in his natural history of Guiana, in South America, gives an interesting account of this article. After speaking of the frequency of disease from worms in that country, and the insufficiency of the usual remedies for their destruction, he states, that the planters have recourse to the Cowhage for that purpose. From whence its use was suggested is uncertain, but its efficacy is indisputable. The part used is the hairy substance growing on the outside of the pod, which is scraped off, and mixed with common syrup to the consistence of a thin electuary, of which a tea-spoonful to a child of two or three years old, and double the quantity to an adult, is given in the morning fasting, and repeated the two succeeding mornings, after which a dose of Rhubarb is subjoined.

The patient, it is added, after the second dose usually discharged an incredible number of worms, so that the stools consisted of little else than these animals. But though there are sufficient proofs of its efficacy, some doubts have been entertained of its safety. For consisting of a number of spiculæ, exquisitely fine, and so acutely pointed that when applied to the skin they excite an intolerable itching, and even inflammation. Hence it might be apprehended that dangerous consequences would arise from their contact with the coats of the stomach and bowels.

From the experience of those who have employed it extensively in practice, it would appear, that these objections are entirely theoretical, and that it may be given with perfect safety. That its good effects are derived from its mechanical operation, is proved by this cir-

cumstance, that Cowhage has been given in tincture and decoction, to worm patients, without any sensible advantage.

The dose of the cowhage mixed with syrup, to the consistence of an electuary, is a tea-spoonful to a child, and a table-spoonful to an adult, repeated in the morning for several successive days.

The worms are said to appear with the second or third dose, but the operation of the medicine is to be promoted with a purgative dose.

This remedy is particularly designed to destroy the long round worm, the species of which I am treating

The dolichos is a vermifuge interesting from its character, but which is seldom or never resorted to in this country.

Camphora.—Of all the remedies for Lumbricoides, Professor Brera thinks there is none equal to camphor. The anthelmintic powers of camphor were known some time since, and its efficacy has been again recently noticed. By the Italian physicians, it is generally preferred to other vermifuges.

Half a drachm is given in the form of mixture rubbed up with mucilage of gum arabic, and this is administered in doses of a table-spoonful frequently repeated.

The employment of camphor is also attended with this advantage, that it counteracts the predisposition to the further developement of verminous ova.

I have always used it, says Professor B. with the greatest success, and cannot too strongly recommend its use to physicians in worm complaints, whether given in the mode already mentioned, or some other, combined with other remedies.

Besides these articles, there are various medicines which having a purgative operation, have been employed for the expulsion of worms. The Ascaris Lumbricoides not being very tenacious of life, is easily destroyed and evacuated by their use. The purgatives which have been most commonly employed, are, calomel alone, or combined with jalap, helleborus fœtidus, scammony, aloes, muriate of soda, &c.

Calomel, as a vermifuge, has long been held in repute, and its powers, in this respect, have been the subject of eulogy by most physicians. It has even been said that the crude metal boiled in water, and the water drunk, has been effectual in these cases. But the water, it is evident, can receive little impregnation from the mercury, and if it has any effect, it must be from foreign or accidental impregnation.

Calomel, however, is a very useful anthelmintic, but to be efficacious it must be given in a large dose at night, and worked off the next morning with castor oil, or some other cathartic. Or it should be repeated at short intervals, in order to remove such worms and ova, as have been screened from the preceding dose, by the folds of the intestines, or in mucous.

A cathartic should be exhibited to remove it from the system, so as to prevent salivation. Combined with jalap it often brings away worms when given for other purposes, and it is a very common ingredient in all the nostrums advertised for the cure of worms. It is also a very useful auxiliary to the more decided vermifuge medicines.

Fifteen grs. of Jalap, the same quantity of Rhubarb, and five grs. of Calomel, will generally expel Lumbrici, when given for three or four mornings in succession.

Helleborus Fœtidus—Is a native of this country as well as Europe. It grows in swamps and meadows, has a very offensive smell and an acrid taste. It operates powerfully as an emetic and cathartic. In doses of five or ten grains, to an adult, of the powdered leaves every night for several in succession, it operates as an active anthelmintic, and for this purpose has been recommended by several European practitioners. It should not, however, be employed till safer anthelmintics have been tried in vain, for the imprudent administration of it has been attended with fatal consequences.

This very active article is still retained in the Materia Medica as an anthelmintic, but no one at the present day thinks of using it.

The next article I shall speak of under this head, is the Chloride of Sodium, or common salt. The practice of using this article is very ancient and common in some countries. In Ireland it is the custom to feed children, who are afflicted with worms, for a week or two upon a salt sea weed, and when the bowels are well charged with it, to give a purgative dose, in order to carry off the worms after they have been debilitated by the salt diet.

In his own practice, Dr. Rush says that he has administered many pounds of common salt, coloured with cochineal, with great success in destroying worms.

Dr. R's. formula, was the following.

℞. Chloride of Sodium, ℥ii.
Cochineal, ℈ii. m. ft. Pulvis.

Of this ʒss. to ʒi. was given in the morning on an empty stomach.

The value of Salt as an anthelmintic may be inferred from the practice in some countries, of compelling criminals condemned to death, to live upon a diet without salt. Multitudes of worms being thus produced, from which death was ultimately the consequence.

The ancient laws of Holland ordained as a punishment to criminals, that they be kept on bread, unmixed with salt, as the severest punishment which could be inflicted. The effect was horrible, the criminals being devoured by worms engendered in their stomachs. Mr. Marhsall has related the case of a lady who had a natural antipathy to salt, and was, in consequence, infested with worms during the whole of her life.

Its importance to animals generally, is evinced by the long journeys they have been known to take to reach what has been called the salt licks.

Before completing our description of the remedies adapted to the Ascaris Lumbricoides, it may be proper to say a few words upon an article of which much has been said within a few years. I mean the *Cedar Apple.*

A paragraph appeared in our newspapers some time ago, setting forth in extravagant terms the efficacy of this substance. The paragraph stated, that some children, on a visit to a friend in one of the Northern states, took from the limbs or twigs of the cedar tree, what is generally called the cedar apple or knot. One of them, who had always been afflicted with worms from the age of two years, and for whose relief every thing had been tried, in the power of a skilful physician, but to no effect, and was then in a delicate state of health, eat several of the apples. The consequence was, that several worms were expelled from her. The remedy was again administered, and in the course of twelve hours, three hundred and upwards came from her. The father of the girl, to be satisfied of its efficacy, gave the apples to five of his children, who were all in health. It had the same effect of expelling worms from them. He also eat several himself, and the effect was the same. Thus, it is added, through the medium of mere chance, perhaps one of the best remedies, and the most simple, has been discovered.

The apples were recommended to be eaten nine mornings in succession, fasting. Or if dry, to be pounded fine, and taken in molasses, or eat just as they come from the tree.

The apples are not to be confounded with the seeds. They are an excrescence from the Juniperus Virginiana or Red Cedar, and are produced by the puncture of an insect, of the bark or young branches. The sap exudes and forms the substance in question. It is formed in short in the same manner as the gall nut. Its sensible properties are considerable astringency and bitterness.

An article, the virtues of which were set forth in such extravagant terms, would not be allowed to remain unemployed for any length of time. Considerable eagerness was therefore manifested to experiment with it, and many cases, in which worms were suspected, were submitted to its operation. I am not sufficiently informed of the result in these cases, to speak positively of its powers. In two cases in which I employed it, considerable irritation of the stomach was produced, and the remedy was discontinued. In another, in which it was tried by a physician of this city, it did not produce the desired effect.

Dr. Brocchus, a writer in the Philadelphia Journal, instituted experiments with reference particularly to its vermifuge powers. It was employed by him in six different cases, and the result was sufficient to satisfy him that the article possessed considerable activity as a re-

medial agent, but that, upon the whole, it was not superior to many others, which are employed with the same intention.

The modus operandi seems to be by virtue of the bitter principle which it contains, proving a poison to the worms, and also by its tonic powers overcoming that condition of the alimentary canal, upon which their generation is supposed to depend.

The dose in which it is given is from ten to twenty grains, two or three times a day, and this pursued for a week.

During the administration of the powder, a decoction of the apples made pretty strong, may be given, in doses of a tea-cupful several times a day.

The quantity directed by the person who introduced the apple to our notice, was one for every year of the person's age, as they are taken from the tree, and this generally continued for nine mornings in succession, fasting. Thus taken, however, the quantity would be very variable, depending upon the size of the apples, varying as they do from the size of a pea to that of a small nut. The medium dose would be such as I have stated.

A more agreeable mode of exhibition, and one that I have been informed has proved effectual, is in the form of tincture, of which ℥ss may be administered several times a day, and thus employed, or in the form of decoction, its irritation upon the stomach would be less felt.

It may be an article worthy of further investigation, and would afford a good subject for an inaugural dissertation.

Having completed the consideration of the remedies which are employed in the treatment of the long round worm, I shall proceed to those of another species of this class, the *Ascaris Vermicularis* or *Ascarides*

Previous to entering upon them, I shall consider the symptoms, seat, and other circumstances connected with their presence.

The Ascarides are about half an inch in length, and their usual seat is the rectum. The symptoms they produce are an uneasiness in the part, and an almost intolerable itching in the anus, which sensations usually come on in the evening, and prevent sleep for several hours.

They are attended with heat, sometimes so considerable, as to occasion a swelling in the rectum, both internally and externally, and if these symptoms are not relieved a tenesmus is brought on, with a a mucous dejection. Sometimes there is a griping pain in the lower part of the abdomen a little above the os pubis. In addition to these symptoms, they are often found in the bed-clothes, or discharged with the alvine evacuations.

The general health of the patient is not much impaired, from the long continuance of the disease, and this kind of worm, though as difficult to be cured as any, yet is the least dangerous of all. They have been known to accompany a person through a long life, without

any reason to suspect they had hastened its conclusion. They are difficult of cure, in consequence of their tenacity of life, and by burying themselves in the mucous of the first passages, they resist, in a great degree, the action of medicines. Hence some peculiarity in their treatment.

One of the difficulties which I have mentioned in the treatment of these worms, depends upon their becoming imbeded in the mucous of the bowels, by which they resist the action of medicinal agents. It is this which preserves them unhurt, though surrounded with many other liquors, the immediate touch of which would be fatal. Purgative medicines by lessening this slime, never fail to relieve the patient; and it is not unlikely that the worms which are not forced away by this quickened motion of the intestines, may, for want of a proper quantity of it, languish and at length die.

Of the kind of purgatives best adapted to this purpose, great difference of opinion exists, some recommending the brisker, and others the more mild cathartics. It seems, however, that those purgatives are the best, which while they operate with sufficient activity, do not enfeeble the patient to such a degree but that a repetition can be easily borne.

Those mineral springs which contain much saline matter are of this sort.

Jalap mixed with sugar, in small doses, is efficacious in children, as it can be repeated daily.

Cinnabar and Rhubarb, in the quantity of half a drachm each is very useful, as it never fails to bring away a mucous as transparent as the white of an egg, and in this many Ascarides will be found.

Calomel too has been spoken of with much confidence of success, but I believe with little more benefit, than any other purgative which operates briskly would have done.

Aloes, and its preparations, have been much prescribed, from their known tendency to act upon the lower portion of the intestinal canal, in which these animals reside. In the ordinary dose it is sometimes very effectual, but the Hiera Picra, which consists of Aloes and Canella Alba, is a more powerful remedy. It is a very popular remedy, and has often succeeded when other means have failed. In the ordinary manner of prescribing it, an ounce of the powder is dissolved in a pint of ardent spirits, of which sufficiently digested, a table-spoonful diluted may be given to a child four years old, and repeated until it operates. Or the Elixir Proprietatis, or Compound Tincture of Aloes, in doses of ʒii. to ℥ss. repeated two or three times a day, or night and morning.

With purgatives, however, other means are required. These are Enemata or Glysters.

They become necessary from the tenacity of life which these worms exhibit, and from their being seated far from the stomach medicines administered by the mouth, have little other effect upon them, than as they evacuate the contents of the rectum in common with

the other viscera; but administered in this way, the relief afforded is very considerable, though not in all cases certain.

The injections most approved, are those of

Aloes, ʒi. to ʒii. dissolved in a pint of new milk, and injected twice a day.

A weak infusion of Tobacco—a solution of Assafœtida—Lime water—Olive oil—Camphor.

The injection of Camphor, which I believe to be the best, is prepared in the following manner.

℞. Camphor, ʒi., olive oil ℥ii. m. for an enema.

It is to be administered at bed-time, every third night, at three different periods, or it may be repeated on alternate nights.

This has been found a more efficacious remedy against the violent itching, and other painful symptoms of the anus occasioned by these worms, than most of the rest. It generally gives some immediate ease, and stays all night without inconvenience. In the morning it comes away with a natural stool, or without, and with it many dead worms are removed.

Solutions of salt, either tepid milk well salted, or a table-spoonful of salt, dissolved in half a pint of water, are very efficacious, and the late Dr. Kuhn of Philadelphia observed, that he hardly ever knew it fail.

The Spirits of Turpentine enveloped in mucilage, or the yolk of an egg is also valuable.

With these injections the rectum should be filled, but the quantity thrown up should never be so great as to produce great distension of its cavity, lest the coats of the bowels being stimulated should hastily contract and expel the glyster, which acts with more certainty if it remains a short time. The operation, repeated for a few successive days, will seldom fail to remove for a time the Ascarides, and the symptoms they produce. It will be proper too after the use of the injections, to administer a cathartic, by which the enfeebled worms will be brought away, and in the majority of cases this plan of treatment will succeed.

The following case, detailing the symptoms connected with the Ascarides, and the treatment pursued, will be read with some interest.

I cheerfully comply with your request that I would communicate what I know of a very troublesome affection, to which I have been subject during the greater part of my life, (I am forty-two years of age,) and of which I have only recently been relieved.

I have been troubled with the small intestinal worm called Ascarides, from my earliest childhood. As far as I can now recollect, from two to three dozen passed from me, on an average, per day, during my boyhood—the number, however, varied considerably.

I recollect that when I was in any way costive, the number of worms that passed from me was not as great as under other circumstances. At all times the eating of fruit, particularly apples, increased the number discharged, and by bringing them into the rectum,

always rendered the symptoms more distressing. A couple of hours after partaking of this fruit, I was sure to be incommoded with Ascarides for a day or two.

In my early life, the eating of cheese produced the same effect. This has not been so much the case with me for the last twenty years, although I have freely partaken of cheese. Any considerable degree of exercise increased them, and this was also the case when I partook of any liquid, containing much sugar or molasses.

From my 18th to my 25th year, I was afflicted with a hæmorrhage of the lungs, and was compelled to travel, to go to sea, &c., and during that time I was not so much troubled with Ascarides; on an average, not more than two or three passed from me in a day.

I exchanged a northern for a southern climate, and my health gradually improved, and my consumptive symptoms have all left me.

But the change of climate did not relieve me from Ascarides, on the contrary, they grew every day more troublesome, insomuch that I was kept awake night after night, for years together, and finding no relief but by taking two or three injections of water, during the night. I am sure that I speak within bounds, when I say, that for fifteen years, there passed from me, on an average from two to three hundred Ascarides per day.

I cannot say that my bodily health was much injured by these worms, but the irritation they incessantly kept up, was very distressing, so much so, that for many years life has almost been a burden, and I found it was affecting my nerves, and with it my temper.

I applied to physicians, and made use of various remedies, all of which afforded me but temporary relief. I took castor oil and magnesia for a whole summer—I was weakened, but not much benefitted. I made use of injections of vinegar and water, one of these would relieve me for a whole day, and destroy every worm within the lower part of the rectum, but I began to think that this was injurious to the intestines, and increased that particular kind of mucous in which these worms are found. I spent two summers at the springs of Saratoga, and had at one time great hopes that these waters, which caused the worms to be evacuated, and operated as a tonic to the intestines, would have cured me. The relief was only temporary. On my return to Carolina the Ascarides became as troublesome as ever. I then imported the Saratoga water, and in the course of three years used one hundred dozen bottles: the use of this water saved me from much misery, but I found I had to increase the dose, till three bottles in a morning scarcely operated as a cathartic. I then had recourse to salts; this so sickened and disgusted me, that I cannot bear to think of it to this day.

I remember once having tried the experiment of eating an excrescence growing on the cedar tree, called the cedar apple; for a whole day the worms seemed quieted, and on the following morning I passed a pint of mucous, containing the remains of thousands of Ascarides: they had evidently been destroyed by the cedar apple. I thought I

had found a specific. I procured a quantity of the cedar apples and had them made into pills, but it appeared to me that, in their dried state, they had lost all their virtues, and I have since used them with some advantage, but not so decided as I once thought.

The medicines which you prescribed for me, I persevered in using for two months; you are acquainted with your prescriptions, and mode of treatment, allow me to say, that I think I have found most benefit from the preparation of aloes. I hope, that I can now say, that I am cured—for 6 weeks not a single Ascarides passed from me.

This patient was placed upon the use of the Compound Tincture of Aloes, ʒii. or ʒiii. night and morning, and advised Enemata prepared with Aloes as directed. Finding that they were so readily discharged by the Tincture, he omitted the injections, though, at times, when irritation was experienced, he would apply cold water or tepid milk. The coldness of the fluid always gave relief, and with the evacuation of it, some worms were discharged. In a little time, by this course being pursued, his uneasiness was greatly abated. He proposed discontinuing the medicine. I advised him still to employ it, only at longer intervals, every other night or twice a week. This plan was pursued for two months, at the expiration of which time, the patient states, that he hopes he can now say he is cured. For six weeks not a single one passed from him. On one occasion he felt some irritation, and upon using an Enema of cold water, three or four were voided, since which time, having felt no further return, he has not resorted to the medicine, though several years have now elapsed.

Trichuris Vulgaris—The third species of round worm, or the long thread worm. This is of rare occurrence, and as there is no peculiarity of symptoms attending its presence, the same treatment may be adopted as for the Lumbricus Intestinalis.

Tænia or Tape Worm.—One of the most difficult to be removed from the body. The reason of its being so difficult to expel is, that though portions of it are apt to break off and be discharged, it is endowed with a power of re-production, so that the patient is little or nothing better.

Of the anatomy of the Tænia little is known. I may be allowed simply to state that the body consists of a callous parenchyma, that they have no abdominal cavity, nor intestines, properly so called, nor anus. They are generally regarded as possessing some sensibility, and as oviparous. But what relates to the history of their generation, or of their nervous system is very obscure. We are also ignorant of the duration of their lives, and it is also impossible in the present state of our knowledge, to determine upon the extent of their increase.

The symptoms of this worm do not differ very materially from the foregoing. The most characteristic, are, pain in the abdomen, with

a turning motion or weight in the side, occasional prickings or bitings in the region of the stomach, with the evacuation per anum of small substances resembling the seeds of the gourd, which are the Vermes Cucurbitini.

Of the remedies for the Tænia,

Polypodium Filix Mas, or *Male Fern.*—This is a perennial plant, and grows in great abundance in almost every part of Great Britain. The only part used is the root, which when chewed is somewhat mucilaginous and sweet, afterwards astringent and bitter.

The root is large, long, firm, and covered with thick brown scales, placed in an imbricate order, and furnished with many long tough fibres.

This article has long been held in repute as a remedy for Tænia. It was known in the time of Dioscorides, and at various periods there have been published successful accounts of the manner of exhibiting it. It had fallen into neglect until the latter part of the last century, when it came into notice by being discovered to be the remedy which had become greatly celebrated in Switzerland, as a specific in the cure of Tænia. The secret was purchased by the King of France, Louis XVI., in 1775, after its efficacy had been attested upon trial by some of the principal physicians in France. The propietor of the medicine was Madame Nouffer, whose reputation was very great in the treatment of this complaint.

The article of which her medicine was composed, consisted of the root of the male fern gathered in the autumn, and reduced to a fine powder.

The manner in which it was directed to be used was the following.

Three drachms of the powdered root are mixed with four or six ounces of water. The whole is to be swallowed by the patient in the morning on an empty stomach. For children the dose is lessened to a drachm of the powder.

If the medicine produces nausea, which it is apt to occasion, the patient is directed to chew any thing which is agreeable, but not to swallow it—or to smell the fumes of vinegar. Should the medicine be rejected another dose must be taken as soon as the sickness is gone off.

Within a few hours after a cathartic is to be exhibited, consisting of drastic articles, and when it has operated, the worm will usually be found to have been expelled.

Such is an outline of the practice pursued by M. Nouffer, and which had acquired much reputation. The efficacy of it is confirmed by Professor Brera, who states that he has cured seven patients by this remedy. The efficacy of the fern is also supported upon the authority of a number of ancient as well as modern writers, and seems fully entitled to be considered a valuable remedy in the treatment of this troublesome disease.

In Dr. Chapman's Therapeutics, a case is related by Dr. Jones of New-York, of a lady, who after taking numerous worm medicines,

with little or no effect, drank a decoction of fern, a pint a day, until some gallons were consumed, when a worm came away measuring forty-five feet.

The usual mode of administering the fern is in the dose of ʒi. to ʒiii. in water or syrup, repeated two or three mornings in succession, fasting, and then followed by a full dose of some active cathartic.

It is given also in the form of extract, prepared by digesting the root cut small in a sufficient quantity of Sulphuric Æther. The tincture is then pressed, concentrated by distillation, and the æther fully removed.

From a pound of the root, ʒxviii. of a brownish thick extract is obtained.

The extract contains not only the volatile oil of the fern, but also a fixed oil, tannin, acetic and gallic acids, a muco-saccharine matter, green and red colouring matter, and a semi-resinous substance

Eighteen to twenty grains given at bed-time, and the same quantity in the morning fasting, destroyed Tænia, so that on the administration of a cathartic, the parasite was discharged, often in the form of a ball. Recommended by Hufeland.—*Dunglison's New Remedies.*

Oil or *Spirits of Turpentine.*—From observation and experience, the oil of Turpentine may be regarded as one of the best and most certain means of procuring the expulsion of this and other intestinal worms.

Its good effects in diseases arising from Lumbrici, are well known, and the periodical Journals contain many cases of its successful application to the cure of Tænia.

This worm, from the very unpleasant symptoms produced by it, and the difficulties which exist in its removal, may be regarded as among the most unpleasant affections to which the system is liable.

The Spirits of Turpentine, from the reports in Europe and this country, may be considered as the most effectual means hitherto discovered for its expulsion.

The earliest mention which is made of the medicine is by Dr. Bateman, in the Edinburg Journal for April, 1810, and it is stated that a Dr. Fenwick having discovered that the oil of Turpentine had been used by a mechanic, with considerable success in the expulsion of the Tape worm, it had been employed by several physicians in the public charities of London, and it appeared to be an active antidote to that troublesome animal in a great majority of cases.

To be effectual, it must be given in large doses, from half an ounce to ℥i. and even ℥ii., and its exhibition is usually followed in a few hours by a considerable cathartic operation, and a discharge of Tænia.

The principle upon which its virtues depend, does not seem to be distinguished by the true cathartic character. The medicine has the power of resisting absolute decomposition, by the assimilating operations of the organs of digestion, passes along the intestines in a great

measure unchanged, and was observed by Dr. Lettsom floating upon the surface of an evacuation.

The Turpentine then comes in contact with the worm, and by the influence of a specific property deprives it of life. By this means it is brought into the state of inert matter, and thereby subjected to the expulsive action of the organ, whose cavity is the place of its production, and whose function its existence disturbs.—*Kennedy on Intestinal Worms.*

In the doses I have mentioned it does not produce any more uneasiness than so much gin, and it is best given in milk. It should be taken early in the morning and on an empty stomach.

In a large dose it is less apt to produce uneasiness of the bladder, or in going to stool, than in small doses, because the medicine is carried off speedily by the bowels.

The constitutional symptoms which follow its use, are, giddiness to a great degree, as if the person was intoxicated, which comes on shortly after taking it, and continues for an hour or more, when it subsides with the cathartic operation. It is stated by Professor Brera, that in a few cases in which it has failed to expel the Tænia, it has commonly afforded great relief to the painful feelings which were believed to originate in the presence of the worm.

I might cite a number of cases from periodical publications of the beneficial effects which have been exhibited by the oil of Turpentine, but they would be too lengthy in detail. I shall refer you to the Eclectic Repertory—the Review of Professor Brera's work—and the Medico Chirurg., Trans. Vol. II.—Journal of Foreign Medical Science, Vol. III.

Carbonate or *Rust of Iron.*—Of the medicines for Tænia, Dr. Rush thought none were more safe and certain than the Rust or Carbonate of Iron. Taught by an old sea captain, who was cured of a Tænia by this medicine, Dr. R. has given from ʒii. to ℥ss. every morning for three or four days, not only with safety but success. Treacle or jelly are proper vehicles to give medicines of this kind to children, but they must not be mixed with them till the moment they are to be taken, otherwise the vehicle will taste strongly of the metal.

Cathartics—Have been used in a greater or less degree in this affection, and it has been said with much success. Those used have been of the drastic nature, and given in such doses as to produce active catharsis, have succeeded in expelling large portions of the Tænia. Of the cathartics employed, the Mercurials have been much esteemed. Also Jalap—Colocynth—Scammony, and Gamboge. The last article has had some reputation, and enters largely into the composition of several nostrums for Tænia.

Werlhoff's remedy for the Tape worm was Gamboge alone. He used to give it morning and evening, to the extent of twenty grains, mixed with a little sugar and water, repeating the same the next day.

if necessary, and even the third day. He never observed any harm to arise from these large doses, the patient being generally as well as ever the day after the exhibition of the medicine.

Besides these, various other remedies have been emploped, as Arsenic—Assafœtida—Tin.

If the powdered Tin is preferred, the following is the mode of administering it.

Powdered Tin, ℥iii.

Conserve of Roses, ʒiii. syr. q. s. ft. electuary.

One to two table-spoonsful to be taken for a dose in the morning. The dose to be repeated for three mornings in succession. The day before the first dose and the day after the last dose of the medicine, the patient is to be purged with an infusion of Senna and Manna. This powder immediately cures the pain in the stomach, occasioned by the worm, even though it does not bring them away until some days after.

Pomegranate.—The bark of the root of Pomegranate has been recommended as a remedy for Tænia, and a number of cases stated as cured by its use.

It may be given in the form of powder, viii. grs. to ℈i. b. v. t. d.

The most usual mode is in decoction, in the following manner.

Bark of the root of Pomegranate, ℥ii.

Water, 1 pint and a half, boil to 1 pint,

℥ii. are given for a dose every half hour until the worm is expelled, which generally occurs twelve hours after the first quantity has been administered.

If the decoction is of greater strength it excites considerable nausea and griping. It also acts upon the nervous system, producing vertigo, tremblings, and the sensation of intoxication, with other symptoms indicative of a poisonous quality in the bark.

The experiment has been made of placing living Tænia in a decoction of the bark, and it was observed that the instant they were plunged in these preparations they writhed, and otherwise manifested great pain and died in the space of five minutes. That their death in these cases arose from the influence of the bark is evident, as these worms live several hours after expulsion, when kept in plain tepid water.

In the treatment of worms we must not confine our attention to the mere expulsion of the worm, but endeavor to give tone to the stomach and bowels, by the use of tonics, so as to prevent their reproduction.

Besides the worms mentioned, there are several others to be found in other structures and cavities of the body.

1. Filaria Medinensis or Guinea worm, found in the cellular tissue, below the integuments.

2. Hamularia sub-compressa, found in the bronchial glands.
3. Strongylus gigas, found in the kidneys.
4. Distoma Hepaticum, or liver fluke, found in the gall bladder, and in the human liver.
5. Polystoma Pinguicola, found in the fat which covers the ovary.
6. Cysticercus Cellulosus, found in the cellular tissue of the muscles and brain, especially in the choroid plexus, where they have been met with in considerable numbers.
7. Echinococcus, the hydatid, found in various parts of the body.

Division V.

ANTACIDS.

Division VI.

Medicines which promote particular secretions.

DIAPHORETICS.

Before I proceed to consider the manner in which this class of medicines increase deficient perspiration, it may be useful and interesting to give some account of the secretion in a healthy state. Of all the natural evacuations none are so important, or so extensive, and none free the body from so many impurities as the function in question.

Perspiration is a subtle, invisible vapour, continually flying off from the surface of the body, though ever so well protected by clothes, and is found to contain several excrementitious substances. For the discovery of the nature, importance, and extent of perspiration, we are indebted to the celebrated Physician Sanctorius, who established, by the labour of thirty years, the existence of this discharge beyond the possibility of doubt, and whose doctrines have since been sanctioned by the experiments, and supported by the authority, of many able men.

It appears that a considerable discharge takes place habitually from the skin though in a form not perceptible to our senses. This has been called insensible perspiration, and it may be demonstrated by holding a highly polished metallic surface to the skin, when a watery vapour collects upon it and clouds it. Under ordinary circumstances the whole discharge is evaporated, and passes off in this invisible form.

When this secretion is increased by any cause, as by violent exercise, it becomes sensible perspiration and is commonly denominated sweat. This, as I have observed, is only an increased quantity of the same kind of fluid, as the insensible perspiration, very small particles are observed on the skin, and they unite into larger drops.

Heat; as it is the most powerful means of exciting the action of the heart and arteries on which this phenomenon depends, is the most common cause of sweating: strong bodily exercise, warm food, and other causes produce the same effect.

The quantity of the cutaneous discharge cannot be easily ascertained, but it may be supposed to be very great, as it is constantly going off through innumerable pores every where spread over the surface of the skin.

When to this we add the extent of the exhaling organ, and the quickness with which we can see the perspiration produced, we shall expect to find the discharge very considerable. Sanctorius has computed its quantity, in the warm climate of Italy, to be equal to five-eighths of the substances taken. In this estimate he has not been followed by other experimenters, and it seems probable that it varies according to the temperature of the climate. In other climates as in England, Ireland, and even South-Carolina, according to the experiments of Dr. Lining, the quantity of urine is greater, and of course less is discharged by the skin.

We may be safe in stating, that in a person of middle stature, and in perfect health, the quantity of perspiration will vary from three to four, and even five pounds in the twenty-four hours.

The importance of this secretion may be judged of from the uneasy feelings produced by its suppression, and from the number of diseases which originate in, or are aggravated by an interruption of its free discharge.

A few words upon the nature of this secretion will close what I have to say upon this subject.

From the very insensible manner in which it escapes from the skin, there is some difficulty in collecting it in sufficient quantity for examination. It seems to be in a great measure aqueous, holding in solution several salts, the excrementitious matter of animal substances, and sometimes acids. It possesses sensible properties, causing the peculiar odour of the body, which is very remarkable in particular individuals, and possessing peculiar characters in some races of mankind.

Having premised these observations, I shall enter upon the consideration of Diaphoretics.

The medicines of this class increase the deficient discharge by the skin, whether in the form of insensible perspiration or by sweating.

In the common language of writers, the term Diaphoretic is applied to those medicines only which promote the insensible perspiration, or the slightest degree of moisture in the skin, and those which occasion sweating, they distinguish by the term sudorific.

But as in the medicines arranged by authors under these titles, we can find no difference, except in the degree of activity, or what arises from the manner of administration, we may comprehend the whole under the title of Diaphoretics.

The action of Diaphoretics may be arranged under three heads.

1st. Those which operate by exciting the action of the heart and arteries.

2d. Those which operate by producing a relaxation of the cutaneous vessels.

3d. Those which are local in their operation, or which are applied to the surface of the body.

Diaphoretics produce their effects in the first place by increasing the general force of the circulation.

By this means the blood is propelled more forcibly into the minute vessels, and the secretory process is thereby promoted. Under this head are included all the stimulating Diaphoretics, and they appear to produce their good effects by evacuating the watery part of the blood, and lessening the quantity in the circulating system, thereby acting as depleting remedies. They also fulfil other indications, for by determining the blood from the internal parts to the surface, they relieve local congestions, remove the spasmodic structure of the cutaneous vessels, and render the skin moist and relaxed.

Although, "every stimulant, may, under certain circumstances, produce sweating, simply by increasing the action of the heart and arteries, yet it must not be supposed that the stimulating Diaphoretics act solely by giving a general increase of momentum to the blood, since many of these remedies undoubtedly possess a peculiar tendency, not only to determine the circulation to the surface, but also particularly to excite the activity of the perspiratory vessels."—*Eberle.*

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ble, that it does vary according to the temperature of the climate. In other places, as England, Ireland, and even South-Carolina, according to the experiments of Dr. Lining, the quantity of urine is greater, and of course less is discharged by the skin. It may with safety be stated, that in a person of middle stature, and in perfect health, the quantity of perspiration will vary from three to four, and even five pounds in the twenty-four h

The importance of this secretion may be judged of from the uneasy feelings produced by its suppression, and from the number of diseases which originate in, or are aggravated by an interruption of its free discharge. The nature of this secretion.

Of the means by which it is excited—1. Agents which increase vascular action. 2. Agents which relax the cutaneous vessels. 3. Agents applied to the surface. Remarks upon these divisions, and the circumstances under which they become useful and proper. Efficacy of these articles improved by their union.

As it is of importance in many diseases to produce Diaphoresis, some rules may be laid down for their exhibition, and for these I am partly indebted to Dr. Chapman's Therapeutics.

Rule I. During the exhibition of Diaphoretic medicines, it is most beneficial that the patient be confined to bed, and in some instances it is essentially necessary.

Rule II. The pulse and temperature of the skin, are to be carefully watched. If the pulse be active, or the heat very great, Diaphoresis cannot be induced until they have been lowered by venæ section or other depletions, which should not be omitted unless contra-indicated. This rule is of the utmost importance, since diaphoresis can never be advantageously excited until the inflammatory action of the system has been reduced. The medicines of this class are, let it be understood, secondary remedies, and are resorted to when more vigorous means have failed, or cannot further be persisted in to subdue disease. When employed at a proper period they are of the utmost benefit, since they not only act as evacuants, but by determining the fluids to the capillaries they relieve the larger vessels. The strength of their impression will be adapted to the existing action, which they may change or subdue, while they will be wholly inefficient at an earlier period.

Rule III. While under the operation of a Diaphoretic, diluent drinks must be employed, unless the stomach be very irritable, or unless the antimonials have been exhibited, for in either case they may induce vomiting. The temperature of the drinks must depend upon that of the surface, for if the skin is very hot cold drinks are preferable, if the skin is cold and the system feeble warm drinks are to be preferred.

Rule IV. After the perspiration has subsided, the patient's linen should be changed, and he should be removed to a dry bed, or a dry part of the bed. The clothes under such circumstances become highly offensive, and in addition tend much to check the perspiratory process.

Rule V. Guard against a sudden suppression of perspiration. This rule is of great importance, whence it is often necessary to watch patients while asleep. I have more than once known relapses to take

place from this cause, which had very near proved fatal. One instance in particular occurs to my mind, in which a female labouring under a Pulmonary affection, had her symptoms suddenly aggravated by the bed-clothes falling off when asleep, and while perspiring freely.

RULE VI. Avoid Cathartics during the administration of Diaphoretics, for it may suppress perspiration by a revulsive action, and will render necessary a frequent exposure to cold.

RULE VII. Avoid during the use of Diaphoretics those medicines which increase the secretion by the kidneys. These last directions are but little considered in ordinary practice, it being very common to hear of medicines being directed with a view to a cathartic and diaphoretic operation, or a diuretic and diaphoretic action. Physicians too often flatter themselves, that they can accomplish more than is compatible with the laws of the animal economy. The functions to which I have reference, are always opposed to each other—whatever will excite one will diminish the other.

RULE VIII. When long continued perspiration is requisite, as in chronic rheumatism, flannel should be substituted for linen next the skin; without this it will be impossible to keep up a uniform and constant perspiration.

Application of Diaphoretics to diseases—In Intermittent, Remittent and Continued Fevers—In affections of the bowels—In Catarrhs and Pulmonary diseases—In Rheumatism, Dropsies, &c.

Particular Diaphoretics, and such as increase arterial action.

Family *Papaveraceæ*—Papaver Somniferum—Poppy. Effects of Opium upon the nervous und vascular systems. The diaphoretic property of opium, is intimately connected with the power it possesses, of stimulating the action of the heart and arteries, and that in a manner corresponding in its effects with other stimulants upon the healthy body. That opium is stimulating, is evinced iu its producing vigour of body and cheerfulness of mind, in its exciting passion and emotion, in inducing watchfulness, dissipating sadness, and inspiring resolution. When taken in immoderate doses, occasioning giddiness, imperfect speech, full pulse quick breathing, nausea, vomiting, convulsions, and death—in all these respects it is strongly allied to other articles, which are indisputably stimulant.

The influence of opium is particularly exhibited on occasions where great mental exertion is required.

To these, we must add the practice of taking opium, so common among the Persians and Turks.

If we examine the effects of opium in certain diseases, we shall find new proofs of its stimulating qualities. Do we not see it recommended every day in those of the greatest debility?

To obtain its diaphoretic operation it is seldom employed alone, but is combined with various articles—as the Antimonial preparations—Ipecacuanha—Calomel. These combinations useful in Inflammatory diseases after depleting measures have been freely pursued. Under these circumstances, symptoms of irritation often succeed, which symptoms

are relieved by opium, and with peculiar good effects when united with the above—combined with calomel particularly, an anti-inflammatory operation is exerted.

Dose 1 gr.

Family *Laurineæ*—Laurus Camphora. Camphor is obtained from two species of trees. The one called Laurus Camphora, a large forest tree, which grows wild in the islands of Borneo and Sumatra. Every part of the tree gives out a strong smell of Camphor, and the wood is much sought after as a material for chests, drawers, &c.—because its peculiarly aromatic smell, renders it impenetrable to ants and other destructive insects. The oldest trees are the best, and the camphor is found in perpendicular veins, near the centre of the tree, or concreted in the knots of the wood.

Method pursued by the natives to separate the camphor from the trunk and branches of the tree.

The other species of Laurus which yields camphor grows in Japan, but does not afford the article so plentifully, nor so good as the first.

Camphor is also obtained from a tree of another genus, the Dryobalanops Camphora, which grows to a great height in the forests on the coast of Sumatra.

In the state in which it is imported into Europe, it is impure. It is of a greyish colour, in small grains, contains much dust, and foreign substances. It is refined before being used. The process consists in uniting thirty to fifty parts of quick-lime with the impure camphor, and submitting the mixture to sublimation.

Camphor is obtained from various aromatic plants and essential oils. Differs from that obtained from the Laurus Camphora—Qualities, and operation of this article on the system. In its operation on the system, this article is somewhat peculiar. In its sensible properties it is, doubtless, stimulant, but it appears to exert but little action on the pulse. It soon produces a strong tendency to perspiration, without the pulse being sensibly affected in quickness. On this account in Febrile affections, accompanied with a dry contracted skin, it is often employed with other articles, even when the excitement would seem to forbid it.

United with Tartarised Antimony, and Calomel, a speedy and effectual relaxation of the skin takes place, with copious perspiration. In place of Calomel the Nitrate of Potash may be substituted, and good effects will often result—Vide Formula. Opium united with camphor, has its diaphoretic operation increased, while the disagreeable consequences which so often follow the use of the former, in some constitutions, are obviated.

German or Camphor practice in the treatment of Cholera.

Exhibition of Camphor—Formula.

Dose ij to viii grs.

The effects of Camphor in a very large dose—ʒii to ʒiii detailed.

Carbonate of Ammonia. Preparation. It is formed by the double decomposition which takes place from the union of Muriate of Ammonia and Carbonate of Lime—the carbonic acid uniting with the ammonia and the muriatic acid with the lime—muriate of lime being formed

and remaining in the retort, while the carbonate of ammonia passes over and concretes on the sides of the receiver. Properties.

Seldom employed in this state as a diaphoretic: but united to vinegar, whereby an acetate of ammonia is formed and held in solution, it is of much utility, and may be beneficially employed when required as a diaphoretic and febrifuge—Employed in fevers generally with this advantage, that it will often be retained on the stomach when most others would be rejected.

Dose ℥ss every hour.

Family *Synanthereæ*—Eupatorium Perfoliatum—Thoroughwort—Indigenous—Natural History—Properties—Employed as a diaphoretic in fevers in the form of infusion.

ʒii to ℥ss in a quart of boiling water. Dose ℥ss to ℥ii

Family *Apocyneæ*—Asclepias Decumbens—Pleurisy Root—Indigenous—Natural History—Employed in diseases of the pulmonary system—Promoting expectoration—relieving the breathing, &c. Given in the form of an infusion.

℥ss of the root to 1 qt. water. Dose, a tea-cup full.

Family *Aristolochiæ*, Aristolochia Serpentaria—Virginia Snakeroot—Indigenous—Natural History—Properties—Employed in the advanced stages of fever, attended with Typhoid symptoms, alone, or in combination. Formula.

ʒi to ʒii in a pint of boiling water. Dose ℥i.

Asarum Virginicum—Heart Snake Root. Indigenous. Natural History. Employed as the preceding.

Asarum Canadense, or Wild Ginger—Indigenous. Natural History. Employed as the preceding.

Family *Araliaceæ*—Aralia Spinosa—Prickly Ash—Indigenous—Natural History. Employed in Rheumatism, and in the formation of Diet Drinks.

℥i of the bark of the root to 1 pint spirits. Dose ʒi to ℥ss repeated.

Vegetable Alteratives.

Family *Rutaceæ*—Guaiacum Officinale. Natural History. The tree from which the gummi resinous substance so commonly met with, is obtained, is a native of South America, and the West-India islands, and grows to a considerable size. The wood is extremely ponderous and solid, very resinous, of a blackish yellow in the middle, and of a hot aromatic taste. From its possessing the properties of the gum resin, though in a less degree, it has been employed in medicine, and as an ingredient in decoctions and diet drinks, which were at one time much celebrated in several diseases of the system, particularly in syphilitic affections. It yields in its efficacy to the extract or gum.

The Gum Guaiac is obtained by wounding the bark of the above tree, from which it exudes in a considerable degree, and when a sufficient quantity has been discharged and hardened by exposure to the sun, it is gathered and packed in small kegs for exportation. Properties.

Medical Uses. The Guaiac was originally introduced into Europe from its supposed efficacy in curing Lues Venerea. For some time it continued to be employed as the chief remedy, and it is difficult to reject the testimony of its efficacy in curing these complaints. It is not employed at the present time in the treatment of this disease in the early stages, but in what is called the sequelæ of the disease, it will be found very useful. It rarely happens that it is employed alone, but combined with other alteratives in the manner which will be detailed. It is also employed advantageously in Chronic Rheumatism, and in Cutaneous diseases. In Dysmenorrhœa—In Rheumatism, &c.—Formula. Forms of administration.

Decoction of the wood prepared by boiling ʒi to ʒii of the shavings in ℔iii of water, reduced to ℔ii—a pint or more to be taken daily in divided doses.

Gum Resin administered in the form of powder—grs. x to ʒss
Tincture ʒii to ʒvj

Family *Thymeleæ*—Daphne Mezereon—Natural History. Possessing similar properties with the preceding article, it has been employed in the same diseases. It is not trusted to alone, but is combined with other alteratives.

Family *Asparagineæ*—Smilax Sarsaparilla—Natural History—Properties. This article was brought into Europe so late as the year 1530, with the character of being a specific for Lues Venerea, in which disease it had been employed by the Indians with considerable success. It has fluctuated much, in the opinion of Medical men, and at the present time its real virtues are better known and appreciated.

In proceeding to speak of this article, I would observe that the remarks made, will not have reference to the Sarsaparilla alone, but they must be understood as applying to it in its various states of combination. By itself, it is highly useful, but the good effects derived from this and other similar articles, as the guaiacum—mezereon—sassafras, &c. are greatly increased by combination with each other. It is therefore of the combinations of this article, contributing as they do, to their increased activity, as well as to the greater convenience of administration, that the practical remarks I shall make, will apply.

Sarsaparilla and its combinations are admirably adapted to the secondary stages of Syphilis. The secondary forms of this disease exhibit themselves in the most painful, loathsome, and mortifying affections of the human body. Originating as these diseases do, not in single acts of folly, or the weakness to which human nature is subjected, but in a continuance of excesses, dissipation, and disease, those who are subject to them, exhibit most frequently in constitution and appearance, a body impaired in its energies, crippled in its faculties. Mercury, alone, in a constitution like the one I have described, cannot be endured. Its stimulating, or rather irritating operation, under these circumstances, aggravates all the symptoms—harrasses the patient, and superinduces the most distressing consequences. Sarsaparilla, and the vegetable alteratives, combined with very minute quantities of the per Chloride of Mercury, in the manner I shall point out, forms a preparation freed

from the objections just made, and a medicine well adapted to the disordered states of the constitution, now under consideration. It will be found excellent in restoring the appetite, strength, and flesh of the patient.

It will complete the cure of ulcerations of the palate, throat, and mucous membrane of the nose—skin, and other parts. It will relieve nocturnal pains of the limbs, painful enlargements of the joints—of the bones, membraneous nodes, cutaneous ulcerations, &c.

It will efface the blotches, foul spots, stains, &c. which in a constitution of this character so frequently occur from slight irritations, or which remain after the ulcerations have healed.

It will remove that morbid condition of the solids and fluids, which disposes every injury, however slight, to degenerate into a festering, painful, scabby ulcer.

It will, in short, so improve the digestive and assimilating operations of the system, that a more healthy blood and more renewed fibre will be substituted for the defective conditions of the one and the other, and thus fully support the character bestowed on these medicines, of being essentially alterative. To accomplish these objects, this class of medicines must frequently be long and perseveringly employed. It cannot be supposed that these great and important designs can be effected with a few or lengthened repetitions of these substances. To their continued use, occasionally other alteratives should be added—as diet, change of climate, a long sea voyage, travelling.

Sarsaparilla, and its combinations, will be found useful, not only in what is called syphilitic rheumatism, but the chronic forms of ordinary rheumatism.

It will be found useful in various affections of the skin, pustular, papillary, herpetic. Under the last, I would consider not only the affections properly so called, but that very troublesome disease Tænia capitis, which, when long existing, refuses to yield to local remedies, and requires the aid of such as are constitutional.

The combinations of which I am speaking, will be found useful in the chronic ulcerations, of such frequent occurrence in the laboring and poorer classes of society. The tonic and alterative impressions excited, contribute to the rapid and sucsessful operations of granulation and cicatrization. From the remarks I have made upon these articles, you will be convinced that I repose no small confidence in their virtues—and with the opportunities I have had of prescribing them, in constitutions impaired and debilitated from diseases and excesses of various kinds, in habits vitiated from a scrofulous or venereal taint, or from the injudicious use of Mercury ; the relief which, in many instances, has been afforded, fully entitles them to these commendations. I might say more, but I shall probably be charged with extravagance. I trust I have said sufficient to direct your attention to their virtues and efficacy.

Preparations of this article. Sarsaparilla yields its virtues very readily to boiling water, but that the whole of its active and extractive matter be obtained, it is necessary that the boiling be continued a considerable

time and in a close vessel. The preparations which are, or have been, in vogue, are the Simple Decoction—Compound Decoction—Syrups, and Extracts.

Simple Decoction prepared by boiling.

℥ ij of the roots in four pints of water four hours, in a vessel lightly covered and placed near the fire; then taking out the roots, bruising them, returning them again into the liquor; macerate in a similar manner for two hours more, and boil to two pints and a half—strain. Dose, 1 pint daily.

The Compound Decoctions are prepared by combining with the sarsaparilla other articles, as the shavings of the wood of guaiac, bark of sassafras, liquorice root, bark of mezereon root—water. This is the Lisbon diet drink, and for the proportions and manner of preparing, I refer you to the Dispensatories.

A preparation superior to the Lisbon diet drink, is the following—Vide Formulæ.

These preparations though valuable, will not be persisted in by the patient for any length of time. From the delicacy of the stomach, or the captiousness of the invalid, large and repeated draughts of these medicines will not be taken. That the remedy may be persisted in, it becomes necessary to present it in a more agreeable form. This is done by increasing the quantities of the ingredients, continuing the decoction longer, forming a fluid extract, and combining sugar and treacle so as to form a syrup.

The first preparation introduced into general notice under this head, was that prepared by Swaim, and called Swaim's Panacea. There can be no doubt that it is a preparation of sarsaparilla, with other of the vegetable alteratives, reduced to a concentrated state by boiling. When thus reduced, treacle or sugar is added, and a syrup formed. In this preparation some advance has been made, and to the vegetable, the mineral alteratives have been added. The mercurial preparation used, is the Perchloride of Mercury or Corrosive Sublimate. This article may have been selected from its activity, the smallness of the quantity required, the difficulty of detection, and its seldom salivating. The union of these articles, has placed us in possession of a preparation, more active, more agreeable to the taste, and more convenient for administration. I shall not recommend to you the use of this medicine for several reasons, and because with a little industry you can be possessed of a preparation free from all objections, and with the operation of which in the diseases I have mentioned, you will be well pleased—Vide Formulæ.

Other preparations of sarsaparilla are simple fluid extracts, and compound fluid extract. By the agency of steam the active matter of this, and other articles has been concentrated, in a very great degree, and very neat and useful preparations furnished.

Sarsaparilla Syrup.

An alkaline principle has been obtained from this root, to which the term Parillina, or Sarsaparilline, has been given.

In selecting the roots, it will be right to choose such as are plump, not carious, or too dusty on breaking, and which split easily longitudinally.

Substitutes for Sarsaparilla.

Family *Asparaginæ*—Smilax Herbacea—Indigenous.

Smilax Pseudo China—or China Briar—Indigenous—Natural History. The root cut into small pieces is much employed in decoctions and diet drinks. It is possessed of some acrid properties, and on this account it often acts as an emetic when the decoction is too strong. I have employed it very frequently.

Family *Ulmaceæ*—Ulmus Fulva—Slippery Elm—Indigenous—Natural History. The bark of the tree, and of the branches employed. It is given in the form of a decoction, prepared as directed in the Formulæ.

The decoction when properly prepared, is of a clear brown colour, not unpleasant to the taste, and contains a considerable proportion of amylaceous and mucilaginous matter.

Administered in the quantity of a pint a day, it appears to increase the insensible perspiration, to restore the appetite, improve the tone and powers of the digestive organs, and to strengthen and invigorate the general system.

[*b*] *Diaphoretics which produce psrspiration by relaxing the cutaneous vessels.*

Antimonial Preparations—Tartarised Antimony. Promotes the excretions. This property supposed to be connected with the production of nausea—Nausea not essential, but perspiration is the result of a direct and specific action upon the vessels of the skin; to this must be added its sedative and febrifuge operation, properties which particularly adapt it to the excited stages of disease—Combinations. Formula.

Dose, 1.6 gr.

Pulvis Antimonialis. It is prepared by calcining together, equal weights of sulphuret of antimony, and hartshorn shavings, until the matter becomes of a white colour, forming a protoxyde of antimony with phospate of lime. It is frequently an inert article, from carelessness in the preparation. Its inertness is owing to the following circumstances:

1. To the Peroxide of Antimony being formed instead of the Protoxide. The Peroxide is comparatively inert, requiring to be given in larger doses, to produce the same effects which result from small doses of the Protoxide.

2. In the second place, it may contain a large portion of the Phosphate of Lime combined with it, which also is an inactive substance.

Employed in febrile and inflammatory affections—in determinations to the head; and when the article has been properly prepared is decidedly useful.

Dose, iij to v grs.

Kermes Mineral and Golden Sulphuret of Antimony—Preparation—Of more uniform strength and equal activity.

Dose, ii to v grs.

Ipecacuanha—Diaphoretic—In small doses useful in Catarrhal and Pulmonic Affections—diminishing the mucous secretion in some cases, and in others exciting it when deficient; useful in other increased discharges from the mucous membrane, as in diarrhœa and dysentery.—Given in small doses alone, or combined with opium and the sulphate of potash, as in the Dovers Powder.

Dose, ss to ij grs.

Dovers Powder, v to x grs.

Nitrate of Potash—Saltpetre—found native and prepared artificially—Properties: to increase its powers, usually combined—as with Tartarised Antimony, or Tartarised Ant: and Calomel, forming the Nitrous and Antimonial Powders—Formula. The *Crystals* of this Salt sometimes mistaken for Glauber Salts—Effects of a large dose—Symptoms—Treatment.

Crystals of other articles, which may be mistaken for each other; Sulphate of Zinc for Sulphate of Magnesia; and the last, for the crystals of Oxalic Acid; Antidotes of Oxalic Acid—Lime—Magnesia—forming an insoluble Oxalate of Lime.

Carbonates of Soda and Potash—Given in the form of Neutral mixture and effervescing draught—Formula.

Soda Powders.

[c] *Agents applied to the Surface.*

Regulated by the condition of the skin—When excited, cool air, cold applications, sponging with spirits, vinegar, &c.

Cold Bath.

Effects of cold water when applied to the excited surface. The nervous system experiences a great and sudden impression—Vascular action is diminished—Morbid heat reduced—the cooling process of perspiration instituted. Employed in febrile diseases when there is no sense of chilliness present—when the heat of the surface is steadily above what is natural—and when there is no general or profuse sensible perspiration. Manner of employing the Bath. The most salutary consequence which follows the proper use of this powerful remedy, is the production of a profuse and general perspiration, and this is the result partly of the sudden reduction of animal heat to its natural standard, but principally of the great reduction produced throughout the whole of the circulating system, by means of the violence of the shock. It is this circumstance that appears to give so much advantage to a general effusion of cold water, in fevers, in preference to any partial application. The application of cold in any way to the skin during the hot stage, whilst it diminishes the animal temperature, takes off the parching thirst, lessens the hurried beat of the pulse, and renders it slow, full and regular. It likewise removes that restlessness, and wandering of ideas, which precede a complete delirium, and occasions a sound and easy sleep. Various instances are to be found in the records of medicine, of persons

when under the delirium of fever, having thrown themselves into cold water, in almost all of which it is mentioned as very extraordinary, that the patients when taken up were perfectly in their senses, and speedily recovered from their disorder. Of these cases a great number have occurred at sea, where it is evident accidents of this kind are most likely to happen. From what has been said, the explanation is very easy, and the remedy may be considered a very natural one. In acute fever, therefore, the object of the cold bath is to lessen the heat of the body, to bring on universal perspiration, to diminish action in the circulating system, and thereby to occasion a state of repose of body and mind, and sound sleep. These objects are fully accomplished in the hot stage of our Yellow Fever, of the Bilious Remittent or Country Fever, of Intermittents, of simple Continued Fevers, &c., in all of which I have employed the bath with the most gratifying effects.

The period for using the bath, should not be the very first paroxysm of fever; but after depleting remedies have been employed, without diminishing the action of the system, when from their continuance they threaten dangerous consequences, or are not likely to yield to the ordinary modes of treatment; then the bath is to be resorted to. Hence, therefore, every case of fever will not require it, for in the majority of them, our usual remedies are capable of making an impression. It is only in the more inveterate fevers, such as by their violence threaten disorganization, or the derangement of parts upon which they fall, that the most powerful remedies must be brought to our assistance. Used with the precautions I have mentioned, the bath is perfectly safe, and will be found efficacious in subduing excitement for a time.

When the paroxysm returns, or the excitement is renewed, it is again to be resorted to; but in the meantime such remedies as the case requires are to be pursued, and our forces thus combined will often be successful, and that, too, speedily.

One of the advantages of the bath is, that it does not interfere with any plan of treatment, and in many instances it will promote their operation. The common impression that cold drinks and cold applications are inadmissible during the use of mercury, is highly erroneous, and when this medicine is employed with a view to excite ptyalism in fevers, the bath will be found an excellent adjuvant. It lowers and subdues action, and so far renders the system more susceptible of the mercurial impression.

Improper in Febrile affections with determinations to the lungs or limbs—but employed with great advantage when the head is affected. In the latter case, when general effusion may not be deemed proper, the utmost benefit will be experienced by pouring water from a small height upon the head for five or ten minutes.

The skin being in an opposite condition, and the functions of the system feeble—*Tepid and Warm Bath.*

These terms are applied to water varying from 85 to 96 and 98° Fahrenheit.

The warm bath, from its stimulating operation upon the vessels of the

skin, has a peculiar tendency to alleviate any local irritation, to remove morbid congestions of the circulating fluids, and therefore to be more peculiarly applicable to the advanced stages of fever, when in addition to the impaired condition of the vital energies, there is added accumulation of fluids upon particular organs. It is applicable to weak and irritable constitutions, which the shock produced by the cold immersion would overpower, and which have not sufficient vigour of circulation for an adequate reaction. By the relaxation it produces perspiration is excited, and hence it is used with impunity in cases where the animal heat is already too high. Diseases in which it is applicable.

Vapour Bath.

It consists of a chamber into which the steam of boiling water, either simple or medicated, is conveyed through pipes from a common digester, or steam boiler. The patient is seated on a chair, and the vapour ascends through a perforated plate at the bottom, which soon envelopes the body, and is taken into the lungs.

In this apparatus the stimulant power of heat is modified and tempered by the moisture united with it. Its heating effect is further diminished by the copious perspiration which ensues.

Utility of this application in several diseases.

Jenning's Instrument described.

Minor Means.

Division VI.

DIURETICS.

Medicines which promote the secretion of Urine.

This is effected by such substances as are known to exert an action upon the kidneys. Their office in health seems to be, to relieve the vascular system from any distension, from too large a quantity of fluids being carried into it, as well as to convey through the urinary passages, such fluids as having served the purposes of the animal economy, have become useless. In disease these happy arrangements are broken up, and in some diseases, particularly in those in which swellings occur in various parts of the body, the superfluous fluids instead of being carried off by the natural passages, become effused in the several cavities of the body. It becomes therefore desirable, that we should be informed, how these organs may be stimulated to a new and more active secretion, in order that these depositions may be removed, and the gland restored to a more healthy state. The secretion of urine is promoted in several ways.

1. By increasing the quantity of water in the mass of blood. Under this head it may be observed, that if much fluid is taken into the stomach, and thence into the mass of blood, it must necessarily pass off by one of the excretories of the body, as the skin, or kidneys, and we commonly find, that an increase in the quantity of drink, is attended with a

proportional increase in the quantity of urine secreted—accordingly this increase of drink has always been considered the chief of diuretics.

There are certain states of the body, in which it may be doubtful, whether this means of increasing the secretion of urine, can be safely employed, as in the well known disease Dropsy.

Much has been said in favour of the practice, and cases related of cures being effected by strict abstinence. Others again condemn this course, and among them, the testimony of Dr. Cullen is very decisive. It is a practice very difficult to enforce, for in few diseases is the demand for drink more urgent.

The utility of drinks in Dropsy, is fully supported by experience, and by authority, and we must consider it a fortunate circumstance, that what is so useful, corresponds also with the desires of the patient.

2. The second mode of increasing the action of the kidneys is, by introducing into the system such articles as are stimulatiug to them. The manner in which this division operates, is more easily understood, as in this way we may suppose a direct application is made to the secreting vessels of the urine, and that thereby action is excited, and a more copious discharge produced. Most of the saline diuretics operate in this manner. They are received into the circulating mass, are brought to the kidneys in the course of the circulation, and a larger quantity of fluid is secreted. Nitrate of Potash, and the fixed alkalies are of this nature, and the various preparations of them, as the Acetate, Bi Tartrate, Carbonate, &c.

Some vegetable substances, as turpentine, garlic, &c., pursue the same course, and experience proves, they produce the same results.

3. The third mode in which diuretics operate, is by increasing the action of the absorbents. This is no doubt effected by the impression of a class of medicines upon the stomach, and by this impression nausea and diminished action of the arterial system takes place. It would appear that these systems act in an inverse ratio, so that whatever diminishes one, is followed by augmentation in the functions of the other. Squill, Digitalis, and Tobacco, are of this class. There is no proof that they are taken into the system, and they operate very peculiarly upon the stomach.

The action of the absorbents is increased by medicines which produce a cathartic impression upon the bowels, by increasing the action of the exhalents directly, and that of the absorbents indirectly. Hydragogue cathartics are of this character.

The action of the absorbents is increased, and diuresis produced by medicines which increase the tone of the body in general. When dropsy is the consequence of debility, as after fevers, &c., any tonic, or even nourishing diet, may have diuretic effects.

The action of the absorbents is increased by medicines which exert a stimulant impression upon the system. Of this description is mercury, and other stimulants, which seem to do good, by exciting the action of the different excretory organs, as the skin, the bowels, the kidneys.

After all, however, that has been said, many of this class are very inefficacious, and it is the common imperfection of the whole, to be very

uncertain in their operation. Sometimes the more feeble will succeed, when the stronger have failed, and often after every variety of kind and combination has been tried, the secretion of urine remains unaltered.

Diseases in which Diuretics are used.

Employed principally in Dropsy, in nepritic and calculous affections, in Gonorrhea. In chronic affections of the lungs, as asthma, dyspnœa, chronic catarrhs, &c., diuretics afford relief.

To ensure to this class greater certainty, I will subjoin a few rules, which may be important in their application.—

RULE I. The diuretic effect of articles generally, cannot be obtained, should they produce any disturbance of the bowels, the cathartic and diuretic action of medicines being opposed to each other.

RULE II. In the administration of diuretic medicines, it is equally necessary to attend to the state of the skin. If during their administration these vessels are excited by external warmth, their action is diverted from the urinary organs to the exhalents on the surface, and occasions diaphoresis. To produce a diuretic effect, the surface should be kept cool.

RULE III. Diuretics should not if it can be avoided, be administered to a patient in bed.

RULE IV. When the full effect of the medicine is required, give diluent drinks freely.

Utility of combining Medicinal forces in this class.

In preceding remarks, I have frequently alluded to the combinations of medicines. There is perhaps no class in which a combination of two or more substances, possessing similar powers, is so frequently important as in diuretics.

Thus the use of Potash joined with bitter vegetable infusions, is recommended by Sir John Pringle as an efficacious medicine, and I have derived great advantages from uniting the Bi Tartrate of Potash with an infusion of Quassia.

The alkaline substances by acting upon the bowels, are often prevented from reaching the kidneys, so their diuretic effect may often more certainly be secured, by giving an opiate at the same time, according to the practice of Dr. Mead.

A combination of squill, with digitalis, and some of the less purgative preparations of mercury, as the blue pill, is occasionally very active in its diuretic operation, and in children, or in old and feeble people, the union of the sweet spirits of nitre with infusions of the vegetable tonics, appears to be often very serviceable.

PARTICULAR DIURETICS.

[*b*] *And such as operate by stimulating the secretories of the Kidney.*

Preparations of Potash—Sub-carbonate of Potash—Preparation—Best adapted to cases connected with acidity of the first passages—Com-

bined with an infusion of Vegetable Tonics, its effects are best promoted.

Dose, ℈i to ʒss

Acetate of Potash—An article formerly much esteemed, but not much employed at the present time.

Bi Tartrate of Potash, or Cream of Tartar—Preparation—Very useful article, and employed in all the forms of Dropsy, but chiefly in ascites and anasarca—Experiments of Home, Ferriar, and Manghini. To obtain success its use must be persisted in for some time—either given alone or in an infusion of Quassia or other Tonics. It sometimes happens that it disorders the stomach and bowels, when its use must be intermitted.

℥ss to ℥i largely diluted with water.
Dose, a small cup full.

Adulterations. This article is frequently adulterated, sometimes with white silicious pebbles, bruised into small fragments, sometimes with Tartrate, and Sulphate of Lime.

Nitrate of Potash—Properties—Employed in Tonic Dropsies. Given largely diluted.

ʒi to ʒiii dissolved in water, or cider, and this taken in small doses in twenty-four hours.

The above salts, those combined with vegetable acids, it is proper to observe, do not enter the circulation in the form of Acetate or Bi Tartrate of Potash. The digestive organs have the power of decomposing the salts, into which the vegetable acids enter as ingredients, and of eliminating their alkaline bases, so that the alkaline substance enters the system, probably combined with carbonic acid. The compounds with the mineral acids are not affected in the same manner, so that they enter the circulation in their combined state.

Spiritus Ætheris Nitrosi—Dulcified Spirits of Nitre—Preparation—Properties—Adapted to Children—Usually combined with other articles.

Dose, infant, viii to x m.
Adult, ʒi to ℥ss.

Diuretics, which to a local, exert a stimulant operation on the system generally.

Tinctura Cantharidum, or Tincture of Cantharides—Natural History of Cantharides—Manner of collecting and preserving them—Analysis—Effects upon the organic structures of the body and particularly the urinary—Employed in the Atonic forms of Dropsy—In Dropsies succeeding Scarlatina; in local diseases of the Urinary and Genital organs; in incontinence of Urine; in Gleets and long protracted Gonorrheas; in Leucorrhea; Impotence.

Dose, xv to xx m, to ʒi and ʒii—increased to the extent of producing irritation of the urinary organs.

Urea—Preparation; Diuretic operation considerable.

Dose, xv grs. to ℈i.

Family *Coniferæ;* Pinus Palustris; Oleum Terebinthinæ; Prepara-

tion; Effects upon the system; Applied to the same disease as the Tinct. of Cantharides.

Dose, xv to xx m, increasing.

Family *Leguminosæ*—Copaifera Officinalis—Balsam Copaiva—Natural History—Analysis—Term balsam incorrect, being a compound of volatile oil and resin—Irritating operation upon the stomach and intestinal canal.

Effects upon the urinary organs—Diseases in which employed—In Dropsies—but in these cases not entitled to particular consideration. Employed in Chronic Catarrhs—Humid Coughs, and the Chronic affections of the pulmonary organs—In diseases of the Genital organs—Gonorrhœa, Gleet, Leucorrhœa. In curing Gonorrhœa, this substance acts in two modes. By the irritation it excites upon the surface of the intestinal canal, and the copious evacuations following, it reduces the general excitement of the system, and acts also by a revulsive operation.

On the particles being absorbed, and the urinary secretion being impregnated, it changes the morbid action of the diseased part, and substitutes a medicinal impression, which is readily cured, for that of the disease of the membrane of the urethra. Upon this principle other diseases are frequently subdued—Examples.

Upon a like principle this article has been employed in protracted diarrhœas and dysenteries. Given in these cases in doses of twenty drops, combined with eight of Laudanum every four hours, in a table-spoonful of mucilage, or cinnamon water.

Forms of Exhibition—In Drops, taken on sugar, or any aromatic tincture, or what is far preferable, in a table-spoonful of sweet-orange juice.—In Emulsion—Combined with the Tincture of Cubebs—In pills rubbed up with Calcined Magnesia—In Enemata.

Formula—Preparations—Volatile Oil—Resin—Consolidated Balsam. Adulterations. This oleo-resin is easily adulterated with the thinner oils, or with turpentine. The detection of the fraud is often difficult, on account of the potency of the smell and taste of copaiva, which covers almost every other. M. Bucholz asserts, that if it does not dissolve in a mixture of four parts of alcohol and one of ether—that it is adulterated.

Dose, xx m to ʒi.

Family *Polygaleæ*—Polygala Seneka—Natural History—Properties much diversified—These enumerated—As a diuretic has been much extolled by several physicians, as Milman, Hartshorn, Percival. It is not very efficacious employed alone, but requires the co-operation of other articles, as the Nitrate of Potash—super. Tartrate of Potash—The states of the system to which it is best adapted.

Besides Dropsy, the Seneka has been recommended in high terms in Croup, and as an Expectorant in Pneumonia and Pleurisy.

The period in these diseases, in which it should be employed, is after the Inflammatory symptoms have abated, and the patient is harrassed with a dry cough, difficult expectoration, with slight feverishness, and a constricted skin. Under these circumstances, a decoction of the root will be found to afford great relief.

Decoction, prepared by boiling ℥ss of the root in a pint and half of water to one pint.

Dose, ℥ss to ℥i every hour, according to circumstances.

The addition of liquorice root to the decoction improves its taste.

Powder x grs. to ℈i with liquorice powder.

[c] *Diuretics which operate by increasing the action of the absorbents.*

The several modes in which this may be effected, pointed out.

Family *Liliaceæ*—Scilla Maritima, or Squills—Used in all the forms of Dropsy, though probably it is best adapted to Hydrothorax. In the early stage of Hydrothorax, medical treatment does a great deal, principally by means of diuretics, and squill is by far the most powerful of any. It never operates so powerfully, as when given to the fullest extent the patient can bear, without sickness. Beginning with a small dose, as thirty drops of the syrup, or tincture, three or four times a day, it may gradually be increased to ℥ss or ℥i and more in the twenty-four hours. Carried to the extent mentioned, it will be found to operate very favourably, and that in a few days. The urine becomes pale and copious under its use, and proportional relief is obtained in the breathing, and in the diffused swelling. Whether it will cure, depends upon the cause giving origin to the disease.

In Hydrothorax when complicated, squill is combined with calomel in doses of ij grs. of squill and 1 gr. of calomel, made into a pill, and taken twice or three times a day. One of the best formula in the treatment of this dangerous and distressing form of the disease.

Squill is sometimes combined with the Nitrate of Potash, in dropsical swellings and in nephritis—and instances of cures are related, by giving patients from ij to iv grs. of the former, with grs. x to xx of the latter.

Squill has been much celebrated in the diseases of the Respiratory system. It is well adapted to promote expectoration, and to relieve the Bronchi when oppressed with a collection of mucus. It is properly resorted to in the conclusion of Catarrhal and other Pulmonary affections, when Inflammatory action has subsided.

In asthmatic affections, or dyspnæa, occasioned by the accumulation of viscid mucus, it has also been held in the highest estimation. As an expectorant, the squill may be supposed, not only to attenuate the mucus, and thus facilitate its ejection; but by stimulating the excretory glands and mucous follicles, to excite a more copious discharge of it from the lungs, and thereby to lessen the congestion, upon which the difficulty of respiration very generally depends.

In the diseases of children, this article is also valuable. Its powers are much improved by combination with other articles, as the Polygala Seneka and Tart. Antimony, as in the compound called Hive Syrup; and in asthma and dyspnæa without fever, combined with the Lac Ammoniac, it is perhaps the best remedy we can employ.

Preparations—Acetum Scillæ—Oxymel Scillæ—Tinctura Scillæ.

Dose, powder, ii to viii grs.
Tincture ʒss to ʒii
Vinegar, same.

In Infusion—Vide Formulæ.

The infusion of squills is a convenient, and very useful form of administration, and in my practice one of the most successful, in removing dropsical effusions.

Family *Scrophulariæ*—Digitalis Purpurea—Foxglove—Natural History. The leaves are gathered at the time the plant is flowering, the largest and deepest coloured being preferred. They are to be carefully dried in a warm room, through which a current of air is passing, and when completely dried, may be compressed into moulds, or kept in bottles closely corked, excluded from light and moisture. Effects of Digitalis upon the system.—When given in a full dose, it exhausts the powers of the body, lowers the pulse from 75 to 40, and even 30 pulsations in the minute, produces sickness, vertigo—dimness of sight: and if the dose be very large, vomiting is excited, and a greater degree of vertigo. A dose still larger puts an end to life. Digitalis in its operation on the system, exhibits very striking properties. One of them is, a most surprising diminution in the strength, and especially the frequency of the pulse. Another remarkable effect is, that it may be given for a considerable length of time, without producing any sensible action upon the system, when its powers become suddenly developed; to such a degree as to occasion alarm for the life of the patient, and though it is discontinued, its effects will remain for several days, being in this similar to mercury. Another peculiarity in the operation of Digitalis is, that it is influenced in its effects by the position of the body. In the first case which attracted notice, the pulse which was reduced to forty strokes in a minute in the horizontal posture, was in the sitting position quickened to seventy, and to 100 by standing. Medical History. Employed in Dropsical Affections—Conditions of the system most favorable to its use—Forms of Dropsy to which it is best adapted. Though its powers have been much overrated, there is also much inattention shewn to the states of the system in which its effects are best exhibited, and to the article being in a proper state, and properly administered. Given in the form of infusion—Preparation. Dose ʒi to ℥ss. Directions to be observed in its use.—When carried to the extent of affecting the system either by the pulse, the stomach, bowels, or head, I have on several occasions observed its diuretic operation exerted to a considerable degree, and like other practitioners, began to be sanguine in my expectations of cure. I have, however, been disappointed, and am convinced, that the effusion we call dropsy, is often, only a symptom of greater derangement, or of alterations in organic structures, which while they continue, though the effusion may be removed, yet it soon returns, and by exhausting the powers of life, by draining the vascular system, by injuring the texture of parts into which it is poured, by the confinement of the patient, and the anxiety he suffers, the case terminates fatally. Still we are not to abandon a patient under these circumstances, but approach the treatment, with the use of means, which may directly or indirectly

be made to bear on the case; and digitalis employed as directed, may prove useful. Utility in other diseases. In Hœmoptysis of advantage in controling the circulation after depleting measures have been properly pursued—Employed in Hæmorrhages from other organs—In Phthisis Pulmonalis of little value—No power to contend with Tubercular formations.

Having placed before you the opinions of men distinguished in our profession, as to the utility of Digitalis in Pulmonary Consumption, candor obliges me to confess, that present experience with this article, by no means entitles it to these encomiums. In proof of it, I remark, that Consumption is a fatal disease, much so in our country, and still more so in Great Britain, where one-fourth of all the deaths are occasioned by its ravages. There are many Pulmonary diseases, bearing a close resemblance to Phthisis, in which this article has been employed, and success following its use, has caused it to be considered a remedy in this complaint. The wasting of the flesh which occurs in Phthisis, is common to other diseases, with the fever, pain, cough, thick expectoration, difficulty of breathing, &c. These symptoms are often observed in Catarrhs, as a consequence of Pleurisy, and other cases, in which the patient often recovers. In consumption, the action of disease is peculiar, and is different from the morbid action occurring in other parts of the body. It generally arises from Tubercles, which are of a nature analogous to scrofula, being very slow and tedious in their progress. This progress is sometimes completed, and the tubercle heals. But it is often succeeded by a multitude of others, which in succession inflame, and suppurate. It is this constant disease, to which there is no end, that wastes the system, and renders the case incurable.

The singular property of Digitalis to lower the pulse, without increasing evacuations to any degree, renders it particularly valuable in these cases. Hitherto this object has only been obtained, by withdrawing from the circulating fluids, or by producing nausea. Digitalis is so far an invaluable remedy, as it enables the physician, in most cases, to accomplish this object. With a reduction of the frequency of the pulse, relief is afforded to many distressing symptoms of the disease, as pain in the side, cough, dyspnœa, fever, and if this remedy is resorted to early, and proper attention paid to diet, and exercise, much benefit will doubtless be derived from its use. Even when the disease is more advanced, and from the feeble and irritable state of the patient, bleeding can no longer be employed, Digitalis in such doses, as keeps the pulse at a more natural standard, may be highly beneficial. But in the more advanced stages, when purulent expectoration, and its train of distressing symptoms exist, nothing can do more than palliate, and smooth, the avenues of death.

Digitalis has been employed in Epilepsy—in some of the Phlegmasiæ.

Morbid effects produced by this article—Symptoms of their approach. These are retardation of the pulse, palpitations, faintness, sickness, and purging. There is, likewise, a pain in the head, sometimes over one eye, with disturbance of the functions of the brain. When any of these symptoms occur, the medicine must be discontinued.

The remedies to be employed, will consist of an Emetic, if the degree of prostration does not forbid it. Æther, volatile alkali, brandy and cordials—Sinapisms and blisters, are also important.

Dose, powder, g. i

Tincture, xx m. increased.

Family *Solaneæ*—Nicotiana Tabacum—Employed as a Diuretic. To Dr. Fowler we owe much that is known upon the diuretic action of this article. His work upon this subject was published in 1785. In it he speaks with the usual extravagance, which characterises those, who are patrons of particular articles, and says that out of one hundred and fifteen cases, in which he administered Tobacco, in ninety-three of them it proved diuretic. He further states, that in thirty-one dropsical cases, in which he employed it, thirteen were cured, and ten relieved. Subsequent writers have also spoken of it. I have employed it on several occasions, and am satisfied that it may be resorted to with considerable prospects of success, as a diuretic—and where there is no organic disorder, as a remedy in dropsy. It is given in the form of Infusion and Tincture.

In Chronic Catarrhs, Phthisis Pulmonalis, and other chronic diseases of the Lungs, it is an article more to be relied upon than Digitalis.

The objections to this article, arising from its tendency to produce nausea, may be obviated by commencing with a small dose, and increasing a drop with every portion, until some sickness at the stomach is experienced.

Infusion is prepared as in the Formulæ.

Dose, x to xx and lx m.

Tincture or Wine—the same.

Family *Colchiceæ*—Colchicum Autumnale—Meadow Safron. Natural History—Sensible Properties. Writers differ much in their opinions respecting the effects, and sensible qualities of the root. By some it is stated to be void of taste and acrimony, and that considerable quantities may be taken without inconvenience, except that of an ungrateful bitterish taste. Baron Stork, on the contrary, tells us, that by gently rubbing the root against the tip of the tongue, it renders the part rigid, and almost void of sensation, for several hours. These contradictory statements can only be reconciled, by supposing the roots to vary much according to age, the soil in which they grow, and probably still more, the season of the year in which they are dug up. The root, therefore, should be taken up by the middle of summer, for medicinal purposes, since they become nearly inert while producing their flowers. Analysis—Introduced into practice by Baron Stork, and employed in Dropsies in the form of Syrup. This preparation superceded, and in place of it the Colchicum Wine substituted. Effects upon the system. Employed in Dropsy, in Gout and Rheumatism. In the last disease, a tincture of the Seeds preferred. Employed in the treatment of Inflammatory diseases, acute as well as chronic. Externally the Tincture is employed as a Liniment in Rheumatism—one or two tea-spoonsful to be rubbed at a time, upon the part. The Tincture of the Seeds may be used in the same manner.

Preparations.

Dose of the Oxymel, ʒi increased.
Of the Wine, xxx to xl m.
Of the Tincture of the seeds, xx to xxx

Veratria—an alkaline principle obtained from the seeds of the Veratrum Sabadilla.

This article has of late been employed in the treatment of Neuralgia, particularly in Tic Doloroux. The external use of the Veratria has succeeded in removing the disease, after other means had been unavailingly employed.

Also employed in partial Palsy, affecting different parts. The manner of using it, is in the form of ointment, prepared by rubbing a scruple of the Salt with an ounce of Lard.

Diuretics varied in their action.

Family *Iridees*—Iris Versicolor, or Blue Flag. Indigenous. Natural History—Effects upon the system—Employed in Dropsies, combined with the Button Snake Root, and thus united, has been used with great advantage in obstinate cases. Given in Decoction.

Formula.

Dose, 1 pint daily.

Family *Umbelliferæ*—Eryngium Aquaticum vel Yuccifolium—Button Snake Root. Indigenous—Natural History—Properties. United with the preceding article in the treatment of Dropsies. In the form of Tincture, employed in Indigestion, &c.

Dose, Tincture, ʒi increased.

Apium Petroselinum—Parsley. Indigenous—Natural History. Useful in Strangury—In suppression of Urine occurring in children—Employed in the form of Decoction of the root—alone, or combined with the Nitrate of Potash.

Family *Ericineæ*—Chimaphila Umbellata—Pipsissewa. Indigenous—Natural History. Properties. Employed in Dropsical Affections, particularly in those cases accompanied with enfeebled digestion, and languid condition of the vital powers.

1 pint of a strong infusion, daily.

Externally employed as a wash for foul ulcers.

Family *Aloideæ*—Aletris Farinosa—Star Grass—Indigenous. Natural History. Employed in similar cases.

Decoction of the root and leaves in liberal doses.

Other articles—Erigeron Heterophyllum. Sweet Scabious. Achyranthes Repens, Forty Knot, &c.

General principles determining the extent of operation of this class of Medicines.

Division VIII.

LITHONTRIPTICS AND ANTILITHICS.

The nature of the urinary secretion has been the subject of much investigation, both on account of its supposed connection with many dis-

eases, and on account of the very singular products derived from it. From an analysis, which has been made by several chemists, it is found to consist of various acids, and salts, in its healthy state, and from the predominance of a few, or their varied combination, the varieties of human calculi are derived.

The several principles contained in Urine enumerated.

Such being the nature and composition of urine, it may be supposed that when the quantity of these substances is augmented beyond what can be held in solution, urinary concretions or calculi would be found.

Particular states of the constitution, give rise to the formation of these ingredients, and when carried to excess, is called the Lithic Diathesis. This state of the system, is probably, intimately connected with the deranged condition of the alimentary canal, and the first link, in the chain of causes, giving rise to the production of these substances, has its origin in the stomach.

The different substances which enter into the composition of urinary calculi, enumerated—and arranged under the following heads:

1. Lithic or Uric Acid.
2. Phosphate of Lime.
3. Ammoniaco Magnesian Phophate.
4. Oxalate of Lime.
5. Cystic Oxyd.

Such being the state and condition of the digestive organs, previous to the appearance of stone or gravel, it will be obvious, that the remedies called Antilithics, are such as will strengthen these organs, and correct the morbid condition of the first passages. How it happens that such a variety of deposites are formed, is difficult to conceive, and the only explanation I can attempt, will be to suggest the various, and almost interminable results of morbid action, as exhibited in a diseased state of the liver, or other organs of the body.

The other class of Medicines, or Lithontriptics, are employed during the formation of urinary calculi, or after they are formed. To produce a solvent effect, it is necessary that they be brought into contact with the substance itself, and this is effected by the remedies passing into the circulation, from whence being separated by the kidneys, they are thrown into the urinary organs, where they exert a solvent action, upon the depositions which may exist.

The practicability of this operation taking place, to a certain extent, inferred from several circumstances mentioned.

The conclusions drawn upon this subject, are

1. That these medicines are not entitled to be considered solvents of stone in the bladder.

2. That in small calculi or gravel, or the forming stage of the disease, the symptoms derived from this cause, with the concretions, have been relieved, and dispersed, by the proper and judicious use of alkaline and acid medicines.

3. That in advanced stages of the disease, or after stones exist in the bladder, the symptoms of irritation they produce, have been so much relieved by acid, or alkaline medicines, that the patient's life has been ren-

dered easy, and comfortable, to such a degree, by changes induced upon the surface of the stone, as to excite a belief that it had been dissolved, though it was discovered in the bladder after death.

4. That even supposing these medicines incapable of exerting any action upon the urinary organs, yet by correcting the morbid condition of the alimentary canal, either from a state of acidity, or alkalescence, that they thereby disturb those affinities, which in the subsequent processes of assimilation, and secretion, give rise to calculous formations.

The last and most important principle in this discussion, remains to be considered, viz. how are we to discover the nature of the calculous secretion, so as to direct a suitable remedy? A knowledge of this principle, is of primary importance, for without some rules to guide us, our practice is but empiricism, whence it is, that failing in several attempts to afford relief, we hastily decide, that all is conjecture and uncertainty; that the practice, in this instance, is based upon an unstable foundation, when, in fact, the fault is not in the remedy, but in our insufficient knowledge of its application.

In the inquiry, as the means by which we are to be directed, in the choice of a remedy, adapted to the chemical character of the calculus, we are to be governed by an examination of the sediment, deposited by the recent urine, or an analysis of the small fragments, which are frequently voided with it. It is in this stage, as I have observed, that we prevent such accumulations from taking place, which may end in stone. Of the many substances which are contained in urine, rarely more than three, make their appearance in the form of deposite, or gravel. These are the phosphate of lime, phosphate of ammonia and magnesia, and uric acid. The former constitute a white, and the latter, a red deposit. Remarks upon each, and their appropriate remedies.

ANTILITHICS.

Of this character are the Medicines which improve the tone of the alimentary canal—Several articles from the class of Tonics enumerated.

Family *Ericinæ*—Arbutus Uva Ursi—Bear Berry. Natural History—Much difference of opinion respecting its virtues—Useful in allaying pain in calculous diseases—Employing with advantage in Nephritic affections. In diseases of the bladder—In Catarrhus Vesicæ—In suppurations of long continuance, in protracted gonorrhœas, &c.

Dose, powder, x grs. to ʒss.

Infusion, ʒiij to ℥ss to water 1 pint

Family *Urticeæ*—Humulus Lupulus, or Hop—Indigenous—Natural History—Lupulin—Is possessed of tonic and narcotic properties—Medicinal virtues extolled beyond its merits—In Nephritis employed with advantage, given in the form of infusion.

Infusion ℥ss to water 1 pint.

Family *Umbelliferæ*—Daucus Carota, or Wild Carrot—Indigenous. Natural History—Is possessed of considerable acrimony and bitterness. An infusion of the roots and seeds is employed in some of the diseases of the urinary organs, and occasionally with benefit.

Family *Liliaceæ*—Allium Sativum or Garlic—of little value.
Importance of Diet as an Antilithic. Experiments of Dr. Wollaston.

LITHONTRIPTICS.

1. Solvents of the Alkaline deposits.

Carbonic Acid—Useful to the patient, and grateful to the system. Prepared by the dealers in Mineral Waters—or impregnating water by a Nooth's apparatus.

Mineral Acids—General and Relative Importance—The Muriatic preferred.

Dose, v to xx m.

Vegetable Acids—Under certain circumstances preferred to the Mineral.

Tartaric Acid, in doses of from v to xx grains, may be employed.

2. *Solvents of the acid deposits.*

Carbonates of Potash and of Soda—Latter preferred—cases of their utility cited—Administered in solution with the mucilage of gum arabic or in weak broth, or saturated with carbonic acid gas.

Dose, ℈i to ʒss repeated.

Soap—Has no advantage separate from the alkali it contains, and as in this state, it is apt to impair the digestive powers of the stomach, and lay the foundation of dyspepsia, is seldom employed.

ʒss to ℥ss daily in pills.

Lime Water—was much commended by Dr. Whytt, and benefit was supposed to have been derived from its use in Lord Walpole's case—but it is an inconvenient and ineffective form of alkaline medicine, and not entitled to much consideration.

1 quart to 3 pints daily.

Magnesia—Has peculiar advantages in the cases under consideration—corrects the conditions of the first passages which favors the formation of uric acid—Particularly useful when the alkalies have been employed a long time without much benefit, or when they excite flatulence, or indigestion.

Dose, xv to xx grs. several times a day.

Injections into the bladder have been proposed, consisting of acid or alkaline solutions—The Gastric juice of animals, particularly the hog, proposed by the late Dr. Dorsey.

Division VIII.

Medicines which promote the Catamenial Secretion.

EMMENAGOGUES.

General Remarks upon the Catamenia—Its nature and importance. Its suppression connected with several forms of chronic disease. Medical men being aware of this fact, have applied themselves with diligence to promote this secretion—but from the frequent failure of their endeavours, doubts have arisen, as to the beneficial effects of medicines in these cases. The precariousness of this class of medicines, those who

have had experience must allow—still I am decidedly of impression, that we are possessed of medicines, which exert an action upon the secretions of the uterus, and if failure attends their administration, it proceeds from the incorrect ideas which are entertained of the nature of the Catamenia, and our inattention to the state of the system. The fact is, the practice in these cases often is in a great degree empirical, and the want of success proceeds from neglect of those circumstances, which should influence their operation. Alibert observes, that there are few diseases, which depend upon such a variety of causes, or are connected with such different conditions of the general system, as obstructed catamenia. Hence, its remedies are so various, and often of such contrary characters, and hence too, the great uncertainty of our remedial measures in such cases. Many of us may have observed, the great facility with which the emmenagogue operation, of a particular agent, has been produced, after the system has been subjected to a process of preparation, when the same substance has proved perfectly futile without it.

In some cases, the suppression of the secretion is produced, by the general relaxation and debility of the system, and hence, our best remedies will be such, as will invigorate and restore it. Here exercise, tonics, the cold bath, and a nourishing diet, produce the best effects.

At other times, an opposite condition of the system exists, connected with a considerable degree of rigidity of fibre, and a high degree of arterial action. In these cases a contrary plan is to be pursued, and the best emmenagogues will be venæ section, and other depleting remedies.

In prescribing, therefore, for a suppression of the catamenia, it is of the utmost importance to attend to general state of the system, as without it, we shall frequently be baffled in our attempts, and our medicines may often increase the disease they were designed to cure.

I shall divide the medicines of this class, into such as increase, and such as diminish, arterial action: and before commencing to speak of the individual articles, I cannot but state, that I think we are possessed of remedies, adapted to the varying condition of the system, provided we use judgment in their selection.

[a] *Such as increase arterial action.*

Under this division is comprehended those articles which stimulate the arterial system, and those which give tone to the system generally.

Family *Polygaleæ*—Polygala Seneka—Properties—Cases of its utility cited—Best adapted to habits that are weak and feeble—and of a temperament apparently cold and leucophlegmatic. It is proper in using this article, always to commence a week, or ten days, before the period, when the catamenial secretion is expected. It produces no mischievous effects, and might be exhibited very safely for a much greater length of time.

Exhibited in the form of Decoction, by simmering slowly ℥ss to ℥i of the bruised root in a pint of water, until it is reduced one-third. Dose ℥ss to ℥i, several times a day—and to a greater extent when necessary.

Should it produce nausea, which it is apt to do, it may be prepared with the addition of an aromatic, as cinnamon, &c.

Family *Coniferæ*—Juniperus Sabina or Savin—Natural History—Properties—Experiments of Home and others, with this article as an emmenagogue.

The constitutions to which it is best adapted, are the weak and relaxed—Employed also in Chronic Rheumatism.

Externally employed in powder as an escharotic—In infusion as a wash for ulcers—In tænia capitis, and in the form of ointment, to keep up the discharge from blistered surfaces.

Dose, powder, ℈i to ℈ii

Decoction ℥i of the leaves to water 1 pint, boiled to half a pint, to which add syrup ℥ii—dose, a wine glassful every 2 or 3 hours.

Besides these modes of administering the savin, the essential oil has been highly recommended, given in the quantity of vj drops on a lump of sugar increased to x or xii.

Juniperus Virginia—Natural History—Properties and uses as the preceding.

Tinctura *Cantharidum*—Tincture of Cantharides—Effects upon the abdominal and more especially the pelvic viscera—Its utility connected with its operation on the latter—particularly when given to the extent of producing strangury. In the production of strangury, its action would not appear to be confined to the bladder, but it excites all the different organs in its neighbourhood. The uterus partakes of this action, and thereby often excited to pour out the menstrual secretion, and in my opinion, the emmenagogue power of this article, depends chiefly on these local effects, rather than upon its stimulant operation on the general system. The bowels, we know, are much affected by the production of strangury, and patients have been heard to complain, that the passage of the fæces through the rectum, excited a sensation of heat, or burning, similar to that which attends the voiding of urine. If such be the strength of the impression produced by the presence of strangury upon the alimentary canal, the uterus, we may suppose, is likely to partake of an equal inflammatory action. Cases of its efficacy cited—Connection of several chronic forms of disease, with the suppression of the Catamenia exhibited, viz. Mania, Nymphomania, Epilepsy, Phthisis.

Dose, xv to xx m. increased.

I have alluded to the connection between chronic derangements, and the suppression of the catamenia. The several cases I have related, have been illustrative of the dependance of mania, nymphomania, epilepsy, and phthisis, on that cause. The connection of the first diseases with the state of the menstrual secretion is admitted; but with phthisis, the relation has been overlooked, or not acknowledged. The present occasion is too favourable a one, not to state to you, that, in my opinion, amenorrhœa is often the cause of consumption. The case cited, confirms this opinion: and, at all events, it is an interesting subject of enquiry, whether the pulmonary disease is not occasioned by the suppression, and whether, in certain cases, amenorrhœa does not prove a cause

of phthisis in the pre-disposed? My own views are favourable to this connection, and in the treatment of cases of phthisis as well as some other complaints, would suggest directing the attention to the suppression, as forming the chief diseases, upon the removal of which all the other symptoms will vanish, provided the secretion can be restored before the lungs have sustained such organic injuries, as to render them incapable of continuing duly to perform their proper functions. Certain it is, that no occurrence is more common, than the attack of cough, pain in the side, difficulty of breathing in females, soon after the obstruction of the menses, and upon its recurrence all these symptoms going off.

The connection derives much support from the knowledge, that the approach of phthisis is generally much more insidious, and its progress more slow in women than in men, and that this difference depends upon its being rather symptomatic, than idiopathic, in females. In other cases, where it arises from some obvious occasional cause other than the catamenia, and to which females are subjected as well as males, its progress is equally rapid and violent. Impressed with this belief, I would recommend, that we keep in view the probable dependence of the pulmonary symptoms, and the other diseases mentioned upon the interrupted functions of the uterus, and direct our treatment accordingly.

But you will inquire, how are we to distinguish those cases in which Phthisis is of symptomatic origin, from others? Its symptomatic origin may be ascertained, by the suppression preceding the appearance of the pulmonary affection—and when such is the case, the disease if not dependent, has, at least, an intimate connection with the state of the uterine secretion. Under these circumstances, advantages, I can assure you, will result from re-establishing the discharge.

When phthisis has existed for some time, this secretion, with others, will be deficient, or suppressed, from the enfeebled condition of the general system. So impressed is the female mind, with the general ill-effects of this state of things, that even here, you will often be urged to do something, and advisers will not be wanting, who will press upon you the necessity of so doing. Here, however, it can be of no advantage, and you will be obliged to resist and combat with much opposition. Do it in this and all other instances, with kindness and forbearance, explain your views clearly, and divested of technicalities, and, from some experience, I am satisfied, that you will make your opponents your friends.

Family *Rubiaceæ*—Rubia Tinctorum—Madder—Natural History—Properties. Opinions of Home, B. S. Barton, Dewees, and others.

Respectable, however, as is these authorities, and this weight of evidence in its favour, it is employed by few physicians at the present day, and whatever may be its virtues, it does not possess the confidence of the profession at large, as an article adapted to restore the uterine secretions. Indeed, in my opinion, an article exhibiting so few active properties, and which, from the mildness of its impression, can be employed under almost any circumstances, and without reference to the states of the system, can be little entitled to consideration in a practical point of view. It is not with such instruments that disease is to be arrested, or deficient secretions excited. In proportion to the mischief an article is

capable of doing when improperly administered, would I estimate the benefits to be derived from it, in the hands of a cautious and judicious practitioner. You have heard the authorities in favour of this article, and may form your own opinions.

Dose, ʒss to ʒi

Secale Cornutum—Spurred Rye—Ergot—Natural History. The only opinion which appears to be well supported is, that the Clavus is a Parasitic Fungus, a species of Ustilago, like the different sorts of blight, smut, &c. Of this opinion is Decandolle. It affects most of the Cerealia, but rye seems, to be most apt to take on this morbid condition, particularly when the plant grows in low damp situations, and when it is exposed to heat succeeding heavy rains. It is found in greater abundance on the margin of fields than in the central parts.

The appearance and properties of the Clavus.

Its most prominent effect is, its direct action upon the uterus, producing and increasing contractions, when there is a pre-disposition to action in that organ, and restoring the catamenial secretion when obstructed. It must, therefore, be ranked in the M. M. as a Partus accelerator, and as an emmenagogue.

Medical History. This article was known to Holland and France in the middle of the last century. From the indiscriminate manner in which it was employed, injurious results followed, and we find it prohibited in France by a legislative decree. In 1807, its use was revived by Dr. Stearns of New-York, who was led to make trial of it, from the powerful effects it produced in the hands of some ignorant Scotch women. My information, he says, was such, as to impress upon my mind the necessity of extreme caution in my first experiments. The continued influence of this impression upon my subsequent practice, has been a source of much consoling reflection.

There can be no doubt at present, that this medicine has the power of exerting a specific action upon the uterus—that this action consists in augmenting the contractile power of that organ during parturition, and in lingering and protracted cases, inducing forcible contractions, and expediting delivery. The concurrent opinion of most physicians is decidedly in favour of these effects.

These effects are not more extraordinary than the almost instantaneous manner in which they are produced. In twenty cases, says Dr. Prescott, I carefully noticed the precise time it required to produce its customary operation. In two of them the increased strength of the pains, and the continued action commenced in seven minutes from the time the decoction was taken. In one case it was eight minutes, in seven it was ten, in three eleven, and in other three cases it was fifteen minutes.

In the employment of an agent so powerful in its operation, certain rules and directions become necessary to prevent any bad consequences which might arise from its use, and which are more particularly proper, as the action when excited is so little under controul.

The rules necessary in its administration, are

Rule I. That it should never be administered when nature is competent to a safe delivery.

Rule II. It should never be given until the regular pains have ceased, or are ineffectual, and there is danger to be apprehended from delay.

Rule III. It should never be administered until the rigidity of the os uteri has been overcome, and a perfect relaxation induced. When labour has been protracted from the rigidity of the os uteri, or of the soft parts, these obstacles should be overcome by venæ section—after which the ergot may be usefully employed, and its operation will be found mild and efficacious.

Rule IV. It should never be administered in the incipient stages of labour, nor until the os uteri is dilated to the size of a dollar.

This rule is of the utmost importance, the success of the article being very much influenced by the time when it is employed. When given in the early stages of labour, and before the os uteri is sufficiently dilated and relaxed, it often fails of success. The pains induced under these circumstances, often terminate before the labour is accomplished, and are of no advantage.

Rule V. It should never be administered in any case of Preternatural Presentation, that will require the fœtus to be turned. The necessity of this caution will be obvious, when it is considered, that the violent and forcible contractions induced, will add much to the difficulty and hazard of the operation.

With these precautions in the use of the Ergot, it may be safely and effectually used, and the relief afforded will, from the united testimony of those who have written on the subject, be gratifying in the highest degree. Without a regard to these rules, the most mischievous consequences will result, and an article capable of serving many valuable purposes, will be neglected and abandoned.

Having premised the rules which are to be observed in the administration of the Ergot, I shall proceed to consider those cases in which it is necessary to have recourse to it.

1. The Ergot is indicated in those cases, where the expulsion of the child is delayed from the action of the uterus being weak and ineffectual,—where it has descended into the pelvis, and the soft parts are prepared for its passage. Any delay to its expulsion when in this situation, would be attended with danger to the mother from pressure on the soft parts, or from the exhaustion of strength, and vital energy, which might ensue from hemorrhage, or other alarming symptoms. In these cases, the action of the Ergot, by renewing the uterine contractions to a considerable degree, speedily effects delivery.

2. When the pains are transferred from the uterus to other parts of the body, or to the whole muscular system, as in puerperal convulsions. In these cases, Dr. Stearns observes, that after copious blood-letting, the Ergot concentrates all these misplaced labour pains upon the uterus, which it soon restores to its appropriate action, and the convulsions cease. The beneficial effects of this practice is also confirmed by Dr. Waterhouse, who in a case of violent puerperal convulsions, accompanied with dilatation of the os uteri, succeeded by employing the ergot, in restoring the pains to the proper organ, in a manner almost instantaneously, he says, and truly astonishing.

3. When in any of the stages of pregnancy, abortion becomes inevi-

table from hæmorrhage—cases complicated with hæmorrhage, call forth all the decision and energy of the Medical character. Their management is connected with much hazard to the mother, and to the physician, a scene of trial and difficulty. Under these circumstances to know, that we possess a remedy, the action of which tends to restrain the hæmorrhage, must be attended with consolatory reflections. The indication to be fulfilled, is to excite the uterus to contract, and expel its burthen, as by this means only, the hæmorrhage can be arrested. The ergot, from its action upon the uterine fibres, presents itself as a remedy suited to these purposes. It must be given to the extent of exciting contractions, and when these are produced, the flooding will commonly cease.

4. The ergot is indicated in cases of labour, complicated with uterine hæmorrhage. The same remarks as in the preceding, are applicable here. The hæmorrhage must be stopped by plugging the vagina, the use of cold applications, &c., until the os uteri is dilated, when the ergot may be tried with safety and effect.

5. Where the placenta is retained from the want of action in the uterus—I have seen several instances of the beneficial application of this article in such cases, and from all that we know of its operation, the ergot will be well adapted to effect its expulsion.

6. The ergot will be beneficial in cases where hæmorrhage occurs after delivery. It occasionally happens, that the uterus, from the want of tone, does not contract after the delivery of the child and secundines, in consequence of which, flooding is very apt to ensue. This is what has been called relaxation of the uterus, and is a state of extreme danger. It may be known by the abdomen being large and flaccid, and the uterine tumor not being perceptible above the pelvis. In these cases, the ergot will be found very efficacious, and in a short time excites contractions of the uterus. I cannot conclude this summary of the beneficial effects of the ergot, without stating to you the opinion of Dr. Dewees on this subject. It would appear, he says, from all I have been able to collect, and from all I have observed, that it rarely fails, or disappoints, when properly prosecuted.

Objections to its employment answered. Manner of exhibiting the Ergot in Parturition. It does not exert as beneficial effects when administered in powder, as in decoction. In this latter form it is prepared, by infusing ʒss of the bruised Ergot in ℥iv of hot water. Of this, one-third is taken as a dose. If the pains are not sufficiently severe in twenty minutes, half the remainder is given, and the last dose if necessary; but this is rarely the case. While this quantity produces its most favourable effects upon the uterus, it does not affect the stomach with nausea, or vomiting, which sometimes interrupts its successful operation.

Besides the cases already mentioned, in which ergot may be successfully resorted to, it has been employed in profuse discharges of the Lochia, in Menorrhagia, by several persons, and by myself, with very gratifying results, and in hæmorrhages from other organs.

The Emmenagogue operation of this article considered, with cases of

its efficacy. It may be given in Powder, in doses of xv grs. to ℈i three times a day, or in Infusion made stronger than directed.

Morbid effects produced by the Ergot.

Two distinct set of symptoms have been noticed. The one a nervous disease, which is characterised by violent spasmodic convulsions, called by the French, Convulsive Ergotism.

The other being a depraved state of the constitution, which ends in that remarkable disorder, dry Gangrene; also called Gangrenous Ergotism—Creeping Sickness, &c., from its being preceded by general weariness, weakness, and a feeling of insects creeping over the skin, followed by a numbness of the feet and toes, which, in a short time, become shrivelled, dry, drop off—and the two affections are not blended together in the same individual.

Guaiac in the form of vol. tincture has been recommended in very high terms in Amenorrhæa and Dysmenorrhæa, by Dr. Dewees. His success with it, has been so considerable that he has pronounced it a specific in these cases, and employs it almost to the exclusion of every thing else—Vide Formulæ.

The dose is a tea-spoonful three times a day in a wine-glassful of water or milk. The Volatile Spirits of Ammonia is added in the proportion of ʒi to ℥iv of the Tincture. Should it operate upon the bowels, a few drops of Laudanum may be added.

Stimulating Injections.

Under Stimulating Emmenagogues, may be mentioned the employment of Aqua Ammonia, in the form of injection into the vagina. This practice was first proposed by an Italian, and he relates cases in which this treatment succeeded in a few days, to produce the discharge. The proportion used, was x or xii drops of Ammonia, in two table-spoonsful of warm milk, often repeated in the course of the day. It generally produced in the vagina a sensation more or less painful, according to the strength of the mixture, and the sensibility of the part, but in no case was any thing dangerous or troublesome produced.

Electricity.

It is natural to suppose, that a power of such energy as Electricity, would be applied to Medicinal purposes, especially since it has been found invariably to increase the insensible perspiration, to quicken the circulation of the blood, and to promote the glandular secretions.—Accordingly, many instances occur, in the later period of the history of this science, in which it has been tried on various occasions, with considerable advantage and success. In most of the cases in which it has been used with perseverance, it has given, at least, temporary and partial relief—in many effected a cure. Of its utility in amenorrhæa, there is not want-

ing the weight of high authority, and the experience of many in this city, who have employed and recommended it. The authority of Cullen and Cavallo cited. The latter observes, that its operation in promoting the glandular secretions, seems to be, by its mechanical stimulus, and it has this great advantage, that it may be directed to any particular organ.

The experience of the late Dr. Shecut, with this remedy, in its application to this disease. Of forty-nine cases which were submitted to electrical treatment, thirty-four of them were effectually cured, and the remaining fifteen relieved from their most distressing symptoms. More might have been cured, for he adds, that it is too common with patients when they find themselves relieved, to trust to nature for the rest.

In bringing before you this statement, I should observe, that such is the dread entertained by females of electrical sparks, together with the trouble of being carried to a machine, that it is seldom resorted to until medical treatment has been practised to some extent, so that I may say the usual remedies had been unsuccessfully employed. In confirmation of the utility of electricity, I am acquainted with a lady of this city, who for six years, laboured under a suppression of the menstrual secretion, in whom, to the ordinary distressing symptoms, was added such strong convulsive paroxysms, as to render the approach of her monthly periods, the occasion of great dread, and painful forebodings to her friends. From her situation in life, the first physicians were employed, and every expedient which medical skill suggested, was united with the utmost care and assiduity in its execution. They were all unavailing. The paroxysms and the morbid derangements still continued, and the patient's constitution became at every period, more and more enfeebled. Her existence seemed nearly to have been extended to its utmost limit, and death, I may say, had marked her for his own. In this situation electricity was proposed, and from the extreme feebleness which existed, apprehensions were entertained that the necessary shocks would be too severe. They were submitted to, however, and the first application was found useful in abating the severity of the symptoms. A few repetitions seemed to unlock the secretions which had so long been retained. With the discharge every unpleasant symptom disappeared, and to this day the lady enjoys a large share of health. So complete a triumph as was thus exhibited, deserves not only to be recorded, but to be remembered. Its application being connected with so many minute directions, which can best be exemplified upon the machine, that I must refer you to the Professor of Chemistry. Another case of spasmodic disease, closely resembling Catalepsy, fell under my notice, in which the benefit conferred by electricity, was conspicuously manifested. The case detailed.

Others of minor efficacy.

Rosmarinus Officinalis—Rosemary.

Mentha Puligium—Pennyroyal.

Monarda Punctata—Mountain Mint.

[b] *Remedies which increase arterial action by giving tone to the system.*

Amenorrhœa being often connected with a debilitated state of the system requiring tonics.

The preparations of Iron have long been considered among the most useful and valuable remedies in these cases; and a number of facts could be cited, of their utility in diseases which proceed from atony of the general system, in cases of feeble re-action, and of languid and imperfect operations of the functions generally. They have, therefore, been employed in a variety of cases, which will be more particularly considered at a future period.

In the state of system which is at present under consideration, few articles can be more beneficial. Not only are they of use by the impression which is made upon the animal fibre, but by being received into the circulating system, the energies of the heart are greatly increased, the pulse is rendered more full and strong, greater energy is afforded to the animal functions, secretions renewed, and health restored. With these changes the process of assimilation is better performed, a more healthy chyle elaborated, nutrition advances. and hence, to an increase of vascular action, is added an increase in the bulk of the body.

Of the Preparations which have been most esteemed.

The Proto. Carbonate of Iron—Rubigo Ferri or rust of Iron—deserves first to be considered. It is obtained by moistening the filings of Iron frequently with water, by which they become oxidated, and are then ground into an impalpable powder. During this exposure to the air and moisture by which the Iron is oxidated, the oxide is found to be combined with carbonic acid gas, derived from the atmosphere.

This is one of the mildest preparations of iron, and is much resorted to. It is seldom given alone; but it is combined with tonics and aromatics, with a view to improve their action, and to lessen the distaste which arises from its uncombined administration.

Useful Formula for exhibiting this article. Vide Formulæ.

Another and more agreeable formula, is the Chalybeate Wine, prepared as seen in Chapman's Therapeutics. This preparation I have frequently employed, and would recommend it to you, as pleasant to the stomach, and highly beneficial in its operation.

In the constitutions submitted to our care, under this condition of the system, much attention is required, in adapting the medicine given, to the excitability, and so to compound your medicines, that exciting but little disgust, their use may be persisted in, until the object intended is accomplished.

Dose, powder, x to xv grs.

Chalybeate Wine, ʒii to ℥ss.

Proto Sulphate of Iron—Preparation—a useful and more active article. The sulphate of Iron is frequently given in the form of pills, combined with the vegetable bitter extracts, as with Cinchona, Gentian, &c., or it may be united to an infusion of Quassia, or Colombo. These

articles being particularly preferred, as in consequence of their containing little or none of the astringent principle, their colour is not changed by the addition of the salts of iron.

Dose, i to ij grs.

Tinctura Muriatis Ferri—Preparation—an agreeable and efficacious article. By its tonic, united to an astringent operation, it will be found useful in immoderate discharges, particularly in Menorrhagia, Leucorrhœa, Gleets, &c.

Dose, viii to xii m, in an infusion of Colombo or Quassia.

Another preparation of iron is, the Liquor Hydriod. Ferri.

A variety of other means are usually resorted to, to restore the tone of the system, but they can scarcely be called emmenagogue. It may be proper to mention them here. They are exercise in the open air, a very powerful means of strengthening the system, and with particularly good effects, if the lower limbs can be much employed, as in walking, riding on horseback, &c.—The cold bath of the temperature of 50 or 60° Fahrenheit—frictions to the lower extremities, and lastly a cordial and strengthening diet, which, if properly directed, and caution observed with respect to quantity, so as not to oppress the digestive organs, I would rank among the best of tonics.

[c] *Emmenagogues which diminish action.*

The suppression of this secretion is often found occurring in full plethoric habits, with much arterial excitement, flushed face, inflamed eyes, and pains in various parts of the system. Depleting remedies, under these circumstances, are the best emmenagogues, and of these venæ section hold the first rank. The uterus, in habits of this description, may be considered as partaking of the same plethoric and inflammatory state, and the action to be carried to such a degree, as to transcend the point of secretion.

To this may be added other means of depletion.—Cathartics may be considered as next in value. For the purposes of depletion any of them may be employed. A few may be enumerated particularly.

Family *Ranunculaceæ*—Helleborus Niger. Natural History—Character—Dangerous and drastic remedy—rarely employed.

Aloe Perfoliata—Natural History and operation already considered. It is seldom given alone, but is combined with various other articles, or administered in the form of Tincture.—Of these preparations, the most celebrated, is the

Elixir Proprietatis, or Compound Tincture of Aloes. It is prepared as seen in the Dispensatory. It is a warm, active, and stimulating cathartic, and is much employed in catamenial obstructions. In the state of Constitution under consideration, I have commonly been more successful, by administering x to xv grs. of Calomel at bed-time, and in the morning, following up its operation with a dose of the Tincture. This practice is to be repeated two or three nights, and will often be found beneficial.

Hooper's Pills, &c.

Preparations of Mercury—They are employed, not only as evacuants, but to renew secretions.—For this purpose their use is continued in moderate doses until slight ptyalism is accomplished, and in very obstinate cases, this course, aided by blisters to the inner parts of the thighs, will, in all probability, be attended with beneficial effects.

Division IX.

Medicines which promote the secretions from the Bronchial passages.

EXPECTORANTS.

State of the bronchial secretion in health—in disease—The action of this class considered, and the circumstances under which their operation is promoted.

PARTICULAR EXPECTORANTS.

[*a*] *Depleting Remedies.*

[*b*] *Medicines which have their action upon the stomach, and operate by increasing the pulmonary with the insensible secretions of the surface.*

Ipecacuanha and Tartarized Antimony of this character—Given combined with other articles and in small doses.

Scilla Maritima—Useful article, particularly in the diseases of children—Compound Syrup of Squills.

[*c*] *Expectorants which operate as stimulants.*

Family *Umbelliferæ*—Gum Ammoniac. Natural History—Preparation—Properties—Employed in Pulmonary affections, where the lungs are oppressed by viscid phlegm—In Chronic Catarrhs—In Asthmas, particularly the pituitary, or humid—In Pneumonia after action has been reduced—and in Peripneumonia Notha. In any of these cases, it is often of essential service in promoting expectoration, and relieving respiration.

Exhibition—Vide Formula.

Gum Assafœtida—Natural History described hereafter. Useful in Pertussis—Tussis Senilis—Chronic coughs, &c. given in the form of a watery solution.

Dose, ʒii to ℥ss.

Polygala Seneka—Expectorant properties considerable—Employed in Pulmonic affections after inflammatory action has been reduced—when the patient is oppressed with a dry cough or difficult expectoration—In Cynanche Trachealis as a secondary remedy, and when employed, the decoction should be stronger than is usually given. Formula.

The decoction, when of ordinary strength, is prepared by boiling ℥ss ℥i of the root in water ℔iss to 1 pint, other articles being added to make it more agreeable.

Dose, ℥ss to ℥i.

Family *Companulaceæ*—Lobelia Inflata—Indian Tobacco. Natural

History—Properties—Action upon the fauces and the salivary and mucous secretions—Upon the stomach produces Nausea, and when in large doses, vomiting frequently succeeds—Employed in Asthma—In the pectoral affections of children—In threatened Croup, for its emetic and expectorant properties.

Dose—Saturated Tincture ʒi to ʒii.
Children xx to xl m.
Infusion—ʒss to water 1 pint.
Dose, ℥ss to ℥i.

Syrup for children similar in its effects to squills—ʒi to ʒii.

Family *Liliaceæ*—Allium Sativum—Garlic—Natural History—Properties—Employed in catarrhal affections of long continuance—Given in the form of

Expressed juice, ʒi to ℥ss.
Syrup of Garlic, a table-spoonful.

Family *Leguminosæ*—Myroxylon Toluiferum—Balsam of Tolu—Natural History—Obtained by making incisions into the bark of the tree, from which it exudes in considerable abundance—Analysis—Useful as an expectorant, when vascular action has been reduced, or when little excitement exists—Employed alone, or more commonly united with other articles. Formula.

Hill's Balsam of Honey—a preparation of this article, useful in the chronic coughs, and pectoral affections of old people.

Dose, Tinct. Bals. tolut. ʒi to ʒii.
Balsam, ʒss suspended in water by mucilage or honey.

Myroxylon Peruiferum—or Peruvian Balsam. Natural History—Obtained by incisions made into the bark of the tree—Analysis—Employed as the preceding.

Doses the same.

Copaifera Officinalis—Balsam Copaiva—To its other properties must be added its very valuable operation in the chronic stages of Pulmonary affections—As Chronic Catarrh—In increased discharges from the mucous membrane lining the bronchiæ, &c.

Dose, xx to xxx m.

[*d*] *Articles which allay irritation of the mucous membrane, lining the larynx and trachea—the existence of which excites coughing.*

Family *Leguminosæ*—Glycirrhiza Glabra—Liquorice—Natural History—Preparation of the Extract—Employed in Catarrhal and Pulmonic affections—In coughs, hoarseness, &c. combined with other articles. Formula.

Mimosa Nilotica—Gum Arabic. Natural History—Manner in which obtained from the tree—varieties to be met with in commerce—Most valuable of all the gums and mucilaginous substances—Useful adjuvant to other substances in the formation of Pectoral mixtures—and for allaying irritation in various parts of the body.

Family *Lineaceæ*—Semen Lini—Flax Seed. Natural History—Much employed as the preceding.

Decoction of the seeds sweetened with honey, and acidulated.

Inhalations.

General Remarks—*Mildest*, vapour of warm water—of Vinegar and water—*More stimulating*—Spirits, impregnated with other substances—Fumes of Tar—Rosin, &c.

Pneumatic Medicine.

Division X.

EPISPASTICS.

History of the employment of blisters—Phenomena arising from their application—The modus operandi of blisters, in the cure of diseases—To give to this subject all the importance it deserves, the structure and relations of the skin briefly considered. The beneficial effects of this class arranged under the three following divisions:

[*a*] *Where the actions of the system threaten to become too weak.*

Their utility exhibited in the several forms of febrile diseases—In Typhus and other continued Fevers—In remittents—In the advanced stages of inflammatory fevers.

[*b*] *Where they are irregular.*

As in convulsive affections—In apoplexy—Mania—In affections of the alimentary canal—Cholera—Colic—Diarrhœa.

[*c*] *Where they are partially too strong.*

As in all local inflammatory affections—The proper period for the application of blisters considered—The connections of the skin with the general system concluding these remarks.

ARTICLES COMPOSING THE CLASS EPISPASTICS.

Cantharis Vesicatoria—or Spanish Fly. Natural History—Manner of collecting and preserving the Flies—Analysis—Cantharidin—Preparation of the ointment, size and shape of the plasters when applied to particular parts—Their proper application—Parts of the body selected when their general operation is to be obtained—when the local—Dressing of blisters.

Their effects upon the Constitution, particularly the urinary bladder—producing strangury—Treatment.

Lytta Vittata, or Potato Fly—Natural History. Effects as the preceding.

Nitric Acid—Employed in diseases which are violent and rapid in their course, for the production of speedy vesication—Thus used in the Cholera Morbus of India—In the low states of fever—In comatose affections, and in cases where the ordinary process of blistering is resisted.

Manner of applying the acid.

Rubefacients—Their general effects, and cases in which they are usefully employed.

Family *Cruciferæ*—Sinapis or mustard—The very beneficial effects

derived from it in disease, in the form of Cataplasm, as a stimulating and revulsive remedy. The seeds administered in several diseases with results not very decisive.

Ol: Terebinthinæ—Very useful article, commonly employed combined. Formula.

Issues.

Setons and Caustic Issues—Useful auxiliary in several chronic diseases—In Pulmonic affections, Chronic Hepatitis—Dysentery—Hypochondriasis—In obstinate Leucorrhæa, Menorrhagia, &c. applied near to the seat of the disease.

Division XI.

Medicines which promote the secretions generally, and particularly the salivary.

SIALOGOGUES.

External or Masticatories.

Internal—Hydrargyrum, or Mercury.

Natural History. It is an opaque silver coloured metallic fluid, appearing to the eye like melted lead, solidified by extreme degrees of cold, and capable of being evaporated by a heat below ignition. It is found in the bowels of the earth sometimes pure, and is called Virgin Mercury, but most commonly it is combined with sulphur, or earthly matters, from which it is purified by processes to be explained by the Professor of Chemistry. The principal mines of quicksilver, of which we have any account, are in Spain, Hungary, Peru, and considerable quantities are brought also from the East-Indies.

Medical History. This fluid, supposed by the Greeks, to be poisonous, urged its way into practice with considerable difficulty. Thus, Diascorides ascribed pernicious effects to it in Medicine, and the elder Pliny declared, that it had the quality of poisoning all things. These opinions of the nature of Mercury, influenced Galen to consider it highly corrosive, and to rank it among the poisons. The writings of Galen, circulating among the Arabians, the correctness of these opinions became questioned, and we find their most distinguished physicians, as Rhazes, Avicenna, introducing it into Medicine, as an ingredient in external applications in different cutaneous diseases. Shortly after this period, Avicenna having observed, that even when taken internally, it caused no injurious effects, and that by its weight, it made a free passage through the bowels, the practice became common to give it largely in affections of the Intestinal canal, and in cases of difficult labour.

The researches after the philosopher's stone, and the chemical doctrines, being coeval with this period, we find mercury occupying the principal attention of the philosophers of that sect, and being the substance

upon which their hopes were chiefly directed. It was accordingly, subjected to a variety of processes, and in the zeal for discovery, its properties became better known. The practice of the Arabians, was followed by some physicians in Europe, towards the end of the thirteenth century, but was not established or looked upon, in general, to be safe, until about the beginning of the sixteenth, when the venereal disease making its appearance in Europe, was found to yield to mercurial preparations alone. By the bold and vigorous use of them, Paracelsus and Van Helmont, made known a practice far more successful than any of their predecessors, and contributed, very much, to extend the reputation of this article. Being found so efficacious in the venereal disease, its use began to be be ventured upon in other complaints. To Dr. Chisolm in the West-Indies, and the Physicians of this country, we owe its extensive use in malignant fevers, and the diseases of warm climates.

Chemical History. In its crude state, it produces no perceptible effect on the body, and is without any sensible acrimony, taste, or smell, yet it may be rendered active, by changes in its chemical state, or additions to its substance. When rendered thus active, it seems to be a stimlus to every sensible and moving fibre of the body to which it is applied. The degree of its stimulant impression, is modified in a very remarkable manner, by the different preparations of it which have been proposed and employed. In consequence of the changes which it undergoes by its numerous preparations, it is not only a powerful stimulant, but it enters the circulation, quickens the vascular action, excites powerfully the whole glandular system, and increases all the secretions and excretions. Hence, it happens, that its various preparations produce different effects, operating sometimes as stimulants to the general system, or as cathartics, emmenagogues, errhines, &c., and hence it becomes useful in a great variety of diseases, such as febrile affections, cachectic diseases, glandular obstructions, and cutaneous eruptions.

The value of these preparations may be inferred from this circumstance, that during a period of 300 years, experience has fully sanctioned their use; and in confirmation, I may adduce the remark of Mr. Pearson, who justly observes, that no one medicine besides, (opium excepted,) derived from the animal, vegetable, or mineral kingdom, has maintained its credit with men actually employed in extensive practice, during a tenth part of that period. Although it is a medicine capable of being abused to the disappointment of the patient, and to the injury of the constitution, yet under the direction of cautious and judicious practitioners, it may be ranked as one of the most useful articles of the M. M.

The chemical changes which have been proposed, in order to render mercury active and useful, may be reduced to oxidation in different degrees, and union with acids, constituting mercurial salts.

The Preparations of Mercury, may be considered under the three following heads:

1. As they are formed by Trituration.
2. As they are combined with Sulphur and Todine.
3. As they are combined with acids of different kinds, forming salts.

The Preparations by Trituration, are formed by rubbing Mercury

with Saccharine, Mucilaginous, or other substances, until the globules of mercury are completely divided. By this operation, the mercury being exposed to the atmosphere, becomes oxidised. They are more mild than the preparations formed by a combination with the acids, but to be effectual, the trituration should be complete, otherwise the practitioner will experience uncertainty in their use.

The first of the Preparations under this head, is the *Pilulæ Hydrargyri* or *Blue Pill.*

Preparation. This is one of the best preparations of mercury, and may, in general, supercede most of the forms of this medicine. In its preparation the mercury is minutely divided and converted into the black oxide. Present a specimen of the blue mass manufactured by steam power, being in a more minute and permanent division—also of the protoxide of mercury as it exists in the blue mass.

The blue pill is much employed to produce a mercurial impression on the system, sometimes to act as a laxative. For these purposes it is much less active than calomel, but possesses this advantage, that it may be administered to irritable subjects, who are purged, or otherwise incommoded by the Proto-Chloride of Mercury. Employed in the treatment of various affections of the stomach, and chylopoietic viscera.

Dose, iv to vj grs.

One grain of mercury is contained in four grains of the mass, according to the Edinburgh formula.

Do. in iij of the London.

Do. in ij of the Dublin. The first is preferred.

Mistura Hydrargyri Mucilaginosa.

This is the second preparation formed by trituration, in which the mercury reduced to the state of a dark grey oxide, is combined with gum or vegetable mucilage. Called also Plenck's solution, from being introduced into use by Professor Plenck. Preparation. This is an inconvenient mode of exhibition, as the mercury does not remain sufficiently suspended—but rarely employed.

Unguentum Hydrargyri—or Mercurial Ointment—Preparation—Mercury exists in the ointment partly oxidated, and partly in the state of minute mechanical division—Employed in the form of friction when the other preparations disagree with the bowels, producing griping, purging, &c., and where it is desirable, to produce a prompt operation upon the system. Used for the discussion of tumors, buboes—In Erysipelas.

Preparation of the patient before commencing the frictions.

ʒi, the ordinary quantity to be rubbed into the inner part of the thigh, groins, and genitals, or inner part of the arm and axilla.

Hydrargyrum cum Creta—Preparation—Employed with advantage in the disordered condition of the first passages occurring in children, exhibiting, as they often do, an altered and morbid condition of the secretions—being either [*a*] of a greenish color, or clay colored, or white, or [*b*] as regards consistence thin and watery, or curdled, or slimy—or [*c*] as relates to odour, either highly offensive, or of an earthly smell—Under

the above circumstances, small doses of this preparation will be found very beneficial.

Three grs. of the Hydrargyrum cum creta contain 1 gr. of Mercury.

Dose, ij to iv grs.

[*b*] *In combination with Sulphur.*

Black Sulphuret of Mercury—Æthiops Mineral—Preparation—rarely employed.

Red Sulphuret of Mercury, or Factitious Cinnabar. Preparation—Rarely employed internally, but chiefly used in fumigations to sores of a syphilitic character, or chronic ulcerations. Remarks upon Mercurial fumigations.

[*c*] *Preparations of Mercury by Acids.*

Proto. Nitrate of Mercury, or Red Precipitate.

It is prepared by dissolving Mercury in Nitric Acid, and exposing the Nitrate formed, to a temperature just sufficient for expelling the whole of the Nitric Acid. It is commonly known by the name of Red Precipitate.

This preparation is seldom used internally. It is not calculated to fulfil any indications, which cannot be obtained by the Protoxide, and is liable to act violently upon the stomach and bowels, sometimes in doses of a grain only. Its exclusion, therefore, from internal use, is recommended.

Externally, it is employed for various purposes, to cleanse ulcers, and to stimulate them to action, and to repress exuberant granulations—also employed in Herpetic affections, Chronic diseases of the skin, Tænia Capitis, Chancres, &c. Vide Formulæ.

Sub deuto Sulphate of Mercury or Turpeth Mineral—Preparation. Properties.

It is too harsh for general use, and is seldom employed. Its action is not confined to tbe prima viæ, but is very apt to produce salivation, if a cathartic is not employed soon after.

Sub Murias Hydrargyri et Ammonia—The Ammoniated Submuriate of Mercury—White Precipitate.

This article is only used externally, in the form of ointment, in the proportion of ʒi of the Salt to ℥i of Lard, in obstinate eruptions, herpetic affections, &c.

The combinations of Mercury with Chlorine, are the most valuable and efficacious remedies the M. M. affords. They form the Per. and Proto. Chloride of Mercury.

The *Perchloride of Mercury*, is formed, by subliming a mixture of the Bi Sulphate of the Peroxide of Mercury, or Turpeth Mineral, with the Chloride of Sodium—the Perchloride of Mercury being formed during the process.

This is the most corrosive, and the most acrid preparation of mercury, with which we are acquainted. It was first introduced into practice by the celebrated Van Swieten, and by him recommended in the form of alcoholic solution.

Antivenereal properties considered—Employed with most advantage in the concluding stages of syphilis—Given in small doses, and in combination with the vegetable alteratives—In cutaneous diseases, obstinate

ulcerations—Chronic inflammations generally—Form of administration—Formula.

In various Chronic affections, especially chronic inflammations, I mentioned in a former lecture, that it was a very valuable article combined with the vegetable alteratives, particularly sarsaparilla, and in these cases is given in very minute doses, 1-3 to 1-2 of a grain in a pint daily. That it was to be continued as long as it was thought necessary, taking care to watch its effects upon the mouth, and always keeping in view, that mercury given in excess, will tend to increase, rather than destroy constitutional irritation. The value of this combination may be inferred, when I mention to you, that I believe Swaim's Panacea owes its efficacy to the union of these substances, and when you consider the numerous and diversified affections in which this medicine has been employed, and the beneficial effects which have generally been derived. I have introduced this subject again to your notice, as much with a view to bring to your recollection what was then said, as to inform you, that the suspicions which I expressed of the composition of the medicine, have been confirmed by conversation with several gentlemen. The composition had been investigated by Professor Hare, and others, and from the evidence of circumstance, there could be little doubt on this subject. So general was the belief, that most of the Physicians of Philadelphia were in the habit of preparing it for themselves.

The Perchloride of Mercury may be given in the form of pill, or dissolved in spirits—Formula.

The Perchloride of Mercury dissolved in a Tincture of Cinchona, in the proportion of ij grs. to an ounce, and given in doses of x or xv drops, according to the age of the patient, twice a day, will be found a valuable medicine in the Chronic diseases of children, and with particular good effects, in those cases where there is enlargements of the mesenteric glands.

Many of the empirical remedies, which are boasted of as curing syphilis without mercury, owe their efficacy to this substance. The dose being small, is easily disguised with other articles with which it is mixed, and it is less liable than the other preparations of mercury to excite ptyalism.

Externally it is employed for various purposes.

In combination with Lime-water, it forms the Yellow-wash, so much recommended in the treatment of obstinate and ill-conditioned ulcers.

Dose, the 1-8 to 1-4 of a grain.

Poisonous operation of the Perchloride—Effects upon the system in large doses. Treatment to be pursued. Antidotes—The best is albumen, or the white of eggs beat up with water, and taken in large quantity. It decomposes the corrosive sublimate, and forms a triple compound, consisting of albumen, muriatic acid and calomel—An ounce of the white of eggs is required to neutralize 3 grs. of the corrosive sublimate.

Protochloride of Mercury. It is prepared by rubbing purified Quicksilver with the Perchloride of Mercury until the globules disappear. It is then sublimed in a glass mattrass, or florence flask. When sublimed, it is reduced to powder, and well washed for the purpose of separating any portion of corrosive sublimate which may have been formed in the

process. It is again sublimed, and washed—corrosive sublimate being soluble in water, and calomel insoluble, this is a ready mode of separating them.

This is the most important and the most extensively employed article in the whole range of the M. M. It is capable of fulfilling more indications, and of being applied advantageously to a greater variety of diseases than any other article which is furnished by the vegetable or mineral kingdoms. It is anti-syphilitic, anti-spasmodic, alterative, deobstruent, purgative, errhine, sialogogue, and anthelmintic.

General operation of Calomel on the system—Mercury when rendered active by Chemical changes, as in the state of an oxide, or neutral salt, seems to be a stimulus to every part of the system. When taken into the system it manifests itself by a quickened circulation, gives the blood the disposition to take on the buffy coat when drawn, renders the pulse frequent and harder, increases respiration, excites the temperature of the body, occasions a whitish fur on the tongue, and other symptoms of general inflammatory action—(Francis.)

It seems also to be a stimulus to all the excretories of the body, of the salivary glands, of the trachea, lungs, digestive organs, the chylopoietic viscera, and the whole alimentary canal.

It is slow in its operation, but when accumulated in the system to a sufficient degree, its action is exhibited in the production of such excitement, as to be called Morbus Mercurialis, during which the functional operations of all the systems of the body, are quickened and excited to a very great degree—(Francis' Inaugural Dissertation.)

It is these various and diversified powers. which give to mercury its very great superiority, and as particular effects are produced by regulating the dose, it becomes a remedy very generally applicable to diseases.

The good effects of Mercury in Fevers depend,

1. On its power of evacuating bile, fæces, and the morbid secretions of the alimentary canal. It is well known, that in malignant fevers, the Intestines are loaded, not only with increased quantity, but a vitiated quality of all the secretions which are poured into them. These, by retention, are not only increased in the degree of their morbid qualities, but by their accumulation become, in reality, exciting causes of disease. They have been known to possess such a degree of acrimony, as to excoriate the rectum, and the skin of the neighbouring parts. For the removal of these acrimonious matters, the milder cathartics, as the neutral salts, &c. have been resorted to, for fear of increasing the debility which exists. But Calomel alone, though generally in combination, surpasses all other cathartics, not only evacuating the contents of the bowels, but by exciting the several glands which empty into them, to a free and copious discharge, changing the character of their vitiated secretions, relieving topical congestions, and by removing the causes which indirectly debilitate, the patient is strengthened.

2. The good effects of mercury in the cure of fevers, depend upon its exciting a new action in the vessels, or one different from that which constitutes the proximate cause of the disease, and accordingly, we find,

that as the mercurial action begins to exhibit itself, the symptoms of the original disease subside. This action commences with the approach of salivation, which seems to be the test of the mercurial impression. The fact of the original disease giving way, upon the approach of the Mercurial, is so well established, that it hardly seems necessary to adduce proofs. For your satisfaction, I might detail the opinions of the most distinguished advocates of the mercurial practice on this point, of Drs. Rush, Chisolm, Clark, Warren, and others.

Application of Calomel to the cure of diseases.

In Yellow-fever—The Practice of several Physicians stated—of Warren, Chisolm, Clark, and of the resident Physicians of Charleston, during the several seasons that it has appeared as an epidemic.

I would not wish to be understood that the mercurial is the only practice which is to be pursued. I am on the contrary, most favourable to the employment of general and local blood-letting in this fever, the use of the cold effusion, purgative, and diaphoretic medicines, with blisters, and the benefits to be derived from a rigid system of abstinence, when that peculiarly irritable and inflammatory condition of the stomach takes place, which precedes and accompanies the black vomit. With these means I have combatted this severe disease, and my practice, I have had reason to think, was as successful as most of my medical brethren.

In severe cases it was observed, that the high excitement of the system, resisted the mercurial action, and though employed in large doses, and repeated at proper intervals, yet it failed to produce its specific effects, and death was often the consequence. In other cases where this excitement was less violent, the peculiar effects of the mercury were produced, and with the ptyalism and gradual subsidence of all the symptoms took place. In these cases, I have every reason to think, that equally beneficial effects follow from the practice just mentioned—and on some accounts it was preferable, as patients in their convalescence were not distressed with the disagreeable effects of sore mouths, swelled tongues, &c. The mildness of the particular case, as Bright and Addison observe, permitted the usual operation of the remedy, rather than, that the remedy controled the fever.

In the Bilious Remittent, or Country-fever. The beneficial operation of this medicine in these cases, may be inferred from what has been said of the peculiar operation of this article, in another place, upon the alimentary canal and the chylopoietic viscera. To the advantages arising from the use of mercurials in this form of fever, it may be added, that relapses are less likely to follow, than where the purgative and diaphoretic course is pursued. Exercising an influence so powerful as this medicine does, and in the several modes I have pointed out, I still think, that in the very acute diseases of our country, it is not alone sufficient. In this disease as well as Yellow-fever, blood-letting at the commencement, is of the utmost importance in diminishing action, lessening undue determinations, reducing inflammation, and other effects, of which I have already spoken. Neither can we depend upon Calomel as a cathartic, for in these acute cases its operation is too slow, and the sufferings

of the patient require that prompt measures be enforced. It is proper, therefore, to alternate its use with the saline cathartics, and this course continued until the disease begins to decline, or the mercurial preparations to exhibit their effects upon the system, either in improved secretions, or if still further continued, in its impression upon the gums and salivary glands.

While I thus advocate the use of this article, I cannot too earnestly caution you in the administration of it. Salivation is always painful, and very distressing, to convalescents. All that is required, is a gentle mercurial impression to the extent of producing tumefaction of the gums, and a slight spitting. This is what most practitioners will allow, is all that is to be desired. Yet, from a careless employment of the medicine, the sialogogue operation often takes place, to a great, and even alarming, degree. It is, therefore, important, that you should be informed how it may be obviated, and by attention to a few rules, you will, in most cases, succeed.

Rule I. In those cases where Mercury is employed, examine the evacuations of your patient, as soon as they are changed either from a dark, ash or grey color, to the color of bile—or their consistence from being thin and watery, to a more natural appearance, which will always take place when the liver pours forth a more healthy secretion, the medicine should be discontinued, or given at longer intervals.

Rule II. By omitting the use of the Medicine as soon as it exhibits the first indications of action upon the gums. These are redness, a peculiar fætor upon being rubbed, and a slight ulceration about the teeth.

Rule III. By attending to the constitution of the patient. The sialagogue operation of Mercury is very badly borne by persons of delicate habits, in whom the nervous temperament chiefly prevails. It is badly borne by persons advanced in life, whose constitutions have been impaired by previous attacks of sickness, and who are, therefore, weak and enfeebled.

Rule IV. The sialagogue operation of Mercury should not be attempted in persons under twelve years of age. By attending to these rules, severe instances of salivation will be prevented from occurring, I will not say invariably, but in a great majority of cases. Only observe the same precautions with this medicine, which are used with other active articles. We discontinue the use of opium when sleep is induced, Digitalis when it affects the brain and the organ of vision, Arsenic when it produces intumescence of the cellular membrane, and Calomel when it changes the secretions. This is sometimes difficult to be discovered, but attention is, on that account, the more necessary, particularly as its effects are more lasting, and distressing.

In Typhus-fever. In many of the Phlegmasiæ, it has been recommended and employed, as Hepatitis, Pneumonia, Rheumatism—in Inflammatory affections of the Throat, Larynx, Bronchiæ, Phthisis Pulmonalis—In Intestinal affections, as Dysentery, Dyspepsia, Cholera Morbus, the Intestinal derangements of children—in Tetanus, Dropsies, Syphilis.

Morbid effects produced from the use of Mercury. The first disease to be noticed, is the Erethismus Mercuriale, or Eczema Mercuriale, or Hydrargyrium.

Description of the disease—Mr. Alley's plates exhibited.

Another of the morbid effects of mercury is salivation. This affection is often a most unpleasant consequence of the employment of mercurial preparations, and sometimes, by its violence, a more distressing disease than the original complaint. The only mode of preventing these effects, is to exercise great caution, and to watch the progress of symptoms.

When the disease is formed, the Treatment will be directed, first, to the mitigation of pain.

This is afforded by washing the mouth with a solution of opium, either in water or milk—a strong infusion of green tea with laudanum—a solution of the acetate of lead, with laudanum. To these may be added leeches, ice water.

When sloughing exists, a solution of the chloride of soda may be resorted to, or the pyroligneous acid, or kreosote diluted. Emetics have been considered useful in counteracting the inordinate effects of mercury. Iodine has also been employed—A free exposure to dry cold air—A gargle of the root of the rhus glabrum, &c.

The second object to be pursued is, to determine the fluids to other parts. Cathartics are among the means resorted to for this purpose—Sulphur has been recommended, but with no particular advantage—Blisters.

The third object to be pursued is, to heal the local injury by restoring the tone of the parts. This is done by astringent gargles, composed of red rose leaves, red oak bark, a decoction of galls with a little alum.

Division XII.

Medicines, the effects of which are exhibited on the system generally.

Under this division are comprised Stimulants or Incitants properly so called—Narcotics—Antispasmodics—Tonics—and Astringents.

STIMULANTS.

Produce their effects by an impression upon the nervous energies of the stomach, which being communicated to the sensorium, is thence diffused over the system. The operation of these substances is too rapid, to admit of the supposition of their introduction into the circulation. By the impression upon the stomach, through the medium of the nerves, the vital energies are excited, as is evinced by the activity of the mental and corporeal powers, the increase of the force and vigour of the pulse, by the general determination of blood to the surface of the body, producing heat, flushing, and even perspiration.

From a knowledge of their effects, we judge of the diseases in which they are applicable. Employed with caution, they become very valuable in those cases of debility, succeeding fevers, or other violent diseases, when morbid action ceases, and no organic disorder remains.

At the present time it is so fashionable to attribute diseases to inflammation, that it might almost be questioned, whether such a class as stimulants should be retained. I confess that I am not so much a convert to the physiological system of medicine, as to admit of their exclusion from practice. I still however consider, that they are less necessary, and that their administration should be more cautiously regulated, than has been usual. This is more particularly the case, when we reflect that all the symptoms of prostration may be produced from irritation, or inflammation, of particular organs. Take for example Typhus, and the low forms of fever generally. The symptoms most commonly characteristic of these diseases, arise in lesions of the cerebral, spinal, and nervous systems. Inflammation of these systems is followed by great prostration of strength, frequent pulse, excited skin, depraved secretions, stupor, coma, convulsions—and it is for the relief of these very symptoms, that stimulants are frequently employed.

There are other cases, however, where Typhus is strictly adynamic, and in which the free use of stimulants becomes necessary. These cases are however rare, compared with the acute forms of the disease. The symptoms are, great prostration of the nervous and muscular energies, delirium, hæmorrhage, scattered petechiæ, soft fluent pulse, heat of skin little increased or below par. Under these circumstances, it is necessary to administer stimulants, and often to a considerable extent.

It is obvious, therefore, that in the employment of these medicines, much discrimination is required, and that until a correct diagnosis is drawn, mischief rather than benefit must arise from their use. The practitioner, therefore, should make himself acquainted with the pathology of diseases, and that he may be guided in his researches, he must have recourse to the productions of the French school. He will be much assisted by Goupil's exposition of the modern doctrines—Broussais on chronic inflammation, and Louis on gastro enteritis.

But though stimulants are improper while inflammation exists, yet they become proper at its decline, to put an end to the relaxation, and inaction, which occur in parts that have been long stimulated. Under these circumstances, the powers of the constitution languish, the circulation is feeble, and the digestive function is weak. The functions here are materially assisted by a supply of gentle stimulation, and it is then that they are useful and safe.

PARTICULAR STIMULANTS.

Sub Carbonas Ammoniæ—Concrete volatile Alkali. Preparation—Properties. Employed in low and malignant forms of fever, and in such as are called putrid. Formula. In Typhus Pneumonia, but with caution; In Cardialgia depending upon acidity; In gastric affections succeeding habits of irregularity and debauch; In Rheumatism combined with the Tinct. of Guaiac, &c.: In the bites of venemous reptiles. Used also as an external application.

Dose, grs. v to x in Julep or Pill.

Camphor—Substance peculiar in its operation on the system—Much

employed in low and malignant forms of disease, alternated with the vol. alkali. Formula—In Gangrene—In eruptive fevers to promote the filling of the pustules, and to bring them back after they have receded—In Inflammatory fevers after action has been reduced, combined with relaxing diaphoretics—In several chronic disorders combined with other articles—In Mania-a-Potu—External employment.

Dose, grs. v to ℈i.

Family *Coniferæ*—Ol. Terebinthinæ Rect—Natural History—Preparation—Very important article—Employed in Puerperal Fever—Produces its good effects in these cases, by exciting a copious secretion from the whole internal membrane of the intestines, by which irritation is determined from the peritoneum—To this may be added what has been termed a specific property in itself, by virtue of which it operates as an antidote to the morbid action which exists. Epilepsy—Chronic Rheumatism—In obstructions of the bowels combined with Castor Oil—As an Anthelmintic—In Chronic Pulmonary affections, in Gonorrhœa, Leucorrhœa.

Dose, from ʒi to ℥ii
ʒi or less in chronic pains of limbs, chest or elsewhere.
ʒii to ʒiij in Epilepsy, Puerperal fever, Obstructions of the bowels, against Lumbrici.
℥i to ℥ii—Tænia.

Alcohol and its combinations—In the former state seldom if ever used internally, but is employed externally for several purposes—Diluted as it exists in wine, it is of essential importance in Medicine, being more agreeably exciting—more refreshing to the patient, and more readily retained than any other article. Its stimulant operation is more permanent; it does not exhaust excitability in any great degree, and may be considered in comparison with ardent spirits as exerting a tonic operation.

The diseases, therefore, in which wine is applicable, may be readily supposed to be of the typhoid nature, when the indication is to support the strength of the patient, and to obviate symptoms of debility.

There are circumstances in the constitution of the patient, or the disease, which plainly forbid its use. In advising it, therefore, its effects are to be duly considered. If it does not increase the fever, restlessness and raving, if the sick are refreshed, composed, and inclined to sleep by it, have greater freedom from their sickness, or are better supported under it, the conclusion is, that it must be a safe, and suitable remedy, and without fear we may direct its use, in such quantity, time, and manner, as the disease seems to require, and the sick can bear. If it produces effects the contrary to them, we may safely conclude that it is injurious, and that it ought to be abstained from, or given in moderate quantities. Thus carefully exhibited, wine will be found not the least important of the stimuli, at a proper period in these diseases.

The quantity of wine, which should be administered in typhus, or other febrile affections, when a feeling of sinking, or prostration exists, must of course depend upon the symptoms and the degree of action existing in the system.

The choice of wine is not a matter of indifference. To obtain the Medicinal effects of wine, a preference is commonly given to Port, as being less disposed to acidity. When this cannot be obtained, good Madeira will be found to possess every quality, which is necessary to excite action, and to supply the pabulum, upon which this action is to be maintained. Next to these is Sherry. As a general rule, it will be found advisable to allow the sick their favourite wine.

When wine cannot be procured, cider, porter, or spirits diluted with water, sweetened and acidulated, are tolerable substitutes. Dr. Cullen was of opinion, that the last mentioned compound and opium, produced all the effects of wine; but opium does not appear to support the pulse like wine.

Poisonous operation of ardent spirits. Treatment. The practice in many respects similar to that recommended where an over dose of Laudanum has been taken—substituting the aqua ammonia largely diluted, or the acetate of ammonia in the form of mixture, in place of coffee—lime juice, &c. recommended to counteract the effects of Laudanum.

The degree of danger arising from ardent spirits, will be estimated by the inirritability of the iris, and the want of energy in the stomach to expel its contents. If this last can be excited, the patient will recover, but if it cannot, death is usually the consequence, since it is to be presumed, that the stimulus has been so powerful as to bring on a fatal state of collapse, by which the powers of vitality are exhausted—and instances are not rare, of persons falling dead instantaneously by swallowing a large quantity of spirits.

Morbid appearances—are engorgement of the vessels of the brain, and a quantity of serum, in the lateral ventricles.

Family *Solanaceæ*—Capsicum Annuum—Red Pepper—Natural History. Analysis—Capsicin—Employed as a condiment. Used also in certain stages of Dyspepsia—In Cynanche Maligna in the form of gargle. Also in that deranged condition of the mucous membrane of the stomach which accompanies the black vomit, but with little effect. Proposed also in febrile disease for its stimulant and diaphoretic properties.

Among the properties of this article, not noticed by writers, is its antilithic. I have only the authority of a single case in speaking of it, and probably my observations may be premature. But I am acquainted with an elderly gentleman, upwards of seventy years, who has been distressed for several years with calculi or gravel. He has tried a variety of remedies, with occasional and temporary relief. Among the means he employed, was the use of active cathartics, and though affording much benefit, yet the operation was too exhausting to be long borne. From the feeling of sinking, with the gastric derangements attending, he was induced to make trial of Capsicum. Since using the article, he is fully impressed with the belief, that his life has been prolonged, being freed from flatulence, heart-burn, loss of appetite, irregularity in the evacuations, which were so distressing.

The quantity he uses is very considerable, employing at his dinner five or six peppers, cutting them up as salad, and mixing them with the food eat. The effect of this treatment by restoring his appetite, has

been to restore his strength, and while promoting the functions of the bowels, giving to them greater regularity, it exerts also a diuretic operation. He also thinks some change has taken place in the structure of the calculi, that they are softer, more readily broken down by the muscular actions of the urethra, and expelled in a more pulverulent state.

Given in the form of infusion.
In Powder.

Family *Piperineæ*—Piper Nigrum or Black Pepper. Natural History. Analysis—Oil—Piperin—Employed as a stimulant and carminative for several purposes: In Intermittent Fevers. Useful as a gargle in relaxed states of the Uvula, and in certain ulcerations of the throat.

Dose, v to viii of the seeds twice a day.
Powder, gr. iv to ℈i.
Oil, i drop.
Piperine, 1-2 to i gr.

Piper Cubeba—Cubebs. Natural History—Properties—Analysis—Employed in Gonorrhœa and Leucorrhœa, alone or combined with Copaiva. Formula.

Dose, ʒss to ʒii of the powder
ʒi to ℥ss of the tincture
Oil Cubebs m viii
Enema, ʒvi to ʒviii of the powder, combined with mucilage and administered to the patient. The practice repeated for several days.

NARCOTICS.

The next class of stimulants, is that termed Narcotics.

Definition of the class and their general effects. The action of the Narcotics is principally directed to the brain and nervous system, and hence may be called sensorial stimuli. As the other stimulants exhibit their effects upon the circulation primarily, and the brain as a secondary operation, these on the contrary exert an influence upon the intellectual and nervous systems, exciting to their increased activity, and as a consequence a diminution of their sensibility and irritability. To this peculiar destination of their powers are we indebted for the beneficial effects which they display in diseases—powers which entitle them to be considered the best gifts of Heaven to its fallen creatures. It is from the action of these articles upon the brain primarily, that speedy dissolution follows the introduction of a very large dose into the stomach. This has recently been established by the experiments of Mr. Brodie. On introducing a small quantity of the juice of Aconite, or the essential oil of Bitter Almonds diffused in water, or of the leaves of Tobacco into the rectum, or in a concentrated state into a wound, the entire loss of voluntary motion, and total insensibility was produced,—yet even when this state was allowed to continue, until all the external signs of apparent death were produced, the heart when exposed to view, was found contracting with considerable force, and by inflating the lungs and keeping up artificial respiration, its action could be kept up nearly to the natural

standard, for a considerable period. It seems, therefore, that while the nervous system was so much affected, the powers of the circulating system were little impaired, and the cessation of the function ultimately producing death, appears in such cases to arise principally from the respiration being affected, and at length ceasing, in consequence of this function being so much more dependent upon the influence of the nerves.

As the question of the stimulant, or sedative, operation of the Narcotics, is of importance, not only in a practical consideration, but from the character of the individuals who have been opposed to each other on this point, it may not be amiss to state the grounds of the discussion.

The reasons assigned for considering the Narcotics sedative, together with a refutation of them.

Rules to be observed in their administration.

PARTICULAR NARCOTICS.

Family *Papaveraceæ*—Papaver Somniferum, Poppy—Natural History. Manner of preparing the extract or opium from the plant. At the time the pods become nearly ripe, incisions are made into them in the evening, and from them there oozes out a considerable quantity of milky fluid. This fluid is scraped off early the next morning from the wounds, with an iron scoop, and worked in an earthen pot for a long time in the sun, until it becomes of a considerable consistence. This is then made into lumps of a globular form, which are covered with the leaves of the poppy, or other vegetable, to prevent their running, or sticking together. The operation of making the incisions into the Capsules, is repeated three times, but the produce gradually decreases in quantity, nor is it of so good a quality. The kind most esteemed, is rather soft, and yields to the touch, is inflammable, of a blackish brown colour, and has a strong smell.

There are four kinds of opium to be met with in commerce—the Turkey, East-Indian, Egyptian, and the European opium. The quality varies according to the care taken in its preparation. It is frequently found in our markets mixed with the leaves, stalks, seeds, &c. of the plant, and the great proportion of these admixtures would lead to the conjecture, that the leaves were worked in when the opium was in a soft and recent state, for the purpose of increasing its weight and consistence. The quantity of these inert substances is frequently so great, that an ounce yields only from 4 1-2 to 5 and 6 drams of soluble, and extractive matter.

It is adulterated with various other substances—with liquorice, when the specimen is brittle and tastes sweet—sometimes with gum arabic, or tragacanth. It is mixed with sand, and gravel, which is very common, in order to increase its weight, and the opium feels gritty between the teeth.

Opium is an article which might very well be cultivated in the Carolinas and in Georgia—and that to a considerable extent. Some specimens have been made, which were as pure and as active as the Turkey, probably more so.

Chemical analysis is as follows:

1. A Volatile Oil, in which the odour peculiar to good and well prepared opium depends.
2. Gum, including Bassorine.
3. Extractive, partly simple, partly more than usually oxiginated.
4. Resin, with which the colouring matter is closely combined.
5. Caoutchouc.
6. Narceine, or Narceina.
7. Meconine.
8. Morphia combined with Meconic Acid.
9. Narcotina.

Besides, Sulphates of Lime, and Potash, a brown acid. Lignine.

Remarks upon a few of these principles.

The Poppy has been cultivated from very remote antiquity. Among the Greeks it served to ornament their gardens, and seems to have been known in the time of Homer. It was not less common in the gardens of the Romans, since Virgil, in his Georgics, speaks frequently of the plant. Opium was first employed internally by Hippocrates, and it is probable that its virtues were discovered about that time and in his country. Since then, the inestimable benefits which it confers, became diffused through the world, and in every country, all are ready to acknowledge the great and important effects derived from this merciful dispensation of Providence.

The Application of Opium to Diseases.

Before entering upon the curative applications of opium, it may be useful to detail at length, its operations upon the different functions of the body.

1. Upon the Animal Functions.
2. Upon the Vital Functions.
3. Upon the Natural Functions.

Diseases in which Opium is recommended.

Continued Fevers—Intermittents—In Inflammatory Affections after action has been subdued, combined with other articles—In Asthma, Catarrh, Phthisis Pulmonalis, Rheumatism, Gout—In the Phlegmasiæ of the Mucous Membranes, especially of the Primæ Viæ—In Dysentery, Diarrhæa, Cholera Morbus, Bilious Colic, Colica Pictonum—In Dyspepsia.

In Hemorrhages—In Tetanus—Mania-a-Potu—Syphilis.

Its external employment often productive of beneficial effects.

Opiate enema.

Opium suppository.

Its poisonous operation considered—Symptoms—Treatment. The first object to be accomplished, is to evacuate the stomach—Emetics of the Sulphate of Zinc, and should this fail, of the Sulphate of Copper, are usually resorted to. With the evacuation of the stomach, the apprehensions of danger will be much relieved. After vomiting, the patient should be moved about—irritating applications be applied to the skin if necessary—and strong coffee, lime juice, or vinegar be given diluted, to correct the effects of opium upon the nervous system.

Should Deglutition be interrupted, and it is impossible to introduce an emetic into the stomach, other means must be resorted to. Blood-letting may be employed with caution—but the affusion of cold water over the head and shoulders has been found productive of the happiest effects in rousing the patient from this state of insensibility. The emetic should then be administered as soon as it can be taken, and whenever the torpor returns, the cold affusion is to be repeated.

Should the insensibility of the patient continue, the stomach pump must be resorted to.

Various articles have been proposed as Antidotes to Opium—Vinegar, Vegetable Acids—the infusion of Coffee, Chlorine, &c. They have no such operation—on the contrary, by being given before the narcotic is expelled, by diluting the substance they promote its absorption, and thus aggravate the symptoms. They are useful, however, after it has been removed, in counteracting its effects upon the nervous system.

Should the means fail, which have been proposed, artificial respiration should be attempted, and persevered in some time, since very hopeless cases have been restored by this means.

Opium acts chiefly upon the respiratory and sympathetic ganglia. If respiration can be sustained by artificial means, until the sedative influence of the opium can be subdued by the recuperative energies of the system, life may be preserved.

Another method of treatment has been recommended by the use of emetics per anum. The ecsophagus tube of a stomach pump, is to be introduced into the rectum, and passed gently up eighteen inches or two feet. This being done, half a gallon of tepid water, containing x or xv grs. of the tartarised antimony, is to be slowly pumped into the colon. The patient will complain of nausea, and an inclination to evacuate the bowels, followed by full vomiting, repeated several times successively. The evacuations may be renewed by x grs. more, dissolved in a quart of water, and introduced as before. The operations which succeed, relieve the patient considerably, and the narcotic symptoms soon disappear.

The same plan may be used in obstinate constipation, and in colic, for the purpose of throwing up purgative medicines.

The *habitual* use of opium greatly impairs the constitution. The persons who accustom themselves to use it, can by no means live without it, and are feeble and weak. They are usually thin, and are often of a sallow complexion, and look much older than they really are. Some of us in this country, may have observed the effects of this deleterious practice, which lays the foundation of a number of distressing feelings, usually termed nervous, with paleness, emaciation, an apathy equally of body and mind, and premature death.

The Officinal Preparations of Opium.

Tinct. Opii.
Elixir Paregoric.
Denarcotised Laudanum.
Denarcotised Acidulous Tincture of Opium. Formula.

Salts of Opium.

Acetate—Citrate Muriate and Sulphate of Morphine. Sulphate of Morphine has a considerable resemblance to the Sulphate of Quinine; and as this latter salt may be mixed with it, the practitioner would do well to remember the following test proposed by Dr. Paris, by which they may be distinguished. It is as follows, that the Sulphate of Morphine treated by concentrated Nitric Acid becomes red, whereas no such effect is produced with the Sulphate of Quinine.

Doses—of the Tinctura Opii—
xxv m for an adult
vj m for a child a year old
i m for an infant within the month.

Denarcotised Laudanum
Dose—the same.
Denarcotised Acidulated Tincture
Dose—the same.

SALTS.

Morphia—rarely employed in its pure state.
Acetate Morphia
Dose—$\frac{1}{6}$, $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$ gr. rubbed up with sugar.
Sulphate Morphia
Dose—the same.
Citrate Morphia
Dose—the same.
Opium—in substance, i gr.

The doses of this article will vary with the indications.

Family *Synanthereæ*—Lactuca Virosa—Lactucarium seu Thridax—Natural History—Preparation—Powers inferior to the preceding article, but freed from its stupifying operation—applied to the same purposes in large doses.

Family *Solaneæ*—Hyosciamus Niger—Henbane—Natural History—Effects upon the system—Employed in several diseases as a substitute for opium, the good effects of which it often exhibits, without its constipating the bowels—Useful as a topical application in scirrhus and cancerous affections, and in scrofulous ulcerations, applied in the form of cataplasm of the bruised leaves, or as a wash.

Dose—gr. ij to ℈i.

Datura Stramonium—Thornapple—Indigenous—Natural History—Properties—Employed in mania—Epilepsy, particularly that form which is regular in its attacks—In Asthma, when uncomplicated—In lessening the pain of chronic diseases, as Rheumatism, Tic Doloureaux, Sciatica; in Scrofulous, Venereal, and ill conditioned Ulcers with thickened edges and a sanious discharge.—Admintstered in the form of powder—Extract from the seeds and plant. Tincture.

Preparation of the extract.

Dose, powder, gr. i
Seeds, gr. 1-2
Extract, gr. i

Extract from the seeds, gr. ss.
Tincture, " " " xx to xxx m.

Ointment—Preparation—applied to hæmorrhoids—to the eye-lids to dilate the pupil—as a dressing in scalds and burns, &c.

Poisonous operation of the stramonium—The capsule, or apples, as they are commonly called, being eat by children, symptoms of a distressing character are produced—These enumerated—Treatment.

Atropa Belladona—Natural History—Analysis—Atropia—Properties—Rarely employed internally—Recommended as a preventive of Scarlatina—Applied io the eye-lids to produce dilatation of the pupils in cataract.

Dose of the Extract, gr. i, increased.

Solanum Dulcamara—Bitter Sweet—Natural History—Properties—Chiefly employed in cutaneous diseases in the form of decoction of the stipites or younger branches.

Decoction, 1 pint daily.

Family *Umbellatæ*—Conium Maculatum—Hemlock—Natural History—Recommended in Scirrhus and Cancer, but without advantage except as a palliative—In Scrofulous ulcerations, and in Opthalmia—In ulcerations of the secondary stages of Syphilis—In the Neuroses—Glandular Obstructions.

Preparation of the extract.

Administration, beginning with small doses, the quantity to be increased until the system becomes sensibly affected by its use—Often an inert article from age—Care should be taken in its selection, and a return to the original small dose with a fresh parcel.

Dose, ij grs. to ʒss and ℈ii.

In the treatment of persons poisoned by the use of this article, or any other narcotic, the treatment is similar to what has been pointed out, under opium. It should consist in the speedy evacuation of the substance from the stomach. Of the emetics the best is the Sulphate of Zinc, on account of its being more quick in its operation.

After the stomach has been cleansed, a cathartic should be administered, and to lessen the effects of the narcotic upon the system, lemon juice, or vinegar, or strong coffee are to be employed. As most narcotic poisons act by destroying the functions of the brain, respiration being suspended because it is under the influence of that organ, life may be preserved according to the suggestion of Mr. Brodie, by keeping up artificial respiration, after death has apparently taken place.

Cicuta Maculata—American Hemlock—Indigenous—Natural History—Effects similar to the preceding, only more powerful.

Dose, ij grs. increased.

Family *Ranunculaceæ*—Aconitum Napellus—Wolf's-bane.

Hydrocyanic Acid—Preparation. Exists abundantly in the vegetable kingdom—Effects upon the system—Action decidedly sedative. Employed in diseases of increased sensibility and irritability—In Nervous and Chronic Coughs—In Catarrhal affections and Whooping Cough. Also in Phthisis Pulmonalis, Asthma, Dyspeptic affections, Tetanus, &c. Evidence of its utility in these cases.

Exhibition—Medicinal Prussic Acid employed—To be administered in distilled water—to be recently prepared since it is easily discomposed.

Dose, i m, increased. Formula.

Poisonous operation—its prompt and fatal effects—Antidotes. It is difficult to point out an antidote to an article which operates with such great activity—several have been proposed, but until lately with little effect. Those most approved, are diluted aqua ammonia, taken internally and applied externally—Chlorine—inhaling the vapour, and injecting a solution of Chloride of Lime, or Soda into the stomach, when insensibility exists.

The best of all remedies is the affusion of cold water, and it should be employed in connection with the last mentioned.

Family *Rosaceæ*—Prunus Lauro Cerasus—Cherry Laurel—Naturalized—Natural History—Effects upon the system similar to the preceding—Active principle separated by distillation—Employed in the same diseases as the preceding.

Dose, xxx to xl m of the distilled water
Tincture of the leaves, x to xx.

Amygdalis Communis—Bitter Almond—Prussic Acid obtained by distillation from the cake which remains after the separation of the fixed oil—The acid rising in union with volatile oil, from which it can be separated by the red oxide of Mercury.

Family *Papaveraceæ*—Sanguinaria Canadensis—Blood Root—Indigenous—Analysis—Natural History—Sanguinarin—Effects npon the system diversified, according to the dose—Employed in Rheumatism, Hepatic derangements, Pulmonic affections attended with difficult respiration, cough, and occasional hæmorrhage—Pertussis—In some of the forms of Dropsy. Externally employed in ill conditioned ulcers—In Polypi of the Nose, combined with calomel as a sternutatory.

Dose, Tincture, xxv to xxx m
Powder, v grs.
Infusion, ʒi of the powder, to ℥v of water
Dose, ℥ss.

Family *Apocyneæ*—Strychnos Nux Vomica. Natural History. All parts of the plant are extremely bitter, and contain more or less Strychnia; but it is from the seeds, that the greatest quantity has been obtained.

Chemical Analysis.

Strychnia combined with Igasuric acid, forming an Igasurate of Strychnia—a concrete oil, gum, starch, a small proportion of wax—Bassorine, Lignine.

Besides Stychnia, Nux Vomica contains also another active principle. Brucia, in combination with Igasuric acid.

Medical Properties. Nux Vomica has no odour, but a very bitter taste, and when given in large doses, is possessed of very destructive properties, producing great disturbance in the functions of the animal economy, as anxious breathing, retching and nausea, tremors, violent convulsions, tetanic spasms of extraordinary force, asphyxia, and death. It exerts an action in a high degree upon the brain and spinal marrow,

giving excitement to these parts, and through them to the whole muscular system of the body. It is possessed of narcotic properties, but in many respects differs from most articles of this class, and may be considered as peculiar in its operation upon the system.

But little employed until the experiments of Delile and Magendie upon the action of the Upas Teute and its kindred species on animals.

Employed in paralytic affections, particularly such as arise from an impaired state of the nervous energy. The symptoms which are considered as favourable in its use, are a sense of thrilling, or throbbing, or starting in the affected part or limb, an internal sense of unpleasant heat, or an increased sensibility all over the parts deprived of motion. In the application of this article to paralytic affections, it would appear to be less useful in that species of the disease arising from apoplexy, but to be principally advantageous in palsy, arising out of an impaired state of the nervous energy, or those cases brought on by excesses of various kinds, in narcotics, by metallic influence, by rheumatism, and by acute diseases. All cases arising in any of these causes, are proper objects for the use of this article. Dr. Thomson is of opinion, that this article does not influence the circulation of the blood in the brain, unless when it is given in sufficient quantities to produce death. He therefore recommends it in cases in which the paralysis may have arisen from pressure on the brain, yet there is reason to think that benefit may be derived from so direct and powerful a stimulant of the nervous energy.

It is also employed in other cases, connected with muscular relaxation of particular parts, as the levator palpebræ of the eye-lid. In Incontinence of Urine, Impotence—In the diseases of the eyes, as Amaurosis. It has been given with advantage in Chorea Sancti Viti, and likewise for the destruction of intestinal worms, which it is supposed to effect by its extreme bitterness.

Forms of administering this article.

In substance rasped fine—grs. iv, form of pill
Alcoholic Extract---i to ij grs.
Strychnia---g. $\frac{1}{12}$.

The doses of the medicine are to be increased gradually, until the expected affection, thrilling, throbbing, tetanic shocks, and prickling, are experienced in the affected parts. When these are felt, the augmentation of the dose is to be discontinued. If continued after these symptoms are produced, violent tetanic shocks are excited throughout the system, so as to throw the patient from his bed.

Stychnia is the form of administering this article, which is generally preferred. It should not be given in its pure state, but combined with an acid, so as to form a neutral salt---otherwise it may be inactive from its insolubility.

Great uncertainty is often complained of, in the effects of this article. This proceeds from imperfection in its preparation, when it will be found to contain Brucia, which is of much less activity; one grain of Strychnia being equal to six of Brucia.

The purity of Strychnia is determined, by adding to a mixture containing it, a small quantity of Nitric Acid. The deeper the red which

is produced. the larger must be the quantity of Brucia present: and no Strychnia should be employed, that is tinged more than a pale reddish yellow hue, by the Nitric Acid.

Poisonous operation of the Nux Vomica—Symptoms—Treatment. The first object is to get rid of the offending substance, by the use of an emetic, or the stomach pump. The second is to destroy the virulence of the poison, and for this purpose a tincture of Iodine should be administered, an Ioduret of Strychnia being formed which is not possessed of active properties.

Brucine—has been employed in the same diseases as Strychnia, but is decidedly inferior in activity, requiring to be given in larger doses.

Family *Urticeæ*—Humulus Lupulus—Hop—Natural History—Lupulin—Its effects evidently narcotic—and used as a substitute for opium when that article disagrees, by producing nervous or other distressing symptoms.

Family *undetermined*—Gelseminum Sempervirens—Yellow Jesamine. Natural History—Indigenous—Effects upon the system of an active and powerful character—Employed in Rheumatism—and from its operation upon the nervous system may be used as a substitute for Prussic Acid, and in the diseases in which that article has been recommended. Bark of the root employed in the proportion of

℥i to ℔i of spirits. Dose, xxx m.

ANTISPASMODICS.

General remarks upon the operation of this class, and the substance of which it is composed. In proceeding to speak of the articles of this class of medicines, I ought not to disguise that they are very rarely employed, at least by myself. So great a revolution has of late taken place in the Pathology, and Treatment of Nervous and Convulsive Diseases, that the remedies which were once in vogue, are now rarely administered.

These diseases have for a long time been considered as originating in great mobility of the system. By this term was meant, much excitability, connected with a debilitated, or more properly, a delicate habit of body. Such, doubtless, is the state of constitution, giving rise to these diseases—But it should also be observed, that the phenomena of nervous excitement, or the symptoms these diseases present, originate often in excited states of the cerebral and spinal systems, and in many instances, stimulants particularly of the diffusible kind, comprised under this class, are injudicious and improper. Such at least has been my views in the management of these cases, particularly during the states of excitement, or while the paroxysm is on.

In many instances, particularly in Hysteria occurring with delicate females, I have afforded almost instantaneous relief by depletion, by drawing a few ounces of blood, by keeping the apartment cool, by cold applications to the head, cold drinks; and by these simple means more prompt and effectual relief has been afforded, than by the whole catalogue of anti-spasmodics successively employed.

There are periods, however, when these Medicines can be resorted to. In the intervals of the paroxysms, they are of use to fortify the nervous system, and to calm the irregular and disorderly movements. They seem adapted to lessen that irritability which is too readily excited into action, upon any, even the most trifling occurrence, which have reference to the feelings and sensibilities. Antispasmodics, though useful, are not even here the most approved means. This very excitable state, or unequally balanced condition of the system, is often effectually, and I believe, most effectually removed, by bringing into action the corporeal energies—by giving vigor to the muscular system, by exercise, by tonics, by change of air: of climate, by soothing mental anxieties, or removing them if practicable, and very often by renewing secretions or discharges, which have been interrupted. Of these secretions, the most important is the catamenial.

Subacute forms of these diseases will occur, in which a depletory course cannot be pursued, and where the chronic remedies which are to be resorted to in the Intermissions, cannot be practised. Under these circumstances, the Antispasmodics, strictly so called, must be resorted to.

It should be observed, that all the substances which we are to consider under this class, are vegetable gummy resinous, or aromatic substances, or animal substances of much odour, or chemical substances, which are very diffusible. It is nevertheless in this vegetable or animal aroma, that the diffusible property of these substances resides, and their anti-spasmodic effects.

PARTICULAR ANTISPASMODICS.

Family *Umbelliferæ*—Ferula Assafœtida—Natural History. The Assafœtida is the concrete juice of the root of this plant, which is procured by making a transverse incision of the top of the root, and allowing the juice to exude upon the surface of the wound. It is scraped off by a proper instrument, and exposed to the sun to harden. The same operation is repeated until the root is exhausted of its juice, when it soon perishes. Properties. The analysis of Assafœtida affords the following results. In 50 grs. of assafœtida, 32-40 are of a particular resin, which becomes of a red colour upon exposure to the light. This resin has no odour unless it is impregnated with a portion of the essential oil; 1-32 of a volatile oil, to which is owing its odour, and acrimony: 9-72, of a gum resembling Gum Arabic: 5-33, of a matter analogous to the gum of Bassora, Malate of Lime.

The virtues and uses of assafœtida are very considerable. In many parts of Arabia and Persia, it forms an important article of the M. M., and is employed largely as a condiment for food. The Banian Indians, (who not using animal food, have recourse to the strongest and most acrid condiments,) employ assafœtida liberally in cooking, and even rub their mouths with it before meals to stimulate their appetites.

The diseases of the class Neuroses in which it is most commonly employed, are Hysteria and Hypocondriasis, and in some of these cases

its administration will afford relief. It is given during the paroxysm of the disorder, and as its effect is not very permanent, the dose should be large and frequently repeated.

In other cases in which it is employed, as Epilepsy and the convulsive affections, it is undoubtedly too feeble to contend with them.

In the diseases of the alimentary canal it is highly serviceable, particularly when the powers of digestion are weakened by habits of intemperance. It is also useful in relieving many of the unpleasant symptoms which so frequently attend dyspepsia. It is also employed in the form of pill as a carminative in those cases, and it is effectual not only in relieving the bowels of flatus, but has manifestly a laxative operation. Its good effects in these cases are dependent upon its stimulating operation; hence it is employed by the inhabitants of India, to season their food, and they regard it as an excellent stomachic.

In diseases of the Thorax employed—Asthma, Pertussis, secondary stages of Catarrh, particularly when following measles.

Exhibited in watery solution, dose ℥ss
Tincture, xxx to xl m
Enema, ʒi to ʒii dissolved in x ounces of a decoction of barley.

Bubon Galbanum—of little value.

Family *Valerianæ*—Valeriana Officinalis—Natural History. The root of this plant is perennial and indigenous to England and Germany. It grows in moist and dry situations, and its qualities are much influenced by the degree of exposure to heat and light, as well as the kind of soil in which they are cultivated. The roots which are obtained in a soil dry and elevated, have much more odour, and contain more medicinal principles than those which are collected in a moist or shady situation. Much care should also be observed in collecting the roots. They ought not to be taken up until they are two or three years old, and they should be gathered before the leaves shoot forth. Properties of the root.

Analysis. A pound of this root is composed of Fecula ʒii, Gum. Extract ℥iss, a Black resin ℥i, volatile oil ℈i, Ligneous matter ℥xl. The camphorated odour and aromatic taste, depend upon the volatile oil, its fœtid odour, and acrid disagreeable taste to the resin, and the sweetish taste to the gummy extract.

The effects of this article are stimulating in a considerable degree. It accelerates the circulation, increases the animal heat, increases some of the excretions, as perspiration, and sometimes the urinary. It exercises a considerable influence upon the nervous system, which is of a calming or soothing nature, allaying the agitation, sleeplessness, the wandering pains, oppression, which so frequently attend in these cases. Employed in the same diseases as assafœtida. In Hemicrania combined with Peruvian Bark—In the Typhus states of fever combined with Ammonia and Bark.

The Valerian is exhibited in Substance, Tincture, Infusion and Essential Oil.

In Substance the dose is ʒi to ℥ss three times a day, though so con-

siderable a proportion of Valerian root consists of mere inert woody fibre, that the powder cannot be considered a commendable form for its exhibition.

In Tincture the dose is ʒii to ℥ss
Of the Infusion, ℥ii three or four times a day.

The Infusion is prepared by boiling an ounce of the bruised roots with twelve ounces of water for ten minutes. Of this, one to two ounces may be taken three times a day with the addition of a dram of the Tincture. By long boiling its virtues are lost.

The Essential Oil is given in doses of ij to x drops in a mixture.

As an Anti-Hysteric, it is usually conjoined with assafœtida, ammonia, and other nervous stimulants.

Family *Liliaceæ*—Allium Sativum—Garlic—Natural History—Properties—Of little value as an antispasmodic.

Musk—obtained from the Moschus Moschiferus—An animal somewhat resembling the rein-deer, inhabiting Siberia, China, Thibet. The musk appears to be a peculiar secretion, which is deposited in a small sac situated near the umbilicus of the male.

This pouch or sac is an organ peculiar to the male, and is found under the skin of the belly, in front of the prepuce. The organ is of an oval shape, and the membrane which lines its internal surface, presents a number of irregular folds. It has a small orifice. It is in this cavity that the musk is accumulated. The secretion has the strongest odour in the animals which inhabit Thibet and China. In more northern countries it looses a great deal of its aromatic qualities. In the rutting season it is formed in the greatest abundance, and its sensible qualities are more developed. The pouch in which it is formed. is only filled in the adult males. It is, however, always seen in the young males.

It is usually imported in round thin bladders, its natural receptacle, covered externally with hair: in general containing not more than two drachms. When pure it has a reddish brown colour, and uniform texture, with a very diffusive odour and bitter taste. In consequence of its high price other substances are frequently mixed with it, or sometimes the place of musk is entirely supplied by foreign matters, as blood, asphaltum. Lead is sometimes introduced into the bag to increase its weight. To be genuine the bags should have no appearance of having been opened.

Musk has been held in repute as an anti-spasmodic, and was much esteemed in the treatment of those diseases in which this class of remedies is adopted. It possesses very considerable stimulating properties, and acts particularly on the nervous system, exciting it in a considerable degree, and giving activity both to the mental and corporeal energies. It has been resorted to in the treatment of Tetanus, Hydrophobia, Epilepsy. It is used more advantageously in the advanced stages of Typhus fever, when subsultus tendium, singultus, and low delirium are present.

In the attacks of retrocedent gout, when falling upon the stomach. Recommended in other spasmodic diseases, but with effects not so decided as to entitle it to particular attention.

It is given in doses of x to xx grs. either in the form of pill or mixture. Vide Formulæ.

Tincture of Artificial Musk---Preparation---Employed in Pertussis.

Dose, xv m

Castor—Obtained from the Castor Fiber—A deposition in both sexes, in two sacs or bags, containing a brownish oily matter—Employed in Hysteria, Hypochondriasis, &c. Its extremely nauseous taste and smell, together with the absence of any very positive properties, has caused it to be rejected.

Dose, Tincture, ʒi to ʒij.

Sulphuric Æther—Preparation—Properties—Effects upon the system—Employed in many cases when the organs of respiration are affected—When a state of congestion exists in the lungs, with an inability to expectorate—In Hysteria—Hiccough---In sea-sickness---In the advanced stages of Typhus fever combined with an infusion of green mint. External employment. Formula.

Dose, ʒss.

Hoffman's Anodyne Liquor---Similar to the foregoing---Only weaker.

Oleum Succini---Natural History---Properties---Employed with advantage occasionally, in palpitations of the heart, &c. External Employment.

Dose. x to xxx m.

Other and opposite remedies frequently Antispasmodic---These enumerated.

TONICS.

Under this class are included Stimulants, with powers modified and differing very essentially from any of the preceding. Their operation is to give tone to the system. In doing this, they do not produce any sensible excitement, and by their gradual operation they give vigour and activity to the vital powers without any depression following their use. In this respect they differ very essentially from any stimulants which have been mentioned. These by raising the excitement to a considerable degree, are quickly followed by proportional languor and debility. But in Tonics, their stimulant operation being more slowly exerted, any change is much less conspicuous, and the succeeding collapse takes place to no considerable extent. Their stimulant effect is principally to be observed from their long continued use, when they increase the force of the circulation, strengthen the powers of digestion, excite the deficient secretions, and restrain them when too profuse. They also give strength to the muscular fibre and renovate the actions of the system. Their action is not mechanical, as was once conceived, giving tension or tone, (hence the term Tonic,) to the muscular fibre. but it is exerted upon the whole system, influenced by laws incident to vitality.

The action of Tonics will be more satisfactorily exhibited, by considering their influence on the different functions of the body.

1. The Digestive. The stomach is the organ primarily acted upon, and from it by nervous communication, the whole system becomes in-

vigorated. The stomach being improved, digestion is better performed, a more abundant and healthy chyle produced, and hence greater health and vigour is imparted to the body. The functions of the stomach being better performed, the fæcal discharges exhibit a corresponding improvement in appearance. They are lessened in quantity, and are of a more firm consistence, they are retained longer in the Intestinal canal, and hence costiveness not unfrequently attends the employment of Tonics.

Tonics are improperly exhibited to persons, in whom there is irritability of the stomach, and this connected with the presence of Inflammation. Far from relieving this symptom, digestion will be found still further to languish. and there will be added anxiety, oppression, pains in the head, &c.

They are improperly exhibited before the Intestinal secretions have been altered, and healthy discharges procured.

They are improperly exhibited when there is determination to particular organs, as the head, lungs, liver, and this connected with inflammation.

2. Upon the Circulation. The contractions of the heart are increased in force and energy by the use of tonics. The action of the capillary system is strengthened in a considerable degree under their influence, and hence they are employed with much advantage in hæmorrhages connected with feeble action, in discharges by the skin, in increased secretions from the mucous follicles, &c.

3. Upon the Respiratory System. The action of Tonics in strengthening the powers by which respiration is performed, improves this function, without rendering it more frequent. The blood experiences changes, it becomes of a more red or vermillion colour, more consistent, and less serous.

4. Upon the Absorbent System. That the action of these vessels is improved, is proved by the rapidity with which the Interstitial absorption is sometimes carried on, as evinced in the speedy removal of œdematous swellings.

5. Secretion and Exhalation. These functions are most commonly diminished under the action of tonics. Connected as they very often are when in excess with a debilitated condition of the system, they can only be advantageously resorted to under such circumstances.

6. Nutrition. In favouring digestion, Tonics improve much, nutrition in general. Under these circumstances the body returns to its fullness, the flesh to its firmness, the skin to its clearness. leaving little doubt of the advantageous impressions produced by this class.

7. The Cerebral System. The functions of the brain experience a like favourable influence. The senses are more acute and delicate, the understanding and memory are exercised with more readiness. The powers of locomotion are renewed, a feeling of health, and well being animates the frame, and the individual experiences that he is himself again.

It is in these several ways that tonics exert an action friendly to life, and to the restoration of an enfeebled system. Upon what principle

they produce their beneficial effects, is not exactly known, but it seems to be connected with their bitterness, as most of the vegetable tonics are possessed of this property. This, however, is not invariably the case, as many articles are bitter without being tonic, as digitalis and opium, and some of the metallic preparations are tonic, though void of bitterness.

Divided into vegetable and mineral—The tonic power of the former is intimately connected with certain sensible properties. All possess these qualities, though in the different articles one may be more predominant than another. The purest Bitters, astringents, and aromatics, possess more or lesr tonic power. But the most powerful tonics are natural combinations of these principles.

PARTICULAR TONICS.

Family *Rubiaceæ*—Cinchona. Natural History. The genus Cinchona comprehends a large and valuable number of plants. Some of them grow to the size of a cherry-tree, the leaves are oblong and lanceolate, the flowers are of a reddish colour, from which is produced a pod, in which is found a nut like an almond.

The soil in which these trees thrive best, is generally a red clayey or rocky ground, and especially on the banks of rivers, descending from the mountains.

The season for cutting the bark, is from September to November, and much care is taken that the bark is not cut wet, as it would soon lose its colour, turn black, and rot.

On the trees being entirely stripped of their bark, they soon perish, and as the number of these trees, to which access could be had, is not very considerable, it has been supposed that a sufficient quantity of the bark to supply the demand, can not long be procured. Condamine, however, asserts that the young trees do not die by losing their bark, and as those which are suffered to become old, have time to disseminate and propagate, the fear of exhausting this valuable medicine is wholly groundless. Medical History. The most probable history of the discovery of the febrifuge virtues of Cinchona is the following, mentioned by Humboldt, in his travels in South America. The Jesuits had noticed the considerable bitterness of the Cinchona, and there being always Medical practitioners among the missionaries, it is said they tried an Infusion of Cinchona in the Tertian agues, a complaint which is very common in some parts of S. America, and having found it succeed in curing the disease, began to employ it as a febrifuge.

The varieties of Cinchona in use, are the pale, yellow, and red bark.

The Pale Bark, is derived from the Cinchona Officinalis of Linnæus, or the C. Condaminea of Humboldt: and in common language, grey, crown, or Loxa bark. It is called Loxa, from the province and port where the bark is obtained, and from whence it is exported, and it was in this province that the Cinchona was first discovered. It is called Crown Bark, from the high estimation in which it was held by the Royal family of Spain. It is found in the mountains of Quito and Santa Feé, and it was regarded as of a superior quality. What was brought from Loxa, a province or jurisdiction in Quito being preferred.

Description of the Plant, and of the Bark, as met with in the shops.

The taste of Pale bark is bitter, and slightly astringent. Its flavour is slightly aromatic, with a degree of mustiness. It was said to be by far the most valuable species of bark, and from its supposed superiority, the Spaniards gave it the name of Cascarilla fina. Recent discoveries in analytical chemistry contradict this opinion. From analysis it is found to contain from 25 to 30 per cent. less Cinchonine, and Quinine, than the Calisaya (a species of yellow bark,) does of Quinine, and the proportion of Cinchonine is much greater than the Quinine.

2. Yellow bark, so named not from its colour being distinctly yellow, but because it approaches rather more to that colour than any other. Two species are comprehended under this term.—

1. Calisaya Arrolenda—rolled Calisaya. This bark is derived from Peru, and is very common in the province of Calisaya, from whence it takes its name.

It is derived from the Cinchona Cordifolia—Appearance of the Bark as met with in Commerce—One of the most striking characters of this species, is its extremely bitter taste without any trace of astringency, and especially its fibrous structure. This is the best species of bark, and it is that employed in the manufacture of Quinine, yielding a much larger proportion of this salt than any other.

2. Species—Cinchona Lancifolia—Orange Yellow Bark, rarely met with in commerce.

3. Red bark is derived from the Cinchona Oblongifolia. It is a tree of considerable size, which grows not only in Peru, but in the kingdom of New-Granada. Description of the plant, and appearances of the bark. This bark has been thought to possess the virtues of Cinchona in a higher degree, and to have been the species used by Morton, Sydenham, and Lister, with such success in the treatment of fevers. Experiments seemed to confirm these opinions, as it contains both Cinchonine and Quinine. From some very late experiments of Mr. Carpenter of Philadelphia, the last salt is less abundant in the red than in the Calisaya by at least 20 per cent. The varieties named, do not comprehend all of this important genus. It is stated that there are many other species—no less than twenty, the history of which is not known, and in consequence of the perplexity which arises from their number, and their being frequently mixed together, the knowledge of this important genus is still involved in obscurity.

Application of Bark to the cure of diseases.

In Intermittent Fevers. This important medicine was originally introduced in the treatment of this form of fever, in which it is admitted to exhibit its best effects. Practitioners are united in opinion on this point, and the only difference which exists, depends upon the previous utility or inutility of evacuating medicines, the proper period of employing the bark—the doses—and the manner of administering it. These subjects considered. In Remittent Fevers—in Continued Fevers. In some of the Phlegmasiæ, as Rheumatism, Hemicrania, Dysentery—these diseases being the disguised forms which Intermittent fever sometimes assumes. In the Exanthemata, as small pox, measles, scarlatina. In hæmorrhages—As an auxiliary to Surgery, in supporting and improving

the vis vitæ, under extensive bodily injuries, large ulcerations, compound fractures, and cases where gangrene is threatened. or actually established.

Forms of exhibiting Cinchona.

In Powder. In this form it is now rarely employed. When used it may be given united with various substances, as seen in the formulæ. In Decoction. For the manner of preparing a decoction—Vide Formula. In Infusion. This preparation and the preceding, are best adapted to the first stage, of the chronic state of fever, and to those stomachs which are weak and delicate. Water being incapable of dissolving the resin of Cinchona, and very little of the alkaloids, in which the power of Cinchona is contained, the Infusion is not so efficacious when the whole energy of the bark is required.

The Infusions in boiling water, acidulated with Sulphuric acid, are preferable preparations. With the infusion, as the Decoction, the sediment which forms after it has been decanted, should be mixed with the clear fluid before being taken.

Tinctures—very numerous, both simple and compound. Huxham's tincture the best. They are chiefly used as auxiliaries to give energy to the decoction, or for weak stomachs. Sulphate of Quinine. Preparation—Cinchonine—Remarks upon each. One grain of Quinine is equal to ʒi of Cinchona. Extracts of various kinds.

Adulterations. Practitioners should not purchase bark in powder, as in this state it is always more or less adulterated. Adulterations are frequently practised, by uniting with bark of a good quality, others of an inferior. Another fraud consists in the admixture of the powder of bark, which has been employed in making the extract, or from which the Quinine has been obtained, with such as is of a good quality.

Quinine is frequently adulterated with crystals of the Sulphate of Lime—with Starch, &c. We discover such as is of a good quality, by the following characters :

1. When exposed to heat on a slip of Platina foil, it melts like wax, and becomes black if there is starch.
2. It is very sparingly dissolved by water, more so by hot than cold.
3. It is much more soluble in alcohol.
4. Iodine has a remarkable effect upon it. A grain of Iodine heated in a dram or two of water, produces in a watery solution of the Sulphate Quinine, a copious precipitate of a cinnamon brown colour.

Pinckneya Pubens—Georgia Bark—Natural History—Indigenous—Properties—Application as the preceding.

Family *Aristolochiæ*—Aristolochia Serpentaria—Natural History—Indigenous—Sensible and Medicinal Properties—Employed in Typhoid states of fever, alone or in combination with Camphor and other diaphoretics, to support the strength, and relieve the distressing symptoms. In Remittents combined with Cinchona—To allay irritability of the stomach, &c.

Exhibited in Infusion—ʒii to water ℔i

Tincture.

Family *Hederaceæ*—Cornus Florida or Dogwood—Natural History—Indigenous—Analysis—Employed as the Cinchona—Liable to affect the bowels with pains. This experienced only in its recent state.

Tincture—Extract.

Exhibited in the form of Powder, decoction.

Cornus Sericea.

Cornus Circinata.

Quassia Amara—Natural History—Properties---Tonic---Stomachic---Febrifuge---Useful when the more active tonics, as Cinchona, &c. produce head ache, uneasiness of stomach, and febrile symptoms. In impaired conditions of the stomach, brought on by excesses---from constitutional causes or a relaxed state of the nervous system. In other disorders of the constitution connected with debility.

Exhibited in Infusion.

ʒi of the rasped wood to water ℔i

Dose, ℥ss.

The Salts of Iron can be conveniently added to infusions of this article and Colombo, their colour not being changed.

Family *Rosaceæ*---Prunus Virginiana---Wild Cherry Tree---Natural History---Indigenous. To its tonic properties must be added those which are derived from the Prussic acid it contains. Useful in Intermittents combined with other articles of this class. In Pulmonary affections, Asthma—In chronic Diarrhæa—In some of the stages of Dyspepsia.

Exhibited in Infusion—taken freely.

Powder, ʒss to ʒii

Decoction useful as a wash for ill conditioned Ulcers.

Family *Synanthereæ*—Eupatorium Perfoliatum—Thoroughwort.—Natural History—Indigenous—Useful tonic during convalescence from acute or other diseases.

Exhibited—Infusion used cold, and freely taken.

Tincture.

Eupatorium Pilosum—Wild Horehound.

Used as the preceding.

Anthemis Nobilis—Natural History—Properties.

Family *Gentianeæ*—Gentiana Lutæa. Natural History. Analysis. Gentianin—Tonic and Stomachic—Employed in Dyspeptic affections, in the convalescence from fevers, and other cases of debility—The basis of most stomachic preparations.

Exhibited in Infusion, ʒii to water ℔i

Powder often combined with other articles, gr. x to xv.

Compound Tincture, ʒii to ℥ss, a very pleasant preparation.

Extract.

Gentiana Catesbei—Blue Gentian—Sampson Snake Root—Natural History—Indigenous—Employed in cases of impaired digestion—In dyspepsia—In Pneumonia of a Typhus character, given in the form of decoction, not only improving the general powers, but determining to the surface.

Dose, Tincture, ʒii to ʒss.

Frasera Walteri---American Colombo---Natural History---Indigenous. Properties and uses as the next article.

Family *Menispermæ*---Menispermum Palmatum---Colombo Root---Natural History---Useful tonic---communicating vigour to the stomach, without nausea or oppression. Has been much recommended in bilious

vomitings and discharges from the bowels, without any particular advantage.

Exhibited in powder variously combined, x to xv grs.

Infusion, ℥ss to ℥iss

Tincture, ʒii ℥ss.

Enters into the composition of stomachic preparations.

Family *Rutaceæ*—Cusparia Febrifuga—Augustura Bark—Natural History—Properties—But rarely employed.

Many other Tonics foreign and Indigenous enumerated.

MINERAL TONICS.

The most important are the preparations of Iron. Their general effects are, to increase the vigour of the circulation, to cause the blood to assume a more florid hue, to promote digestion, and excite the secretions, or restrain them when they have been morbidly increased—Employed in diseases of debility, and chiefly in Chronic affections. The diseases in which they are particularly employed enumerated.

Particular Preparations—Limatura Ferri—Filings of Iron—Objectionable preparation and rarely employed.

Dose, grs. v to ʒss.

Sub Carbonas Ferri—Rubigo Ferri—Carbonate or Rust of Iron—Preparation—one of the most valuable articles of this class, and much employed to obtain the general effects of Tonics. Given alone or combined with various articles.

Formula. Dose, grs. v to ℈i.

Proto Sulphates of Iron—Green Vitriol—Preparation—A more active article, and to its tonic, astringent properties are added—Its use requires more caution—Combined with vegetable infusions, or given in union with vegetable extracts in the form of pills.

Dose, i to iv grs.

Prussiate of Iron—Preparation. To the general purposes, for which these articles have been applied, has been recommended in Intermittent Fevers.

Dose, grs. iv to vi.

Tinct. Ferri Muriati—Preparation—Valuable article, and much resorted to, when the full operation of Iron is desired. Exhibited combined with bitter infusions or in drops.

Formula. Dose, viii to xii m.

Mineral Chalybeate waters—most important.

Preparations of Copper—Deuto Sulphate of Copper, or Blue Vitriol—Has been employed in the treatment of Intermittent and Remittent Fevers, either alone or as an auxiliary to Bark. In Epilepsy—In hæmorrhages. Given in such doses as the stomach will bear without vomiting.

Employed externally as a wash in obstinate ulcers—In Leucorrhœ, Gonorrhœa, &c.

Dose, ¼ to ½ gr. combined with the extract of Bark or Gentian.

Cuprum Ammoniatum—Rarely employed.

Zinc—In its metallic state exerts but little action on the system—*Protoxide of Zinc*—Flowers of Zinc, &c. Preparation—Employed in Epilepsy, Hysteria, Chorea—Degree of consideration to which entitled.

Applied externally as an absorbent—and with simple ointment as an application in Chronic ophthalmia; and to Herpetic and other cutaneous diseases.

Dose, grs. v increased.

Sulphate of Zinc—Also tonic in small doses, and for this and its astringent properties, has been used in Chronic Dysentery; In Dyspepsia, combined with bitter infusions. Also in Intermittent and Remittent Fevers, combined with Hyosciamus—used externally for various purposes.

Dose, i to iij grs.

Nitrate of Silver—Preparation—Employed in Epilepsy, and other nervous and convulsive affections—To irritable conditions of the system—Effects of its long continued use.

Employed externally for various purposes, particularly in Opthalmia. Applied in the form of ointment or solution.

Formula. Dose, $\frac{1}{8}$ gr. increased.

Bismuth—Physical properties.

Oxide Bismuth—Preparation—Employed in debilitated conditions of the stomach, particularly in those cases where pain follows the introduction of food—In Gastrodynia, Pyrosis, Cardialgia, &c.

Dose, v grs. increased.

Aurum-Gold—Preparations—Employed as substitutes for Mercury in Syphilitic diseases. Rarely or never administered.

Arsenicum Album—Properly arsenious Acid—Physical properties—Medical History—Employed in Intermittent Fevers—Cases in which it is inadmissible—Administration—Useful to alternate its use with Cinchona—In Remittent Fevers—Typhus, Periodical Head-aches—Rheumatism—Cutaneous affections, &c. Comparative operation of Bark and Arsenic—Poisonous operation—Follows the external as well as internal employment—Symptoms.

The Treatment to be pursued when a large dose of arsenic has been taken—The first object will be to evacuate the stomach—The emetics used should be of the mildest character—after vomiting, various substances have been proposed with a view of neutralizing the noxious substance, or protecting the surface of the alimentary canal from its influence—With the former view, sulphurets of Potash and Soda have been employed, but very little dependance can be placed upon them—Others have been proposed, as Magnesia and Charcoal. From the experiments of Hume and Bertrand, large doses of arsenic combined with these substances have been taken with impunity—hence their utility has been inferred after the poison has been swallowed.

With the second intention, various mucilaginous matters have been employed—Milk particularly, should be given—large quantities before and after vomiting, since in coagulating it envelopes the poison and thereby promotes its discharge.

Should these means be insufficient, our efforts should then be directed to obviate Inflammation, and its consequences.

Tests for the presence of Arsenic.

Dose, Fowler's mineral solution.

vi to xii m.

Arsenious Acid, $\frac{1}{16}$ gr.

Mineral Acids—Sulphuric Acid—Preparation—Useful in restoring tone to the digestive organs—Strengthening the appetite and checking the acetous fermentation in the stomach—In Hæmorrhages—Colliquative sweats in hective Fever—Externally employed in cutaneous diseases diluted with water as a substitute for sulphur.

Dose of the acid, vi to viii m in sugar and water.

Elixir of Vitriol, x to xv m.

Nitric Acid—Preparation—Employed in Hepatic derangements—Alterative action upon the hepatic secretions—In the secondary forms of Syphilis—External Employment—Diluted for checking gangrene and promoting granulation.

United with the Muriatic and forming the Nitromuriatic usefully employed in the formation of baths in various states of disease. Preparation of the bath.

Dose, viii to xm in sweetened water.

Muriatic Acid—Preparation—Employed for the same general purposes as the preceding—and for checking the acetous fermentation in the stomach—Diluted very freely with water, as a gargle in ulcerated sore throats, and in ulceration of the gums—Employed in the state of gas for purifying foul wards, and chambers.

Chlorides of Lime and Soda. Preparation—Much employed as disinfecting agents—In medicine to correct the odour from diseased surfaces—Applied to scurvy, Tinea capitis, or Porrigo—Psora—and other affections of the skin—As a wash in ulcers of the uterus and cancers.

ʒi to ℥i of the powder to water 1 pint.

Chloride of Soda. Preparation—Used as the preceding, and as a gargle in ptyalism.

Other means of restoring tone to the system.

Change of climate.

Exercise.

Sailing.

Riding.

Remarks upon each.

ASTRINGENTS.

General remarks upon the operation of this class—Astringent principle extensively diffused, and connected with the presence of Tannin.

VEGETABLE ASTRINGENTS.

Different species of Oaks—Family *Cupuliferæ*—Quercus Robur. Employed in Intermittent Fevers, but with little advantage; in Chronic discharges, Diarrhæa, Leucorrhœa, and in the formation of gargles.

Gallæ or Galls—Their formation—employed as above. Used in the form of decoction, or pulverized and united with simple cerate as an application to hæmorrhoids.

Family *Rubiaceæ* Kino—Obtained from several plants, chiefly the Nauclea Gambir. Natural History—Analysis. Employed in Intermittent Fevers; in excessive discharges from the Uterus and Intestinal Canal; in Incontinence of Urine, Gleets. Leucorrhœa, &c.

Formula. Dose, Tincture, ʒi to ʒii

Powder, gr. x to ʒss.

Family *Leguminosæ*—Lignum Campechianum—Logwood—Natural History—Employed in chronic discharges from the bowels and in Cholera Infantum.

Dose, decoction, ʒss to ℥iii

Extract, ʒss to ʒi.

Family *Geraniaceæ*—Geranium Maculatum—Cranes bill—Natural History. Employed as the preceding, and as an injection in Gonorrhœa. In the formation of gargles, and as a wash for chronic and obstinate ulcerations of the mouth.

Dose, powder, ℈i

Decoction, ℥i.

Family *Rosaceæ*—Rubus Villosus et R. Procumbens—Dewberry and Blackberry—Properties. Employed as the preceding.

Dose, decoction of the root, ℥i to ℥ii.

Other articles enumerated.

MINERAL ASTRINGENTS.

Super Sulphate Alumina with Potash—Physical properties. Employed as the preceding articles, and in Hæmorrhages connected with relaxation of the system—In Menorrhagia—Externally employed for various purposes—In the formation of Injections combined with any of the preceding articles, in Leucorrhæa, Gleets, in the formation of gargles for cleansing ulcers of the mouth and fauces, or relaxation of the uvula.

In Ophthalmia a pleasant application is formed by coaguling the albuminous portion of an egg.

As an escharotic in the state of burnt alum.

Administered in the form of powder. Dose, grs. v to ℈i.

Alum Whey. Preparation. Dose, ℥i.

Acetate Lead. Preparation. Objections to its use answered. Employed in Hæmorrhages from the lungs—Uterus bladder—bowels. In Diarrhæa and Dysentery. Formula. In Hydrophobia—Tetanus—Externally employed in the formation of collyria—Injections—To inflammatory Tumors, &c. Poisonous operation of the Salts of lead—Symptoms—Treatment.

The Salts of Lead when swallowed in large quantities may be so neutralized as to become inert. They are readily decomposed by the Sulphate of Soda or Magnesia—forming thereby an insoluble Sulphate of Lead, which is not possessed of poisonous properties—The first ob-

ject of the Physician, when called to a person who has taken a large dose of the Acetate of Lead, is to administer copious draughts, containing a solution of the Sulphate of Soda or Magnesia. It decomposes the Lead in the manner mentioned.

Dose, i to ii grs. increased, combined with Opium or Laudanum.

Goulard's Extract. Preparation. Employed in the same diseases as the preceding.

MISCELLANEOUS CLASS.

Iodine. Natural and Medical History. Properties. Employed in Bronchocele or Goitre. Symptoms forbidding its use. In enlargements of other glands. In the discussiou of tubercles in the lungs. As an Emmenagogue. Administered in the form of pills. Tincture. Solution of Hydriodate of Potash. Precautions to be observed in its use.

Dose, Iodine, gr. $\frac{1}{2}$
Tincture, x to xx m
Solution, same.

Externally employed in the form of ointment. Preparation.

Spongia Usta. Properties as the preceding.

Family *Euphorbiæ* Styllingia Sylvatica. Indigenous. Natural History. Properties. Employed in Syphilis, particularly in what is called Syphilitic Rheumatism. In Rheumatism, Obstinate ulcerations, Scrofula, &c. Used in the form of Decoction—Tincture—Powder.

Dose, decoction, ℥i
Tincture, ʒi to ʒii
Powder, i to v grs.

Family *Ranunculaceæ*—Hepatica Triloba. Indigenous. Natural History. Properties. Employed in Pulmonary affections, and as a subtonic in cases of debility.

Acupuncturation.

History of this operation and of its mode of action. Description of the Needle, and manner of using it. Employed in Rheumatic affections; In Neuralgia, Opthalmia, and for evacuating fluids in anasarca.

Electricity.

Its operation of a stimulating character. Its importance increased by the late pathological researches of the French physicians. Effects upon the system. Promotes the secretions. Restores muscular energy. Employed in Rheumatism. Paralysis. Amenorrhœa and other diseases. *Galvanism.* Action similar to the preceding, but as a stimulant less intense and more steady. Applied to the same diseases as the preceding. Recommended in Asthma, Dyspnœa, Dyspepsia. Galvanic machine.

Plates applied to the surface of the body.

ALIMENTS.

A knowledge of dietetics all important and particularly required of the physician. The human subject capable of subsisting upon a variety of articles—illustrated by the habits of different nations—Holds an immediate station between carnivorous and graminivorous animals—illustrated by a comparison of his digestive apparatus with theirs—Distinction between alimentary and medicinal substances.

Aliments derived from the vegetable kingdom.

Nutritive principles in vegetables depend upon Gluten—Sugar-Farina—Oils—Mucilage—Remarks upon each—The nutritive qualities of vegetables will further depend upon the greater or less difficulty with which the digestive organs separate the nutritious particles. This will be affected by the texture of the article—also by the state of strength or weakness of the particular habit of body, or peculiarity of constitution—Duty of the Lecturer.

Remarks upon the digestibility of different substances not to be considered *absolute*, but to correspond with the *general experience* upon the subject.

1. *Of Alimentary substances in which Mucilage chiefly prevails.*

1. Of Leaves of Plants.

Spinach.
Cabbage.
Lettuce.

Stems.

Asparagus.

Roots.

Turnip.
Carrot.
Parsnip.
Beet.

Receptacle of Flower.

Artichoke.

Fruits.

Cucumber.

Of the effects of a Mucilaginous Diet.
Of the diseases in which its use is contra-indicated.

Of alimentary substances in which Farina chiefly prevails.

Solanum Tuberosum—Potatoe.
Marunta Arundinacea—Arrow Root.
Jatrophia Manihot or Cassava Tree—The root furnishes the substance called Tapioca.
Cycas Circinalis—Species of Palm—the pith of the leaves and of the upright shoot furnishing the substance called Sago.
Hordei Semina—Barley
Secalis Semina—Rye.
Oryzæ Semina—Rice.
Avenæ Semina—Oats.
Zeæ Mayæ Semina—Indian Corn.
Tritici Semina. Wheat The article most commonly employed in the preparation of Bread.
Of Unleavened Bread.
Of Leavened Bread.
Of Fresh Bread.
Stale Bread.
Toasted Bread.

Of Pastry and its properties.

Family *Leguminosæ*–Comprehending the varieties of Peas, Beans, &c.
Of the effects of a Farinaceous Diet.
The diseases in which a Farinaceous diet may properly be employed.

Of alimentary substances in which Oil chiefly prevails.

Nuts.
Almonds.
Their effects upon the system.
Diseases in which they are improper.

Of Alimentary substances in which Sugar chiefly prevails.

Comprises Fruits, ripe, or preserved.
Their effects upon the system.
Diseases in which they are improper.

Of Milk.

Its value and importance—the changes it undergoes when taken into the stomach—Utility as an article of diet in convalescence and in particular diseases. Milk when congula-

ted by acids or wine, forms a pleasant drink, grateful and refreshing to the sick.

ANIMAL FOOD.

Proximate principles of which animal substances are composed.

Gelatine---Albumen---Fibrine---Remarks upon each.—Circumstances affecting the digestibilty of animal substances. Differences will arise from the texture of the fibre—from age—sex—size—from the quantity of oily, fat, and glutinous matter they contain—from the manner in which the animal has been fed.

Other circumstances affecting the digestibility of animal substances—The food of the animal---The state of motion or of rest---its being fat or lean---the flesh being kept a short time.

Particular food, with remarks upon the digestibility of each.

Beef.
Veal.
Mutton.
Lamb.
Pork.
Wild Meats.
Domestic Fowls.
Wild Fowls.
Eggs.

Aliments derived from

Fishes.
Salt and fresh water.
Oysters.

Salted Meats.

Comparative effects of a diet exclusively animal or vegetable—Advantages of a Vegetable diet—Disadvantages—In favor of an animal diet—Objections—A mixture of both, the proper course to pursue.

Condiments.

Consist of Salt, Vinegar, and Aromatics. Remarks upon each.

Cooking of Food.

Drinks—Water—Varieties—Hard and soft—Spring—River--Rain.

Fermented Liquors.

Porter.
Beer.
Cider.
Wines.

Distilled Liquors.

The proportion of Alcohol contained, is shewn in the following: Brandy, 53, 39; Rum, 53, 63; Gin, 51, 60; Scotch Whiskey, 54, 32—Irish do. 53, 90—Hollands genuine, 59 00. As Medicines have advantages over fermental liquors---Less liable to become Acid--and therefore preferred in those cases when acidity prevails. Employed as stimulants in great prostration, and after much exposure. Diseases produced by the immoderate use of spirits.

Of other Drinks.

Coffee---Stimulating and Refreshing---Becomes injurious when excessively indulged in, or drank too strong---When to this free use, is added sedentary habits, delicate and weak constitutions, the organs of digestion become impaired, the appetite destroyed, and general debility with nervous symptoms produced. Medicinally employed in Asthma, and to counteract the operation of Narcotics.

Tea---Properties similar to the preceding---becoming injurious under similar circumstances.

FORMULÆ.

Formulæ referred to in the preceding observations, which are introduced to assist those Gentlemen who are unaccustomed to take Notes, and to furnish others more advanced, with a collection, which from experience, will, I think be found useful.

Emetics.

℞. Powdered Ipecacuanha, ℈i to ʒss
Tartarised Antimony, gr. ii
m---for a powder.

℞. Tartarised Antimony, gr. iv.
Prepared Chalk, gr. iv m.

Divide into 4 powders---a powder to be taken every 15 minutes until they operate.

In Asthma.

℞ Tincture of Lobelia

Comp. syrup of Squills.
Simple Syrup aa ℥i m, dose ʒii to ʒiii

To be given every 10 minutes with a little honey during the paroxysm, until relief is afforded---smaller doses in the intervals.

In Pnemonia and Catarrhs.

℞. Kermes mineral ʒss to ℈ii
Mucilage of Gum Arabic ℥vi
Honey ℥i m, dose ʒii to ℥ss

To be taken every 2 hours until the cough is relieved.

Cathartics.

Oleaginous mixture.

℞. Castor Oil ℥i to ℥ii
Sugar ʒiii

To be rubbed well with the oil---add slowly mucilage of Gum Arabic ℥v.
Mint Water ʒii
Laudanum ʒss---dose ℥ss to ℥i repeated every hour or two, until relief is obtained.

Instead of Mucilage, the yolk of an egg may be used, or honey, or an emulsion of sweet Almonds, these being employed to render the oil misceable with water.

Fol. Senna, ℥ss
Warm water, ℥xii, simmer a short time, and strain, add sulphate Magnesia ℥i
Manna, ℥i---dose a small cup full every hour or two, until it operates.

℞. Sulphate of Potash, or super Tartrate Pot:
Pulv. Jalap: a ℈ii, mix and divide into 4 powders.

To increase its activity, Calomel may be added,, or Tartarised Antimony, or Ipecacuanha. One every two hours until it operates.

Or,

℞. Super Tartrate of Potash, ʒii
Pulv. Jalapii, ʒi---mix and divide into 4 powders.
Administered as above.

℞. Proto Chloride of Mercury, g. viii
Pulv. Jalapii, gr. xvi---m. for a dose.

Powdered Rhubarb may be exhibited combined as the

preceding article---or with Magnesia or the Carbonate of Soda for Children.

℞. Carbonate of Potash or Soda, gr. xii to ℈i
Pulv. Rhei, ℈i to ʒss
Water, ℥ii m
Dose, ʒii to ʒiii every 2 hours pro re nata.

Rhubarb Tea.

℞. Pulv. Rhei, ʒii
Fennel Seed, ʒii. Water ℥xii.

Boil until 1-3 is dissipated---Dose, ʒss to ℥ss, two or three times a day for several days.

℞. Powdered Rhubarb
Powdered Aloes
Blue pill mass---Each equal parts
Syrup, gr. s.

Mix and divide into pills of a convenient size.
A pill to be taken at bed time, or night and morning, as a gentle aperient.

More active.

℞. Powdered Aloes.
Powdered Gamboge.
Calomel, a ʒi
Syrup, as much as is necessary---mix and divide into Lx pills. ij to iv. a dose.

℞. Powdered Aloes, ʒi
Powdered Gamboge, ℈ii
Tartarised Antimony, gr. iv.
Syr. q. s. mix and divided into xxiv pills---iij at a dose, and followed by ij others, in 6 hours if necessary.

Comp. Ext. Colocynth, ℈iv
Ext. Hyosciamus, ʒss
Blue Mass, ℈i m and divide into xxx pills,---ij to be taken at bed time.

Or,

Comp. Ext. Colocynth, ʒi
Calomel, grs. xv
Tartarised Antimony, gr. i
Ol Carui v. drops, make into a mass and divide into xxiv pills---1, 2, or 3 every night.

In Scabies.

℞. Flores Sulphuris ℥i
Powdered muriate of Ammonia, ʒi
Lard, ℥iiss fl. unqt. m.

Sir John Pringle's formula in this disease.

In Tœnia Capitis.

℞. Sulphuret of Potash, ʒi to ʒii
Water, ℥viii, m, for a wash.

A Bath with the Sulphrets is prepared in the following manner.

Take ℥ii of the dry Sulphret of Potash dissolved in ℥viii of water.

To this is added of the Liquid Hydrosulphuret of Potash ℥viii, also of the Liquid Sulphuret of Lime, ℥vjjj.

Of this solution ℥ii are sufficient to give to an ordinary bath sufficient strength, and the quantity may be increased to ℥iiss.

For Children.

℞. Calcined Magnesia,
Powdered Rhubarb—a ℈i—m. divide into 4 powders, one every two hours pro re nata.

Dr. Dewees's Formula in the Colicy complaints of Children.

℞. Calcined Magnesia, ℈i
Water, ℥i
Tinct. Assafæd. lx. m.
Tinct. Opii, xx m dose, xx drops

Repeated in an hour or two if not relieved.

Diaphoretics.

℞. Camphor, gr. viii.
Opium, gr. i.
Calomel, gr. ii m. fiat Puly. Repeated according to circumstances.

Or,

℞. Camphor, ʒss
Nitrate of Potash, ʒi
Antimon. Tart. g. l. m. fiat Pulv. vi.

To the above Calomel may be added, or substituted for either of the last articles.

Cathartic and Febrifuge mixture.

℞. Sulphate of Soda, ℥ii
Tart. Antimony, grs. ii
Lemon Juice or vinegar, ℥i
Water, ℥viii ℥ss to ℥i to be taken every 2 hours.

℞. Sulphate of Magnesia, ℥ss
Infusion of Senna, ℥iss
Tincture of Senna, ʒi
Syrup of Ginger, ʒi, mix for a draught—To be repeated if necessary.

Seidlitz Powders.

℞. Tartrate of Potash and Soda, or Rochelle Salt, ʒii
Carbonate of Soda, ℈i m. and fold in white paper.
℞. Tartaric Acid, grs. xxxv fold in Blue paper.

The contents of the white paper are dissolved in the fourth of a tumbler of water, and the blue paper in the same quantity of sweetened water—They are united upon being taken, and swallowed during the effervescence.

℞. Infusion of Serpentaria, ℥xii
Camphor, ʒss to ℈ii
Spts. Nitr; Dulc; ℥ss
White Sugar, ʒiii—m

Rub the Camphor with the sugar until it is reduced to a fine powder---Add the spirits of Nitre, and then the infusion. Strain.

Dose, ℥ss.

℞. Gum Guaiac, ℈i
Antim. Tart, gr. 1-8.
Gum Op. gr, 1-2---m ft. Pulv.

To be repeated as often as the case requires, and recommended in Chronic Rheumatism.

℞. Rad : Sarsaparilla.
China Briar Root.
Sulphuret of Antimony a ℥viii
Gum Guaiac, ℥iiss
Water xxiv ℔s.

These ingredients are to be simmered in a close vessel for 12 hours, the steam being prevented from escaping. After simmering the time prescribed, to be strained, bottled and kept in a cool place. The Antimony is to be coarsely pow-

dered, enclosed in a piece of linen rag, and suspended from the cover of the vessel.

Dose as much as the stomach will bear, and its use continued for weeks or months.

Or,

Sarsaparilla ℔ss
Stylingia, Sylv : ℥iv
Shavings of Guaiac, ℔ss.
Sassafras Root, ℥iv
Water, 1 gallon.

Boil for a sufficient length of time, to extract the virtues of the articles—Water must therefore he added as it evaporates, and it may finally be reduced to two quarts. To this, sugar or molasses is added, and the whole reduced to the consistence of a syrup. To each pint of this syrup, add, of the Perchloride of Mercury, previously dissolved in spirits, grs. ij. The dose for an adult will be ℥ss to ℥i, three or four times a day. For children less.

Further experience in the preparation of the Syrup, induces me to recommend that the Sassafras root, and the shavings of Guaiac, be added to the decoction, towards the close of the boiling—and the Stylingia or Queen's delight, added in the form of Saturated Tincture, to the Syrup, in the proportion of a pint to the gallon.

The Syrup may be given with, or without the Prechloride, according to circumstances.

To a decoction of the Bark or Ulmus Fulva, or Slippery Elm, add

Sassafras Root, ℥i
Bark Mezereon Root, ʒiii
Shavings of Guaiac wood, ℥i
Liquorice Root, ℥i.

These are to be boiled together an hour and strained.

℞. Tartarised Antimony, gr. viii
Powdered Gum Arabic.
Powdered Liquorice Root a ʒi.
Dose, ii to iv grs.

Antimonial Powders.

℞. Nitrate of Potash, ʒi.
Tartarised Antimony, gr. i—m. and divide into six powders. A powder to be taken every two hours.

Nitrous Powders.

℞. Nitrate of Potash, ʒiss
Tartarised Antimony, gr. i
Calomel, gr. viii—m. and divide into ix powders.

Neutral Mixture.

Take of Lime Juice or Vinegar, ℥ii
Carbonate of Soda, as much as is sufficient to saturate it—first dissolving the Soda in a little water.
Sugar, ʒii
Water, ℥ii—ʒss every hour or two.

Diuretics.

℞. Balsam Copaiva, ʒii to ℥ss—to be well rubbed with powdered gum arabic
Yolk of an egg, or
Sweet Almonds blanched, a dozen—add
Water slowly, ℥vi
Sweet Spirits of Nitre, ℥ss
Tincture Opii, ʒi—Dose, ℥ss to ℥i, repeated frequently.

Or,

℞. Oil of Copaiva, ʒii
Powdered Gum Arab. ℥ss
Cinnamon Water, ℥ii
Simple Syrup, ℥iss
Tinct. Op. ʒss—Dose, ℥ss.

℞. Squill root, ʒii
Orange peal, ʒii
Boiling water, ℥xii—dose, half a wine-glass every two or three hours.

℞. Dried leaves of Tobacco, ℥i
Water, ℥xiv
Spirits of Wine, ℥ii—digest for a week:
Dose xx drops three times a day.

℞. Root of the Blue Flag, ℥i
Button Snake root, ʒii
Water, ℔iss, boil to one pint.
This quantity taken daily in divided doses.

The two following Formulæ should have been inserted under the preparations of Rhubarb, but were overlooked. They are too valuable to be omitted.

In Diarrhæas—Intestinal derangements of Children—Cholera.

℞. Powdered Rhubarb, ʒss
Calcined Magnesia, ʒi
Syrup of Morphine, ℥ii
Mint Water, ℥viii—m.
Dose for an adult, ℥ss every hour or two, until relieved. For children, ʒi to ʒii every two or three hours until relieved.

Syrup of Morphine is prepared as follows:

℞. Sulphat Morphine, gr. iv
Simple Syrup, ℔i—m.

In Diarrhæa—Cholera Infantum, &c. &c.

℞. Prepared Chalk, ʒii
White Sugar, ʒii. To be well rubbed together.
Cinnamon water, ℥viii
Elixir Paregoric, ℥ss m
℥ss to ℥i for an adult every hour or two, until relieved.
ʒi to ʒiii for children, every hour or two, until relieved.

Emmenagogues—Tonic Formulæ.

℞. Powdered Cinchona, ℥ss
Powdered Ginger
Proto Carbonate of Iron a ʒii—m. and divide into eight or ten powders.

A powder to be taken two or three times a day.

℞. Sulphate of Iron, ℈i
Gum Myrrh, ʒi
Sub carbonate of Pot. ℈i
Sugar, ʒii.

The articles to be well rubbed together, and during the trituration add,

Rose Water, ℥viiss
Spirit of Nutmeg, or other
Aromatic, ℥ss
Dose, ℥ss to ℥i.

Sulphate of Iron, ℈ii

Ext. of Gentian or Bark, ʒi—m. ft.
Pil, xx.

Expectorants.

Lac Ammoniac ℥ii, prepared by dissolving the gum in the proportion of ʒi to ℥viii of water.
Cinnamon Water, ℥ii
Syrup of Squills, ℥ss
Elixir Paregoric, ʒii
Dose, a table-spoonful as often as is necessary.

℞. Rad. Poly. Seneka, ℥ss
Water, ℥viii—boil to one half.

Dose—a tea-spoonful every half hour or hour, as the urgency of the symptoms require.

Dr. Archer's Formula in Croup.

Pectoral Formula.

℞. Syrup of Squills, ℥ss
Honey, ℥i
Elixir Paregoric, ʒii
Antimonial Wine, ʒiii
Laudanum, ʒi
Water, ℥vi—m.

A table-spoonful at night, or as often as circumstances require.

℞. Extract of Liquorice
Gum Arabic, a ℥ss
Hot water, ℥viii—simmer until dissolved.
Antimonial Wine, ʒiii
Laudanum, l to lx m.

A table-spoonful to be taken every two or three hours.

Rubefacients.

℞. Spirits Turpentine
Olive Oil
Hartshorn—a ℥i—m—for a linament. The friction to be repeated several times a day.

To the above, spirits of Camphor, or Laudanum, Oil of Amber, or Tinct. of Cantharides may be added.

Sialogogues.

Formula in Tinea Capitis—Chancres—Cracked Skin—Chronic Eczema.

℞. Red Precipitate, ʒii

Venice Turpentine, ℥i
Fresh Butter, or
Spermaceti Ointment, ℥iii—m.

℞. Perchloride of Mercury
Muriate of Ammonia, a gr. xv
Distilled Water, ʒiss
Crumb of Bread—as much as is necessary to make a mass.
Divide into 120 pills, each containing $\frac{1}{8}$ of a gr.

Or,

Perchloride of Mercury, gr. iv.
Alcohol, ℥i
xxv m. equal to a $\frac{1}{4}$ of a gr.

Stimulants.

℞. Sub. Carbonate of Ammonia, ʒi
Mucilage of Gum Arabic, ℥vi
Sugar, ʒii
Spirits Lavender, C. ʒii
A table-spoonful every hour or two.

℞. Camphor, ʒss
Powdered Gum Arabic
White Sugar, a ʒii
Or, Sweet Almonds blanched, No. vi
White sugar, ʒii
To be rubbed together until reduced to a fine powder—add Water—or
Mint Water, ℥vi
Laudanum, xxx m.
Dose, a table-spoonful every hour or two.

℞. Piper Cubebs
Balsam Copaiva, a ℥ss
Powdered Gum Arabic, ʒiii
Cinnamon Water, ℥viii
Dose—two table-spoonfuls three or four times a day.

Sir A. Cooper's Formula.

℞. Balsam Copaiva
Tinct. Cubebs, a 1 oz.—m.
i dr. to iii dr.—frequently.

Narcotics.

Medicinal Prussic Acid, viii m.
Distilled Water, ʒviii
Simple Syrup, q. s.
Dose—a table-spoonful every two hours. The quantity of Acid to be increased gradually.

Antispasmodics.

℞. Sulphuric Æther, ʒii dr.
Infusion of green Mint, ℥xvi
White Sugar, ʒii.
Dose, ℥i, every hour or two.

Tonics.

℞. Powdered Cinchona, ℥ss to ℥i
Powdered Nutmeg, Cloves or Cinnamon, dr. ss to ℈ii
Carbonate of Soda, ʒss m.
And divide into four papers.

Powdered Serpentaria may be added in place of the aromatics, and the dose taken in a cup of coffee with sugar and milk, or red wine, or water, with a small quantity of brandy or warm tincture.

℞. Bark of Cinchona, bruised, 1 oz.
Water, ℥xvi—boil for ten minutes, and at the close add Serpentaria, ii dr.—let it stand for an hour and strain—add
Tincture of Cinchona, ℥iss
Dose, ℥i, as often as necessary.

℞. Sub. Carbonate of Iron
Powdered Ginger, a gr. v.

Mix for a powder to be repeated three or four times a day. To the above, powdered Colombo may be added.

℞. Tinct. Ferri Mur. vi m.
Infusion of Quassia ʒvj
Cinnamon Water, vi dr.
Tinct. Colomb. i dr—m. for a draught. To be repeated several times a day.

Ointment of the Nitrate of Silver, in Opthalmia.

℞. Nitrate of Silver, gr. ii to x.
Solution of Subacetate of Lead, xv m.
Simple ointment, ʒi.

The Nitrate of Silver is first powdered finely, and mixed with the ointment on a slab—the solution being added afterwards.

Or,

The Solution substituted.

℞. Nitrate of Silver, ii to viii grs.
Water, ℥i. Applied to the eye with a camel's hair pencil, or dropped upon the eye.

Astringents.

℞. Tinct. Kino, ℥ss
Solut. Gum Arab. ℥iv
Vin Antimon. ℥ss
Tinct. Opii, i dr—m.

A table-spoonful every three hours after the bowels are evacuated.

In Gleets.

℞. Kino, i dr.
Alum, i dr.
Mucilage of Gum Arabic, ℥i
Water, ℔i. to be well united together and filtered for use.

Mr. Bell's Formula.

In Dysentery and Diarrhœa.

℞. Sac Saturn, gr. xii
Pulv. Ipecac, gr. vi
Gum Opii, gr. iv
Syrup, gr. s m. and divide in viii pills, one every two hours until relief is afforded.

Carb. Potas. ℥j } 1 to 2 Teaspoonfulls
Rhei ℥ss } every 2 hours for a
Aqua ℥ij } Child —
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