

The American new dispensatory : containing general principles of pharmaceutic chemistry ; pharmaceutic operations ; chemical analysis of the articles of materia medica ; materia medica, including several new and valuable articles, the production of the United States ; preparations and compositions ; with an appendix, containing medical prescriptions ; the nature and medical uses of the gases ; medical electricity ; galvanism ; an abridgment of Dr. Currie's reports on the use of water ; the cultivation of the poppy plant, and the method of preparing opium ; and several useful tables ; the whole compiled from the most approved authors, both European and American / by James Thacher.

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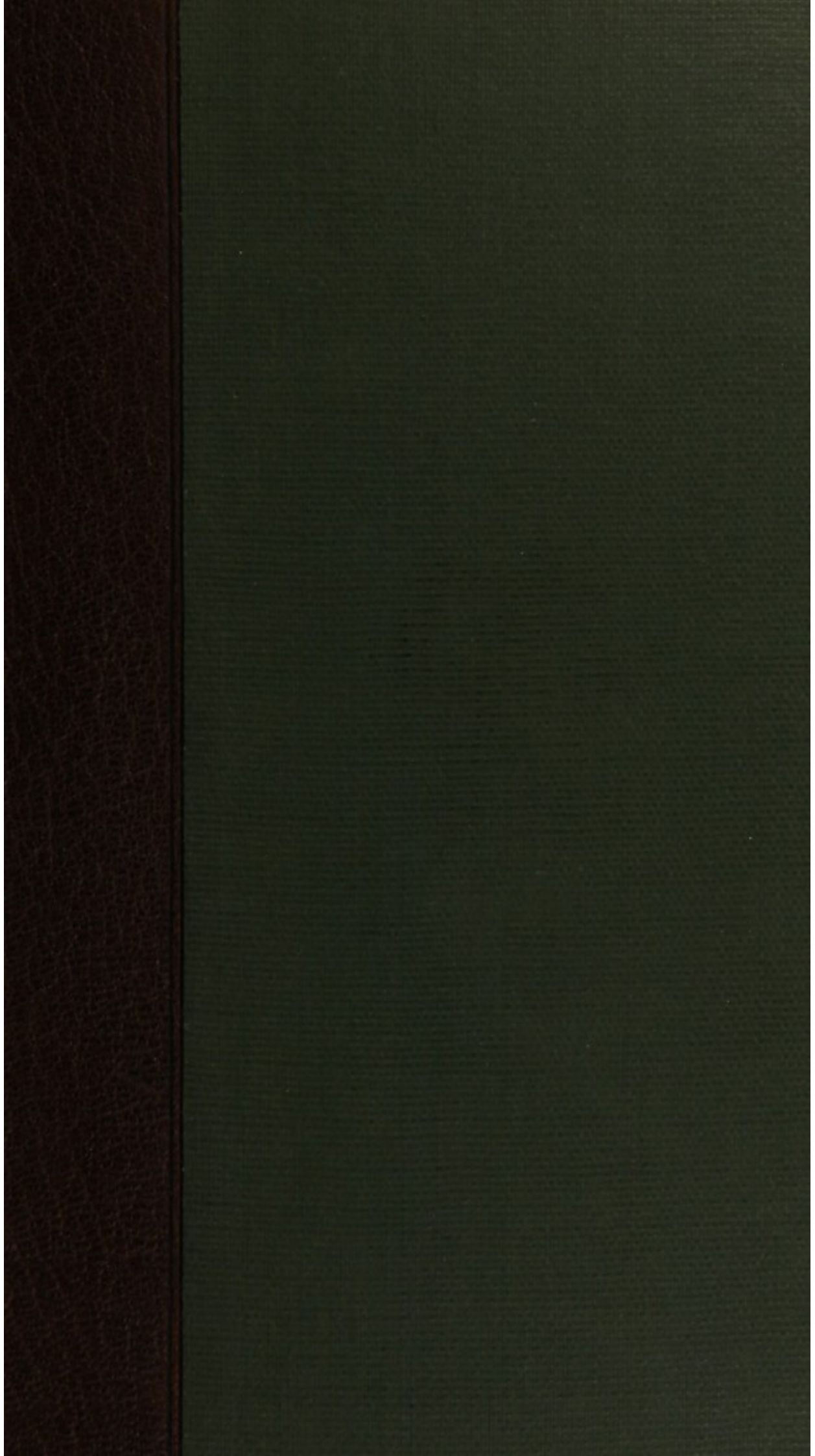
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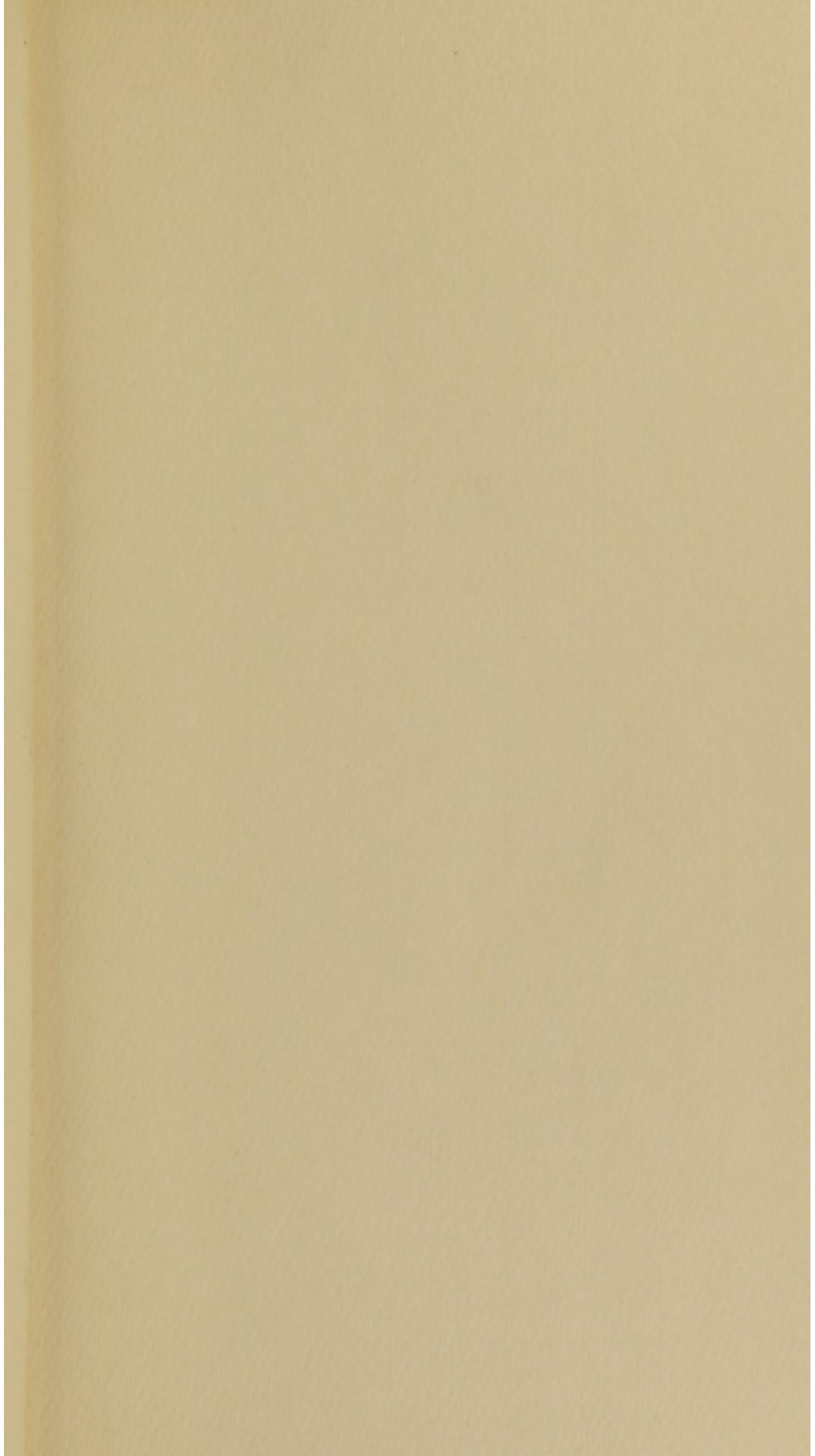


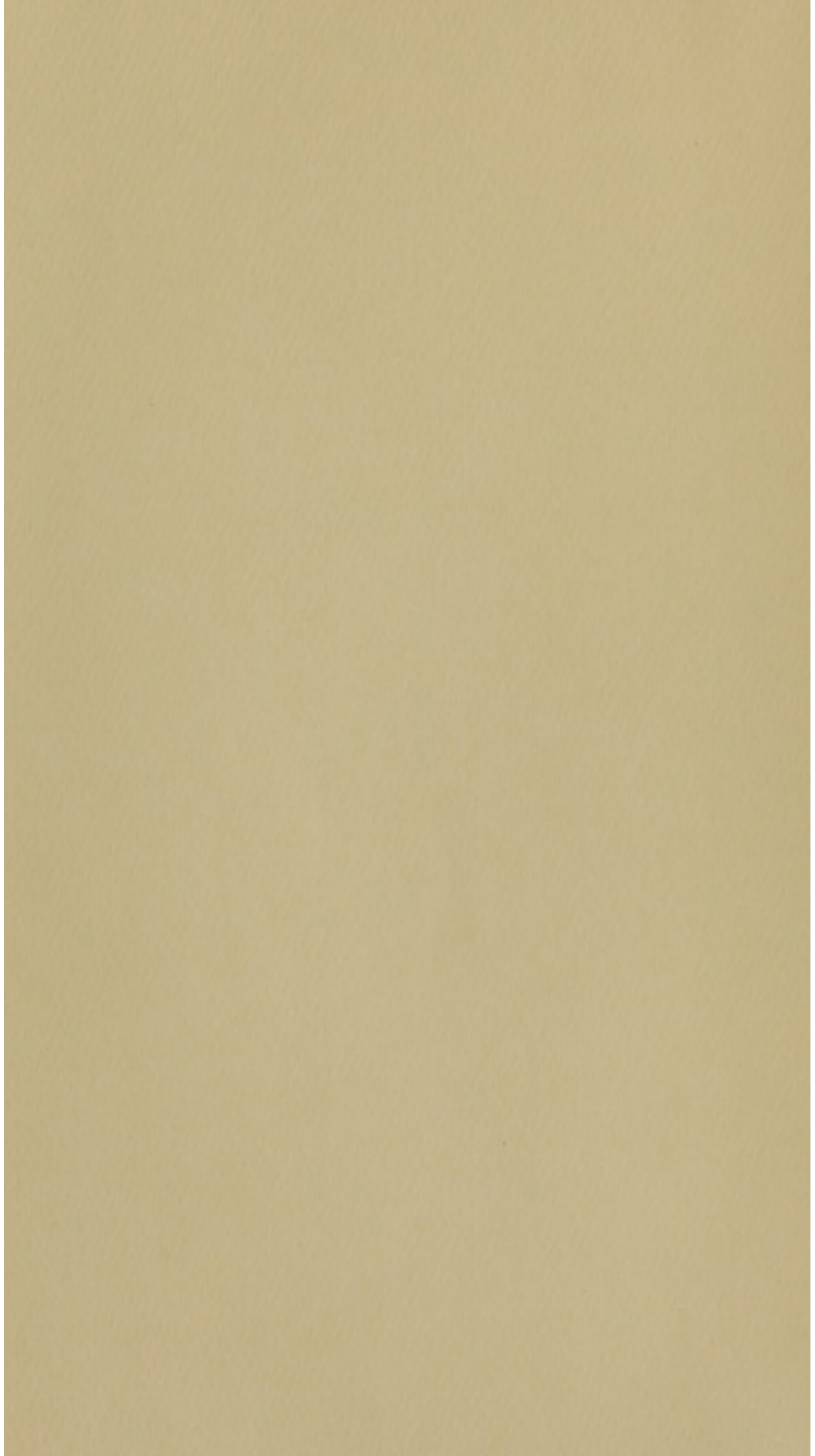
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the use of mercury, &c. - Dublin Medical Journal.

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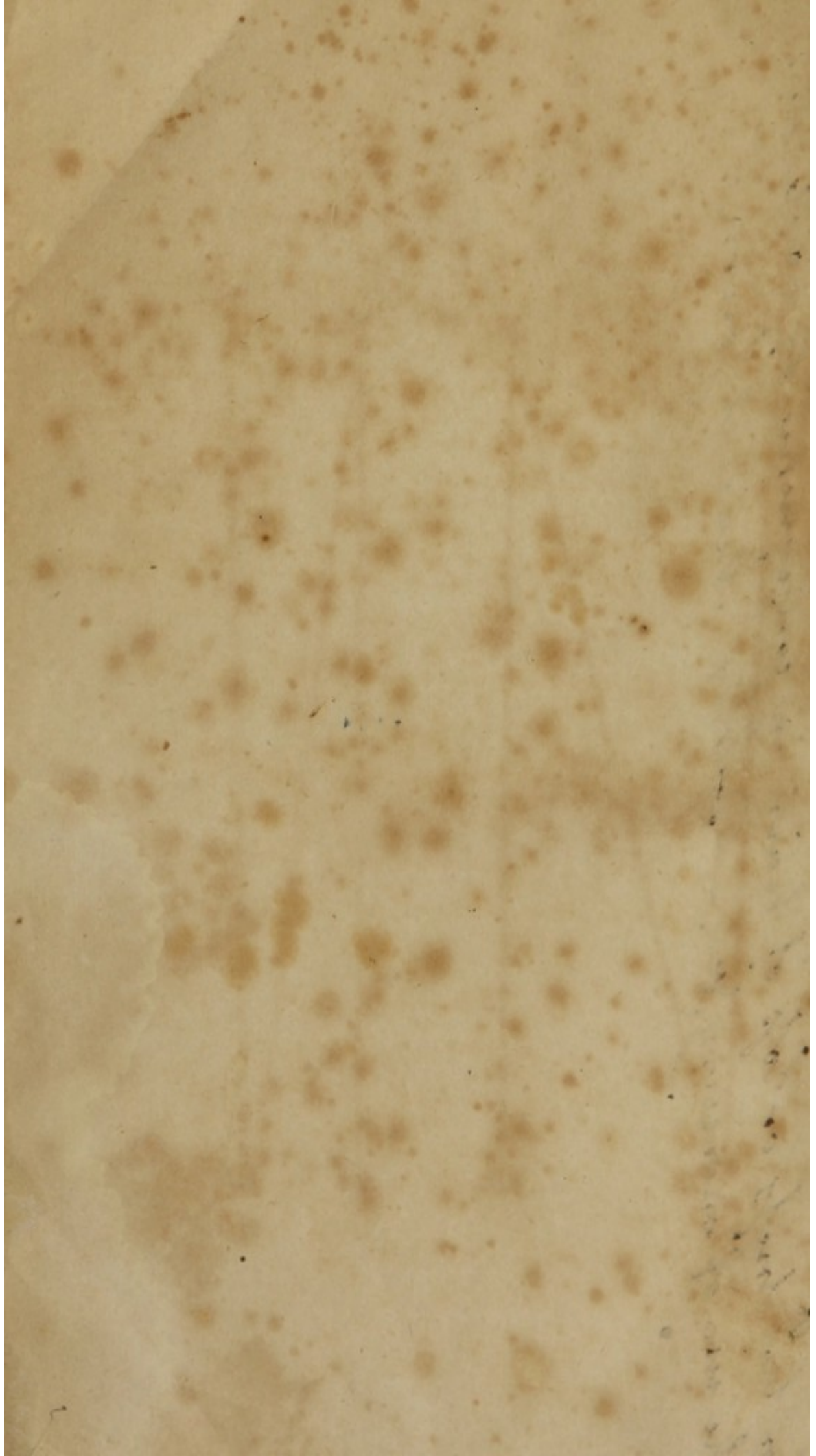
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Black plaster, or Healing Salve.

Take of Olive oil 3 quarts
Common resin 3 $\frac{1}{2}$ lbs
Beeswax 3 $\frac{1}{2}$ lbs

Melt these together, & raise the oil almost to boiling heat; then add gradually, of pulv. red lead $2\frac{1}{4}$ lbs, if it be in the winter; if in the summer, $2\frac{1}{2}$ lbs. In a short time after the lead is taken up by the oil, & the mixture becomes brown, or a shining black, remove from the fire, and, when nearly cold, add of pulverized camphor, half an ounce.

It should remain on the fire until it forms a proper consistence for spreading, & which may be known by dipping a spatula or knife into it from time to time, & suffering it to cool. -
Use. We have found this elegant salve superior to every other, where applications of this kind are required. -
It has an excellent effect in every kind of ulcer, in burns, in venereal scrophulous, & fistulous, and all other ulcers. Should be spread thin, on a piece of linen, & renewed once or twice a day. - - -

From Dr. Beach's American Practice
(Dec. 1836.)

[Faint, illegible handwriting throughout the page]

James Hodge

THE AMERICAN

NEW DISPENSATORY.

CONTAINING

GENERAL PRINCIPLES OF PHARMA-
CEUTIC CHEMISTRY.
PHARMACEUTIC OPERATIONS.
CHEMICAL ANALYSIS OF THE ARTI-
CLES OF MATERIA MEDICA.

MATERIA MEDICA, INCLUDING SEV-
ERAL NEW AND VALUABLE ARTI-
CLES, THE PRODUCTION OF THE
UNITED STATES.
PREPARATIONS AND COMPOSITIONS.

WITH AN APPENDIX,

CONTAINING

MEDICAL PRESCRIPTIONS. THE NATURE AND MEDICAL USES OF THE GASES. MEDICAL ELECTRICITY.
GALVANISM. AN ABRIDGMENT OF DR. CURRIE'S REPORTS ON THE USE OF WATER. THE
CULTIVATION OF THE POPPY PLANT, AND THE METHOD OF PREPARING OPIUM.

AND SEVERAL USEFUL TABLES.

THE WHOLE COMPILED FROM THE MOST APPROVED AUTHORS, BOTH
EUROPEAN AND AMERICAN.

BY JAMES THACHER, A. A. & M. S. S.

BOSTON:

PRINTED AND PUBLISHED BY T. B. WAIT AND CO.
COURT-STREET.

1810.

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DISTRICT OF MASSACHUSETTS, TO WIT :

BE it remembered, That on the tenth day of May, in the thirty-fourth year of the Independence of the United States of America, Thomas B. Wait and Company, of the said district, have deposited in this office the title of a book, the right whereof they claim as proprietors, in the words following, to wit : " The American New Dispensatory. Containing General principles of pharmaceutic chemistry. Pharmaceutic operations. Chemical analysis of the articles of materia medica. Materia medica, including several new and valuable articles, the production of the United States. Preparations and compositions. With an appendix, containing medical prescriptions. The nature and medical uses of the gases. Medical electricity. Galvanism. An abridgment of Dr. Currie's reports on the use of water. The cultivation of the poppy plant, and the method of preparing opium. And several useful tables. The whole compiled from the most approved authors, both European and American. By James Thacher, A. A. & M. S. S."

In conformity to the Act of the Congress of the United States, entitled, " An Act for the Encouragement of Learning, by securing the copies of Maps, Charts, and Books, to the Authors and Proprietors of such copies, during the times therein mentioned ;" and also to an act entitled, " An act supplementary to an act, entitled, an act for the encouragement of Learning, by securing the copies of Maps, Charts, and Books, to the authors and proprietors of such copies during the times therein mentioned ; and extending the benefits thereof to the Arts of Designing, Engraving, and Etching Historical, and other Prints."

WILLIAM S. SHAW,

Clerk of the District of Massachusetts.

RECOMMENDATION.

REPORT OF A COMMITTEE OF THE MASSACHUSETTS MEDICAL SOCIETY.

THE Committee appointed by the Massachusetts Medical Society, to examine a manuscript submitted to their inspection by Doctor James Thacher, under the title of the American New Dispensatory, have performed that service as minutely as their various avocations would admit; and are of opinion, that a work of this kind is much wanted at the present period, on account of the improvements and important discoveries, which have been made in chemical science within a few years, by which the existing publications have been in some measure superseded.

Dr Thacher appears to have made his compilation from the most approved modern publications, and to have adapted it to the purpose of "a standard work, exhibiting, in familiar language and a concentrated form, the principles of modern pharmacy, chemistry and materia medica."

Many of the ancient pharmaceutical articles and preparations, which experience has proved to possess little or no value, have been left out of the work, by which means it is compressed into a smaller compass, and rendered less expensive than most European publications of the same kind.

A number of indigenous substances are introduced into the *Materia Medica*, which have been hitherto unknown, or which, though their properties are in some instances highly active, have never been brought into general use.

As it appears to have been a principal object of Dr. Thacher to adapt the work to American practice; and, as he has adopted for the basis of his work the *Pharmacopœia* of Massachusetts, lately published by the Medical Society, and recommended for general use, they are of opinion, that it will co-operate with the views of the Society in that publication, especially as "its nomenclature and order of arrangement seem to be strictly observed" in the manuscript.

They therefore conclude, that it will be for the interest of medical science in this country, to encourage the work, and that it may be the means of exciting a more general attention to the medicinal virtues of American productions, many of which might be introduced into the *Materia Medica*, and advantageously, as well as economically, supply the place of foreign articles.

JOHN WARREN
AARON DEXTER.
JOSIAH BARTLETT.

Boston, October 14, 1809.

TO

JOHN WARREN, M. D.

PROFESSOR OF ANATOMY AND SURGERY IN THE UNIVERSITY OF CAMBRIDGE; AND PRESIDENT OF
THE MASSACHUSETTS MEDICAL SOCIETY.

SIR,

WERE any apology necessary for the liberty I have taken, of inscribing to you the following sheets, without previously soliciting your assent, it might be found in the various relative circumstances, which designate you as the most proper patron of the work. You have been eminently instrumental in the establishment and advancement of the philanthropic institutions over which you preside ; while the applause of the public bears ample attestations to your pre-eminent attainments in medical science, and numerous qualifications as a distinguished teacher of medicine. But, if permitted to indulge, on this occasion, considerations of a more personal nature, I might recur to that interesting period, when officiating in a military hospital, I experienced from your beneficence civilities and acts of friendship very propitious at the time ; and which, with more recent instances of friendly intercourse, I shall ever recollect with the most pleasing emotions. Permit me, therefore, to proffer this dedication, as a tribute of respect and gratitude, accompanied with my fervent wishes, that you may long continue to exhibit to the public and to your friends those virtues and that benignity, which are conspicuous traits in your character.

It has become one of the felicities of your day to have associated with you as coadjutor a son, whose talents and intelligence have already attracted public attention, and whose prosperity is peculiarly interesting to yourself.* May this important union, so auspicious to the medical character of our country, with your excellent example and influence, excite emulation in the field of science, and prove a shield to the community against the baneful effects of medical demerit and empiricism.

I am, sir, with sentiments of profound consideration,

Your most obedient servant.

JAMES THACHER.

PLYMOUTH, January 1, 1810.

* John C. Warren, M. D. recently elected adjunct Professor of Anatomy and Surgery.

THE HISTORY OF THE
LORDS OF THE MANOR OF
ST. MARTIN'S, IN THE
COUNTY OF MIDDLESEX.
BY
JAMES HALLAM, ESQ.
OF THE BARR.

IN TWO VOLUMES.
LONDON:
PRINTED BY J. JOHNSON, ST. PAUL'S CHURCH-YARD, 1783.

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PREFACE.

SUCH has been the series of improvements in Chemical Science for the last thirty years, that Dispensatories and Pharmacopœias have in constant succession been superseded and rendered obsolete. Those gentlemen, therefore, whose education is not of modern date, are subjected to the alternative, either of making continual accessions to their libraries, or of treating with disrespect the prevailing systems of the day. Medical students seldom have leisure to search the pages of numerous volumes on the subject; and there is much reason to apprehend, that candidates frequently commence their professional duties under circumstances extremely inauspicious as respects this branch of education. The mutual duties, therefore, both of the medical instructor and the student, might be facilitated by a standard work, exhibiting in familiar language, and in a concentrated form, the principles of modern Pharmacy, as well as those of Chemistry and Materia Medica, to which it is so closely allied.

European Dispensatories, it will be conceded, are not well suited to the views and purposes of American physicians: they still contain in their catalogues many antiquated substances and Pharmaceutical preparations, whose medicinal powers are found by experience to be too trivial to entitle them to consideration; while some valuable remedies employed in this country have not been introduced. The Epitome of Chemistry, and a variety of tables, plates, &c. with the Pharmaceutic apparatus, occupying nearly one hundred and fifty pages in Dr. Duncan's Dispensatory, are altogether omitted in this work; and the more concise and perhaps no less judicious "General Principles of Pharmaceutic Chemistry" of Mr. Murray, are substituted. Under the head of Preparation and Compositions, the analogous officinals of the three British Pharmacopœias, are inserted in his Dispensatory; and in some instances the different processes of each are particularly described. These, although of utility in a scientific view, are not to be considered as indispensable to American prac-

tioners in general ; nor do they comport with the plan here prescribed.

The Pharmacopœia of the Massachusetts Medical Society, it will be confessed, is not inferior in point of merit to any other. It contains an ample and judicious selection of medicinal substances and preparations ; but, being intended merely as a standard of uniformity, the natural history, chemical properties, and medicinal virtues of natural and artificial substances, and their application as remedies, not being appropriate subjects, were inadmissible in such a work. Indeed, since the appearance of that production, the expediency of a concise compilation adapted to our own practical use, has become more evident ; and from the desire of co-operating with the views of the Massachusetts Medical Society, their Pharmacopœia is adopted as the basis of this work, and its nomenclature and order of arrangement are strictly followed throughout.

It is, however, to be considered in the character of a compilation only ; and when other than the language of the original is substituted, it is with the view of condensing the subject. The general principles of Pharmaceutic Chemistry, general analysis of the articles of *Materia Medica*, and classification of Medicine, taken from Murray's Elements, will be found to enrich the first part of this volume. With respect to the natural history, chemical composition, and properties of medicinal substances, both Duncan and Murray, together with the American Dispensatory by Dr. Cox, have been carefully consulted, and the same respectable and well established authorities have been the sources resorted to for information relative to officinal preparations and compositions.

The munificence of Providence is so amply displayed in our country, that it may not be deemed too enthusiastic to anticipate the happy period, when by the associated labours of medical men, our *Materia Medica* shall be copiously furnished from the three kingdoms of nature, with such materials, as will derive additional value from the consideration of their domestic origin, and the facility with which they may be procured. Several indigenous substances, not to be found in any other Dispensatory, have, on this occasion, received proper attention, and their respective characters delineated under all the advantages which the most unexceptionable sources of information could afford. Professor Barton, whose authority is held in universal respect, furnishes in his valuable collection for a *Materia Medica* of the

United States, the requisite information relative to most of these productions. On some occasions the compiler has had recourse to that excellent publication, the Domestic Encyclopedia, edited by Dr. Mease, and also the communications to be found in the several volumes of the Medical Repository of New York.

In other instances, where important information respecting medicinal substances has been announced by American physicians, or otherwise found floating on the surface of science, he has not failed to collect, and incorporate into the general mass.

To the Rev. Dr. Cutler acknowledgments are due for his botanical account of indigenous vegetables,* in which are described some productions that have hitherto escaped the investigation of other writers, and we are induced to hope, that, from the more extended researches of this respectable botanist, the public will derive advantages still more considerable.

Although the appendix augments the size and price of the volume, its contents will be found to afford the reader ample compensation. Indeed, the advantages derived from access to public and private libraries, and an extensive correspondence, have been accompanied with a diligent and zealous application to the subject, and a constant endeavour to compress in this volume an unusual mass of well authenticated medical facts, embracing objects of solid and practical utility.

PLYMOUTH January 1, 1810.

* Vid. Memoirs of the American Academy of Arts and Sciences, vol. I:

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INTRODUCTION.

MATERIA MEDICA, understood according to the strict definition of the term, is that department of the science of medicine which relates to the knowledge of remedies, or of the effects produced in the human system by such substances as are employed for the removal of disease. The OBJECTS to be attended to in its study are the natural history, the chemical composition and properties, and the medicinal powers and applications of the substances which belong to it.

The NATURAL HISTORY of these substances is of utility in furnishing appropriate characters by which they may be distinguished. Many of them bear a close resemblance to each other, and can only be discriminated by those minute and accurate distinctions which the methods of natural history afford.

From the intimate connexion which frequently subsists between those properties on which natural classification is established, and the various qualities with which bodies are endowed, natural history is likewise, to a certain extent, capable of affording indications of the virtues of remedies. Thus, in the vegetable kingdom, the different species of the same genus, and even the different genera of the same natural order, are composed of substances which frequently exert the same actions on the living system; yet to this connexion there are exceptions so numerous and important, that it is incapable of just application to any considerable extent; it can only suggest conjectures, which require to be brought to the test of experiment.

The more full description of the sensible properties of the articles of the materia medica, affords the most obvious method of distinguishing them, and in many cases the easiest and most certain criterion of their purity and perfection.

It has likewise been imagined, that the sensible qualities of medicines afford indications of their peculiar powers. Those, for example, which are inodorous and insipid, are seldom active remedies; and those which have a similarity in taste or in flavour, have also a general resemblance in their virtues. But though indications of this kind may be partially true, they are

extremely limited in their application, and are liable to many causes of obscurity and error.

The CHEMICAL HISTORY of the articles of the *materi medica*, embraces several important subjects of inquiry.

Their analysis, especially that of those belonging to the vegetable kingdom, has been supposed capable of leading to a knowledge of their virtues; and the opinion does not *a priori* appear improbable, since the medicinal powers of any compound body, in common with its other internal properties, must arise from its peculiar composition. Without any reference, however, to the very imperfect analyses of the older chemists, it may be remarked, that even from the researches of modern chemistry little information of this kind can be acquired. It may be discovered, indeed, in what proximate principle of any vegetable substance its virtues reside; but this affords no previous indication of these virtues. Nor can the analysis of these principles explain the source of the powers which are attached to them in particular substances; the peculiarities of composition from which these may originate, being by far too subtle to be detected by chemical means.

Chemistry, however, is in other respects more directly useful in its application to the *materia medica*. It enables us, by the use of proper solvents, or by the due application of heat, to separate those proximate principles of vegetables in which their virtues reside, from other inert or noxious matter with which they may be mixed; it ascertains how far these processes are useful, points out those changes in composition by which the virtues of the substances acted on are frequently altered, and the means by which such injuries may be lessened or prevented. Similar advantages are obtained from its application to the few products of the animal kingdom that are used in medicine. Those which are derived from the mineral kingdom, can be employed with advantage and discrimination only when their composition is known; and the analyses of these substances have exploded many errors respecting them, have enabled us to distinguish them from each other, have pointed out the identity of others, and have rectified the processes by which they are prepared.

By new combinations, chemistry furnishes us with many remedies equally active and important with those afforded by nature; and by pointing out the mutual chemical action of different substances, it guards against the errors which might arise from improper mixtures.

The last object in the study of the *materia medica*, that to which the others are merely subservient, is the *MEDICAL HISTORY* of its articles; the investigation of their virtues, or their practical uses in the treatment of disease.

This includes, in the first place, the consideration of the actions of these substances on the system, in general, as, this being ascertained, leads to their application to the treatment of morbid affections.

It is likewise necessary to investigate, so far as it can be done, the *mode* in which remedies act, either in the healthy or in the diseased state, and by which they produce their peculiar effects. We are thus better enabled to diversify their application, to determine the cases to which each may be more peculiarly adapted, and to discover the various circumstances by which their operations are influenced.

In considering the practical uses or applications of remedies, the objects demanding attention are the various kinds and forms of disease to which they are adapted, the circumstances that may render their exhibition improper in particular cases, the cautions necessary in their use, their doses, together with their usual and proper modes of administration, and the effects of their combinations with each other.

PHARMACY is the art of preserving, preparing, and compounding medicines.

The *PRESERVATION* of medicines is its least extensive part. It includes principally the general rules for collecting plants at certain seasons, or in particular states of maturity, and those by which they are dried or preserved from the injuries they would sustain by exposure to light, air, and moisture. It comprehends, in like manner, rules for the collection and preservation of animal and mineral substances.

That part of pharmacy termed the *PREPARATION* of medicines, includes a variety of important operations.

The virtues of those remedies which are derived from the vegetable kingdom, generally depend on one or other of the proximate principles of each substance; on its gum, its resin, essential oil, or some other. These different principles are dissolved by different agents, by water, alcohol, &c.; and as they are often, as they exist in the entire vegetable, mixed with much inert matter, it is of advantage to extract the active principle by means of its proper solvent, and to exhibit it in its pure and concentrated state. Hence have arisen the various pharmæ-

ceutic preparations of infusions, decoctions, tinctures, extracts, &c. these being all processes by which the active matter of any substance is separated from the inert matter with which it is naturally mixed, and differing from each other only in the solvent employed, or in the form to which the solution is reduced.

Sometimes, also, the principles of these substances are extracted by other means, as when an unctuous oil is obtained by expression, or an essential oil by the application of heat. This oil may also be combined with water or alkohol, and thus distilled waters or spirits are formed.

By such processes, we extract only a principle previously existing in any particular substance; we form no new remedy, but merely obtain the same virtue in a different form. In other cases, pharmacy produces remedies altogether new. These are always the result of chemical action; they are either compounds, produced by the combination of two or more chemical agents, or they are the products of chemical decomposition. In this manner are obtained the various saline and metallic preparations. These preparations, too, are often dissolved in various fluids, in order that they may be conveniently exhibited; processes analogous to the infusions or tinctures of vegetable substances.

COMPOSITION is the last part of pharmacy. In this no chemical combination is effected; but different medicines are merely mixed together, with the intention of promoting their efficacy, of correcting their operation, of covering their taste or flavour, or of giving them a commodious form.

From this view of the objects of pharmacy, it is evident, that it is principally a particular application of chemistry. Its operations are either directly chemical, or require that the chemical properties of the bodies operated on should be accurately known.

THE
AMERICAN NEW DISPENSATORY.

PART I.

GENERAL PRINCIPLES OF PHARMACEUTIC CHEMISTRY.

PHARMACEUTIC CHEMISTRY is that department of chemical science which investigates the composition and chemical relations of bodies with a view to their medicinal properties, and explains those operations by which they are fitted to act with more efficacy or safety as remedies against disease. It includes those facts and principles, which connect *materia medica* and pharmacy, the enumeration of which forms the proper introduction to the study of these two branches of medicine.

SECTION I.

PHARMACEUTICAL OPERATIONS.

THE phenomena which it is the object of chemistry to investigate, and upon which, therefore, the principal operations of pharmacy depend, arise principally from the exertion of that power possessed by the particles of different kinds of matter, by which they have a tendency to combine together. When two different bodies are placed in contact, under certain circumstances, they unite, and form one homogeneous substance, in which the particles of either can no longer be discovered. The power whence this combination proceeds, is termed chemical attraction or affinity. It is exerted only between the *minute particles* of different kinds of matter, and between these only at insensible distances. The substances which it combines never separate spontaneously, nor are they capable of being separated by any mechanical means; and they form a compound possessing properties more or less different from those of its component parts.

The change of properties from combination is the most remarkable phenomenon attending the exertion of chemical attraction. The sensible qualities, and chemical properties of the compound, bear in general no resemblance to these qualities and properties in the substances of which it is formed. This, however, is not invariably true. There are a number of instances, especially in pharmacy, where the change is much less complete, as in the solutions of resins or essential oils in alcohol, or

of gums or saline substances in water. But in these the marks of chemical combination are still present, the compound is homogeneous, and cannot be decomposed but by the exertion of a superior affinity.

Chemical attraction is not invariably or equally exerted by each substance to every other. Between many substances there seems to exist no attraction, at least they cannot be made to combine together. Others have a very extensive power of combination, and seem capable of uniting with almost every substance which is not already saturated with them; and there are many intermediate, in their facility of combination, between these two extremes.

Chemical attraction is not limited, in its action, to two bodies. It can be exerted between three, four, or more, and can thus form compounds of so many principles. It can likewise unite bodies in different proportions. Some combine in every proportion, others only in limited quantities. In the latter case, the compounds formed by the different proportions have in general very different properties.

The compounds which are thus formed, have still the same relation to chemical attraction. They have a tendency to combine with other bodies, simple or compound; they can combine in various numbers and proportion; and these combinations are accompanied by the same phenomena, and regulated by the same laws.

The attraction exerted by any substance towards others, is not uniform in its force. To some it is stronger, to others weaker. Hence it follows, that if two bodies have been combined together, they may be separated, or the compound they have formed may be destroyed, by presenting to it another substance, which exerts an attraction to one of its component parts, superior to the attraction by which they were held united. If the circumstances necessary to favour the exertion of chemical attraction be present, the two bodies between which there is the strongest attraction combine, and the other is separated. In chemical language this process is termed decomposition, from a single elective attraction.

A case of decomposition, more complicated, is that, where two compounds are mixed together, and where the constituent parts of the one exert attractions to those of the other stronger than the attractions by which they are held combined in the original compounds. In this case, a complete exchange takes place, and two new compounds are formed. This is termed double decomposition, or the exertion of a double elective attraction. Tables have been constructed of the relative forces of attractions of many bodies towards others, whence may be estimated the combinations or decompositions that will take place on their mixture with each other.

The exertion of chemical attraction between bodies is greatly influenced by another power, that of heat or caloric. This is the cause of the temperature of bodies, of their expansion, fluidity, and conversion into the aeriform or gaseous state. Its

influence on chemical combination and decomposition is very extensive. Some bodies combine together at the common temperature of the atmosphere; others require that temperature to be raised; and in some it is necessary to expose them to a very intense heat. The same differences take place with respect to decomposition. Many bodies remain in chemical union within a certain range of temperature, more or less extensive; but whenever the heat, to which the compounds in which they exist are exposed, is increased beyond a certain degree, decomposition takes place, and the constituent principles are separated from each other. These effects are partly to be explained from the power caloric has of weakening the force of aggregation in bodies by which their particles are held in union, and by which that power tending to separate them, in order to bring them into a state of new combination, is counteracted; and partly from the state of expansion or of fluidity produced by caloric, by which the surfaces between which chemical attraction is exerted are increased, and the minute particles of bodies are brought to act upon each other.

THE OPERATIONS OF PHARMACEUTIC CHEMISTRY are entirely dependent on chemical attraction, or on the action of caloric. They are merely particular arrangements of circumstances, by which the exertion of that attraction is promoted, and the products of the combinations or decompositions which take place are obtained.

There are several preliminary operations, not directly chemical, but employed either to favour the exertion of chemical attraction, or to facilitate the medicinal operation of the substances subjected to them. They are those operations, by which bodies are reduced to a state of extreme mechanical division. The principal are PULVERIZATION, or reducing bodies to powder by beating; TRITURATION, in which the same effect is obtained by rubbing; and LEVIGATION, in which the powder is reduced to a greater degree of fineness, from the rubbing being continued longer, and being facilitated by the addition of any fluid which does not act chemically on the substance subjected to the operation. These are performed in mortars of glass, earthen-ware, or metal. As the particles into which the substance is reduced by any of these means, must necessarily be of unequal fineness, the coarser are separated from the finer, by SIFTING or passing the powder over a sieve. WASHING or ELUTRIATION is an operation in which the same end is attained. The powder is agitated in a fluid, in which it is not soluble; the larger particles are allowed to subside; the liquor, holding the finer suspended, is poured off; and, on its remaining at rest, are deposited. These methods can be applied to few of the metals with advantage. They are, therefore, mechanically divided, by filing, by beating into fine leaves, or by pouring them when melted into water; an operation termed granulation, as the metal becomes solid, in the form of small grains.

These operations do not directly promote chemical action, as they are far from reducing bodies to their minute particles, be-

tween which that action is exerted: they are merely employed as preliminary to those which are more directly chemical. In pharmacy, some of them are of utility, besides promoting chemical combination, as there are several medicines which act with more certainty and power when finely levigated, than when given in a coarser powder.

Of the CHEMICAL OPERATIONS, the most important are those by which that fluidity is obtained, which is in general requisite for the exertion of chemical attraction. SOLUTION is the principal operation of this kind. It is that process in which a solid body, when immersed in a fluid, disappears, so that its particles are no longer discoverable, and upon standing do not subside, the fluid likewise retaining its usual transparency. It is merely an example of chemical combination between two bodies, which happen to exist in different forms, the compound remaining in the fluid state. The fluid being conceived to be the more active substance, has been termed the solvent, the solid the solvend or body dissolved. The attraction, however, whence the solution proceeds, is reciprocal, and is not more exerted by the one than by the other.

The previous mechanical division of solids, promotes their solution, by enlarging the surface between which the mutual attraction is exerted. Agitation causes the solution to proceed more rapidly, by bringing successively the different parts of the fluid into contact with the solid.

There are, in general, certain limits to the solution of solids in fluids. A certain quantity of sea-salt, for example, may be dissolved in a given quantity of water; but if more be added, it remains undissolved, and can only be diffused through the solution. When the fluid has taken up as much of the solid as it can dissolve, it is said to be *saturated* with it. The same fluid requires for its saturation very different quantities of solids; of some it can dissolve only a very small portion, of others more than its own weight. The saturation of a fluid with one substance, does not prevent it from dissolving a portion of a second, or even of a third or fourth, though it lessens the solvent power with regard to each. There are some cases in which the solvent power is apparently unlimited, or in which no precise point of saturation can be pointed out, such as the solution of sugar, gums, &c. in water.

The temperature or degree of heat has a very important influence on solution, and in varying the point of saturation. In general every solution proceeds with more facility or rapidity at a high than at a low temperature, and the fluid is even capable at the high temperature of dissolving a larger portion of the solid, though with respect to different solids, this increase of solvent power, by a given temperature, is very different.

Solution, besides being one of the most important operations in chemical analysis, is one of the most useful in pharmacy, the active principles of many substances being extracted, by means of their proper solvents. Saline substances are dissolved in water, as are also gum, sugar, and other vegetable and animal

products. Resins, camphor, essential oils, &c. are dissolved in ether, alcohol, or wine; and metals are rendered soluble and active by the different acids. The operation receives different appellations, according to the nature of the solvent, of the substances dissolved, and of the manner in which it is performed. When we have a mixture of saline or earthy substances, of which part is soluble in water, or in any other fluid, while another part is insoluble, the one may be separated from the other by the due application of its proper solvent. The process thus performed is termed *LIXIVIATION*, and the solution obtained, a *LEY*. When a fluid is poured on any vegetable or animal substance, so as to dissolve only part of its principles, the operation is termed *EXTRACTION*, and the part dissolved is said to be extracted. If it is performed without the assistance of heat it is termed *MACERATION*; if with a moderate heat, *DIGESTION*; if the fluid be poured boiling hot on the substance, and they are kept in a covered vessel till cold, it forms *INFUSION*. Lastly, *DECOCTION* is the term given to the operation where the fluid is *boiled* upon the substance to be dissolved.

To obtain the solid matter which has been dissolved in any fluid, the process named *EVAPORATION* is employed. The liquor is exposed to heat in a vessel of such a form as to present a wide surface to the atmosphere; the fluid is converted into vapour, and the matter that had been dissolved is thus obtained in a solid state. The heat employed in evaporation should always be as moderate as possible, as the flavour of the solid residuum is otherwise apt to be injured, its composition changed, or part of it carried off with the vapour. In many cases, the heat afforded by placing the vessel containing the fluid to be evaporated over boiling water is sufficient. This forms the *water bath*, or *balneum mariæ*.

There are many substances, especially those belonging to the class of salts, which, when their solutions are evaporated to a certain extent, concrete in masses of regular forms, hard and transparent. These are termed *crystals*, and the operation itself *CRYSTALLIZATION*. The first step in this process is to evaporate part of the fluid till the solution while at its boiling point is saturated, or retains in solution the largest quantity of the body which at that temperature it can hold dissolved. On allowing it to cool, the portion which the high temperature enabled the fluid to hold in solution, will separate, and crystals will be formed; and by successive evaporations, the whole of the solid matter may be obtained in the crystalline form. In like manner, crystals are formed by the slow or spontaneous evaporation which takes place when a fluid is exposed to the atmosphere, and these being formed more slowly, are even harder and more perfect in their figure than those obtained by hasty evaporation.

In crystallizing, the figure which the body assumes, is regular and peculiar to itself, and hence is established the arrangement of crystals into prismatic, rhomboidal, and other forms; these, however, are frequently varied by external circumstances.

Water is essential to the formation of crystals, and gives them their transparency. The crystals of different bodies contain very different quantities of this fluid. It is termed their Water of Crystallization; and by whatever means it is expelled, the transparency, density, and figure of the crystal is lost. If crystals lose their water of crystallization on exposure to the air, they are said to *effloresce*; if, on the contrary, water is absorbed, so that the substance becomes moist or fluid, it is said to *deliquesce*.

Crystallization is promoted by the access of the atmospheric air to the fluid, and by affording a nucleus or solid point at which the crystallization may commence. Some substances have so strong an attraction to the fluid in which they are dissolved, that they do not separate in the crystalline form, even when the solution has been considerably evaporated. They either remain dissolved, forming a liquor more or less glutinous; or if the evaporation be carried to a greater extent, they are recovered in the solid form, but destitute of any regular figure. Some of these bodies, when dissolved in water, may be made to crystallize by the addition of a small quantity of alcohol, which, by exerting a still stronger attraction to the water, weakens their combination with it. Other substances soluble in water, as gum, starch, &c. can by no management be made to undergo this operation.

Besides this species of crystallization, there is a process of a similar kind to which the same term is applied. When a body has been melted, if the fluid has its temperature slowly reduced, so that it approach gradually to the point at which it becomes solid, its particles frequently unite, so as to form masses of regular figures, or crystals. This species of crystallization is not however, applied to any pharmaceutical purpose.

PRECIPITATION is another process by which a solid body is separated from a fluid. If, for example, to the solution of any solid matter in any fluid, a substance be added, which has a stronger attraction to the fluid than the solid previously dissolved in it has, the latter will be separated, and will be thrown down in its solid form. In like manner, precipitation may take place from the substance which is added combining not with the fluid, but with the solid dissolved, and forming with it a new compound no longer soluble. The process, in either case, is termed *precipitation*, the substance thrown down is a *precipitate*, and the substance by which the precipitation has been effected, is the *precipitant*.

In order to obtain a precipitate pure, it is allowed to subside; the clear liquor is poured off, the precipitate is repeatedly washed, to carry off any of the substance by which it was precipitated, which may still adhere to it; it is then dried.

The preceding operations are those in which a solid body dissolved in a fluid is recovered by abstracting part of the fluid. But there are many cases of combination, or decomposition, in which our object is rather to obtain the more volatile part of the mixture. In such cases *distillation* and *sublimation* are had recourse to.

In DISTILLATION, the materials are exposed to a proper degree of heat, in vessels contrived so as to collect the part which passes

off in vapour, condense it, and thus obtain it in the fluid form. Distillation is therefore nothing but evaporation in close vessels, with the design of obtaining the volatile products.

In many cases of distillation, the matter to be distilled is apt to be injured by the application of too strong a heat; such, for example, is the case with regard to the essential oils of plants. To prevent this, they are not exposed alone to heat, but with the addition of a quantity of water. The temperature at which water is converted into vapour, (212° of Fahrenheit) is sufficient to volatilize these oils, without injuring them. The oil therefore rises with the vapour, is condensed with it, and is easily separated from the water, by their difference in specific gravity, a small quantity of it only being lost by being retained by the water in solution.

When the substance to be distilled is not of such a nature as to act chemically on metallic vessels, the common still, made of iron or copper, is employed. This is a cylindrical vessel, from the head of which a pipe issues, which is connected with a spiral tube, placed in a vessel filled with water. The heat is directly applied to the bottom of the still; the vapour produced passes off through the tube, and is condensed in the spiral tube (or worm as it is termed), the cold water with which this is surrounded promoting the condensation.

Acids, or other substances that would act upon metallic vessels, or receive from them a noxious impregnation, are distilled from glass vessels. The retort, or conical bottle bent nearly at a right angle, is used for this purpose; the heat being communicated to it by the medium of a sand-bath. The vapour is condensed in a conical or globular vessel, termed a receiver, connected with the retort. Where the vapour is highly elastic or difficult of condensation, a series of receivers connected together is necessary; and where it is incapable of condensation by itself, but is easily absorbed by water, a portion of that fluid is disposed in the receivers, by which it is condensed. Some bodies are impure on their first distillation; they are purified by a second distillation, which is then termed *rectification*. Or, with the proper product of the distillation, a portion of aqueous vapour may have passed over: this may be abstracted by exposing the distilled fluid again to heat, and the process is named *concentration* or *dephlegmation*.

SUBLIMATION is another operation, by which a volatile matter is separated from one more fixed, by the application of heat; but the matter volatilized is again condensed, not in the fluid but in the solid form. The operation, therefore, is generally performed in one vessel, the sublimate being condensed in the upper part. When it concretes, in the form of light flakes, it was termed flowers, in the old language of pharmacy.

FUSION is, next to solution, the principal operation by which chemical combination is promoted. It is adapted to those cases in which the bodies designed to act upon each other are not soluble in any fluid, or at least in none that does not alter their attractions. The fluidity necessary for their mutual chemical action, is therefore given to them by the due application of heat. The

operation is commonly preformed in vessels termed crucibles, which are cups made of earthen-ware, of black-lead, or of some metal; the necessary heat being excited and communicated in general by a furnace.

Chemical combination is also frequently promoted by the application of heat, even though the bodies are not fused. *Calcination* is an operation of this kind. It is merely the exposing of a metal to a high temperature, with the free access of atmospheric air, by which it is oxygenated. *Deflagration* is an operation of a similar kind. It consists in mixing some salts, especially nitrat of potash, in which a large quantity of oxygen is retained with a very weak attractive force, with any inflammable body, and exposing the mixture to heat. The oxygen is attracted by the inflammable substance, which is thus oxydated.

Chemical decomposition is, in like manner, promoted by an increase of temperature. One principle of a compound, which is disposed to volatility, may thus be expelled; or two bodies, one or both of which are compounds, and which when mixed together have no action on each other, may, when exposed to a strong heat, exert attractions, by which their decomposition is effected.

These are the principal operations of pharmacy. Connected with this branch of the subject, there remain to be noticed the measures and weights which are usually employed. *Troy weight* is that ordered to be observed in the different pharmacopœias. The pound is divided into twelve ounces; the ounce into eight drachms; the drachm into three scruples; and the scruple into twenty grains. Measures are rejected by the Edinburgh college, but are admitted in other pharmacopœias, and used by the apothecaries. They are subdivided in a similar manner, and are made to answer to the specific gravity of water. A table-spoonful and tea-spoonful, (measures frequently employed), are understood to be equal, the former to half an ounce, the latter to one drachm.

N. B. Sixty drops of water, one hundred of diluted alcohol, or an hundred and twenty of alcohol, are equal to a drachm by measure.

SECTION II.

CHEMICAL ANALYSIS OF THE ARTICLES OF THE MATERIA MEDICA.

THE consideration of the general analysis of the substances employed as remedies, must necessarily precede their particular history, as it is so intimately connected with the observations to be made on their properties, the marks of their purity and perfection, their actions on each other, their combinations, and pharmaceutical treatment.

CHEMISTRY arranges all bodies under two classes; those which are simple, and those which are compound. The former are such as consist merely of similar parts; the latter such as can

be resolved into particles different in their properties from each other, and from the compound which they had formed. From the combinations of a few simple substances, originate all the productions of nature, and all those which are the results of the operations of art.

It is the province of chemistry to trace these combinations, to determine whether bodies are simple or compound; and, if compound, to ascertain the number and proportions of their constituent parts, and the modes in which they are combined. These objects are attained by analysis and synthesis, two general operations, comprehending the greater number of the processes of chemistry.

Analysis is the decomposition of a compound, or the separation of its constituent parts. It is effected, either by exposing it to heat, when, from the unequal action of the caloric on the particles of which it is composed, they are separated from each other; or, by subjecting it to the action of a superior attraction, in other words, by presenting it to some substance which exerts an attraction to one or other of its component parts, superior to the attraction by which these were held united.

When the analysis has been effected, we may often again combine the principles obtained, so as to form the compound that has been decomposed. This forms what is termed synthesis, which, when it can be effected, is always a proof of the accuracy of the analysis. Very frequently, however, in the decomposition of a compound, the principles that are separated, instead of passing off pure, combine in new modes and proportions, and form compounds, which then become the products of the analysis. These cannot be combined again, or, if they could, they would form a compound totally different from the substance originally analysed. They may, however, be subjected to a further analysis, and thus the ultimate principles of the compound may be accurately ascertained. The whole of the substances belonging to the vegetable and animal kingdoms are subject to this complicated analysis.

In analysing the various products of nature, we ultimately arrive at a few substances which we are unable farther to decompose, and which are therefore regarded as *simple*. Their absolute simplicity is not indeed established, but is inferred, till their composition be proved. They are simple with regard to our present knowledge of them, that is, they consist of particles, which, so far as can be discovered, are similar to each other, and they are regarded as the elements of which all other bodies are composed. It is sufficient to state their distinguishing characters, and the principal compounds which they form.

The first order of these substances, those which seem best entitled to the character of simplicity, are the SIMPLE GASES, oxygen, azot, and hydrogen. Modern chemistry has demonstrated, that these gases are solid substances, brought into the aerial form by the operation of caloric. In the new nomenclature, therefore, the name of each is given to the base, and from this the appellation of the air or gas is derived.

Of these simple bodies, **OXYGEN** is the most important, since it is either capable of combining with, or forms a component part of the greater number of the productions of nature. Like other gases, it is invisible, and permanently elastic; its specific gravity is a little superior to that of atmospheric air. Its distinguishing characters are its capacity of supporting combustion and animal life. It is indeed the only substance that can support either of these processes, and it is absolutely necessary to enable them to be carried on.

The influence of this air in supporting combustion, is more particularly to be assumed as its distinguishing chemical character, since so many of the most important chemical agents are formed by this operation. It is proved by the most unequivocal experiments, that combustion is nothing more than the combination of oxygen with the combustible body. Burnt bodies are therefore merely substances combined with oxygen: that principle is contained in them in very various quantities, and is retained by very different degrees of attractive force.

Many substances can also be combined with oxygen, without the phenomena of combustion taking place, that is, without the disengagement of light and caloric. This happens when the oxygen has been previously combined with another body, and is only transferred from it by the exertion of a superior affinity. It happens, too, when the oxygen is slowly absorbed from the atmosphere, at the natural temperature. It is thus that many animal and vegetable substances are altered by exposure to the air. The absorption in these cases is so gradual, that the caloric, and perhaps the light, which are disengaged, are not perceptible.

The compounds resulting from the union of oxygen with other bodies, are among the most active of the chemical agents.

It forms one-fourth part of the atmospheric air, and it is principally upon its action that the many chemical changes produced on bodies by that air depend. United with hydrogen, it forms water, the substance which of all others has the greatest share in promoting chemical combinations.

Another order of important compounds resulting from the union of oxygen with other bodies, is that of **ACIDS**. These are distinguished by their sour, styptic taste; by their greater or less causticity; by their changing the vegetable colours to a red; and by their combining with the alkalis, earths, and metals, forming peculiar compounds in which the acid properties are totally lost. They are compounds of inflammable substances with oxygen, and this element derives its name from being the principle of acidity.

With the same substance oxygen is capable of combining in different proportions, so as to form different acids, the more powerful acid being generally formed by the larger proportion of oxygen.

The nomenclature of the acids is designed to express these facts. The name of each acid is derived from the substance of which, combined with oxygen, it is formed; and by a variation in termination, the different acids resulting from the different degrees of oxygenation of this base are denoted; the name of the

more perfect acid terminating in the syllable *ic*, that of the one with the less proportion of oxygen in *ous*. Thus sulphur, with two proportions of oxygen, forms sulphureous and sulphuric acids.

Acids have a great tendency to combination. From this, and from the facility with which they are in general decomposed and part with oxygen, they are the most active of any of the compound chemical agents, and are used in many pharmaceutic operations.

Lastly, oxygen unites with many bodies without rendering them acid; it then forms an order of bodies termed oxyds. It in general communicates to them a greater tendency to combination. To this order belong almost all the compounds it forms with the metals, and the greater number of the vegetable and animal products.

The second of the simple gases is AZOT. Like oxygen, when pure, it exists always in the gaseous form, forming azotic gas. This gas, with less than one-fourth part of oxygen, constitutes the common atmospheric air. It possesses no remarkable property by which it may be characterized, and therefore it is rather distinguished by its negative qualities. It is lighter than atmospheric air, its specific gravity, compared with it, being as 985 to 1000; it is unable to support combustion or respiration; it is not absorbed by water, at least in any considerable quantity; and it is not inflammable in the strict sense of the term, for although it combines with oxygen, yet the combination is not sudden, nor is it attended with the emission of light, and with scarcely any extrication of caloric.

Azot combined with oxygen, in proportions in which these two elements are mutually saturated, forms a powerful acid, the Nitric; with a smaller proportion of oxygen it forms the nitrous acid. These acids are very easily decomposed, and hence are often employed in chemical operations to afford oxygen to other bodies. With smaller proportions of oxygen, it forms two gases, neither of which has acid properties; nitrous gas, composed of 44 of azot with 56 of oxygen, distinguished by the facility with which it unites with an additional proportion of oxygen; and nitrous oxyd, consisting of 63 of azot, and 37 of oxygen, peculiarly characterized by its high exhilarating powers on the animal system. Combined with hydrogen, in the proportion of 121 parts to 32, it forms ammonia, or volatile alkali, and hence it has been supposed, from analogy, that the other two alkalies also contain azot as a constituent principle.

Lastly, azot is contained in great abundance in animal matters, and is the principle which distinguishes them, by their chemical composition, from vegetables.

The last of these simple airs is HYDROGEN. It is the lightest of all the gases, its specific gravity, when it is in its purest state, being to that of atmospheric air as 13 to 1. It is highly inflammable; one part of it mixed with four parts of atmospheric air, exploding with violence on the approach of an ignited body.

The most important compound of hydrogen is water, formed by its union with oxygen, in the proportion of 15 parts, by weight,

of the former to 85 of the latter. As a chemical agent, water is of the first importance, both from its very extensive power of combination, and from its agency in affording oxygen. It is the solvent of all saline, and of the greater number of the earthy substances; and it likewise dissolves a number of the vegetable and animal products. In these combinations, it is singular that the general law of chemical attraction, (that combination which alters the properties of bodies,) is scarcely observed; the properties of the bodies dissolved by water remaining almost invariably nearly the same, and that fluidity being merely communicated to them which is necessary for their mutual chemical action, or which renders convenient their preparation as medicines.

Water is farther an important chemical agent, by affording oxygen to a number of bodies. Thus, many of the metals are slowly oxydated by it; and in their solutions by acids, it is frequently from the water that the metal receives oxygen. The vegetable and animal products receive oxygen also from the water they contain; and in the decompositions which they suffer, whether from the reaction of their principles at a natural temperature, or by exposure to heat, the elements of the water present enter into the composition of the products which such analysis afford.

Under the appellation of SIMPLE INFLAMMABLE SUBSTANCES, are commonly described three bodies, carbon, sulphur, and phosphorus. They exist in the solid form, but are totally destitute of the metallic splendor, opacity and gravity. They are highly inflammable, and form acids when united with oxygen.

CARBON, the first of these, is an inflammable matter, the basis of common charcoal. In this substance, it was supposed to be merely mixed with oxyd of iron, and some other impurities. But the experiments of Guyton have proved that it is also combined with a portion of oxygen, and that the *diamond* is the pure inflammable base. Charcoal therefore, or the black porous substance which remains after the imperfect combustion of wood, is an oxyd of carbon containing 36 parts of oxygen in the 100. It is inflammable. Combined with a larger quantity of oxygen, it forms a gas still possessing the property of inflammability, the gaseous oxyd of carbon. Saturated with oxygen, it forms a gas possessing the properties of an acid; carbonic acid, or what was formerly named fixed air. Its acid powers are extremely inconsiderable, and its attractions so weak, that it is displaced from its combinations by all the other acids. Carbon, with hydrogen and oxygen, forms several compounds possessing inflammability. Some of them exist in the gaseous form, and differ slightly in their properties from each other. Alkohol, which is the product of fermentation from sugar, and which when pure is a colourless fluid, fragrant and pungent, volatile and inflammable, is a compound of a similar kind; and ether, which is formed by the action of acids from alkohol, and which is still more light and volatile, is nearly of the same composition, differing from alkohol principally in containing a larger proportion of hydrogen.

SULPHUR is a simple inflammable substance found in abundance in nature, either pure or in combination with metals. When pure, it is hard and brittle, semitransparent, of a light yellow colour, insipid, emitting when slightly heated a foetid smell. It melts and volatilizes at a very low temperature, that of 185° ; at a temperature of 302° , it burns with a blue flame, when atmospheric air is admitted.

Sulphur combines with oxygen, hydrogen, phosphorus, with many of the metals, and indeed with the greater number of the simple bodies. Its combination with oxygen forms the sulphuric and sulphureous acids. The latter is gaseous, has a pungent suffocating odour, and does not possess the acid properties in a very eminent degree. The former is fixed and inodorous; in the general acid powers it is superior to any body of the same class; it has a strong attraction to water, and is always combined with it; it exerts also strong affinities to the alkalies, earths and metallic oxyds, and oxydates the metals, and the greater number of inflammable bodies. It is therefore extensively used in chemical and pharmaceutical operations.

With hydrogen, sulphur forms a compound, sulphurated hydrogen, which exists in the aerial form, and is distinguished by its very foetid smell. It resembles the acids in several of its properties. Sulphur is also a component part of some animal substances, and it has even been detected in a few vegetables.

The last of these simple substances is **PHOSPHORUS**, a substance with which we have been made acquainted only by the art of the chemist. It exists no where pure and uncombined, but its acid is found in great abundance in nature. In the fossil kingdom, it is combined with several of the earths and metals, and it forms a component part of many animal and several vegetable productions.

Phosphorus is always obtained by decomposing this acid, by heating it with carbon, which attracts its oxygen. The phosphorus is sublimed in close vessels; it is of a soft tenacious consistence like wax; transparent, of a pale yellowish colour. It emits fumes, which are owing to its combination with the oxygen of the atmosphere. From this combination, two acids are formed, according to the proportion of oxygen: the phosphorus, which is foetid, and when heated, emits luminous vapours; and the phosphoric, which is inodorous, and more powerful as an acid than the other. Phosphorus is one of the component principles of animal substances.

Besides the acids formed by the oxygenation of these simple inflammable bodies, there are three not yet decomposed, but which are supposed from analogy to be of a similar composition; the muriatic, fluoric, and boracic.

The **MURIATIC ACID** exists in sea-salt, and in various other natural substances. In its pure state it is gaseous, has a pungent suffocating odour, and extinguishes combustion. It is rapidly absorbed, and in large quantity, by water; and it is under the form of this solution that it is generally used. It possesses in an eminent degree the general acid properties. It combines

with the alkalies and earths; and though incapable of affording oxygen directly to the metals, it affects the oxydation of many of them, by enabling them to decompose the water it contains. This acid is capable of being combined with a considerable proportion of oxygen, forming the oxy-muriatic acid. The acid powers of this are inferior to those of the simple muriatic acid; but parting with facility with the oxygen combined with it, it acts with more energy on many inflammable substances.

The fluoric and boracic acids cannot be regarded as pharmaceutical agents.

The METALS, the third order of simple substances, are distinguished by their opacity, brilliancy, fusibility, ductility, malleability, and by possessing a specific gravity superior to that of any other class of bodies. They are truly inflammable, since they are capable of combining with oxygen, and many of them during their oxydation emit light and caloric. It scarcely comes within the limits of pharmaceutical chemistry to notice all the metals particularly: it is sufficient to take a general view of their properties, and of their influence in combination.

The metals are very various in their degree of fusibility. Mercury does not become solid but at a temperature equal to 40 degrees below 0 of Fahr., while iron or platina requires a very intense heat for its fusion. They differ also in their ductility and malleability. Gold is at once the most ductile and most malleable, that is, it can be drawn into the finest wire, and beat into the thinnest plates, without its texture being injured. The other metals possess these properties in different degrees, some being ductile which are scarcely malleable, and *vice versa*. Others are neither ductile nor malleable. These have been improperly termed semi-metals. Specific gravity is the property by which the metals are most clearly distinguished. The specific gravity of the heaviest stone is to that of water as 4 to 1, while that of the lightest metal is as 6 to 1.

Metals are very susceptible of combination. They unite with sulphur, with phosphorus, and with each other. Their combinations with oxygen are the most extensive and important.

This combination is effected in different ways. When raised to a temperature more or less high, with the access of atmospheric air, they attract oxygen; some are oxydated rapidly, and exhibit all the phenomena of combustion; others undergo this operation much more slowly; and there are some (gold, silver, and platina) which can scarcely be oxydated in this manner. Several of them are oxydated by the agency of water. It is thus that iron and some others, especially when assisted by a high temperature, attract oxygen from water, the hydrogen being disengaged. Lastly, all of them may be oxydated by the action of acids. The acid itself is not only decomposed, by its oxygen being attracted by the metal, but its presence enables several of the metals to decompose the water present with great rapidity.

The results of these combinations are compounds, which in general belong to the class of oxyds. They are destitute of the metallic qualities, and are more similar to earths, being in ge-

neral insipid, insoluble in water, and vitrifiable by heat. Four metals, tungsten, molybdena, arsenic, and tin, can be so highly oxygenated as to pass into the acid state.

Metals attract very different quantities of oxygen. Some combine with only a small proportion of that principle, while others can take up nearly their own weight.

Each metal, too, combines with certain different proportions, and the oxyd produced by each proportion differs in its properties from that produced by the others. The first degree of oxygenation generally produces an oxyd, having a colour not much different from that of the metal: by higher oxygenation, more brilliant colours are produced.

Metals also attract oxygen with very unequal degrees of force. Hence one metal can often be oxydated merely by heating it with the oxyd of another. Some oxyds, too, as those of gold, silver, and mercury, are decomposed by the mere agency of caloric, at a temperature not raised very high, and even by the action of light at the natural temperature.

It is principally from their combination with oxygen that metals derive their activity. They are, for instance, incapable of combining with the earths, unless they have been previously oxydated. The case is the same with respect to the acids. If the metal has not been previously oxydated, it immediately decomposes either part of the acid, or of the water present, and then this oxyd combines with the remaining acid. The union of the different metals with the different acids, is much influenced by the degree of their oxygenation; and at a high degree of oxygenation they frequently become incapable of combining with the acid. Hence, many metallic solutions are decomposed by exposure to the atmosphere; the metal attracting more oxygen, and becoming insoluble in the acid. In the same manner, heating a metallic solution, often decomposes it, as it enables the metal to attract more oxygen from the acid. The different oxyds have very different degrees of attraction to the acids, and hence some are able to decompose the combinations others form.

Metals are rendered active on the system, only by being combined with oxygen, or with acids. The most deleterious of them prove innocent in the metallic state, and produce their bad effects only when given oxydated, or when oxydated by some of the animal fluids. In general, they are more active the more oxygen they contain; and they are always rendered more powerful when the oxyd is farther combined with an acid. The mildest preparation of mercury, for example, is that prepared by trituration merely, in which the mercury approaches nearest to the metallic state, and the most virulent preparation of that metal is the corrosive muriat, in which it is very highly oxydated.

The last class of simple substances is the **EARTHS**. They have usually been defined substances, insipid, infusible, having little solubility, unflammable, having a specific gravity, compared with water as a standard, always less than 5 to 1, and combining with acids to form neutral salts. Of these characters some apply only to some earths; that of insipidity, for instance, is con-

finer to two or three ; others, as lime and barytes, being considerably sapid.

These characters too are understood as applying to pure earths ; substances which, so far as has been discovered, are absolutely simple. These by combination, or intimate mixture with each other, and with other bodies, give rise to a vast variety of compounds, still distinguished by the title of earths, but to which these characters are only in part applicable. Such compounds are not the objects of pharmaceutic investigation, it being only the pure earths, or combinations of them effected by art, that are used in medicine.

The principal earths are six ; silex, argil, magnesia, lime, barytes, and strontites. Of late two or three others have been discovered, but in quantities so minute as not to require notice in this sketch.

SILEX, though an abundant ingredient in stones, scarcely exists pure in nature. When obtained by a chemical process, it is in the form of a light white powder. Its chemical character is its little susceptibility of combination. It unites with none of the acids, the fluoric excepted. It is dissolved by potash and soda ; and by fusion it combines with the earths and metallic oxyds.

ARGIL is distinguished by insipidity, infusibility by heat, insolubility in water, and by forming a ductile paste with that fluid, but more completely by the compounds which it forms with acids. It is never used in medicine in its pure state ; but some of its compounds, especially that resulting from its union with sulphuric acid, are employed. The salts formed by its combination with acids, have one general medicinal character, that of being possessed of a considerable degree of astringency.

MAGNESIA, when pure, is always in the form of a fine white very light powder. It is infusible ; insoluble in less than 2000 parts of water, and does not form with it a ductile paste ; is somewhat sapid ; changes the colours of vegetables to a green, and forms with the acids peculiar neutral salts. It is never found in a pure state in nature, but is always the produce of art.

Magnesia, in its pure state, is extensively used in medicine, as are also several of its compounds. It is given as an antacid, and the salts it forms with the acids have all a cathartic power.

LIME is distinguished by its disagreeable, penetrating, styptic taste. It attracts water rapidly from the atmosphere ; it is heated when water is poured on it, and falls into a dry white powder ; it is soluble in about 700 parts of that fluid, and its solution changes the vegetable colours to a green. In the fire, it is infusible by itself ; it fuses, however, when mixed with the other earths ; it combines with almost all the acids.

Lime is used in medicine as an antacid, as an astringent, and as a remedy in calculus. It is given in the form of solution in water. Some of its compounds, particularly that with the carbonic acid, are also used to correct acidity, and are sometimes preferred, as being less acrid than the pure lime.

BARYTES is distinguished by its great specific gravity, which is superior to that of every other fossil not metallic. In nature,

it is always found combined with the sulphuric or carbonic acid. When pure, it is in the form of a very fine white powder; it is fusible and soluble in 20 parts of water, its solution changing the vegetable colours to a green; its attractions to the acids are in general much superior to those of any of the other earths.

Barytes has a much more powerful action on the system than the other earths have. Even in a small dose it occasions vertigo, insensibility, and other nervous symptoms. From this circumstance, as well as from its great specific gravity, some have supposed that it is a metallic oxyd, which we have hitherto been unable to decompose.

STRONTITES is, in many of its properties, similar to barytes. Like it, it is found in nature combined with sulphuric and carbonic acids, and these compounds are distinguished by great specific gravity. It is fusible, but less soluble, requiring 200 parts of water for its solution. Its saline combinations are, on the contrary, in general, more soluble than those of barytes. It has no poisonous quality, or does not appear to exert any great activity on the animal system.

The ALKALIES are somewhat analagous in their properties to the earths; they are distinguished by the following characters. They have a penetrating acrid taste; change the vegetable colours to a green; have a strong attraction for water, unite with oils, and combine with the acids, forming neutral salts. There are three substances of this kind; potash, soda, and ammonia. There is reason to believe that they are compounds. One of them, ammonia, is proved to consist of azot and hydrogen, which renders probable the opinion that the others are also compounds, though they have not hitherto been decomposed*.

* DECOMPOSITION OF ALKALIES.

Mr. Davy, Lecturer in the Royal Institution, has lately discovered the bases of potash and soda. He has obtained them separately, and they look like metals, both in their solid and fluid form. They also combine with metals, preserving their metallic appearance. With oxygen, they recombine potash and soda. Much is expected of this interesting discovery, as leading to others of equal, and perhaps superior importance. *Phila. Phy. and Med. Journal.*

Davy's Bakerian Lecture from the Edinburgh Review, of July 1808, page 396, &c.

Decisive and satisfactory is the evidence, by which Mr. Davy has proved, that the alkalies are compounds of oxygen and metallic bases, or rather that they are metallic oxyds. The metals are substances hitherto quite unknown to chemistry. According to the result made with great accuracy, 100 grains of potash contain 86, 7 of metal, and 13, 3 of oxygen. And according to another trial of the same kind, 100 grains contain 85, 5 of metal, and 14, 5 of oxygen; the mean between the two being 86, 1 of metal, and 13, 9 of oxygen. Soda in like manner consists of 80 grains of metal and 20 of oxygen in 100 of alkali. The decomposition of water by the metallic bases afforded another approximation. This gave for potash 84 parts of metal to 16 of oxygen in the hundred; and for soda 76 per cent. of metal to 24 of oxygen. Comparing these leading experiments with the mean results of a variety of others, our author infers as a general medium of the whole, that potash contains about six parts of metal to one of oxygen; and soda about seven parts of metal to two of oxygen. The metallic base of potash resembles mercury so exactly, that it is not possible to distinguish by the eye a

POTASH is the most powerful of these substances: it is solid, and crystallizable, of a white colour, is highly acrid and caustic, has so strong an attraction to water as to take it from almost any other substance. It melts at a moderate temperature; by fusion with siliceous earth it forms glass; it has a stronger attraction than either of the other alkalies for the acids, and therefore the compounds it forms are not easily decomposed.

This substance is obtained from vegetable matter, principally the ligneous part. This is made to burn slowly, till its carbon is totally destroyed: a saline mass remains, which consists principally of potash. There is reason to believe that it is formed during the combustion, since, although it can be detected by other means as a component principle of vegetable matter, it is only in some vegetables, and never in such quantities as are afforded by the combustion.

The physical characters of SODA are so precisely the same with those of potash, that it is scarcely possible to distinguish them when both are in a state of purity. Soda, it is said, attracts humidity from the atmosphere less rapidly than potash.

It is by their combinations, however, that they are principally distinguished. The salts, in particular, which soda forms with the acids, are totally different in their properties from those that have potash for their base. It forms glass with silex in the same manner as potash.

Soda is obtained as well as potash by burning vegetables. It is, however, only sea plants, or those that grow by the sea-shore, that afford it: it has therefore been supposed, that these plants may contain sea-salt, or muriat of soda, and that it is from the decomposition of this salt that the soda is derived.

The third of these alkalies, AMMONIA, differs much from the others. It can never be obtained in the solid or fluid form, but when pure, is always in the state of gas: it is absorbed in great quantity by water, and thus forms a solution of pure ammonia. Its smell is extremely pungent: it is also volatile, escaping gradually from the water in which it has been dissolved: hence it has received the appellation of volatile alkali. It is considered as a less powerful alkali than either of the others: it does not combine with the siliceous earth; it acts more feebly on animal matter, and it adheres to the acids with much less force.

Ammonia is composed of azot and hydrogen, in the proportion of 121 of the former to 32 of the latter. It is obtained in great quantity by exposing animal substances to heat: they are

globule of the one metal from a globule of the other, when they are laid together. The fluidity of the potash metal at the temperature of 60° is considerably smaller than that of mercury: but at 100° its fluidity is perfect; at 50° it is malleable, and at 32° is chrySTALLIZED: its specific gravity to that of water is as six to ten. In many essential properties, the basis of soda resembles this very singular metal, but is considerably less fusible, and its specific gravity is greater; it melts at 120° of Fahrenheit, and is quite fluid at 180° : its specific gravity is to that of water as nine to ten nearly. *Potassium* is the name of the metallic base of potash, and *sodium* of the metallic base of soda.

decomposed, and part of their hydrogen and azot combining form ammonia.

The alkalies are all used in medicine, and their combinations form some of the most important articles of the *materia medica*. They are also important pharmaceutical agents.

With the alkalies, earths, and metallic oxyds, the acids combine and form an order of compounds termed **NEUTRAL SALTS**. In these, the properties of the acid, as well as of the base with which it is united, are in general lost; the compound acquires some new properties; it has in general a considerable attraction for water, and it is capable of assuming a crystalline form. The acids adhere with very different degrees of force to these bases; in general the attractions of the earths to the acids are greater than those of the metallic oxyds, and those of the alkalies greater than of the earths.

The names of the neutral salts are taken partly from the acid, and partly from the base; the generic name is derived from the acid, the specific from the base to which it is united. Thus, all the salts composed of the sulphuric acid, are arranged together under the name of sulphats; and each species is named from the substance to which the acid is united, as the sulphat of potash, the sulphat of lime, &c.: and as each acidifiable base can be combined with different proportions of oxygen, so as to form acids of different qualities, the salts formed by these are distinguished by a variation in the termination of the generic name. Thus, the salts formed by the sulphureous acid are termed sulphites. In this manner the nomenclature of all the compound salts is established.

It remains to notice the analysis of the **VEGETABLE** and **ANIMAL PRODUCTS**, important in a pharmaceutical point of view, as so many of them are employed in medicine. The vegetable kingdom, in particular, furnishes by far the greater part of the articles of the *materia medica*.

The substances which are the products of organization, are very different in their chemical characters from those belonging to the mineral kingdom.

The latter we can easily analyze. We can determine the number and proportions of their constituent principles with accuracy, and their analysis can often be confirmed by synthesis; in other words, we are able by artificial combination to form compounds possessed of the same chemical qualities as the bodies we have analyzed. But with regard to the products of the vegetable and animal systems, the case is extremely different. If we are able to detect their component principles, we can scarcely determine their proportions; much less are we able to ascertain the mode in which they are combined. In no instance, therefore, does the analysis enable us to combine the principles, whether proximate or ultimate, which we have obtained, so as to form any compound at all resembling that which has been analyzed. These productions, too, consist of a few principles, chiefly of carbon, hydrogen, and oxygen, with the addition of azot and phosphorus in the animal kingdom; while the com-

pounds belonging to the mineral kingdom are more varied in their composition.

The products of organization are likewise distinguished by susceptibility of decomposition. Their principles, having strong mutual attractions, are disposed to react on each other; and if this be favoured by humidity, or slight increase of temperature, new combinations are formed, whence the original compounds are destroyed.

In the analysis of these substances, it is necessary to mark an important distinction,—that between the proximate and ultimate principles of a compound. Two compounds may unite and form one substance; and this substance, by the means which analysis affords, may be resolved into the compound bodies of which it was immediately formed, or into the simple principles of which they consist. The former are its proximate, the latter its ultimate principles. The proximate principles of vegetable products are gum, resin, oil, &c.; their ultimate principles, are chiefly carbon, hydrogen and oxygen.

In subjecting any vegetable to analysis, the first object is to discover what are its proximate principles. For this purpose we subject it to the action of caloric, and of different chemical agents.

By the first, we separate those principles that are volatile, such as the essential oil. The application of this mean is, however, very limited, since an increase of temperature, not much exceeding that which is necessary to disengage any of their volatile principles, tends not merely to separate, but actually to decompose them. It is necessary, therefore, that the temperature should not exceed 212° of Fahrenheit's scale, which is obtained by heating these substances with water, when the volatile principles escape without any decomposition along with the aqueous vapour.

Of the different chemical agents useful in the vegetable analysis, water dissolves the gummy and extractive parts, the saline substances, and several other principles of inferior importance. Alcohol dissolves the resin, balsam, camphor, and essential oil. The substances which alcohol dissolves are separated by water; while the gum, which water holds in solution, is precipitated by alcohol. Ether dissolves the same principles as alcohol; it farther dissolves the elastic gum of some vegetables, and it precipitates the extractive matter from water. The alkalies discover several of the acids contained in vegetable substances, and the acids are sometimes used as tests.

Lastly, in the analysis of vegetables, we are often able to procure several of their proximate principles by mechanical means, particularly by expression. Sometimes, also, they exude spontaneously from the growing vegetable, or are obtained from it by incisions made in the branches or trunk.

After we have discovered the proximate principles of vegetables, the next step is to ascertain their composition. This, with respect to their ultimate principles, is nearly uniform; the differences in their chemical properties and sensible qualities arising principally from differences in the proportions of these prin-

ciples, and in the modes in which they are combined. These differences are too subtle to be very accurately determined by analysis, and hence this species of investigation is now acknowledged to convey no information on the medicinal powers of vegetables. Besides carbon, hydrogen, and oxygen, which are their principal constituent parts; some of them contain azot and phosphorus, which modify their properties. Various metals, too, particularly iron and manganese, lime and the three alkalies, either pure, or in combination with some of the acids, are not unfrequently constituents of vegetable matter, though never in any considerable proportion, nor is it certain but that some of these are formed during the analysis by which they are obtained.

The proximate principles of vegetables are sometimes analysed by mere exposure to heat; their elements enter into new combinations, and from the products we discover what the principles were, and even, to a certain extent, in what proportions they had been united. Sometimes the atmospheric air is admitted when they are raised to the temperature of ignition, and by collecting the substances formed by their combustion, we form a similar judgment as to their composition. Others of them are capable of undergoing fermentation; and from the products of this process, the constituent principles of the substance operated on are determined. Lastly, their analysis may often be effected by the agency of the nitric acid, which communicates to them oxygen, and by the resulting compound ascertains the nature of their acidifiable base.

The proximate principles of vegetables are numerous, and of very different kinds. They are not all to be met with in every plant, or in every period of vegetation, but each of them is to be found in some plants, at certain periods of their growth.

They are all the products of vegetation from a common juice or sap, which circulates freely through every part of the vegetable system, which is uniformly supplied by absorption, and which is perpetually changing its composition, according to the state of the plant. This sap being brought into contact, in the vessels of the vegetable, with the gaseous bodies absorbed by its leaves, is by the action of these vessels, assisted by the agency of light, changed in its composition, and thus the peculiar products of the vegetable are formed.

The first transition of the sap seems to be into MUCILAGE or GUM, as this is one of the proximate principles contained in the greatest quantity in vegetables, and which is abundant in young plants. It is an inodorous, insipid and glutinous substance, soluble in water in every proportion, and forming with it a viscid solution termed mucilage. It is insoluble in alcohol, ether, or oil, and is precipitated from its solution in water by the addition of alcohol, or any of the alkalies. It does not absorb oxygen from the atmosphere; it is neither fusible nor volatile. At a temperature superior to 212° , but inferior to that of ignition, it is decomposed, affording pyromucous or rather impure acetous acid, ammonia, carbonic acid and carbonated hydrogen gases, its residuum being charcoal containing lime. The principal products

of its combustion are carbonic acid and water. By the action of nitric acid, it is converted into oxalic acid. The experiments of Mr. Cruickshank, prove it to be composed of oxygen, hydrogen, carbon, azot, and lime.

Gum is obtained by spontaneous exudation, by incisions made in the trunk of the growing vegetable, or by decoction of any vegetable containing it in water. No proper distinction exists between it and mucilage. As a medicine, it has little activity. From its chemical qualities it is of more importance; as its mixture, with the other vegetable principles, renders them more soluble in watery liquors, by which their action on the stomach is promoted. In pharmacy, it is employed to render oils, balsams, &c. miscible with water.

RESIN is another of these proximate principles, most abundantly diffused through the vegetable kingdom. It is often united with gum, but some vegetables exude juices purely resinous. Resin is insoluble in water, is soluble in alcohol, ether, and oils; is not acted on by oxygen at any natural temperature, but burns when heated to ignition; is fusible at a temperature nearly that of boiling water, but incapable of being volatilized without being decomposed. The products of its decomposition by heat are, water, acetous acid, an empyreumatic oil, and a residuum of charcoal. Its constituent parts, therefore, are carbon, hydrogen and oxygen.

Resins are frequently odorous and sapid. They are more active than gums, with respect to their medicinal effects, the virtues of many of those vegetables which act most powerfully as medicines depending on their resinous part.

Gum and resin are often intimately mixed in vegetables, forming a gum-resin. Some of the most active articles of the *materia medica*, are natural compositions of this kind.

A proximate principle of vegetables, which, till lately, was always confounded with gum-resin, is that termed by the French chemists EXTRACT OR EXTRACTIVE MATTER. The peculiar character by which it is distinguished from gum, resin, or any mixture of the two, is its being equally soluble in water and in alcohol; hence its solution in the one fluid is not precipitated by the addition of the other. The extractive principle also, when dissolved in water, and heated to 212° , in contact with the atmospheric air, absorbs oxygen with avidity, which neither gum nor resin does. By this absorption, it is converted into an insipid inert substance, no longer soluble in water. By the oxygenated muriatic acid, it is also changed into an insoluble concrete of a yellow colour. These properties seem sufficient to characterize it as a distinct principle; but there is still some obscurity respecting the mode of its existence in vegetable products. According to the French chemists, it is the principle upon which the virtues of many vegetable medicines depend, though it is difficult to obtain it unmixed with the other principles. By exposure to heat, it affords an empyreumatic acid and oil, and a small quantity of ammonia. Its elements, therefore, are carbon, hydrogen, azot, and oxygen.

OIL is a very common proximate principle of vegetable matter; it is of two kinds, expressed, or unctuous oil, and distilled, volatile or essential oil. These have some common qualities, they are inflammable, insoluble in water, and unctuous to the touch; but they are also possessed of peculiar properties by which they are distinguished.

The first class, the expressed, fat, or fixed oils, are thick and unctuous, nearly insipid and inodorous; they congeal on exposure to cold, are insoluble in water or in alcohol; they combine with the alkalies, forming soaps; they are not volatilized at the temperature of 212° ; they are decomposed in close vessels, and burn when the atmospheric air is admitted, the products of the combustion being water and carbonic acid. At a natural temperature they slowly absorb oxygen, and by long exposure to the air they are thickened, and at length become concrete. They consist of carbon and hydrogen in the proportion nearly of 12 of the former to 3 of the latter.

Expressed oils are generally contained in the seeds and fruit of certain vegetables. They are extracted by expression or decoction with water, and are thus frequently in part impregnated with the extractive, mucilaginous, or resinous particles, whence in some instances they derive taste, odour, and even some medicinal virtues. In general, however, they are insipid, and are used in medicine principally for their lubricating quality; they are diffused in water by the medium of gum or sugar, or by the addition of a small quantity of any of the alkalies.

Volatile, essential, or distilled oils, differ from the expressed oils in several of their properties. They are volatile at a low temperature, are entirely and quickly converted into vapour, at the heat of boiling water, without being decomposed; they are soluble in a small proportion in water, and are more abundantly soluble in alcohol; they do not combine with the alkalies with facility; they are more highly inflammable than the fixed oils, and, on exposure to the atmosphere, slowly absorb oxygen, are thickened, and are at length converted into substances of a resinous nature. In their composition, they contain more hydrogen proportioned to their carbon than the fixed oils do.

The essential oils are in general highly odorous, pungent, and often even acrid; they exist in greatest quantity in the aromatic plants, and are usually obtained by distillation; the vegetable being heated to 212° along with water, and the oil being volatilized with the aqueous vapour. As medicines they possess a highly stimulating power.

In many vegetables there exists a natural combination of essential oil and resin, forming a fluid more or less thick and tenacious, usually also odorous and pungent, termed a *Balsam*. Balsams also contain a quantity of a peculiar vegetable acid, the acid of benzoin.

Another proximate principle of some vegetables, similar in many of its properties to the essential oils, is CAMPHOR. It is a solid tenacious concrete, of a white colour, semi-transparent, having a strong peculiar smell, and a penetrating taste. It is inso-

ble in water, but completely soluble in alkohol, ether, and oils; it evaporates at the common temperature of the atmosphere, and is volatilized in close vessels without decomposition. When its volatilization, however, is prevented, and heat applied, it is decomposed: a volatile oil, fragrant and pungent, of a rich yellow colour, amounting nearly to one-third of the weight of the camphor, distils over; a quantity of charcoal remains as a residuum, and hydro-carbonate, and carbonic acid gases escape with a portion of the peculiar acid termed camphoric. Camphor, therefore, differs from the essential oils, in containing a larger proportion of carbon, and perhaps also of oxygen.

Camphor is found in distinct vesicles in the wood and bark of several vegetables; it is also contained in many essential oils. As a medicine, it possesses considerable powers.

The same relation which camphor has to the volatile oils, wax seems to bear to the fixed oils. This substance is a product of vegetation. It is solid and tenacious, easily fusible, and inflammable. It does not combine with the alkalies; but, when melted, unites with expressed or essential oils. It consists of carbon and hydrogen, in the proportion nearly of 13 of the former to 2 of the latter: some have supposed that it also contains a quantity of oxygen.

FECULA is a name appropriated to a dry, white, insipid powder, contained in many vegetables, particularly in the tuberose roots and gramineous seeds. It is extracted by beating the dried root, wood, or seeds, with a large quantity of water; the fluid becomes milky, from the diffusion of a white powder through it. This, when dried, is the fecula, which, when not united with any of the other principles of the vegetable, is mild and insipid. It is insoluble in cold water, but with boiling water it forms a jelly. It is also insoluble in alkohol. It is an oxyd having carbon and hydrogen for its base. It is capable of being converted by certain processes into saccharine matter. By destructive distillation it affords a large quantity of acetous acid. The fecula is the most nutritious principle of plants, and is contained in great quantity in all vegetables used as food.

GLUTEN.—The farina of some vegetables is found to contain a viscous, elastic, and fibrous-like substance, which, from its close resemblance in properties to the animal product termed gluten, has been named vegetable gluten. It is insipid, elastic, totally insoluble in water, and very sparingly soluble in alkohol. By the action of nitrous acid, it is converted into oxalic acid, and by exposure to heat in close vessels, it affords a large quantity of ammonia. Its analysis proves, that it contains more azot than any other vegetable principle.

ALBUMEN.—This is another principle of vegetables, which receives its name from its resemblance to a principle of animal matter. It is soluble in cold water, its solution being coagulated by heat or by alkohol; it is liable to putrefaction, and furnishes a large quantity of ammonia on exposure to heat. It abounds in the juices of several acrid and narcotic plants, and is also contained in the gramineous seeds.

SACCHARINE MATTER.—This exists in many vegetables, particularly in their fruits and roots, generally united with their gum and extractive matter. When pure, its taste is sweet. It is soluble in water and in alcohol; is capable of crystallization. By fermentation, it is converted into alcohol, as this, by a second stage of fermentation, is changed into acetous acid. By the action of nitrous acid, it is converted into oxalic acid. By decomposition by heat, it affords more than half its weight of acetous acid; a small quantity of empyreumatic oil, carbonic acid, and hydro-carbonate gases, the residuum being charcoal. It consists of oxygen, carbon, and hydrogen.

ESSENTIAL SALTS.—The saline substances contained in vegetables have been termed their essential salts. They are either acids or neutral salts.

There are seven acids found native in vegetables; the malic, citric, oxalic, gallic, tartarous, acetous, and benzoic. The first five consist of carbon and hydrogen, brought to the state of an acid by oxygen, and differ from each other chiefly in the proportion of hydrogen and carbon they contain.

The oxalic acid contains the largest proportion of oxygen; and it is into it that several of the other acids, and many of the vegetable oxyds, are converted by oxydation. It is very soluble in water, and crystallizable. It is distinguished by the very strong attraction which it has for lime, which it takes from every other acid. As it exists in vegetables, it is commonly united with potash, but so that the acid is present in excess.

The malic acid is contained in apples and in many other fruits before they are ripe. It does not crystallize; it contains more oxygen than the citric acid does, and is converted into the oxalic acid by the action of the nitrous acid.

The citric acid is soluble in water and crystallizable; it has a stronger attraction to the earths than to the alkalies; it is not, like the malic, convertible into oxalic acid.

The tartarous acid, as it exists in vegetables, is generally combined with potash, but in such a quantity as still to leave an excess of acid. From this salt the pure acid of tartar is obtained; it is very soluble in water, and is crystallizable; it is convertible into oxalic acid; it is decomposed by heat, and affords more empyreumatic oil than any of the other acids; hence, it has been inferred, that it contains a larger proportion of hydrogen.

The acetous acid, though generally the product of fermentation, has been found in the sap of the vine, and in some other vegetables. It is decomposed in a high temperature, and along with the usual products of the decomposition of vegetable matter, it yields a small quantity of ammonia.

Benzoic acid is contained in several balsams and gum resins: it is highly fragrant, and has a pungent acidulous taste; it is volatile and inflammable, is sparingly soluble in cold water; it is dissolved in considerable quantity by boiling water, and on cooling, crystallizes in white flakes.

The last of the native vegetable acids is the gallic acid, hitherto distinguished as the principle of astringency. It exists in gall-

nuts, and in all those vegetables termed astringents. It is extracted either by maceration with water or by sublimation. It is distinguished from every other acid by the strong attraction which it has for the oxyds of iron, and by forming with them a precipitate of a very deep black colour. It contains a very large quantity of carbon, combined with an inferior proportion of oxygen, and with a very small quantity of hydrogen.

A principle, which till lately was confounded with the gallic acid, is TANNIN, or the tanning principle. It is distinguished from every other principle by its power of combining with animal jelly, and forming a substance absolutely insoluble in water. It is contained in considerable quantity in the greater part of the vegetable astringents, and is generally mixed with the gallic acid.

Several of the native vegetable acids exist together in the same vegetable. They are never contained in distinct vesicles, but are either mixed with the mucilaginous or saccharine juice, or are combined with the alkalies or earths. Combinations of these acids with lime or potash, are, in particular, very abundant in the vegetable kingdom. Compounds formed by the union of the sulphuric, nitric, muriatic, carbonic, and even phosphoric acids with the alkalies and earths, also exist in many vegetables.

The last of these proximate principles is the LIGNEOUS part, or woody fibre. It is the basis to which the others are attached, and composes the greater part of most vegetables, as it forms their entire structure. It is insipid and insoluble in water or alcohol, and consequently remains as the residuum, after the active principles of any vegetable have been extracted by the action of these solvents. By the action of the nitrous acid, it affords the malic and oxalic acids; by distillation it yields the pyroligneous acid. Its principal constituent part is carbon, combined with hydrogen and oxygen.

Besides those principles of vegetables which can be exhibited as distinct bodies, there are some of a more subtile kind, the existence of which has been maintained by many chemists; such as the aroma or spiritous rector, the colouring principle, the bitter principle, the narcotic principle, and several others. The existence of these, however, is very doubtful; the properties of smell, taste, colour, &c. being probably the result of peculiar variations in the composition of some of the known principles of vegetables, and not depending on any peculiar principle. The odour of vegetables, for instance, generally depends on their essential oil; and all the facts that have been stated in support of a distinct aroma, are explicable on the known volatility of these oils, or on the probability of part of them being dissolved by the atmospheric air.

After this enumeration of the proximate principles of vegetables, it may be proposed as a question of some importance, Whether they exist in the vegetable in a state of chemical combination, or whether they are merely mixed together?

The latter seems most probable. These principles can often be distinguished as existing separately from each other, and even as placed in separate cells; they can in many cases be separated

by mechanical means; and even where they are more intimately mixed, that change of properties does not take place, which we must have expected were they chemically united, the virtues of each principle being discernible in the entire mixture, weakened, but not changed. It seems to follow, therefore, that the virtues of vegetable substances do not depend on chemical combinations of their proximate principles, but rather on the peculiar ultimate composition of one or other of these principles. Hence also it is evident, that in separating the proximate principles of any vegetable, we cannot expect to alter or improve its virtues, farther than in concentrating them by a separation from what is inert, or in separating principles which are possessed of different, or even opposite powers. The attainment even of these ends, however, is, in innumerable cases, of importance in their exhibition as medicines.

From this enumeration of the proximate principles of vegetables, we may perceive the reasons for those pharmaceutic processes to which plants are usually subjected.

By infusion in water, we impregnate the fluid with the gum, sugar, extract, tannin, saline substances, part of the essential oil, and part also of the resinous principle. The aroma of the plant is generally first taken up: by longer infusion the water is loaded with the colouring astringent and gummy parts: these are also most abundantly dissolved when the temperature is high. Hence an infusion differs according as the water has stood longer or shorter on the materials, and according as it has been promoted or not by heat. An infusion made in the cold is in general more grateful, while one made with heat, or by keeping the fluid long upon the materials, is more strongly impregnated with active matter.

By decoction or boiling, the solvent power of the water is still farther increased; and hence the liquor always appears darker coloured, and is, in fact, more loaded with the principles of the vegetable which it can hold dissolved. The volatile parts, however, particularly the essential oil, are entirely dissipated; and therefore it is an improper process for those vegetables whose virtues depend, wholly or partially, on these parts. Even the fixed principles of vegetables, at least some of them, are injured by long decoction. The extractive matter, for instance, gradually absorbs oxygen from the atmosphere, and is converted into a substance nearly insipid and inert. Opium, peruvian bark, and many other vegetables, are injured in this manner by decoction, especially if the atmospheric air is freely admitted; and these two circumstances, the dissipation of the volatile matter, and the oxygenation of the extractive, considerably limit the application of this process. It is still used, however, with advantage, to extract the mucilaginous parts of vegetables, their bitterness, and several other of their peculiar qualities.

Alcohol may be applied to vegetables to extract those principles which are not soluble in water. It dissolves entirely their essential oil, camphor, and resin; and as these are often the parts on

which the virtues of vegetables depend, these solutions, or tinctures as they are termed, are often active preparations.

Equal parts of alcohol and water, in general, extract still more completely the active matter of plants, as we thus obtain a solution of all those substances which are separately soluble in either of these fluids.

When by the action of one or both of these fluids, we obtain a solution of the active principles of a vegetable, the solution may be evaporated to the consistence of a thick tenacious mass. This forms what is termed an extract: it is termed an aqueous extract when obtained from the aqueous infusion or decoction of a plant, and spiritous when alcohol has been the solvent. The design of this preparation is to obtain the active matter of the vegetable in a small bulk, and in such a state that it may be preserved a long time without suffering any alteration. It is evident, that it is a process which can be properly applied to such plants only as have their virtues dependent on some of their fixed principles, and even these are often injured by the heat employed, and the free access of the atmospheric air.

Distillation is another process applied to vegetable substances, by which we obtain some of their active principles, particularly their essential oil. If the vegetable matter be heated along with the water, the oil is volatilized, along with the aqueous vapour: it separates from the water on being allowed to remain at rest; a part of it, however, is also dissolved, and communicates to the water a considerable degree of flavour, and often also of pungency. This forms what are termed distilled waters. If alcohol be used instead of water, the essential oil is completely dissolved in it, and we thus obtain what are termed distilled spirits.

By such processes we extract the active matter of vegetables from the inert matter with which it is more or less mixed, and are enabled to administer many remedies under a variety of forms, suited to particular circumstances. A single example will show the utility of investigations of this kind, respecting the component principles of vegetable products, and their relations to the more important chemical agents. Peruvian bark is one of the most important remedies in the materia medica. Practitioners have not always found it practicable to exhibit it in substance with advantage, as where the stomach is uncommonly irritable, or where, from the nature of the disease, it is necessary to give it in large doses, frequently repeated, it is apt to occasion sickness and other uneasy sensations, and even to be rejected by vomiting. Such inconveniencies are attempted to be obviated, by giving it in the different forms of infusion, decoction, tincture or extract, as any of these may best agree with the patient. Our knowledge of its constituent parts can only lead us to the proper application of these processes. From an accurate analysis of it, it has been proved that seven parts out of eight of it consist of woody fibre, or of a matter inert and insoluble, which cannot act on the system, and which affects the stomach only by its weight and insolubility. The remaining

eighth part is that in which the activity of the medicine resides: it is therefore evident that if this be extracted, without injuring its activity, the medicine could be exhibited with much more advantage. This is in part accomplished by the preparations of it that have been mentioned; but even these do not convey it in all its force. If one ounce of the bark be infused or boiled in a certain quantity of water, the infusion or decoction is not nearly equal in efficacy to the whole quantity of bark operated on. It is therefore evident that during either of these operations, the active matter of the bark has not been entirely extracted, or has suffered some change. And here chemistry lends her assistance, and still farther elucidates the peculiar nature of this substance, and the changes produced in it by these processes. It has been proved by experiments, that the matter on which the power of the bark depends, has a strong attraction for oxygen at a temperature moderately increased; that during the infusion, and particularly during the decoction of that drug, this active matter absorbs oxygen from the atmosphere, and is converted into a substance insipid and inert. This leads to the improvement of the preparations of this medicine; and experiments instituted for the purpose have accordingly proved, that, while by long boiling the virtues of the bark are nearly totally destroyed, they are fully extracted by a few minutes decoction in covered vessels. The same investigations have pointed out the nature of the action of some other substances on bark, formerly not well understood. Thus, it has been found by experience, that the alkalies, and more particularly magnesia, enable water to extract the virtues of bark, more completely by infusion,—a circumstance elucidated by the fact since discovered, that the extractive matter of the bark, to which its activity is owing, combines with facility with these substances, and forms soluble compounds*.

Similar examples might be given of several other important vegetable remedies, which would sufficiently prove the utility to be derived from the analysis of the vegetable kingdom, and that indeed researches of this kind are absolutely necessary for the preparation of substances belonging to it as medicines.

It remains only to notice the animal analysis. But on this few observations need to be made; as there are comparatively but a small number of the articles of the *materia medica* which belong to the animal kingdom.

The animal products have the same general chemical characters as vegetables. They differ from them in being more liable to the process named Putrefaction; and in affording a large quantity of ammonia, when decomposed by heat. These differences depend principally on the presence of azot in a much larger proportion in the animal than in the vegetable products; which, during their decomposition, combines with the hydrogen they also contain, and furnishes the ammonia which is so abundantly discharged. Animal substances also contain sulphur and

* *Annales de Chimie*, tom. ix. p. 19.

phosphorus; and in general a smaller proportion of carbon enters into their composition than into that of vegetables.

Notwithstanding these differences, there are many of the animal products which closely resemble the vegetable principles in their properties. The vegetable gluten and albumen are similar to the animal. The vegetable oils and butters resemble the animal fats. Gelatin has a resemblance to mucilage or fecula. A principle similar to the vegetable saccharine matter is found in milk. In some of the animal secretions, there are substances of a resinous nature; and the animal acids do not differ greatly from the vegetable compounds of the same class. Many of these substances, therefore, are acted on by chemical agents in a similar manner to vegetables, and, for medicinal purposes, are subjected to similar pharmaceutic processes.

PART II.

MATERIA MEDICA.

UNDER this head are comprised simple and some prepared medicines, such as are usually kept in the shop of the apothecary, but not prepared by him; to which is subjoined a short view of their natural, medical, and pharmaceutical history, with the virtues and doses of each. A few unimportant articles still retained in pharmacopœias are excluded, and several new substances introduced.

“ Much pains has been bestowed by the writers on *Materia Medica* in attempting to form useful arrangements of those articles. Some have arranged them according to their natural affinities; others according to their native constituent parts; and others according to their real and supposed virtues. Each of these arrangements has its particular advantages. But no arrangement has yet been proposed which is not liable to numerous objections. Accordingly in the *Pharmacopœias* published by the Colleges of Physicians of London, Dublin, and Edinburgh, the articles of the *Materia Medica* are arranged in alphabetical order, and the same plan is now also adopted in almost every *Pharmacopœia* of much estimation lately published on the continent of Europe.” We have, therefore, in conformity to the *Massachusetts Pharmacopœia*, adhered to the universally established system. As, however, Murray’s medicinal distribution of substances, and explanation of their operations, are the most unexceptionable of any that have hitherto appeared, it may be proper to premise his observations relative to a new classification of the articles of the *Materia Medica*; and his concise view of their operations on the living system.

In explaining the operations of medicines, and classing them according to these operations, it is to be regarded as a first principle, that they act only on the living body. The presence of life is accompanied with peculiar properties, and with modes of action, inexplicable on mere mechanical or chemical principles. Substances acting on the living system no doubt produce effects referable to these; but the changes they produce are also always so far modified as to be peculiar in themselves, and regulated by laws exclusively belonging to organized matter.

Medicines, in general, operate by stimulating the living fibre, or exciting it to motion. This proposition has even been stated as universal, and was received as an axiom, in a system superior, perhaps, to any, in conveying just and precise ideas on the nature of life, and the affections to which it is subject. Medicines,

in common with all external agents, are, according to this system, incapable of directly altering the state of the vital power: they can only excite the parts possessed of that power to action; and however diversified their effects may appear to be, such diversities are to be referred merely to the different degrees of force in which they exert the general stimulant power they possess.

This proposition cannot, however, be received in an unlimited sense. From the exhibition of different medicines, very different effects are produced, which cannot be satisfactorily explained from the cause assigned,—the difference in the *degree* of stimulant operation. They differ in *kind* so far, that even in the greater number of cases, one remedy cannot by any management of dose or administration be made to produce the effects which result from the action of another.

It is therefore necessary to admit some modifications of the general principles above stated, and the following are perhaps sufficient to afford grounds for explaining the operations of remedies, and for establishing a classification of them sufficiently just and comprehensive.

I. Stimulants are not to be regarded as differing merely in the degree of stimulant operation which they exert. An important distinction exists between them, as they are more or less diffusible and permanent in their action. A stimulus is termed diffusible, which, whenever it is applied, or at least in a very short time after, extends its action over the whole system, and quickly produces its full exciting effect. A diffusible stimulus is generally also transient in its action; in other words, the effect, though soon produced, quickly ceases. There are others, on the contrary, which, though equally powerful stimulants, are slow and permanent. These varieties, which are sufficiently established, serve to explain the differences in the powers of a number of the most important medicines; and they lay the foundation for the distinction of two great classes, narcotics and tonics, with their subordinate divisions of antispasmodics and astringents, both consisting of powerful stimulants; the one diffusible and transient, the other slow and permanent in their operation.

II. There is a difference between stimulants, in their actions being directed to particular parts. Some, when received into the stomach, quickly act upon the general system; others have their action confined to the stomach itself, or, at least, any farther stimulant effect they may occasion is slow and inconsiderable; while a third class consists of those which operate on one part, often without producing any sensible effect on the stomach or general system. Some thus act on the intestinal canal; others on the kidneys, bladder, vessels of the skin, and other parts; the affection they excite in these, being the consequence, not of any stimulant operation equally extended over every part, but of one more particularly determined. This difference in the action of stimuli is the principal foundation of the distinctions of medicines into particular classes. Cathartics, for instance, are those medicines, which, as stimuli, act peculiarly on the intestinal canal: diu-

retics, those which act on the secreting vessels of the kidneys : emmenagogues, those which act on the uterine system : diaphoretics, those which exert a stimulant action on the vessels of the skin. With these operations, medicines, at the same time, act more or less as general stimulants, by which each individual belonging to any class is thus rendered capable of producing peculiar effects ; and many of them, by a peculiarity of constitution in the patient, or from the mode in which they are administered, frequently act on more than one part of the system, by which their effects are still farther diversified. Medicines, when thus determined to particular parts, are sometimes conveyed to these parts in the course of the circulation ; more generally their action is extended from the stomach, or part to which they are applied, by the medium of the nervous system.

III. Medicines, besides acting as stimuli, sometimes occasion mechanical or chemical changes in the state of the fluids or solids, by which their action is more or less diversified. These operations of medicines were formerly supposed to be more extensive than they really are ; and many absurd explanations were deduced from the supposed changes which the solids and fluids underwent in disease. Though these notions are now exploded, it must still be admitted that changes of this kind take place in the living system. Chemical changes in particular, there is reason to believe, very frequently modify the actions of remedies ; and some very obvious operations of this kind, as well as others of a mechanical nature, serve as distinctions for establishing several particular classes.

These observations point out the principles on which the arrangement of the articles of the *Materia Medica*, from their medicinal operations, may be established.

Those stimulants, which exert a general action on the system, may first be considered. Of these there are two well marked subdivisions, the diffusible and the permanent ; the former corresponding to the usual classes of narcotics and antispasmodics ; the latter, including likewise two classes, tonics and astringents. In these there is a gradual transition passing into the one from the other, from the most diffusible and least durable stimulus, to the one most slow and permanent in its action.

The next general division is that comprising local stimulants ; such are the classes of emetics, cathartics, emmenagogues, diuretics, diaphoretics, expectorants, sialagogues, errhines, and epispastics. These all occasion evacuation of one kind or another, and their effects are in general to be ascribed, not to any operation exerted on the whole system, but to changes of action induced in particular parts.

After these, those few medicines may be considered whose action is merely mechanical or chemical. To the former belong diluents, demulcents, and emollients. Anthelmintics may perhaps be referred with propriety to the same division. To the latter, or those which act chemically, belong antacids or absorbents, lithontriptics, escharotics, and perhaps refrigerants.

Under these classes may be comprehended all those substances capable of producing salutary changes in the human system. Several classes are indeed excluded which have sometimes been admitted; but these have been rejected, either as not being sufficiently precise or comprehensive, or as being established only on erroneous theory.

The subdivisions of these classes may sometimes be established on the natural affinities existing among the substances arranged under each; on their chemical composition; their resemblance in sensible qualities; or, lastly, on distinctions in their medicinal virtues, more minute than those which form the characters of the class. In different classes one of these methods will frequently be found preferable to any of the others.

TABLE OF CLASSIFICATION.

A. GENERAL STIMULANTS.

- | | | |
|----------------|---|-----------------|
| a. Diffusible. | { | Narcotics. |
| | | Antispasmodics. |
| b. Permanent. | { | Tonics. |
| | | Astringents. |

B. LOCAL STIMULANTS.

Emetics.
Cathartics.
Emmenagogues.
Diuretics.
Diaphoretics.
Expectorants.
Sialagogues.
Errhines.

C. CHEMICAL REMEDIES.

Epispastics.
Refrigerants.
Antacids.
Lithontriptics.

D. MECHANICAL REMEDIES.

Escharotics.
Anthelmintics.
Demulcents.
Diluents.
Emollients.

CLASS I.—NARCOTICS.

THIS first division of the preceding classification, is that comprehending those stimulants, the action of which is general over the system. The first class of this division comprises those which are highly diffusible, and at the same time transient in their operation. This corresponds with the common class of narcotics or sedatives, usually defined, Such substances as diminish the actions and powers of the system, without occasioning any sensible evacuation. The definition is imperfect, as it does not include that stimulant operation which it is acknowledged they equally produce.

When given in a moderate dose, narcotics excite the functions both of body and mind: the force and frequency of the pulse are

increased, muscular action is more vigorous, and hilarity or intoxication are induced. These symptoms, after continuing for some time, are succeeded by those of diminished action: the pulse becomes slower, is full and soft, the body is less sensible to impressions, and less capable of voluntary exertion, and the mind is inactive. This state terminates in sleep. When it ceases, there remains a degree of general debility, marked by sickness, tremor and oppression. By a large dose, debility, without previous excitement, is occasioned, and the consequences of an immoderate quantity are delirium, paralysis, coma, and convulsions, sometimes terminating in death. These are the general effects, considerably diversified, however, as arising from different narcotics, and varied by other circumstances. Habitual use considerably diminishes their power.

These medicines act primarily on the stomach, whence their action is conveyed by nervous communication to the general system. Externally applied, they exert their usual action, though with less force. Directly applied to the muscles of animals, they first stimulate them to contraction, but ultimately exhaust their irritability.

As the medicines belonging to this class diminish the actions of the system, when given even in small doses, their primary operation was generally considered as of a depressing kind; and the stimulant effects which occasionally appeared to be produced by their exhibition, were ascribed to what was termed the re-action of the system, or the exertion of that salutary power supposed to belong to the living body, by which every noxious application is resisted and thrown off. They were therefore considered as *directly* sedative, and *indirectly* stimulant.

Precisely the reverse of this doctrine was likewise advanced. As their exciting effects were those which appeared first, and were succeeded by those of debility, and as the first were produced from a small dose, while the others were occasioned when the dose was comparatively large, these substances were regarded as direct stimulants, capable of exciting the actions of the system; and the symptoms of debility which they so frequently produced, were considered as arising from that exhaustion of power, which, according to a general law of the system, always follows increased action suddenly raised and not kept up. They were regarded, therefore, as *directly* stimulant, and *indirectly* sedative, and the peculiarities of their action were ascribed to their rapid and transient stimulant operation.

If, in investigating this subject, we merely contrast these two theories, little doubt can remain of the superiority of the latter. The suppositions of there being a power in the living system, fitted to resist any noxious agent, and of such a power acting before the deleterious effects have taken place, and thus retarding or preventing their production, are improbable, and unsupported by any satisfactory proof. Since the stimulant operation of narcotics always precedes the symptoms of languor and debility which they produce; it is the direct conclusion, that these latter are the consequences of the former. The analogy between nar-

cotics and other substances, admitted to be stimulants, but which are less rapid in their operation, is also in many respects so direct, as to prove similarity of action. And their utility in several diseases, in which they are employed as stimulants, is scarcely consistent with the opinion, that they possess a real depressing power. Some doubt, however, is still attached to the theory that they are direct stimulants, from the fact, undoubtedly true, that the sedative effects of narcotics are frequently disproportioned to their previous stimulant operation, allowing even in such cases, for its rapidity and little permanence; and the proposition, though apparently somewhat paradoxical, is perhaps just, that these substances are at once capable of stimulating the living fibre, and, independent of that stimulant operation, exhaust to a greater or less extent, by *direct* operation, the living power. The effects of certain chemical agents on the living system, as lately ascertained, appear to support some conclusion of this kind.

Narcotics being capable of producing either stimulant or sedative effects, may be practically employed with very different intentions. Either operation is obtained chiefly by certain modes of administration. If given in small doses, frequently repeated, the actions of the system are excited, and kept up. But if given in larger doses, at distant intervals, the state of diminished action and lessened sensibility is obtained. As stimulants, they are employed in various diseases of debility; in intermittent fever, and continued fevers of the typhoid type; in gout, hysteria, &c. As sedatives, they are used to allay pain and irritation, to procure sleep, and diminish secretions; hence their applications in spasmodic and painful diseases, in hæmorrhagies and increased discharges. In an inflammatory state of the system, the use of some of them is not altogether without danger from their stimulating effects.

CLASS II.—ANTISPASMODICS.

THIS class might perhaps be considered as a subordinate division of narcotics. They have similar virtues, being used principally to allay pain and inordinate action, and they differ only in not producing that state of general insensibility and diminished action, which arises from the action of narcotics. This might be supposed owing merely to a difference in power; yet there seems also to be something more than this, since they produce no such effect in any dose, and since, although they are so much inferior to narcotics in this respect, they are equally powerful in repressing inordinate and irregular muscular action. This difference may be explained, on the supposition that they are equally powerful stimulants, but are less diffusible, and more durable in their action, or that they are powerful diffusible stimulants, possessing little direct power of diminishing the excitable principle. Considered in this point of view, they will form an intermediate class between narcotics and tonics; and experience shows, that they partake of the properties of both; several narcotics and tonics being frequently used as antispasmodics.

From the name given to this class, their effects may be easily understood. Spasm is an irregular contraction of a muscle; sometimes the contraction is permanent, at other times it alternates with relaxation, but is still irregular. Such medicines as obviate and remove such affections, are termed antispasmodics.

Spasm may arise from various causes. One of the most frequent is a strong irritation continually applied; such as dentition or worms. In these cases, narcotics prove useful, by diminishing irritability and sensibility. Sometimes spasm arises from mere debility; and the obvious means of removing this is by the use of tonics. Both narcotics and tonics, therefore, are occasionally useful as antispasmodics, such as opium, camphor, and ether, in the one class, and zinc, mercury, and Peruvian bark, in the other. But there are farther, several substances which cannot be with propriety referred to either of these classes, and to these the title of antispasmodics may be more exclusively appropriated.

CLASS III.—TONICS.

By tonics, are understood those substances whose primary operation is to give strength to the system. Their operation is not mechanical, as was once conceived; they act not on the simple solids, increasing their tension or tone, but on the living fibre, and are merely powerful stimulants, permanent in their operation. By producing a gradual excitement, they give vigour to the actions of the system, and as that excitement is gradually produced, it is in like manner gradually diminished, and the habitual stimuli continuing to operate, diminished action does not succeed. Where tonics, however, are given in excess, are used unnecessarily, or for too long a time, they weaken the powers of life.

Tonics act primarily on the stomach, the action they excite in that organ being communicated generally by the medium of the nerves to the rest of the system. Some of them, however, are received into the mass of blood.

The immediate effects of a tonic, given in a full dose, are to increase the force of the circulation, to augment the animal heat, promote the various secretions, or moderate them when morbidly increased, quicken digestion, and render muscular action more easy and vigorous. By some of them, however, these effects are very slowly induced.

The affections of the system in which tonics are employed, must be obviously those of debility; hence their use in the greater part of the diseases to which mankind are subject.

This class may be subdivided into those individuals derived from the mineral, and those from the vegetable kingdoms.

TONICS FROM THE MINERAL KINGDOM.

THESE are in general more local in their nature than the vegetable tonics, they do not operate so speedily, and seldom occasion considerable excitement.

TONICS FROM THE VEGETABLE KINGDOM.

THE tonic power in vegetables is intimately connected with certain sensible qualities, with their bitterness, astringency, and aromatic quality, all of them perhaps possessing these qualities, though, in each, one may be more predominant than the other. The purest bitters, astringents, and aromatics, possess also more or less of a tonic power. Of these divisions, the pure astringents form a distinct class; the remaining tonics may be arranged according as the bitterness or aromatic quality is predominant in them.

The stimulant operation of the purer bitters is little diffusible, and very slow in its operation; their effects are principally on the stomach and digestive organs, to which they communicate vigour, though they also act in some degree on the general system, and obviate debility, as is evident in particular from their efficacy in intermittent fevers, in dropsy, and gout, and from their debilitating effects when used for too long a time.

Aromatics are more rapid and diffusible in their action; they quicken the circulation, and augment the heat of the body. Their action has little permanence; hence, in medicine, they are employed either as mere temporary stimulants, or to promote the action of bitters or astringents.

From these different modes of action of bitters and aromatics, it is evident, that a more powerful tonic will be obtained from the combination of these qualities than where they exist separately. The most powerful tonics are accordingly natural combinations of this kind.

AROMATICS.

THE substances belonging to this subdivision of the vegetable tonics, stimulate the stomach and general system, augment the force of the circulation, and increase the heat of the body. They are scarcely sufficiently permanent in their action to be used by themselves as tonics; but they always promote the action of bitters and astringents, and are used with advantage to obviate symptoms arising from debility of the stomach or intestinal canal. Their aromatic quality in general resides in an essential oil, which in each of them varies in flavour, pungency, and other sensible qualities, but which is nearly alike in its chemical properties. It is soluble entirely in alcohol, is sparingly soluble in water, and is extracted from them by distillation.

CLASS IV.—ASTRINGENTS.

ASTRINGENTS have been usually considered as substances capable of obviating or removing increased evacuations, by their power of constringing or condensing the simple solids, of which the vessels are formed, and this by an action entirely chemical or mechanical, the same as that which they exert on dead animal matter.

Allowing, however, these substances to possess some power of this kind, their effects as remedies cannot be explained merely from its exertion. Increased evacuations cannot be ascribed to mere mechanical laxity of the solids; and their removal cannot be referred to simple condensation of these solids. Neither can it be admitted that active substances may be applied to the system without occasioning changes in the state of the living powers. Many substances, arranged as astringents occasion very considerable alterations in several of the functions; they produce effects too which cannot be solely referred to a condensing power, and therefore, in all the changes they produce, part at least of their operation must be referred to their acting on the powers peculiar to life.

For reasons of this kind, some have denied the existence of such remedies, and have considered those which usually receive the appellation of astringents, merely as stimulants, moderate and permanent in their action; in other words, as *tonics* of inferior power. But though there be a great analogy between these two classes in their effects, and probably in their mode of operation, there is also a very obvious difference: the most powerful astringents,—that is, substances which immediately restrain excessive evacuations, being much inferior in real tonic power to other substances having little astringency; while there are powerful tonics or medicines capable of removing debility, which do not with any uniformity produce the immediate effects of astringents.

Perhaps astringents may be regarded as moderate, permanent stimulants having their stimulant operation modified by their power of condensing the animal fibre by a mechanical, or rather a chemical action. That they exert a stimulant operation, is proved by their power of curing intermittent fever, and other diseases of debility; and that they possess a constringing quality is evident, not only from the sensation they excite on the tongue, but is proved by the change they produce in animal matter. If these combined actions be exerted on the fibres of the stomach, the change produced, it is possible, may be propagated by nervous communication to other parts of the system.

The hypothesis of Dr. Darwin, that astringents produce their effects by powerfully promoting absorption, though it serves to explain part of their operation, seems to be refuted by their power of stopping hæmorrhage.

Some narcotics, as opium, have, in certain cases, effects apparently astringent. These are, where increased discharges arise from irritation, in which, by diminishing irritability, they lessen the discharge; but such an operation is altogether different from that of real astringents.

As remedies against disease, astringents may sometimes, from their moderate stimulant operation, be substituted for tonics. They have thus proved successful in the treatment of intermittent fever; and in all cases of debility, they seem to be serviceable, independent of their power of checking debilitating evacuations.

It is, however, for restraining morbid evacuations that astringents are usually employed. In the various kinds of hæmorrhagy, menorrhagia, hæmoptysis, &c. they are frequently employed with advantage, though their power is also often inadequate to stop the discharge. In diarrhœa they diminish the effusion of fluids, and at the same time give tone to the intestinal canal, and thus remove the disease. In the latter stage of dysentery they prove useful by a similar operation. In profuse sweating, and in diabetes, they are frequently sufficiently powerful to lessen the increased discharge; and in those kinds of inflammation, termed passive, and even in certain cases of active inflammation, they are applied with advantage as topical remedies.

It is an obvious caution, that astringents are not to be used to check critical evacuations, unless these proceed to excess.

Astringents may be subdivided into those belonging to the vegetable, and those belonging to the mineral kingdom, which differ very considerably from each other in their operation.

VEGETABLE ASTRINGENTS.

ASTRINGENCY in vegetables seems to be connected with a certain chemical principle, or at least with some peculiarity of composition, since vegetable astringents uniformly possess certain chemical properties. The astringency is extracted both by water and alcohol, and these infusions strike a black colour with any of the salts of iron, and are capable of corrugating more or less powerfully dead animal matter.

Chemical investigations have accordingly discovered two distinct principles in the vegetable astringents, one or both of which may probably give rise to the astringent property. One of these, the Gallic acid, is distinguished by its property of striking a deep black colour with the salts of iron: the other, the tanning principle, or tannin, is characterized by its strong attraction to animal gelatin, with which it combines, and forms a soft ductile mass, insoluble in water. These may be separated by a solution of animal jelly, which unites with the tannin, and leaves the gallic acid pure.

As both these principles exist in all the stronger vegetable astringents, it is probable that the corrugating property by which the action of these substances as medicines is modified, depends on their combination, especially as, in their action on dead matter, the change produced on the animal fibre by the gallic acid, promotes the combination of that fibre with the tanning principle.

MINERAL ASTRINGENTS.

OF these, the principal are the mineral acids, especially the sulphuric, and the combinations it forms with some of the metals and earths.

LOCAL STIMULANTS.

CLASS V.—EMETICS.

EMETICS are substances capable of exciting vomiting, independent of any effect arising from the mere quantity of matter introduced into the stomach, or of any nauseous taste or flavour.

The effects of an emetic, are an uneasy sensation in the stomach, with nausea and vomiting. While the nausea only is present, the pulse is feeble, quick and irregular, and the countenance pale: during vomiting the face is flushed, the pulse is quicker, and it remains so during the intervals of vomiting. When the operation of vomiting has ceased, the nausea goes off gradually; the patient remains languid, and often inclined to sleep; the pulse is weak, but becomes gradually slow and full, and the skin is commonly moist.

The general nature of vomiting is sufficiently evident. The peristaltic motion of the stomach is inverted, the diaphragm and abdominal muscles are called into action by association, and the pylorus being contracted, the contents of the stomach are forcibly discharged. The peristaltic motion of the upper part of the intestinal canal is likewise frequently inverted.

How this peristaltic motion is thus inverted, it is difficult to explain. The substances which have this effect, no doubt possess a stimulant power, but the effect is by no means produced in proportion to the degree of stimulant operation exerted on the stomach, and it has not been explained how such an operation can invert the usual motion.

Dr. Darwin considers vomiting as the effect, not of increased action from the operation of a stimulus, but of diminished action, arising from the disagreeable sensation of nausea. This being induced, the usual motion is gradually lessened, stopt, and is at length inverted, which gives rise to the phenomena of vomiting.

The susceptibility of vomiting is very different in different individuals, and is often considerably varied by disease.

Though nausea generally accompanies vomiting, this is scarcely a necessary connexion: some emetics acting without occasioning much nausea, while others induce it in a much greater degree than is proportioned to their emetic power.

The feeble and low pulse which accompanies vomiting, has been ascribed to direct association between the motions of the stomach and those of the heart, or it may be owing to the nausea excited, which being a disagreeable sensation, is equivalent to an abstraction of stimulus.

It is supposed also, that a sympathy exists between the stomach and the surface of the body, so that the state of the vessels of the one part is communicated to the vessels of the other. Hence vomiting is frequently followed by diaphoresis.

Emetics powerfully promote absorption.

They often occasion increased evacuation by the intestinal canal, more especially when they have been given in too small a dose to excite vomiting, an effect arising from their stimulating power.

Lastly, several of the effects of vomiting have been ascribed to the agitation of the body, and to the compression of the viscera, by the action of the diaphragm and abdominal muscles.

Emetics are employed in many diseases.

When any morbid affection depends upon, or is connected with over-distention of the stomach, or the presence of acrid indigestible matters, vomiting gives speedy relief. Hence its utility in impaired appetite; acidity in the stomach; in intoxication, and where poisons have been swallowed.

From the pressure of the abdominal viscera in vomiting, emetics have been considered as serviceable in jaundice arising from biliary calculi obstructing the hepatic ducts.

The expectorant power of emetics, and their utility in catarrh and phthisis, have been ascribed to a similar pressure extended to the thoracic viscera.

In the different varieties of febrile affections, much advantage is derived from exciting vomiting, especially in the very commencement of the disease. In high inflammatory fever, it is considered as dangerous; and in the advanced stage of typhus it is prejudicial.

Emetics given in such doses as only to excite nausea, have been found useful in restraining hæmorrhage.

Different species of dropsy have been cured by vomiting, from its having excited absorption. To the same effect, perhaps, is owing the dispersion of swelled testicle, bubo, and other swellings, which has occasionally resulted from this operation.

The operation of vomiting is dangerous or hurtful in the following cases: where there is determination of blood to the head, especially in plethoric habits; in visceral inflammation; in the advanced stage of pregnancy; in hernia, and prolapsus uteri, and wherever there exists extreme general debility.

The frequent use of emetics weakens the tone of the stomach.

An emetic should always be administered in the fluid form. Its operation may be promoted by drinking any tepid diluent or bitter infusion.

The individual emetics may be arranged under those derived from the vegetable, and those from the mineral kingdom.

CLASS VI.—CATHARTICS.

CATHARTICS are medicines which quicken or increase the evacuation from the intestines, or which, when given in a sufficient dose, excite purging. They evidently act by augmenting the natural peristaltic motion, from their stimulant operation on the moving fibres of the intestines, whence the contents of the canal are more quickly propelled. The greater number, or perhaps all of them, seem likewise to stimulate the extremities of the exhalent vessels terminating on the internal surface of the intestines, and hence the evacuations they occasion are not only more frequent, but thinner, and more copious.

Besides these immediate actions, the stimulant operation of cathartics appears to be more or less extended to neighbouring organs, and hence they promote the secretion and discharge of the bile, and other fluids usually poured into the intestinal canal. It is also exerted on the stomach, so as to occasion a more quick evacuation of the contents of that organ by the pylorus.

Besides the differences between individual cathartics in quickness, slowness, or other circumstances attending their operation, there is a general difference in the mode in which they act, from which they may be, and usually have been ranked under two divisions. Some operate mildly, without exciting any general affection of the system, without even perceptibly stimulating the vessels of the intestines, and hence they merely evacuate the contents of the canal. Others are much more powerful stimulants: they always occasion an influx of fluids from the exhalant vessels, and neighbouring secreting organs: they extend their stimulus to the system in general, and if taken in too large a dose, excite inflammation on the surface of the intestines. The former are distinguished by the title of laxatives; the latter are termed purgatives, and the stronger of them drastic purgatives.

Cathartics, as medicines, are capable of fulfilling various indications.

Where there exists a morbid retention of the contents of the stomach, where these contents are acrid, or where extraneous bodies are present, they are calculated by their evacuating power to relieve the symptoms arising from these affections, and hence their utility in constipation, colic, dysentery, and a variety of febrile affections. Partly by exciting the intestines to action, and partly by extending their stimulus to the other abdominal viscera, cathartics are of service in dyspepsia, hypochondriasis, amenorrhœa, jaundice, and visceral obstructions.

By their power of stimulating the exhalant vessels, on the internal surface of the intestinal canal, and causing a larger portion of fluid to be poured out, cathartics are capable of producing a diminution of the fluids with respect to the general system, and of course cause an abstraction of stimulus. Hence purging is a principal part of what is termed the antiphlogistic regimen, and is employed as a remedy of much power in highly inflammatory diseases.

From the same power of causing effusion of fluid, is to be explained the utility of cathartics in the various species of dropsy. A balance is preserved in the system between exhalation and absorption, so that when one is increased, the other is so also. The increased secretion and discharge of serous fluid, which cathartics occasion, causes an increased absorption; whence the affused fluid in dropsy is frequently taken up and removed.

Partly by the serous evacuation which cathartics occasion, and partly by the derivation of blood they make from the head, they are highly useful in the prevention and cure of apoplexy, all comatose affections, mania, phrenitis, and headach.

By a change in the distribution of the blood, it has been supposed that purging determines from the surface of the body ; and hence in a great measure has been explained its utility in small-pox and some other eruptive diseases.

The administration of cathartics is rendered improper by inflammation of the stomach or intestines, or tendency to it, and by much debility. Several cautions are likewise requisite in their exhibition. The nausea or griping they frequently produce, may be obviated by the addition of an aromatic, or by giving them in divided doses. The more powerful cathartics should always be given in the latter mode ; and in general they irritate less when given diffused in a fluid than when given in a solid form.

The different cathartics may be considered under the two divisions of laxatives and purgatives : the former being mild in their operation, and merely evacuating the contents of the intestines ; the latter being more powerful, and even extending their stimulant operation to the neighbouring parts.

A division of cathartics remains, intermediate in their operation between the laxatives and purgatives, more powerful than the one, less violent and stimulating than the other. These are the neutral salts. They seem to act principally by stimulating the exhalant vessels on the inner surface of the intestines ; and by the watery evacuation they occasion, they are particularly adapted to those cases where inflammatory action or tendency to it exists.

CLASS VII.—EMMENAGOGUES.

THE medicines arranged under this class are those capable of promoting the menstrual discharge.

As the suppression of this discharge is usually owing to debility of the uterine vessels, or want of action in them, the medicines capable of exciting it must be those which can stimulate these vessels.

General stimulants or tonics must have this effect to a certain extent, and there are several stimulants both diffusible and permanent, employed as Emmenagogues.

It is doubtful, whether there are further any medicines, which have their stimulant operation particularly determined to the uterine vessels. There are several, however, which, acting on neighbouring parts, have their action extended to the uterus, and hence exert an emmenagogue power greater than can be ascribed to any general stimulant operation they exert on the system. Several cathartics act in this manner.

Under one or other of these divisions, may be arranged the principal medicines employed as emmenagogues.

CLASS VIII.—DIURETICS.

DIURETICS are those medicines which increase the urinary discharge.

It is obvious that such an effect will be produced by any substance capable of stimulating the secreting vessels of the kidneys. All the saline diuretics seem to act in this manner. They are received into the circulation, and, passing off with the urine, stimulate the vessels, and increase the quantity secreted.

There are other diuretics, the effect of which appears not to arise from direct application, but from an action excited in the stomach, and propagated by nervous communication to the secreting urinary vessels. The diuretic operation of squill, and of several other vegetables, appears to be of this kind.

There is still, perhaps, another mode in which certain substances produce a diuretic effect, that is, by promoting absorption. When a large quantity of watery fluid is introduced into the circulating mass, it stimulates the secreting vessels of the kidneys, and is carried off by the urine. If, therefore, absorption be promoted, and if a portion of serous fluid, perhaps previously effused, be taken up, the quantity of fluid secreted by the kidneys will be increased. In this way *digitalis* seems to act: Its diuretic effect, it has been said, is greater when exhibited in dropsy than it is in health.

On the same principle, (the effect arising from stimulating the absorbent system), may probably be explained the utility of mercury in promoting the action of several diuretics.

The action of these remedies is promoted by drinking freely of mild diluents. It is also influenced by the state of the surface of the body. If external heat be applied, diuresis is frequently prevented, and diaphoresis produced. Hence the doses of them should be given in the course of the day, and the patient if possible be kept out of bed.

The direct effects of diuretics are sufficiently evident. They discharge the watery part of the blood; and by that discharge they indirectly promote absorption over the whole system.

Dropsy is the disease in which they are principally employed, and when they can be brought to act, the disease is removed, with less injury to the patient than it can be by exciting any other evacuation. Their success is very precarious, the most powerful often failing; and as the disease is so frequently connected with organic affection, even the removal of the effused fluid, when it takes place, only palliates without effecting a cure.

Diuretics have been likewise occasionally used in calculous affections, in gonorrhœa, and with the view of diminishing plethora, or checking profuse perspiration.

CLASS IX.—DIAPHORETICS.

DIAPHORETICS are those medicines which increase the natural exhalation by the skin. When this is carried so far as to be condensed on the surface, it forms sweat; and the medicines producing it are named sudorifics. Between diaphoretics and sudorifics, there is no distinction; the operation is in both cases the same, and differs only in degree, from augmentation of dose, or employment of assistant means.

Since diaphoresis or sweat is merely the increase of the natural exhalation, it must arise from increased action of the cutaneous exhalant vessels, and the medicines belonging to this class must be those which are capable of exciting that action.

Of stimulants capable of producing this effect, the application of heat to the surface affords an example. It is one of the most effectual, and is always employed to promote the action of sudorifics.

The same effect may be produced indirectly, by increasing the general force of the circulation, which acts as a stimulus on the exhalant vessels, and increases their discharge.

By one or other of these modes of operation, the medicines classed as diaphoretics seem to act.

The saline diaphoretics, as they do not sensibly augment the force of the circulation, probably act in the former manner, exerting a particular action on the stomach, which is communicated to the vessels of the skin, or perhaps being received into the blood, and directly applied to these vessels.

Those diaphoretics, on the contrary, which are termed heating, as the aromatic oils and resins, act by directly stimulating the heart and arteries, and increasing the force of the circulation.

Diaphoresis is not, however, the necessary consequence of the circulation being increased; for the surface often remains dry, where the pulse is frequent and strong. In this case, a morbid constriction of the cutaneous vessels exists, which opposes a resistance to the impetus of the blood. Whatever, therefore, relaxes these vessels, will favour the production of sweating; and to this mode of operation probably is to be ascribed the diaphoresis produced by antimonial preparations, or by ipecacuan, and in part the advantage derived from the use of warm diluents in promoting sweat. When these circumstances, the increase of the force of the circulation, and the relaxation of the cutaneous vessels, are conjoined, the sweating will be still more copious; and from this probably arises the superiority of the combination of opium with antimony or ipecacuan, to any other sudorific.

The primary effects of diaphoretics, are to evacuate the watery part of the blood, and thus lessen the quantity of fluid in the circulating system; to determine the blood to the surface; to increase the action of the absorbents, and to remove spasmodic constriction of the cutaneous vessels, and render the skin moist.

The first of these effects probably takes place to no great degree, as the free use of diluents makes part of the sweating regimen.

The last effect, the changing the state of the vessels on the skin, is the most important, considered in a practical point of view, that diaphoretics produce, as on this their efficacy in fever, in which principally they are employed, depends.

The limits to the practice of sweating in affections of a febrile kind, are now sufficiently established. It is attended with advantage in synocha, and the various phlegmasiæ; but in fevers of the typhoid kind it is useless, and, unless in the very commencement of the disease, is uniformly hurtful.

As evacuating the serous part of the blood, and as promoting absorption, sudorifics have been used with advantage in the different species of dropsy, especially in anasarca.

By determining to the surface, and preserving a gentle diaphoresis, they are found serviceable in asthma, dyspepsia, habitual diarrhoea, chronic dysentery, and chronic rheumatism, and likewise in a number of cutaneous diseases, probably by altering the state of the extreme vessels of the skin.

A few circumstances are to be attended to in the administration of sudorifics. In inflammatory affections, if the action of the vascular system is strong, bleeding should be previously used: during the sweating, the free use of warm diluents is necessary; and external cold ought to be guarded against.

The particular diaphoretics may be arranged from the affinity in their operation, as they act by increasing the force of the circulation, or as they operate without producing any general stimulant effect.

CLASS. X.—EXPECTORANTS.

EXPECTORANTS have been defined, those medicines which facilitate or promote the rejection of mucus or other fluids from the lungs and trachea. The theory of their operation is very imperfectly understood. It has been supposed that where a greater quantity of fluid is thrown out into the lungs than the exhalants can take up, there are remedies which may facilitate its rejection. But as expectoration is an operation partly voluntary, and dependent on the action of a number of muscles, it is difficult to discover how such an effect can be produced. If by expectorants be meant substances capable of producing it by some specific action on the parts concerned, there seems no reason to believe in the existence of such remedies.

Dr. Cullen supposed that expectorants might act by promoting the exhalation of a thin fluid, which diluting the viscid mucus present in the mucous follicles in the lungs and trachea, might facilitate its rejection. But the action of the different individuals belonging to the class, and especially their effects in various diseases, cannot be explained on this principle.

There are probably various modes of operation by which certain remedies will appear to promote expectoration, and which will give them a claim to the title of expectorants.

Thus, in certain diseases the exhalant vessels in the lungs, seem to be in that state, by which the exhalation of fluid is lessened, or nearly stopped, and in such cases expectoration must be diminished. Any medicine capable of removing that constricted state, will appear to promote expectoration, and will at least relieve some of the symptoms of the disease. It is apparently by such a mode of operation, that antimony, ipecacuan, squill, and some others, promote expectoration in pneumonia, catarrh, and asthma, the principal diseases in which expectorants are employed.

There is a case of an opposite kind, that in which there is a redundancy of mucus in the lungs, as occurs in humoral asthma, and *catarrhus senilis*. In these affections, certain expectorants are supposed to prove useful. If they do so, it is probably by being determined more particularly in their action to the pulmonary vessels, and by their moderate stimulus diminishing the secretion, or increasing the absorption, thus lessening the quantity of fluid, and thereby rendering the expectoration of the remainder more easy. The determination of these substances to the lungs is often perceptible by their odour in the air expired. A similar diminution of fluid in the lungs may be effected by determining to the surface of the body, and those expectorants which belong to the class of diaphoretics probably act in this manner.

Expectorants, then, are to be regarded, not as medicines which directly assist the rejection of a fluid already secreted, but rather as either increasing the natural exhalation where it is deficient, or diminishing the quantity of fluid where it is too copious, either by stimulating the pulmonary vessels, or by determining to the surface. In both cases expectoration will appear to be promoted or facilitated.

Pneumonia, catarrh and asthma, are the principal diseases in which expectorants are employed; and the mode in which they prove useful will be apparent from what has been said of their operation.

CLASS XI.—SIALAGOGUES.

SIALAGOGUES are substances which increase the quantity of the salivary discharge. This may be effected by the mastication of certain acrid substances, or by the internal exhibition of certain medicines.

Of those which act in the latter mode, *Mercury* is the only one that uniformly produces this effect. No satisfactory explanation has been given of this peculiar power which it exerts; and the inquiry why it should be particularly directed to the salivary glands, appears as fruitless as that into the specific virtue of any medicine. It does not from its sialagogue power appear to be of advantage in the treatment of any disease; salivation being only a test of its action on the system, but not in itself of any utility.

The remaining sialagogues are those which act merely by topical application by mastication, and from their acrid stimulating quality. By increasing the salivary discharge, they have been found of service in toothach, and, as has been supposed, in some kinds of headach.

CLASS XII.—ERRHINES.

ERRHINES are medicines which occasion a discharge from the nostrils, either of a mucous or serous fluid. They all operate by direct application, and generally in consequence of a

greater or less degree of acrimony which they possess. Their practical uses, it is evident, must be very limited. By the evacuation they occasion, it is supposed that they may diminish the quantity of fluid in the neighbouring vessels; and that they hence may prove useful in rheumatic affections of these parts, in headach, pain of the ear, and ophthalmia. They are sometimes used with advantage in some of these affections. It has likewise been imagined that they may be of use in preventing apoplexy.

CLASS XIII.—EPISPASTICS AND RUBEFACIENTS.

THESE, as they operate on the same principles, and produce the same effects only in different degrees, may be considered merely as subdivisions of one class.

EPISPASTICS.

EPISPASTICS are those substances which are capable, when applied to the surface of the body, of producing a serous or puriform discharge, by exciting a previous state of inflammation. The term, though comprehending likewise issues and setons, is more commonly restricted to blisters,—those applications which, exciting inflammation on the skin, occasion a thin serous fluid to be poured from the exhalants, raise the cuticle, and form the appearance of a vesicle. This effect arises from their strong stimulating power, and to this stimulant operation, and the pain they excite, are to be ascribed the advantages derived from them in the treatment of disease. The evacuation they occasion is too inconsiderable to have any effect.

It is a principle sufficiently established with regard to the living system, that where a morbid action exists, it may often be removed by inducing an action of a different kind in the same or in a neighbouring part. On this principle is explained the utility of blisters in local inflammation and spasmodic action, and it regulates their application in pneumonia, gastritis, hepatitis, phrenitis, angina, rheumatism, colic, and spasmodic affections of the stomach; diseases in which they are employed with the most marked advantage.

A similar principle exists with respect to pain; exciting one pain often relieves another. Hence blisters often give relief in toothach, and some other painful affections.

Lastly, blisters, by their operation, communicate a stimulus to the whole system, and raise the vigour of the circulation. Hence, in part, their utility in fevers of the typhoid kind, though in such cases they are used with still more advantage to obviate or remove local inflammation.

RUBEFACIENTS.

RUBEFACIENTS excite pain and inflammation, but in a less degree than blisters, so that no fluid is discharged. They stimu-

late the system in general, and obviate local inflammation, and are used for nearly the same purposes as blisters.

Any stimulating application may be used for this purpose.

CANTHARIDES added in a small proportion to a plaster, or the tincture of cantharides applied by friction to a part, is often employed as a rubefacient.

AMMONIA mixed with one, two, or three parts of expressed oil, forms a liniment frequently used for this purpose in rheumatism, angina, and other cases of local inflammation.

REMEDIES ACTING CHEMICALLY.

CLASS XIV.—REFRIGERANTS.

THE remedies comprised under this class have been usually defined, substances which directly diminish the force of the circulation, and reduce the heat of the body, without occasioning any diminution of sensibility or nervous energy. The theories, that have been delivered respecting their mode of operation, are obscure or unintelligible; and even the facts, which are adduced to establish the existence of such remedies, are far from being conclusive.

Keeping in view the very inconsiderable action of these remedies, it may perhaps be possible, from the consideration of the mode in which animal temperature is generated, to point out how their trivial refrigerant effects may be produced.

It has been sufficiently established, that the consumption of oxygen in the lungs is materially influenced by the nature of the ingesta received into the stomach; that it is increased by animal food and spirituous liquors, and, in general, by whatever substances contain a comparatively small quantity of oxygen in their composition. But the superior temperature of animals is derived from the consumption of oxygen gas by respiration. An increase of that consumption must necessarily, therefore, occasion a greater evolution of caloric in the system, and of course an increase of temperature, while a diminution in the consumption of oxygen must have an opposite effect. If, therefore, when the temperature of the body is morbidly increased, substances be introduced into the stomach, containing a large proportion of oxygen, especially in a state of loose combination, and capable of being assimilated by the digestive powers, the nutritious matter received into the blood, must contain a larger proportion of oxygen than usual; less of that principle will be consumed in the lungs, by which means less caloric being evolved, the temperature of the body must be reduced; and this operating as a reduction of stimulus, will diminish the number and force of the contractions of the heart.

It might be supposed that any effect of this kind must be trivial, and it actually is so. It is, as Cullen has remarked, not very evident to our senses, nor easily subjected to experiment, and is found only in consequence of frequent repetitions.

The principal refrigerants are the acids, especially those belonging to the vegetable kingdom. As these contain a large

proportion of concrete oxygen in a state of loose combination, their refrigerant power may be explained on the above principle. The neutral salts form the remaining division of refrigerants ; they are much inferior in power ; and what refrigerant quality they do exert, probably arises from the same cause. In some of them, it may be increased by the sensation of cold they excite in the stomach, which is equivalent to an abstraction of stimulus.

It is obvious, that the indication to be fulfilled by the use of refrigerants, is the reduction of the morbidly increased temperature. Hence they are administered in synocha and other inflammatory affections, and likewise in fevers of the typhoid kind.

ACIDS.

ALL acids are supposed to be refrigerants ; but the vegetable acids are allowed to possess this power in a more eminent degree.

The native vegetable acids are found chiefly in the fruits of vegetables. The sour juice of these fruits consists either of the citric or malic acids, or more frequently of a mixture of both. The citric acid is that which is most largely employed, as it forms chiefly the acid juice of the orange and lemon, the two acid fruits in common medicinal use.

CLASS XV.—ANTACIDS.

ANTACIDS are remedies which obviate acidity in the stomach. Their action is purely chemical, as they merely combine with the acid present, and neutralize it. They are only palliatives, the generation of acidity being to be prevented by restoring the tone of the stomach, and its vessels. Dyspepsia and diarrhoea are the diseases in which they are employed.

CLASS XVI.—LITHONTRIPTICS.

LITHONTRIPTICS are medicines supposed to be capable of dissolving urinary calculi. Their operation is entirely chemical.

The researches of modern chemists have proved, that these calculi, in general, consist principally of a peculiar animal acid, named the lithic or uric acid. With this substance the alkalies are capable of uniting, and of forming a soluble compound ; and these are accordingly the sole lithontriptics.

From the exhibition of alkaline remedies, the symptoms arising from a stone in the bladder are very generally alleviated ; and they can be given to such an extent, that the urine becomes sensibly alkaline, and is even capable of exerting a solvent power on these concretions. Their administration cannot, however, be continued to this extent for any considerable length of time, from the strong irritation they produce on the stomach and urinary organs. The use, therefore, of the alkalies as solvents, or lithontriptics, is now scarcely ever attempted ; they are employed merely to prevent the increase of the concretion, and to palliate the painful symptoms, which they do, apparently by pre-

venting the generation of lithic acid, or the separation of it by the kidneys; the urine is thus rendered less irritating, and the surface of the calculus is allowed to become smooth.

When the alkalies are employed with this view, they are generally given saturated, or even super-saturated, with carbonic acid. This renders them much less irritating. It at the same time diminishes, indeed, their solvent power; for the alkaline carbonats exert no action on the urinary calculi: But they are still equally capable of correcting that acidity in the *primæ viæ*, which is the cause of the deposition of the lithic acid from the urine, and therefore serve equally to palliate the disease. And when their acrimony is thus lessened, their use can be continued for any length of time.

CLASS XVII.—ESCHAROTICS.

ESCHAROTICS are substances capable of dissolving animal matter; applied to the skin, they erode it, and to an ulcer, they remove its surface. They are employed to consume excrescences, to open an ulcer, and to change the diseased surface of a sore already existing. Their action is entirely chemical.

REMEDIES ACTING MECHANICALLY.

CLASS XVIII.—ANTHELMINTICS.

ANTHELMINTICS are those medicines used to expel worms from the intestinal canal. The greater number of them act mechanically, dislodging the worms, by the sharpness or roughness of their particles, or by their cathartic operation. Some seem to have no other qualities than those of powerful bitters, by which they either prove noxious to these animals, or remove that debility of the digestive organs, by which the food is not properly assimilated, or the secreted fluids poured into the intestines are not properly prepared; circumstances from which it has been supposed the generation of worms may arise.

CLASS XIX.—DEMULCENTS.

DEMULCENTS are defined, "Medicines suited to obviate and prevent the action of acrid and stimulant matters, and that, not by correcting or changing their acrimony, but by involving it in a mild and viscid matter, which prevents it from acting upon the sensible parts of our bodies," or by covering the surface exposed to their action.

Where these substances are directly applied to the parts affected, it is easy to perceive how benefit may be derived from their application. But where they are received by the medium of the stomach into the circulating system, it has been supposed that they can be of no utility, as they must lose that viscosity on which their lubricating quality depends. Hence it has been concluded, that they can be of no service in gonorrhœa, and some similar affections. It is certain, however, that many substances

which undergo the process of digestion are afterwards separated in their entire state from the blood, by particular secreting organs, especially by the kidneys; and it is possible that mucilaginous substances, which are the principal demulcents, may be separated in this manner. There can be no doubt, however, but that a great share of the relief demulcents afford in irritation or inflammation of the urinary passages, is owing to the large quantity of water in which they are diffused, by which the urine is rendered less stimulating from dilution. In general, demulcents may be considered merely as substances less stimulating than the fluids usually applied.

Catarrh, diarrhœa, dysentery, calculus, and gonorrhœa, are the diseases in which demulcents are employed. As they are medicines of no great power, they may be taken in as large quantities as the stomach can bear.

The particular demulcents may be reduced to the two subdivisions of mucilages and expressed oils.

CLASS XX.—DILUENTS.

DILUENTS are defined, those substances which increase the proportion of fluid in the blood. It is evident that this must be done by watery liquors. Water is indeed, properly speaking, the only diluent. Various additions are made to it, to render it pleasant, and frequently to give it a slightly demulcent quality. But these are not sufficiently important to require to be noticed, or to be classed as medicines.

Diluents are merely secondary remedies. They are given in acute inflammatory diseases, to lessen the stimulant quality of the blood. They are used to promote the action of diuretics in dropsy, and to favour the operation of sweating.

CLASS XXI.—EMOLLIENTS.

EMOLLIENTS are those medicines, according to the definition of Dr. Cullen, which diminish the force of cohesion in the particles of the solid matter of the human body, and thereby render them more lax and flexible. Their operation is mechanical; they are insinuated into the matter of the solid fibre, and lessen the friction between its particles. They are useful when the fibres are rigid, or when they are much extended, and therefore afford relief when topically applied to inflamed parts, to tumours distending the skin, or where the skin is dry and rigid.

Heat conjoined with moisture is the principal emollient; and water applied warm by the medium of some vegetable substances, constituting the various fomentations and cataplasms, is the form under which it is applied, the vegetable matter serving to retain the heat, and to allow the proper application of the moisture.

Oils and unctuous substances are the only other emollients; they are merely introduced by friction. Any of the expressed oils already noticed, or lard, (*axungia porcina*) may be used for this purpose.

The preceding observations are inserted, not with the view of adopting Murray's classification of remedies, but to give a general idea of the virtues of such medicinal substances as are possessed of the qualities which make the objects of the respective articles. I shall therefore proceed to an account of each of the remedies separately, and in alphabetical order.

ACIDUM ACETOSUM. *Acetous acid. Vinegar.*

Vinegar was known many ages before the discovery of any other acid, those only excepted which exist ready formed in vegetables. It is mentioned by Moses, and indeed seems to have been in common use among the Israelites and other eastern nations at a very early period. This agreeable pungent acid is the product of the fermentation of solutions of saccharine matter or sweet vegetable juices. It is obtained from wine, cider, beer, or other fermented liquors, which are the products of the first stage of the fermentative process. The acetous fermentation is nothing more than the acidification or oxygenation of wine, produced in the open air by means of the absorption of oxygen. Vinegar is composed of hydrogen and carbon united together in proportions not yet ascertained, and changed into the acid state by oxygen. That prepared from white wine is most free from impurities. Beside the pure acetous acid diluted with much water, vinegar contains tartarous acid, tartrate of potash, mucilaginous matter, and sometimes phosphoric acid. From the mucilaginous impurities which all vinegars contain, they are apt, on exposure to the air, to become turbid and ropy, and at length vapid. This inconvenience may be obviated by the following method. Boil vinegar in a well tinned kettle for a quarter of an hour, and bottle it, or fill the bottles with vinegar and put them into a kettle full of water upon the fire. After the water has boiled for an hour, they are to be taken out and corked. Vinegar thus boiled, will keep for several years, without growing turbid or mouldy. The acetous acid may be concentrated by suffering vinegar to freeze; after which separate the fluid from the ice, and secure it in a bottle. By the process of distillation vinegar is rectified, and the acetous acid concentrated and rendered more suitable for pharmaceutical preparations.

Vinegar possesses strong antiseptic powers, and its action on the living body is gently stimulant and astringent. It is employed as a useful addition to the patient's drink in putrid and inflammatory fevers. In ardent, bilious fevers, pestilential and other malignant distempers, it is recommended by Boerhaave as one of the most certain sudorifics. In the form of clyster it is used in the same diseases, and in obstinate constipation. Faintings, vomiting, hysterical and hypochondriacal complaints, have been frequently relieved by vinegar applied to the mouth and nose, or received into the stomach. It is highly serviceable in obviating the effects of poisonous substances of the vegetable kind, when taken into the stomach, as well as in promoting their discharge by the different emunctories, when received into the

blood. When fully saturated with muriate of soda (common salt) it has been resorted to as a valuable remedy in dysentery, and angina maligna; one table spoonful of this mixture, with two of hot water, gradually swallowed and frequently repeated, will seldom fail to induce a diaphoresis, and procure essential relief from the most distressing symptoms attending these dangerous diseases.

The same saturated mixture may also be applied to local inflammations with the happiest effects. Vinegar is applied externally in fomentations and baths, as a stimulant and discutient; and its vapor is inhaled in putrid sore throat; and diffused through the chambers of the sick to correct the putrescency of the atmosphere.

ACIDUM SULPHURICUM. *Sulphuric Acid. Oil of Vitrol.*

This acid is formed from the combination of sulphur with oxygen to the point of saturation. It is obtained by the combustion of sulphur. The sulphur, reduced to powder, is mixed with from one eighth to one tenth of its weight of nitrate of potash, by which its combustion, when begun, can be continued without the free access of atmospheric air. It is thus burnt in a large leaden chamber; the sulphuric acid, which is slowly formed, is absorbed by water placed in the bottom of the chamber; the acid liquor is concentrated by exposing it to heat in glass retorts, and the pure sulphuric acid is obtained. It is of a thick consistence, and has an apparent unctuousity; its specific gravity is 1850; when pure, it is colourless and transparent. It strongly attracts water, which it imbibes from the atmosphere very rapidly, and in large quantities, if suffered to remain in an open vessel. If it be mixed with water, it produces an instantaneous heat, nearly equal to that of ebullition. Its action is very strong upon all the earths, except the siliceous; upon the alkaline salts; upon many metals; and almost every other combustible substance. It is highly corrosive; and in fine, possesses all the general acid properties in an eminent degree. When sufficiently diluted, this acid is an excellent tonic, and its astringency is considered as superior to that of any other acid. It is therefore used in hæmoptysis, manorrhagia, diabetes, hectic, and dyspepsia. From its refrigerant and antiseptic properties, it is a valuable medicine in many febrile diseases, especially those called putrid. Checking fermentation, exciting appetite, promoting digestion, and quenching thirst, it is exhibited with success in acidity, weakness, and relaxation of the stomach. If taken in a considerable quantity, or for any length of time, it seems to pass off undecomposed by the kidneys or skin; and it is perhaps by its stimulant action on the latter, that it is advantageously employed in psora and other cutaneous affections. In its concentrated state, its dose cannot be measured. In the pharmacopœias therefore, it is ordered to be kept diluted. The best mode of prescribing it, is to mix the quantity of acid to be used, with as much water as will render it palatable, to which some syrup or mucilage may

be added. To prevent it from attacking the teeth, it may be conveniently sucked through a quill, and the mouth should be carefully washed after each dose. From its astringent powers, this article is generally added to gargles, which are employed to check salivation, or relieve inflammatory affections of the uvula, and aphthous mouths. Dr. Simms and others assert, that experience has demonstrated the superior efficacy of sulphuric acid when freely administered, as a remedy in *scarlatina anginosa*.

Mixed with lard, in the proportion of half a drachm to an ounce, it has been used externally with advantage, in cutaneous affections and ill conditioned ulcers.

The different combinations of this acid, and the processes in which it is employed, will be found under the head of preparations.

ACONITUM NEOMONTANUM. *Large blue Wolfsbane. Monks-hood. Aconite.* The herb and root.

This is a perennial plant, found in the mountainous countries of Germany.

The characters which distinguish the several species of aconite are so obscure as to occasion considerable confusion. Stoerk, who first rationally employed aconite as a medicine, used the *A. neomontanum*, and mistook it for the *A. napellus*; other physicians, who saw his error, committed a similar one, by supposing the aconite used in medicine, to be the *A. cammarum*. The real *A. cammarum*, when it was sometimes given, was also mistaken for the *A. tauricum*. These errors were however of little consequence as they regarded the names only, and not the article employed.

The fresh plant and root are very violent poisons, producing remarkable debility, paralysis of the limbs, convulsive motions of the face, bilious vomiting and purging, vertigo, delirium, asphyxia, and even death. The fresh leaves have very little smell, but when chewed have an acrid taste, and excite lancinating pains, and swelling of the tongue. By drying, their acrimony is almost entirely destroyed. For medical use the root must be gathered before the stem shoots.

When properly administered, it acts as a penetrating stimulus, and generally excites sweat, and sometimes an increased discharge of urine.

On many occasions, it has been found a very effectual remedy in glandular swellings, venereal nodes, ankylosis, spina ventosa, itch, amaurosis, gouty and rheumatic pains, intermittent fevers, and convulsive disorders.

It is commonly used in the form of an inspissated juice. As soon as the plant is gathered, the juice is expressed, and evaporated without any previous clarification, to the consistence of an extract. It is an unfortunate circumstance, that the powers of this medicine vary very much, according to its age and the heat employed in its preparation. When recently prepared, its action is often too violent, and when kept more than a year, it

becomes totally inert. It may therefore be laid down as an universal rule, in the employment of this and many other similar active medicines, to begin with very small doses, and to increase them gradually to the necessary degree; and, whenever we have occasion to begin a new parcel of the medicine, we should again commence with the smallest dose, and proceed with the same caution as at first.

We may begin by giving half a grain of this extract, either formed into a powder with ten grains of white sugar, or made up with any convenient addition into a pill, twice or thrice a day, and gradually increase the dose: or a tincture of aconite may be prepared, by digesting one part of the dried leaves in six parts of spirit of wine; the dose of which will be at first five or ten drops, and may be gradually increased to forty.

ÆSCULUS HIPPOCASTANUM. Horse Chesnut. The seed and bark.

This is a very common and well known tree. The fruit is principally farinaceous, and produces excellent starch: in powder it is employed as a moderate sternutatory. The bark is bitter, and promises to become a valuable and important remedy, as a substitute for the very expensive and often adulterated Peruvian bark. Many successful experiments of its effects, when given internally in intermittent and typhoid fevers, and also when applied externally in gangrene, sufficiently warrant future trials of its virtues. In powder it may be given to the extent of a scruple and an half, or a drachm for a dose. It rarely disagrees with the stomach; but its astringent effects generally require the use of some aperient medicine. Some species of *æsculus* are cultivated in the United States, on account of the beauty and agreeable shade of the tree. Medical knowledge might be promoted, were practitioners to try the efficacy of the bark of our native species.

ALCOHOL. Alcohol. Ardent Spirit. Spirit of Wine.

This fluid is formed by the process of fermentation, from sweet vegetable juices, or solutions of saccharine matter in water. It forms the true characteristic of vinous liquors, and arises from the decomposition of sugar, being always in proportion to its quantity. It is found in greatest proportion in the wines from warm countries, and in those prepared from thoroughly ripened fruit. In the south of France, some wines yield a third of brandy. It is the proportion of alcohol which renders wines more or less generous, and prevents them from becoming sour. The richer a wine is in alcohol the less malic acid it contains, and therefore, the best wines give the best brandy; because they are free from the disagreeable taste which the malic acid imparts to them. Old wines afford better brandy than new, but in less quantity. Ardent spirits, such as brandy, rum, and whiskey, consist almost entirely of three ingredients, viz. water, *alcohol* or *spirit of wine*, to which they owe their strength; and a small quantity of peculiar oil, upon which their flavour depends. From

vinous liquors, alcohol is obtained by distillation. It passes over diluted with water, and impregnated with an oily matter derived from the fermented liquor. In this manner the different spirituous liquors of commerce are formed, and it is by the repeated distillation of these last, with a small proportion of potash, that *pure alcohol* is procured. It is a colourless transparent fluid, fragrant and pungent, whose specific gravity when pure, is to that of water as 835 to 1000. On the living body, alcohol acts as a most violent stimulus. It coagulates the fluids, and corrugates the solids. Applied externally, it strengthens the vessels, and may thus restrain passive hæmorrhages. It constantly contracts the extremities of the nerves it touches, and deprives them of sense and motion. This liquor received undiluted into the stomach, produces the same effects, contracting all the solid parts with which it comes in contact, and destroying, at least for a time, their use and office. In a moderate dose it produces a state of high excitement both of body and mind, which is followed by proportional languor: if the quantity be considerable, a palsy or apoplexy follows, which frequently ends in death. Alcohol is scarcely employed in medicine in its pure state, but extensively under the form of vinous and spirituous liquors, which afford our most powerful stimulants. Wines seem more permanent in their stimulant operations, than ardent spirits, hence they are superior in tonic power, though inferior in producing a sudden stimulus.

From the long continued use of alcohol many diseases derive their origin, as dyspepsia, hypochondriasis, and visceral obstructions, occasioning dropsy. These may be ascribed to the exertion of its stimulant power, by which the irritability of the stomach and other viscera is worn out, and indirect debility produced. Alcohol is used externally as a stimulant in muscular pains, and is one of the best applications to recent burns. In pharmacy it is employed as a solvent of the active matter of many vegetable and some animal productions. Diluted with an equal weight of water it forms proof spirit (alcohol dilutum) which is also extensively used as a menstruum.

Ardent spirits, like wine, in small quantities, prove a powerful cordial, and for the time a strengthening beverage. They increase the circulation, raise the pulse, give vigour to the stomach, promote digestion, and prevent flatulence. Thus they are of great service in counteracting the influence of a moist and cold atmosphere, and of noxious exhalations, and consequently are fitted for those employed in occupations of an unwholesome nature. To the weakly and relaxed, they are highly useful, by giving an elasticity and firmness of tone. But in a rigid habit they are equally pernicious, by producing a dryness of fibre, and by prematurely hastening the approach of age. The abuse of ardent spirits is also productive of much more fatal effects than an immoderate use of wine. Wine may be said for the most part to sap the constitution by degrees; spirits on the contrary attack it by storm, and at once prey on the principle of existence.

ALLIUM SATIVUM. *Garlic.* The root.

Garlic is a perennial, bulbous rooted plant, all the parts of which, but more especially the roots, have a strong, offensive, very penetrating and diffusive smell, and an acrimonious taste. It is a powerful and diffusive stimulant; hence in cold phlegmatic habits, in rheumatism, catarrhus disorders of the breast, asthma, both pituitous and spasmodic, flatulent colics, hysterical and other diseases proceeding from laxity of the solids, garlic is eminently serviceable, proving expectorant, diuretic, and if the patient be kept warm, sudorific. Sydenham extols it in hydropic cases; and assures us also, that, among all the substances which occasion a derivation or revulsion from the head, no one operates more powerfully than garlic applied to the soles of the feet. In hot bilious constitutions, where there is already a degree of irritation, where the juices are too thin and acrimonious, this stimulating medicine is obviously improper, and never fails to aggravate the distemper. Garlic may be exhibited in substance, several cloves of it cut into slices may be swallowed without chewing. In this manner it has been successfully directed for the cure of intermittent fever; but the most commodious form for administering it, is that of bolus or pill; the expressed juice, or even the infusion, is too acrimonious for common use. Cotton moistened with the juice and introduced within the ear five or six times in a day, has afforded relief in deafness proceeding from atony or rheumatism. In the form of ointment applied externally, garlic is said to resolve and discuss indolent tumors; and when applied under the form of poultice to the pubes, it has some times proved effectual in producing a discharge of urine, when its retention has arisen from want of due action of the bladder.

ALOE PERFOLIATA. *Aloes.* The gum resin.

- a. Aloe hepatica—Hepatic aloes.
- b. Aloe socotorina—Socotorine aloes.

A perennial plant consisting of many varieties, which grows in the south of Europe, Asia, Africa, and America. The various kinds of aloes differ in their purity, and likewise in their sensible qualities. The *socotorine* is considered as the purest, and is brought from the island of Socotora, wrapped in skins. It is in small pieces of a redish brown colour, with a purplish cast; when reduced to powder, of a bright golden shade. Its taste is bitter, accompanied with an aromatic flavour; the smell is not unpleasant, and slightly resembles that of myrrh. The *Barbadoes* aloes is in large masses, of a lighter colour, and has an odour much stronger, and more unpleasant than the former. The *hepatic* is of a similar kind. The *caballine* or horse aloes, is still more impure, and is weaker in its power. They are all the inspissated juice of the several varieties of the aloe plant. They consist of gum and resin, the former being in larger quantity. The smell and taste reside principally in the gum, as do the principal virtues of the aloes. Aloes is a warm, stimulating purgative, used principally to obviate costiveness. Its medium dose is from

five to fifteen grains, nor does a larger quantity operate more effectually. Its operation is exerted upon the large intestines, principally on the rectum, and hence its purgative effect is slow and moderate. It has been supposed that the stimulant action of aloes may be extended to the uterus, whence it is also used as an emmenagogue; but its exhibition is deemed improper during pregnancy. It has also been supposed, that its use is apt to induce or aggravate hæmorrhoidal affections, and with those liable to such complaints, it can seldom be employed. In dry bilious habits, aloes proves injurious, immoderately heating the body, and inflaming the bowels. In small doses frequently repeated, aloes cleanses the stomach and bowels, attenuates and dissolves viscid juices in the remoter parts, quickens the circulation, warms the habit, and promotes the uterine and hæmorrhoidal fluxes. It is particularly serviceable to persons of a phlegmatic temperament and sedentary life, and where the stomach is oppressed and weakened. Taken in doses of a few grains, mixed into pills, with a third or equal parts of soap, it acts as a gently stimulating laxative, and if continued, is capable of removing very obstinate obstructions. On account of its bitterness, aloes has been supposed to kill worms, either taken internally, or applied in the form of plaster to the umbilical region. Dissolved in alcohol, it is also employed for restraining external hæmorrhages, and for cleansing and healing wounds and ulcers.

ALTHÆA OFFICINALIS. *Marsh Mallow.* The root and leaves.

The marsh mallow is a perennial, indigenous plant, growing in salt marshes, and on the banks of rivers; flowering in the month of August. Every part of the marsh mallow, and especially the root, upon boiling, yields a copious mucilage; on account of which, it is frequently employed in emollient cataplasms, and by way of infusion. In humid asthma, hoarseness, dysenteries, and likewise in nephritic and calculus complaints, it is of eminent service; as by lubricating and relaxing the vessels, it procures a more easy passage to the stagnant fluids. It is with equal advantage applied externally, for softening and maturing hard tumors, and when chewed, it is said to afford relief in difficult teething.

AMMONIACUM. *Ammoniacum.* A gum resin.

This gum resin is brought from Egypt, and the East Indies; the tree which produces it is unknown. It comes in large masses, or, when of the best quality, in small round fragments, yellow on the surface, and white within. It has a faint smell, and a nauseous taste. It contains nearly half its weight of resin, which is dissolved by alcohol. Triturated with water, it forms a milky like mixture. The general action of gum ammoniac is stimulant. On many occasions it proves a valuable antispasmodic, deobstruent, or expectorant. In large doses,

purges gently, excites perspiration, and increases the flow of urine. It is prescribed for removing obstructions of the abdominal viscera, and in hysterical complaints, occasioned by a deficiency of periodical evacuations, and in long and obstinate colics, proceeding from viscid matter lodged in the intestines. But it is no less frequently resorted to as an expectorant, in cases where the lungs are oppressed with tenacious phlegm, as in asthma, and chronic catarrh. In this last disease, if the cough continue dry and husky, without expectoration, and fatigue the breast, provided there be no apprehension of tubercles, there is not, perhaps, a more efficacious remedy for it, than half a drachm of gum ammoniacum, with twenty drops of liquid laudanum, made into pills, taken at bed time, and occasionally repeated. This excellent remedy was recommended by Sir John Pringle; and Dr. Mudge observes, that he has in many instances found it very successful, and generally expeditious; almost uniformly producing expectoration, and abating the distressing fatigue of the cough. This gum, combined with squills, is used as a diuretic in dropsical affections, in doses from ten, to thirty grains. Externally, it is applied as a discutient, under the form of plaster, to white swellings of the knee, and to indolent tumors.

AMOMUM ZINGIBER. *Ginger.* The root, and the candied root brought from India.

Ginger is a perennial shrub, which grows about three feet high, indigenous to the East Indies, but now cultivated in the West Indies. It is in small wrinkled pieces, of a grayish, or white colour, having an aromatic odour, and a very pungent, and even acrid taste. The black ginger, is the root prepared with less care than the white, which, previous to drying, is scraped and washed. Ginger yields its active matter completely to alcohol, and in a great measure to water. This root is frequently employed as a grateful and moderately powerful aromatic, either in combination with other remedies, (to promote their efficacy, and obviate symptoms arising from their operation), or by itself, as a stimulant, particularly in dyspepsia, flatulence, tympanites, and gout. This spicy root is more immediately serviceable in cold flatulent colics; in laxity and debility of the stomach and intestines, and especially in torpid phlegmatic constitutions, in order to induce a more brisk action of the vessels. Candied ginger is prepared in India, from the young and succulent roots. When genuine, it is almost transparent.

AMOMUM REPENS. *Lesser Cardamom.* The seeds.

The seeds of this plant are dried and imported from India in their capsules, by which their flavour is better preserved. Their smell is aromatic; their taste pungent. They are used merely as grateful aromatics, and are frequently combined with bitters. These seeds are said to possess this advantage over the pepper

species, that notwithstanding their pungency, they do not immoderately heat, or inflame the bowels.

AMYGDALUS COMMUNIS. *The Almond Tree.* The kernel of the fruit, such as is called sweet almond.

The almond tree is eminent, both for its fruit, and for the ornament it affords to a shrubbery. It is much cultivated in the south of Europe. Sweet almonds are supposed to afford but little nourishment, and are not easily digested, unless thoroughly comminuted. The oil is obtained by expression from the seeds, or by decoction. It is very similar to olive oil, but more pure, and is given to blunt acrimonious humours, and to soften and relax the solids; hence its use internally in tickling coughs, heat of urine, pains and inflammations; and externally, in tension and rigidity of particular parts. There is another mode in which this oil is given as a demulcent; that of emulsion. The almonds are triturated with water; the oil they contain is diffused in the water, by the medium of the mucilage of the almond, and a milky like liquor is formed, which is extensively used as a pleasant demulcent.

AMYRIS GILEADENSIS. *Balsam of Gilead Tree.* The liquid resin, called Balsam of Gilead.

This is a resinous juice, obtained from an ever-green tree, growing spontaneously, particularly near Mecca, on the Asiatic side of the Red Sea. This balsam, procured by incisions made in the trunk of the tree, is highly fragrant, and is so much valued in the East, that it is said not to be imported into Europe. A coarser kind is met with, obtained by strong decoctions of the branches and leaves, and adulterated by various mixtures. This is of a yellow colour, and thick consistence; its taste is warm and bitter; its flavour somewhat fragrant. The medicinal virtues of the genuine Balsam of Gilead, have been very highly rated, undoubtedly with much exaggeration. But the real opobalsam, or Balm of Gilead, frequently mentioned in scripture, is not to be obtained in its genuine state, as it is presented only to sovereign princes: nor need it be regretted, since it is now entirely superseded by the balsams of Canada and Copaiba, which are equally efficacious.

ANGUSTURA. *Angustura.* The bark.

Is a bark imported within these few years from the Spanish West Indies; the botanical character of the tree producing it is unknown. It is in flat pieces, externally gray and wrinkled; internally, of a yellowish brown, and smooth; has little flavour; its taste is bitter, and slightly aromatic. Water, assisted by heat, takes up the greater part of its active matter, which does not seem to be injured, even by decoction. Alcohol dissolves its bitter and aromatic parts, but precipitates the extractive matter, dissolved by water. Proof spirit is its most proper menstruum.

Angustura is a powerful antiseptic. It was originally introduced in the West Indies, as a remedy in fevers, equal, or even superior, to the Peruvian bark. As an aromatic bitter, it has been found to be a tonic and stimulant of the organs of digestion. It increases the appetite, removes flatulence and acidity arising from dyspepsia, and is a very effectual remedy in diarrhœa, from weakness of the bowels, and in dysentery; and it possesses the singular advantage of not oppressing the stomach, as Peruvian bark is apt to do. Its dose is from ten to twenty grains of the powder, or one drachm in infusion, or decoction. Its tincture, in a dose of one or two drachms, has been used in dyspepsia. It proves ineffectual as a remedy in intermittents.

ANTHEMIS NOBILIS. *Chamomile.* The flowers.

Chamomile is a perennial plant, indigenous to the south of England, but cultivated in gardens for the purposes of medicine. The flowers have a strong, not ungrateful aromatic smell, and a very bitter nauseous taste. Their active constituents are bitter extractive, and essential oil. To the latter is to be ascribed, their antiseptic, carminative, cordial, and diaphoretic effects; to the former, their influence in promoting digestion. Chamomile flowers are a very common and excellent remedy, which is often used with advantage in spasmodic diseases, in hysteria, in spasmodic and flatulent colics, in suppression of the menstrual discharge, in the vomiting of puerperal women, in after pains, in gout, in intermittents, and typhus. From its stimulating and somewhat unpleasant essential oil, chamomile is also capable of exciting vomiting; and a strong infusion of the flowers is often used to promote the action of other emetics. In substance, it has been frequently given as a remedy in intermittent fever, in a dose of a drachm, or more, three or four times in the day. Chamomile flowers are applied as a discutient and emollient, in the form of clyster or fomentation, in colic, dysentery, strangulated hernia, &c.

AQUA. *Water.*

Pure water is defined, a liquid, transparent, colourless, insipid substance. By a moderate degree of cold, it is converted into a solid, transparent body, called ice; and at a temperature of 212° of Fahrenheit's thermometer, it becomes rarified, is augmented in bulk, and quickly dispersed in the form of vapour. It is diffused through the atmosphere, and over the surface of the globe; and exists in a certain proportion, in animals, vegetables, and minerals. Till the latter end of the eighteenth century, it was generally believed to be a simple element; and, the late discovery of its being a compound, is considered as one of the most important and astonishing, that has been made since the origin of chemical science. By a variety of chemical experiments, the fact has been demonstrated beyond controversy, that water consists of 85 parts of oxygenous, and 15 of hydrogenous gas.

All natural waters are more or less impure; having a strong attraction for different substances, they imbibe part of them in every situation in which they are found. Water cannot be obtained in a pure state, without undergoing the process of distillation. Its salubrity depends on the peculiar properties which it possesses. Some waters are strongly impregnated with animal, vegetable, or mineral particles, which render them unfit for culinary purposes. Pure water has neither smell, nor taste, and is perfectly transparent. If water be of a brown colour, some extraneous substance is diffused through it; if of a green colour, it indicates the presence of iron; and, if blue, that of copper. If, on agitation, air-bubbles appear in the water, and if it have a mild sourish taste, we may be sure that it contains carbonic acid gas, or fixed air.

Atmospheric water comprehends *rain* and *snow water*; the former is that which was evaporated from the sea and land, dissolved in the air, and afterwards discharged on the earth. It would be as pure as distilled water, if the atmosphere did not abound with vapours and exhalations, capable of combining with it. The rain, which is collected from the roofs of houses in large cities, is always mixed with soot, animal effluvia, and other impurities. *Snow water* is contaminated with the same impurities as rain water, and it is probably from the want of common air, or of carbonic acid, that snow water is injurious to health.

River water may be considered as a compound of spring and rain water. Near great cities particularly, it is blended with a number of impurities; but by the process of filtration, it becomes fitted for every purpose of life; and it is preferred for brewing, or forming malt-liquor. It is also more or less wholesome according to the particular strata it flows over; as from a sandy or stony soil it attracts less impurity than from a soft muddy one; and the more rapid its course, the sooner it frees itself from those adventitious particles which taint its natural wholesomeness.

Spring water is a compound of sea-water changed by subterraneous heat, and of the vapours of the atmosphere. It is, indeed, always impregnated more or less with mineral substances, which must be noxious to a certain degree. But, like river-water, the strata through which it rises, must in a great measure regulate its qualities.

Well, or pump water, is much of the same nature with spring water, but it generally receives a fuller or more complete filtration from the manner in which it is procured. Where the filtration is through a sandy soil the water is purest, and the more frequently a well is emptied, the less chance there is of the water acquiring a putrid taint by stagnation.

Stagnant waters, as those of lakes, swamps, and ditches, are the most unwholesome of any, as they both collect impurities from their situation, and acquire from their want of motion a disposition to putrescency; and they are the fruitful source of contagion.

The temperature of water requires attention as well as its purity. The colder it is, the more tonic and invigorating it proves; while warm water is on the contrary the most sedative and debilitating of drinks.

The utility of water can only be judged of by its use. Experience clearly evinces that it is the most healthy and natural beverage of mankind; and, as the basis of all drinks, deserves the title of an universal remedy more than any other substance with which we are acquainted. It is the most powerful solvent of alimentary matter we possess, and without it, neither life nor health could be maintained. Nor is it less powerful in disease, especially as a diluent in febrile affections. In fine, where custom has not altered the constitution of man, it forms the most salubrious of all drinks, and those, who have made it their constant and only beverage, have enjoyed a constant health, a flow of spirits, and a length of life, superior to all others; and, in the language of the celebrated Hoffman, "of all the productions of nature or art, water comes nearest to that universal remedy so much searched after by mankind, but never discovered."

Some water, possessing the quality of hardness, does not readily dissolve soap, nor boil vegetables soft, nor make an infusion of tea. It generally contains some acid, combined with an absorbent earth, for which the acid has less attraction than for the alkali of the soap. When soap is put into such water, its alkali is immediately attracted by the acid, the soap is decomposed, and the oil swims on the surface.

From the influence of the animal and vegetable substances which it contains, water is extremely liable to become putrid on long voyages; in this state it is in a high degree pernicious to the human frame, and capable of producing mortal diseases, even by its effluvia. Various expedients have been devised to keep it in a state of purity. Dr. Butler has found, that four ounces of fine clear pearl ash, dissolved in 100 gallons of water, and the cask closed in the usual manner, have proved effectual for preserving water perfectly sweet, during a voyage of eighteen months. The same desirable object may be attained, by adding a small portion of vitriolic acid and of alkali to every cask; which will preserve the water in a pure and salubrious state, for at least twelve months. Charcoal has also proved to be eminently adapted to such purpose. With this view the inner surface of the staves are charred previously to constructing the casks. Putrid water may be restored to its original purity, by adding to each gallon ten grains of calcined alum, and twenty five or thirty of powdered charcoal; both ingredients, however, ought to be preserved in close vessels, otherwise their efficacy will be considerably diminished. The same purpose may be effected, according to the experiments of Mr. Lowitz, by charcoal and vitriolic acid: one ounce and a half of charcoal in powder, and twenty four drops of vitriolic acid, are sufficient to purify three pints and a half of corrupted water, and do not communicate to it any perceptible acidity.

Putrid water may be restored to its original purity, by filtering it through sand and charcoal. Several filtering machines have been invented admirably calculated to facilitate this process; and repeated experiments have demonstrated their great utility.*

As a medicinal agent in the various forms of its application to diseases, water is highly deserving the attention of practitioners. For further consideration of this subject the reader is referred to the appendix of this volume.

ARALIA SPINOSA. *Prickly-ash. Tooth-ache tree.* The bark, root, and berries.

This is a native of Virginia, and other southern states. The height to which this tree will grow, when the soil and situation wholly agree with it, is about twelve feet. It is a very ornamental shrub, and the stem which is of a dark brown colour is defended by sharp prickly spines. A decoction of its bark and root has often succeeded, when taken internally, in removing rheumatic complaints. It excites a gentle perspiration. The berries are used to put into a hollow tooth when aching. A tincture of them is also used for the same purpose, both of which afford relief. In Virginia a spirituous infusion of the berries is much esteemed in violent colic.

ARBUTUS UVA URSI. *Bearberry. Bear's Whortleberry.* The leaves.

The uva ursi is a low shrub, somewhat resembling the myrtle. The leaves have a bitterish, astringent taste; and their astringent qualities are so considerable, that in certain places, particularly the provinces of Russia, they are used for tanning leather. A watery infusion of the leaves, immediately strikes a very black color with chalybeates. Dr. de Haen of Vienna, has bestowed very high encomiums on the uva ursi, against ulcerations of the kidneys, bladder, and urinary passages. He represents it as capable of curing, almost every case of that kind; and even asserts, that in cases of calculous, much benefit is derived from its use; patients, after the employment of it, passing their urine without pain. It has not however answered the expectations, which, on these grounds, other practitioners formed of it. But in many affections of the urinary organs, it has proved to be a remedy of considerable use; and it has been particularly serviceable in alleviating dyspeptic symptoms in nephritic and calculous cases. From its astringency, uva ursi has been employed in menorrhagia, and other fluxes, but more particularly in cystirrhœa, calculus, diabetes, and ulcerations of the urinary organs, in some of which affections, its efficacy is greater than has of late been allowed. Professor Barton of Philadelphia, from long experience of its efficacy, is high in its commendation, in cases of nephritis

* See Domestic Encyclo. vol. 2. page 512.

depending on gout, and has found it serviceable in old gonorrhœa. It is sometimes exhibited in the form of decoction, but most frequently in that of powder, from a scruple to a drachm for a dose, repeated twice or thrice in a day.

In the New-England states, and in New-York, and New-Jersey, the *uva ursi*, a low evergreen shrub, is found in great abundance trailing on the ground in dry, sandy soils, in woods, and on mountains. The inhabitants, to whom it is known by the name of *wild cranberry*, have recourse to it with much confidence, as a remedy, under various circumstances attending affections of the urinary organs.

ARCTIUM LAPPA. *Burdock. Clot-burr.* The root and leaves.

A well known plant growing on the road sides, on rubbish, and ditch banks, bearing purplish blossoms in July and August. In medicine, says Dr. Withering, decoctions of the burdock-root are esteemed by judicious physicians, as equal, if not superior, to those of sarsaparilla. The fresh root has a sweetish bitter and somewhat austere taste ; it is aperient, diuretic, and sudorific, and said to act without irritation, so as to be safely used in acute diseases. The seeds have a bitterish sub-acrid taste, and are recommended as powerful diuretics, when taken either in the form of emulsion, or a powder, in doses not exceeding one drachm. Decoctions of the root have of late been used in rheumatism, gout, venereal, and other diseases. The leaves, externally applied, abate local inflammation, and assuage pain, by promoting perspiration.

ARGENTUM. *Silver.*

Silver is entitled to a place in the *Materia Medica*, only as being the basis of the nitrate of silver, which is the only preparation now in use.

ARISTOLOCHIA SERPENTARIA. *Virginian Snake Root.* The root.

This medicinal plant, is a native production of the United States exclusively. The root consists of a number of small strings or fibres, matted together, issuing from one head, of a light brown colour, having a slightly aromatic smell, and a pungent, bitterish taste. It is highly stimulant, and increases the pulse very perceptibly. *Serpentaria* is a stimulating, aromatic tonic, and sudorific, much employed in fevers of the typhoid kind, to support the powers of the system. But its use is improper whenever bleeding is required. It promotes the efficacy of cinchona in the cure of intermittents, and remittents, and is a remedy of considerable power in dyspepsia. Externally, it is used as a gargle, in putrid sore throat. It is given in powder to the extent of fifteen or twenty grains ; or it may be administered in tincture, its active matter being entirely extracted by proof spirit. By decoction, its powers are entirely destroyed. This root is usually combined with *calamus aromaticus*, and infused in spi-

rits, or water, and forms the common morning dram in aguish situations.

A new species of snake root, termed by the honourable Daniel Cony, Esq. *Serpentaria Kennebis*, is found in great abundance in the vicinity of the Sabesticook, a branch of the Kennebeck river; its particular character and medicinal properties are not well ascertained, but it appears to be highly aromatic, and is employed as an elegant addition to common bitters.

ARTEMISIA ABROTANUM. *Southern wood.* The leaves.

ARTEMISIA SANTONICA. *Wormseed.* The top and seeds.

ARTEMISIA ABSINTHIUM. *Common Wormwood.* The leaves and flowering heads.

The two former of the several species of artemisia, are still regarded as articles of the Materia Medica, although no important effects, are expected to result from any medicinal virtues which they may possess. The seeds of santonica have a faint disagreeable smell and a very bitter taste. They have long been held in estimation as anthelmintic; the dose, half a drachm, or a drachm of the powder, for an adult. They are given to children in powder, to the extent of ten grains or half a drachm, in the morning, when the stomach is empty; and when continued for several days, a proper cathartic is administered. The *absinthium* or *common worm wood*, is a perennial herb, growing wild on the road sides, and is cultivated in gardens. It flowers in August; the smell of the leaves is strong and disagreeable; their taste intensely bitter. The active constituents of this plant, are bitter extractive and essential oil. It is used in stomach complaints, and is of great service to hypochondriacs. It is also employed in intermittent fevers, in cachectic and hydropic affections, in jaundice, and against worms. According to Dr. Withering, an infusion of the leaves is a good stomachic, and, with the addition of fixed alkaline salts, proves a powerful diuretic in some dropsical cases.

Their ashes produce a purer alkali, than most other vegetables. The essential oil, is used both externally and internally, for destroying worms. The herb, being an excellent antiseptic, is often employed in fomentations, to resist putrefaction; and if the plant be macerated in boiling water, and repeatedly applied to a bruise, by way of cataplasm, it will not only speedily remove the pain, but also prevent the swelling and discolouration of the part.

ARUM MACULATUM. *Wake-Robbin. Dragon Root.* The root and leaves.

A native and hardy perennial, growing in shady places, ditch banks, and rough ground, flowering in May and June. Both the bulbous root, and the leaves of this vegetable, in a fresh state, are extremely acrid. When dried, and pulverized, these roots loose all their acrimony, and afford an almost tasteless, farinaceous powder. In this state it is perfectly inert; but the roots may be

preserved fresh, for a year, by burying them in a cellar, in sand. Arum is doubtless a very powerful stimulant, and by promoting the secretions, may be advantageously employed in cachectic and chlorotic cases, in rheumatic affections, and other complaints of phlegmatic and torpid constitutions; but particularly in a relaxed state of the stomach, occasioned by a prevalence of viscid mucus.

In chronic rheumatism and other disorders, requiring the full effect of this medicine, great care should be taken, that the root be fresh and newly dried; and to cover its intolerable pungency, Dr. Lewis advises it to be administered in the form of emulsion, with gum-arabic and spermaceti, increasing the dose from ten grains to upwards of a scruple, two or three times in a day. The French manufacture from the arum root, when properly dried and reduced to powder, a harmless cosmetic, which is sold at a high price, under the name of *cypress powder*.

ARUM AMERICANUM. *Skunk Cabbage*. The root and leaves.

The first appearance of this singular plant is the flower. After the flower is arrived to a state of perfection, the leaves appear at a small distance from the flower stalk, in a conic form, very closely rolled together. Common in swamps and borders of meadows. Flowers in April and May. This plant, which is found native no where but in *North-America*, has been considered by botanists as a species of the *arum*. The vulgar name, by which it is here generally known, is taken from its very rank and disagreeable smell, nearly resembling that of a skunk or pole cat.

The roots dried and powdered are an excellent medicine in asthmatic cases, and often give relief when other means are ineffectual. It may be given with safety to children as well as to adults; to the former, in doses of four, five, or six grains, and to the latter, in doses of forty grains and upwards. It is given in the fit, and repeated as the case may require. This knowledge is said to have been obtained from the Indians, who it is likewise said, repeat the dose after the paroxysm is gone off, several mornings, then miss as many, and repeat it again; thus continuing the medicine until the patient is perfectly recovered. It appears to be antispasmodic, and bids fair to be useful in many other disorders. In collecting the roots particular care ought to be taken that the *white hellebore*, or *poke root*, which some people call skunk weed, be not mistaken for this plant, as the consequence might be fatal. There is an obvious distinction; the hellebore has a stalk, but the skunk cabbage has none.

Two instances have occurred in which *skunk cabbage* appeared to be remarkably and speedily efficacious, in the cure of dropsy. Of the powdered root two teaspoonfuls were taken every morning successively till the cure was effected. The seeds of this plant are said by some to possess more efficacy in asthmatic cases than the root, and many asthmatic patients have experienced from their use the most effectual relief.

ARUM TRIPHYLLUM. *Indian Turnip.* The root.

The acrimony of the recent root of this plant is well known. By drying, much of this is lost. It has been very beneficial in asthma, especially in old people; in croup and whooping-cough. The recent root boiled in lard, to the consistence of ointment, has been found useful in tinea capitis. The dried root boiled in milk, in the proportion of one root to half a pint, has been advantageously employed in consumption. Some acrimony should be perceptible to the tongue and throat in its exhibition. It never affects the general circulation, says Dr. Mease, but acts solely on the parts just named; to the glands of which it is a powerful stimulus, causing a copious secretion of mucus. A fine sago has been prepared from the roots, in the proportion of one part to four of the root, freed from its exterior coat.

ASARUM EUROPÆUM. *Asarabacca.* The leaves.

This is a perennial plant, which is the natural produce of some places in England; although the dried roots are generally brought from the Levant. The root is fibrous, of a gray-brown colour externally, but white within. Both the roots and leaves have a nauseous, bitter, acrimonious, and hot taste; their smell is strong, but not very disagreeable. Asarabacca contains a portion of the same acrid principle with arum, and it also loses much of its activity, by decoction, or long keeping. Given in substance, from half a drachm to a drachm, it evacuates powerfully, both upwards and downwards. Linnæus proposed it as a substitute for ispecacuan, and according to Dr. Cullen, the powdered root proves, in a moderate dose, a gentle emetic. But the principal use of this plant, among modern practitioners, is as a sternutatory, being the strongest of all the vegetable errhines, not excepting white hellebore itself. Snuffed up the nose, in the quantity of a grain or two, it causes a large evacuation of mucus, and raises a plentiful spitting, which sometimes continues several days together; and by which headach, toothach, ophthalmia, as well as some paralytic and soporific complaints, have been effectually removed. Several species of asarum have been found to grow in the United States; as the Canadian asarum, called also wild ginger; and the asarum virginicum, or sweet scented asarum or cat's-foot. Experience has in some instances demonstrated their characteristic properties, and they are deserving further trial.

ASCLEPIAS DECUMBENS. *Pleurisy Root.* The root.

This is a species of swallow wort, sometimes called butterfly root. It is one of our most beautiful and common plants, producing orange coloured blossoms. The bark of the root is much celebrated in Virginia, as a remedy in dysentery; and has been highly extolled for its virtues in pleurisy and some other fevers. It is said to possess a remarkable power of affecting the skin, in-

ducing general and plentiful perspiration, without heating the body. In the form of decoction, it often induces a diaphoresis, when other medicines have failed to produce that effect. Professor Barton, in his commendations of this medicine, has a quotation from the publication of a Mr. Thompson Mason of Virginia, whose experience of its virtues in pleurisy has been so extensive, as to establish its reputation. After the use of an antimonial emetic, and the loss of some blood, he gives his patients about half a drachm of the root finely powdered, in a cup of warm water, and repeats the dose every two hours, until the patient is perfectly recovered, which happens frequently, after three days, and never fails freeing him from pain after six days. Mr. Thompson asserts, that, by those simple means he has cured hundreds, and never failed in a single instance. The powdered root frequently acts as a mild purgative.

ASTRAGALUS TRAGACANTHA. *Goatsthorn.* The gum, called gum tragacanth.

Gum tragacanth is the product of a very thorny shrub, which grows on the island of Candia and some other places in the Levant. It is obtained by exudation; it comes in small wrinkled pieces, semi-transparent and brittle, has neither taste nor smell, and is entirely a pure gum. It is greatly superior to all the gums in giving viscosity to water, its power in this respect, being to that of gum arabic, as twenty-four to one. Its solution, is not perfectly uniform, unless boiled for some time.

Tragacanth has virtues similar to gum-arabic, and is principally employed as a demulcent, to blunt acrimonies, and as a pharmaceutical agent.

ATROPA BELLADONNA. *Deadly Nightshade.* The leaves.

The deadly nightshade, is perennial and indigenous in mountainous and woody situations; and is often cultivated in gardens. It flowers in June and July. The whole of this plant is a strong poison of the narcotic kind; and children, allured by the beautiful appearance of its berries, have too often experienced their fatal effects.

The symptoms excited, are a dryness of the mouth; a trembling of the tongue; a very distressing thirst; difficulty of swallowing; fruitless endeavours to vomit; and great anxiety about the præcordia. Delirium then comes on, with gnashing of the teeth and convulsions. The pupil remains dilated, and is not sensible, even to the stimulus of light. The face becomes tumid, and of a dark red colour. The jaws are frequently locked; inflammation attacks the stomach and intestines; mortification and death succeed. The body soon putrifies, swells, and becomes marked with livid spots; and the stench is insupportable. The best method of cure is to excite vomiting as soon as possible, to evacuate the bowels by purgations and clysters, and to give largely, vinegar, honey, milk, and oil. Yet this virulent poison under

proper management may become an excellent remedy. Besides a very remarkable narcotic power, it possesses considerable influence in promoting all the excretions, particularly by sweat, urine, and it is also said by saliva; but its exhibition requires the greatest caution; and, when dangerous symptoms occur, its use must be suspended for some time, and afterwards resumed in smaller doses.

Deadly nightshade has been exhibited in several febrile diseases, in obstinate intermittents, in inflammations, and gout; in comatose diseases, palsy, and apoplexy; in spasmodic diseases; in chorea, epilepsy, hydrophobia, melancholy, and mania; in cachectic affections, in dropsies and obstinate jaundice; in local diseases; in amaurosis; in scirrhus and cancer.

Belladonna is best exhibited in substance, beginning with a very small dose of the powdered leaves, or root; such as the fourth or eighth of a grain for children, and one grain for adults, to be repeated daily, and gradually increased. The watery infusion, is also a powerful remedy; one scruple of the dried leaves are infused in ten ounces of warm water, and strained after cooling. At first, two ounces of this may be given daily to adults, and gradually increased, until the tension of the throat, shews that it would be dangerous to go farther.

In this manner, Dr. Cullen has repeatedly experienced its efficacy in cancerous affections. Externally the powdered leaves are applied as a narcotic, to diminish pain in cancerous and ill-conditioned sores.

AVENA SATIVA. *Oats.* The seeds.

When deprived of their husks and formed into groats, oats are converted into an excellent dish for the infirm and diseased. When ground into meal, and boiled in water, they afford a thick and nourishing mucilage, which, with the addition of a few currants, is very wholesome, and produces a mildly laxative effect. An infusion of the husks in water, allowed to remain until it becomes acidulous, is boiled down to a jelly, which is called sowins. In these forms, oats are nutritious and easy of digestion.

Gruels or decoctions, of groats or oatmeal, either plain, acidified, or sweetened, form an excellent drink in febrile diseases, diarrhoea, dysentery, &c. and, from their demulcent properties, prove useful in inflammatory disorders, coughs, hoarseness, roughness, and exulceration of the fauces.

BITUMEN PETROLEUM. *Rock Oil.* *Barbadoes Tar.*

Bitumen is now employed as a generic name for several inflammable bodies of different degrees of consistency, from perfect fluidity to that of a brittle, but very fusible solid, and of little specific gravity.

Petroleum is a bitumen of a red colour, and thick consistence, of a disagreeable smell, and a bitter, acrid taste. In medicinal virtues, it participates of those of oil of amber, and of turpentine. It is, at present, very rarely employed as a medicine; some of the

more common mineral oils, being preferred. An oil extracted from a kind of stone-coal, has been extolled, under the name of British-oil, for external purposes; against rheumatic pains, paralytic complaints, and for preventing chilblains. Even this is often counterfeited, by adding a small portion of the oil of amber, to the common expressed oils.

The Barbadoes tar is found in several of the West India islands, where it is esteemed by the inhabitants of great service as a sudorific, and in disorders of the breast and lungs; though in cases of this kind, attended with inflammation, it is certainly improper.

BUBON GALBANUM. *Loveaged Leaved Bubon.* The gum resin, called galbanum.

Galbanum is obtained by exudation from incisions, made in the stem of a perennial plant, which grows in Africa. The best kind of galbanum consists of pale coloured pieces, about the size of a hazel nut, which on being broken, appear to be composed of clear white tears, of a bitterish acrid taste, and a strong peculiar smell. Alcohol dissolves its resin, in which its principal virtues reside. Proof spirit dissolves it entirely, the impurities excepted. Triturated with water, it forms a milky-like fluid.

Galbanum possesses the virtues of the foetid gums, and is used for the same purposes; dose from ten grains to one drachm. It is chiefly employed in the form of plaster to white swellings, and it is supposed to resolve and discuss tumors, and to promote suppuration; but for these purposes, it is more efficacious in a liquid state. In hysteric spasms and inflamed hæmorrhoids, no application can afford more effectual relief, than a tincture from this gum; but in the latter case, the painful parts ought to be covered with linen rags, moistened in lime water, before the tincture is dropped upon them.

CALX. *Lime, recently burnt.* *Quick-Lime.*

This article is a soft, white, friable substance, prepared from marble, chalk, and other calcareous earths, by the process of calcination. All calcareous earths, whether in the form of marble, lime stone, chalk, marine shells, &c. are convertible into quick-lime, by the action of heat.

These substances are found in a state of combination with the carbonic acid or fixed air. During the process of calcination, the carbonic acid is expelled from the carbonates, in the state of gas or air; and the product is quick-lime in a caustic state. As quick-lime attracts moisture and carbonic acid from the atmosphere, it should be always recently prepared, or preserved in very close bottles for medicinal use.

On the living body, lime acts as an escharotic, and as such, was formerly applied to ill-conditioned sores; but it is now principally used in pharmacy, for the purpose of forming lime water, and as a chemical agent, in several preparations.

CANCER ASTAGUS. *The Craw Fish.*

CANCER PAGURUS. *The black clawed Crab.* The claws, called crab's eyes.

In the head and stomach of the craw fish, are found certain concretions, about the size of peas, or larger, of a white colour, and sometimes of a redish and bluish cast. They are prepared by levigation and washing with water. They are termed *lapilli cancerorum preparati*, formerly *oculi cancerorum preparati*. The tips of the claws of the common crab, are precisely similar in composition, and are prepared in the same manner. They are named *chela cancerorum preparatae*. Both these substances are carbonates of lime, free from the other earths which chalk always contains, and therefore preferable to it for medicinal use.

CANELLA ALBA. *Canella Alba.* The bark.

This is the inner bark of the branches of a tree which is very common in Jamaica and other West-India islands. It is in quills, or flat pieces, of a light brown or grayish colour; its flavour is aromatic, and its taste pungent. Canella is a moderately strong aromatic, and is employed principally on account of its flavour. It enters into the composition of several tinctures, and is scarcely applied to any other use.

CAPSICUM ANNUM. *Cockspur-Pepper.* The fruit.

This species of pepper is a native of South America, and is cultivated extensively in the West-India islands. The pods are long, pointed, and pendulous, at first of a green colour, and afterwards of a bright orange red. The taste of capsicum is extremely pungent and acrimonious; setting the mouth, as it were, on fire. Its pungency is completely extracted by Alcohol, and partly by water.

Cayenne pepper is an indiscriminate mixture of the powder of the dried pods of many species of capsicum. These peppers have been chiefly used as a condiment. They prevent flatulence from vegetable food, and have a warm and kindly effect upon the stomach. An abuse of them, however, gives rise to visceral obstructions, especially of the liver. Of late they have been employed also in the practice of medicine. There can be little doubt, but they furnish us with one of the purest and strongest stimulants, that can be introduced into the stomach; while, at the same time, they have nothing of the narcotic effects of ardent spirits. Dr. Adair Makitrick, who was perhaps the first that employed them as a medicine, directs them to be given to the extent of six or eight grains, under the form of pills; or in tincture, made by infusing half an ounce of the pods, in a pound of rectified spirit, and to be given from one, to three drachms in a dose. He has found them useful in a variety of affections, particularly in that morbid disposition, which he calls the *cachexia africana*; and which he considers as a most frequent and fatal predisposition to disease among the slaves. Dr. Wight says, that in dropsical and other

complaints, where chalybeates are indicated, a minute portion of powdered capsicum, forms an excellent addition, and recommends its use in lethargic affections.

This pepper has also been successfully employed, infused in vinegar, as a gargle in a species of cynanche maligna, which proved very fatal in the West-Indies, resisting the peruvian bark, wine, and the other remedies commonly employed. The practice, though successful in the West-Indies, it is said, is not without danger.

In tropical fevers, coma and delirium are common attendants; and in such cases, cataplasms of capsicum, have a speedy and happy effect. They redden the parts; but seldom blister, unless kept on too long. In ophthalmia, from relaxation, the diluted juice of capsicum is a sovereign remedy.

CARBO LIGNI. *Charcoal of Wood.*

Common charcoal of wood, (carbonous oxide) or carbon of the French chemists, is a sort of artificial coal, consisting of half burnt wood. It is in the form of solid masses of a black colour, is brittle, and has neither smell nor taste. It is extremely porous, and therefore absorbs light strongly, which accounts for its blackness; for, the rays of light, striking on the charcoal, are received and absorbed in its pores, instead of being reflected, whence, the body must of necessity appear black. This substance, also attracts air from the atmosphere, which it continues to absorb for a considerable time. It is insoluble in water, and a bad conductor of coloric, but an excellent one of electricity.

This substance is found to consist of 63, 86 of carbon, and 36, 14 of oxygen.

Charcoal possesses a number of singular properties, which render it of considerable importance in many respects. It is incapable of putrifying or rotting, like wood; and so remarkable is the durability of this substance, that it may be preserved to an indefinite length of time; for there yet exists, according to Dodart, charcoal made of corn, (probably in the days of Cæsar), which is in so complete a state, that the wheat may be distinguished from the rye. Besides the great advantage which this article affords to the artist and manufacturer, it has been of late employed with considerable success.—First. In correcting the burnt, or empyreumatic taste in ardent spirits.—Secondly. In depriving rancid oil of its disagreeable flavour.—Thirdly. In restoring putrid meat. For these useful purposes, it should be previously reduced to powder, and that only used which is fresh prepared, or has been kept in close vessels, that it shall have absorbed no fixed air from the common atmosphere. The tainted flavour of ardent spirits, or the unpleasant one of those distilled from grain, may be entirely destroyed, by merely shaking it with powdered charcoal.

Charcoal is of still greater utility for purifying water on ship board. The most offensive water may be rendered perfectly sweet, by merely filtrating it through maple, hickory, or oak

coal and sand. New made charcoal, by being rolled up in cloths that have contracted a disagreeable odour, effectually destroys it; and the bad taint of meat, beginning to putrify, is in like manner corrected. It is possible that meat surrounded by fresh charcoal, might keep sweet for months. On account of its absorbent and antiseptic properties, this substance promises to be of considerable service in medicine. It has been found to arrest the progress of mortification, when applied in the form of medicated poultice to the affected part, and frequently repeated. In a variety of instances, it has been found to have a remarkable effect, in removing habitual costiveness, without inducing an extraordinary degree of weakness, especially if it be mixed with syrup of yellow roses. Many persons, afflicted with that disagreeable complaint, a fœtid breath from a costive habit, have obtained effectual relief, by taking two or three times in a day, a table spoonful of each of the above articles. Charcoal, made from maple wood, or burnt bread, finely powdered, makes a simple, efficacious, and safe tooth powder, which is preferable to any other. It neutralizes, and entirely destroys for a time, any fœtor which may arise from a carious tooth. It has lately been found to cure *tinea capitis*, by being sprinkled over the ulcer in fine powder.

The most eligible process for preparing charcoal for medicinal uses, free from all impurities and disagreeable taste, is, to inclose small billets of wood in an iron cylinder, having a tube fixed to one end, and distil them until no more smoke and water escape from the tube. Then put out the fire, and close the mouth with clay, until the cylinder cool. The barrels of old guns or pistols, may serve for this purpose; or the pieces of wood may be put into a pot not closely covered, and surrounded with live coals, until all smoke from the pot shall cease. Then remove the coals and closely lute the cover with clay, until the pot cool. Or pulverize some well burnt common charcoal, and then heat it in a covered crucible to a glowing red, till it cease to give out any inflammable vapour. It should be immediately secured in well stopped glass bottles, and in that way it may be preserved unimpaired for any length of time.

Charcoal is one of the greatest non-conductors of heat. This quality renders it applicable to a variety of economical purposes.

CARBONAS. *Carbonate.*

Is a generic name for the combinations of the carbonic acid, with earths, alkalies, and metallic oxyds.

The nature of these substances was totally unknown until the year 1756, when the genius of Dr. Black at once removed the veil, and displayed to his contemporaries a new and immense field, in which the most important discoveries might be made; and to their ardour in cultivating it, we are indebted for the present state of chemical knowledge.

Before the brilliant epoch we have mentioned, the carbonates were supposed to be simple bodies; and the facts of their ac-

quiring new and caustic properties by the action of fire, was attempted to be explained by supposing the particles of fire combined with them. Dr. Black, however, demonstrated by proofs that carried universal conviction along with them, that these bodies in their caustic state are simple, and that their mildness is owing to their being combined with an acid, to which the name of carbonic is now given.

The most general character of the carbonates, is their effervescing violently when any of the stronger acids are poured upon them. This phenomenon is owing to these acids displacing, by their greater affinity, the carbonic acid, which flies off in the form of gas.

The carbonates may be also deprived of the carbonic acid, either by the action of heat alone, or by heating them when mixed with charcoal, which decomposes the carbonic acid, by combining with part of its oxygen, so that both the acid and charcoal are converted into carbonic oxyd gas.

The carbonates may be divided into three great families: the alkaline, the earthy, and the metallic.

Family 1st. The alkaline carbonates have an acrimonious taste; tinge vegetable blues green, and are soluble in water, and insoluble in alcohol.

Family 2d. The earthy carbonates are insipid, and insoluble in water, but soluble in water saturated with carbonic acid.

Family 3d. The metallic carbonates scarcely differ in appearance from the metallic oxyds.

We shall have occasion immediately to notice some individuals of each of these families.

CARBONAS BARYTÆ. *Carbonate of Baryta.*

Carbonated baryta is rarely found in nature, and as it was first discovered by Dr. Withering, Mr. Werner gave it the name of Witherite.

Its colour is grayish white, sometimes inclining to milk white, and sometimes with a slight tinge of yellow. It is found in solid masses, sometimes filling an entire vein, sometimes interspersed with sulphated baryta, frequently rounded, or effecting that form, seldom crystallized. Although it has no sensible taste, it is poisonous; even in a small dose, it occasions dangerous symptoms. It is used for preparing the muriate of baryta, to which the reader is referred.

CARBONAS CALCIS. *Carbonate of Lime. Chalk.*

1. *Soft Carbonate of Lime, called Chalk.*
2. *Indurated Carbonate of Lime, called Marble.*

Of the two varieties of this article, the soft carbonate of lime, *Creta alba*, white chalk, is principally employed in medicine. This is a carbonate of lime found abundantly in nature; it always contains more or less agillaceous, and siliceous earths.

From the grosser impurities with which it is mixed, it is freed by levigation and washing. It is then termed prepared chalk, and is very commonly employed as an antacid. As the salt it forms with the acid in the stomach, has no purgative quality, it is the one commonly employed to check diarrhœa, proceeding from acidity. It is given in a dose of one or two drachms, with the addition of a small quantity of any aromatic. In pharmacy, it is employed for the preparation of carbonic acid gas, and of the muriate of lime.

CARBONAS POTASSÆ IMPURUS. *Impure Carbonate of Potash, called Pearl Ashes.*

The potashes of commerce are made by reducing large quantities of wood of any kind to ashes; this process is termed incineration. The ashes, which are of a blackish gray, or white colour, are next boiled in water, so as to form a strong lixivium or ley; which, after being strained, is evaporated in an iron vessel, almost to dryness. The saline matter which remains at the bottom, is then put into a crucible, and liquified over an intense heat, and poured out on iron plates, where it speedily cools, and assumes the form of concrete salt. This, however, being mixed with many impurities, is again burnt in a reverberatory furnace, and in this state, although not free from impurities, it receives the name of *pearl ashes*. This is the fixed vegetable alkali, and was formerly known in Pharmacopœias under the names of Sal Absinthii, Sal Tartari, &c. and by the London College, Kali. But, since the fixed vegetable alkali, from whatever vegetable it has been produced, is one and the same thing; those several terms as leading to error, have been with justice expunged, and the new chemical term *potassa*, universally adopted.

The best vegetable alkali is obtained from weeds, the ashes of which yield a larger proportion of salt, than most kinds of wood; and among these, wormwood is said to produce the largest quantity. This kind of salt, never preexists in the vegetable, but is always generated during the burning. These salts are acrid and caustic. They may be purified sufficiently, for pharmaceutical uses, by lixiviating them in cold water, and evaporating the ley to dryness in an iron pot.

Potassa is of extensive use in medicine, and particularly serviceable in complaints of the stomach and intestines, produced by acids. The medicinal virtues of this salt, are to attenuate the juices, resolve obstructions, and promote the natural secretions. A diluted solution of it, drank warm in bed, generally excites sweat; if that evacuation is not favoured, its sensible operation is by urine. When acidities abound in the first passages, this salt absorbs the acid, and unites with it, into a mild, aperient, neutral salt. As one of its principal effects is to render the animal fluids more thin; it is obvious, that where

they are already colliquated as in scurvies, and in all putrid disorders, in general this medicine is improper*.

The common dose of this salt is from two or three grains to a scruple, or even to a drachm. Its acrimony must, however, be sheathed with some mucilage, or largely diluted with watery liquors.

But potassa is more frequently employed in a neutralized state with the vegetable acids. It is of late employed in calculous complaints, but its continued use seldom fails to injure the constitution, or the intestinal canal.

It is applied externally as a stimulant to the inactive state of the vessels, in certain foul ulcers.

Dr. Mitchell recommends the use of potash cakes for children, to prevent the injurious effects of acidity in their stomachs, and mitigate the disorders to which their bowels are liable. He observes, that those children, who have been accustomed to eat cakes, a little tinctured with this excellent ingredient, grow fat and healthy.

CARBONAS SODÆ IMPURUS. *Impure Carbonate of Soda.*

The fixed mineral, or fossil alkali, called soda, is a very common mineral production. It is the basis of sea salt, and is found on the surface of the earth in Egypt, Syria, Barbary, &c. but the native production being found greatly inadequate to the consump-

* According to the theory of Dr. Mitchell, and other respectable writers in the United States, alkaline salts, both fixed and volatile, but more especially potash and soda, are the greatest detergents, or purifiers, which are known. They are capable of resisting the dangerous progress of the septic acid, abounding in pestilential or infectious air. Hence they are employed as the principal and active ingredient in soaps, and are signally active in the form of lixivia, or leys, in cleansing and purifying apartments in houses and ships, when infected with putrid exhalations. Alkalies, too, are the most powerful antiseptics with which we are acquainted. Potash and soda are remarkable for removing tainted and fœtid odours, and for keeping animal substances sweet, entire, and free from decay. They cleanse garments, and every thing else which is contaminated with common filth, infection, and contagion, which they neutralize, and render harmless. Alkalies are admirable remedies in fevers, and in dysentery. Administered by the mouth, they neutralize in their passage through the alimentary canal, the septic acid, which is the existing cause, and, injected in clysters, they allay tenesmus like a charm.

In both cases they mitigate pain, allay spasmodic action, and restore and equalize the peristaltic motion. They effectually destroy the fœtor and infection of the stools.

Alkalies are also excellent helps in surgery: many foul ulcers are very much benefitted by their application with the dressings, in weak, watery solution. Experiments have proved, that in foul and degenerate ulcers, of the common, as well as of the syphilitic, cancerous, and scrofulous kinds, the matter secreted on their surfaces, degenerates to a venomous acid: the propriety of alkaline dressings, therefore, will be instantly apparent.

These and other properties of alkalies, have been treated of in Dr. Mitchell's Essays, published in the several volumes of the Medical Repository of New York; where the reader will find a large body of evidence in favour of the antiputrid and antipestilential properties of alkalies, and of their virtues in curing various diseases.

tion of this article, in the arts and manufactures; it is now obtained by the incineration of marine plants, especially the Spanish Barilla, Kali, &c. These plants, after being dried, are thrown into a deep pit, where they are burnt. When the incineration is complete, the soda is found at the bottom, caked into a solid mass. When good, it is firm, heavy, dry, sonorous, spongy, and internally of a blue colour, mixed with white spots; does not deliquesce, emits no unpleasant smell on solution, and does not leave a large proportion of insoluble matter. In medicine, this salt possesses similar virtues with the carbonate of potash, and from its crystallizability and efflorescence when exposed to the air, it is preferable to it, because its dose may be more accurately ascertained, and may be given, either in the form of powder or pills. A solution of soda is an excellent gargle for cleansing the throat, mouth, and gums, both in a sound and a diseased state; while it whitens the teeth, and dissolves all incrustations that may have been formed on their surfaces, without injuring their enamel. A small quantity of this liquid occasionally swallowed, after washing the fauces, is said effectually to remove a foetid breath. Soda is also in many instances preferable to magnesia, for correcting acidity in the stomach.

CARBONAS ZINCI IMPURUS. *Impure Carbonate of Zinc.*

This mineral is found plentifully in England, Germany, and other countries, either in distinct mines, or intermingled with the ores of different metals. It is usually of a grayish, brownish, yellowish, or pale reddish colour. This mineral, formerly called *Lapis Calaminaris*, is generally roasted, before it comes into the shops, to render it more easily reducible into a fine powder. In this state it is employed in collyria, against defluctions of thin acrid humours upon the eyes, and is the basis of the common healing cerate.

CARUM CARUI. *Caraway.* The seeds.

This is an indigenous, biennial plant, cultivated in our gardens, both for medicinal and culinary uses. On account of their aromatic smell, and warm, pungent taste, the seeds of caraway may be classed among the finest stomachics and carminatives of our climate. To persons afflicted with flatulency, and liable to colics, if administered in proper quantities, they generally afford considerable relief, and may sometimes be used with advantage in tertian agues.

CASSIA FISTULA. *Cassia Tree.* The fruit.

This tree is indigenous in India and Egypt, and is cultivated in Jamaica. Its fruit is a cylindrical pod, scarcely an inch in diameter, a foot or more in length; the outside is a hard, brown bark; the inside is divided by thin, transverse, woody plates,

coverd with a soft black pulp, of a sweetish taste, with some degree of acrimony. This pulp, which dissolves, for the most part, both in water and rectified spirit, is a gentle laxative, and is frequently given in doses of several drachms, to persons of costive habits. In inflammatory complaints, it is sometimes administered in much larger doses, from one to two ounces, when acrid purgations are improper; though it is apt to nauseate the stomach, to produce flatulency, and griping; especially if the pulp be of an inferior kind, or spoiled by long keeping: these effects may, however, be obviated by the addition of aromatics, and by taking it in a liquid form.

There are several species of cassia in the United States. *Cassia Marilandica* is used in the southern states, as a purgative, and possesses nearly the same virtues as the senna of the shops.

CASSIA SENNA. *Senna.* The leaves.

This species of cassia is annual, although in its mode of growth, it resembles a shrub, and sends out hollow, woody stems, to the height of four feet. It is principally brought to us from Alexandria, in Egypt. The leaves, the only part in use, are of an oblong figure, sharp 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. Some inferior sorts of this drug are obtained from Tripoli, and other places; but they may be easily distinguished, as the latter is of a fresh green colour, without any yellow shade.

Senna is an useful purgative, operating mildly, though effectually; and at the same time promoting the secretion of urine. It is always given in the form of watery infusion, two or three drachms being infused in four or six ounces of water, with the addition of a few coriander seeds, to cover its flavour, and obviate griping. It is also frequently combined with manna, with tamarinds, or with acidulous tartrate of potash, to increase its action on the bowels. By decoction with water, the activity of senna is much impaired, if not destroyed.

CASSIA MARILANDICA. *American Senna.* The leaves.

This plant is abundant in America, and known by the name of senna, is of the same genus with the senna of the shops, and possesses nearly the same virtues as the eastern species. It is used as a purgative, in different parts of the United States, and, from the high price of foreign senna, deserves to be attended to. It is easily cultivated from the seeds, and ought to be generally introduced into our gardens.

CASTOR FIBER. *The Beaver.* The substance collected in the follicles, near the anus, called castor.

The beaver is an amphibious animal, which inhabits the northern parts of Europe, Asia, and America; in the banks of

rivers, or lakes, and at a distance from the habitations of men. Near the rectum of both sexes, there are two little bags, about the size of a hen's egg, containing a brownish oily matter, called *castor*, which is a peculiar deposition of fat, interwoven with cellular membrane. This substance has a disagreeable, narcotic smell, and a bitterish, acrid, nauseous taste. By drying it in the smoke of a chimney, it may be preserved seven or eight years. The best castor is brought from Russia, Prussia, and Poland; that procured in Canada, and New England, is of an inferior quality. That which is very old, quite black, and destitute of smell and taste, is unfit for medicinal use.

To preserve this drug from injury, it should be kept wrapt up in bladders or oiled-paper. Its active matter is dissolved by alcohol, proof spirit, and partially by water. The tincture made with diluted alcohol, is the least nauseous. Castor is an excellent antispasmodic, and acts particularly upon the uterine system. It is given with advantage in most spasmodic diseases, especially in hysteria and epilepsy. In powder, which is the most eligible form, it is exhibited in doses from ten to twenty grains, or from one to two drachms of the tincture.

CENTAUREA BENEDICTA. *Blessed Thistle.* The herb.

The *carduus benedictus* is an annual exotic plant, cultivated in gardens; it flowers in June and July, and produces ripe seeds in autumn.

The virtues of this plant, says Dr. Duncan, seem to be little known in the present practice. The nauseous decoction is sometimes used to provoke vomiting, and, a strong infusion, to promote the operation of other emetics. But excellent effects have been frequently experienced, from a slight infusion of *carduus*, in loss of appetite, where the stomach has been injured by irregularities. A stronger infusion, made in cold or warm water, if drunk freely, and the patient kept warm, occasions a plentiful sweat, and promotes the secretions in general.

CERA. *Wax.*

- a. Flava. *Yellow.*
- b. Alba. *White.*

For this useful substance, we are indebted to the common honey bee, by whom it is collected from the leaves and flowers of vegetables. It is formed into solid cakes by melting the combs, after all the honey has been expressed from them, in hot water. The best sort should be hard, compact, of a clear yellow colour, and an agreeable odour, similar to that of honey. Pure bees-wax, when recent, is tough, yet easily broken; by long keeping, it becomes harder, and more brittle, loses its fine colour, and, in some measure, its fragrance.

The yellow colour of bees-wax, and its peculiar smell, may be destroyed by the combined action of water, air, and the sun's rays. In the process for bleaching wax, we therefore extend

its surface as much as possible, by melting it, and forming it into thin plates, which are exposed to the sun's rays, and repeatedly moistened until they acquire the whiteness desired. White wax is more delicate, but in medicine, it has no advantage over yellow wax. When taken internally, wax agrees in its effects with the fat oils, and is preferable, in being less apt to become rancid. Its principal use, is for the formation of cerates, ointments, and plasters.

CERVUS ELAPHUS. *The Stag, or Hart.* The horns.

The horns of the common male, red deer, have long been considered as an article of Materia Medica. The scrapings, or raspings of these horns, are medicinal, and employed in decoctions, ptisans, or cooling drinks, &c. Hartshorn jelly is remarkably nourishing, and sometimes given as an agreeable demulcent, in cases of diarrhœa. The coal of hartshorn, which is prepared by exposing it to a strong and long continued fire, changes into a very white earth, called *calcined hartshorn*. It is employed as an absorbent, and likewise in dysenteries, which are supposed to arise from acrid and ill digested matter. These animal horns are to be considered of the same nature as bones; and their products by heat, are those of animal substances in general. They were formerly so much employed for the preparation of the volatile alkali (ammonia) that it was commonly called hartshorn.

CHENOPODIUM ANTHELMINTICUM. *Jerusalem Oak.* The herb and seeds.

This plant, a native of Buenos Ayres, and of various parts of the United States, is said to be an excellent vermifuge. The whole plant has a powerful smell, of which it is very retentive; the taste is bitter, with a good deal of aromatic acrimony. The whole plant may be employed. Sometimes the expressed juice is used in the dose of a table spoonful, for a child of two or three years old: more commonly, however, the seeds, emphatically called *wormseed*, are reduced to a fine powder, and made into an electuary with syrup. Of this, the dose for a child two or three years old, is a table spoonful early in the morning. The patient is to be kept without nourishment for some hours; after supper another dose is to be administered. It is often necessary to continue this course for several days, and great numbers of lumbrici are frequently discharged, after the use of a few doses of the medicine.

CHIRONIA CENTAURIUM. *Smaller Centaury.* The flowering heads.

This plant is annual, and grows wild in many parts of England, and other countries, chiefly on barren pastures. It agrees in every respect with other pure bitters. The chironia angu-

laris, common American centaury, is a native of the United States, and has the appearance of lesser centaury (*gentiana centaurium*). It is universally known by the name of centaury, and is deservedly esteemed as an highly medicinal, and very agreeable simple bitter.

It is used with great success in relaxations of the stomach, loss of appetite, and general debility. In sickly situations, an infusion of this plant, joined with *calamus aromaticus*, is commonly resorted to as an excellent medicine, taken in the morning as a preventive.

CINCHONA OFFICINALIS. *Officinal Cinchona.* The bark.

a. Communis. *The Common.*

b. Flava. *The Yellow.*

c. Rubra. *The Red.*

It is by no means ascertained, that the two last are the bark of the *cinchona officinalis*, but have been merely classed under it until we are better acquainted with their botanical history.

The tree affording this bark grows wild in the hilly parts of Peru. In the dry season, from September to November, the bark is stripped from the branches, trunk, and root, and after being carefully dried in the sun, is packed in skins. The name *Cinchona*, is derived from that of the lady of the Spanish viceroy, who was cured by the bark, in the year 1640. The discovery of its medicinal virtues was in all probability an accident, and on its first introduction into Europe, it was reprobated by many eminent physicians; and at different periods long after, it was considered a dangerous remedy; but its character, in process of time, became universally established.

The common pale bark is in the form of small quilled twigs, thin, breaking close and smooth, friable between the teeth, covered with a rough coat of a brownish colour, internally smooth and of a light brown; its taste is bitter, and slightly astringent; flavour lightly aromatic, with some degree of mustiness.

The yellow Peruvian bark has only been introduced since the year 1790. It approaches more to the yellow colour, than either of the others do; is in flat pieces, not convoluted like the pale; nor dark coloured, like the red; externally smooth, internally of a light cinnamon colour; friable, and fibrous; has no peculiar odour different from the others; but a taste incomparably more bitter, with some degree of astringency.

The red Peruvian bark is in large thick pieces, externally covered with a brown rugged coat, internally more smooth and compact, but fibrous; of a dark red colour, taste and smell similar to that of the pale, but the taste rather stronger. Its powder is reddish, like that of Armenian bole; its astringency and bitterness are more intense, and it contains more resin than the pale bark. It also produces its effects in smaller doses; but it is said to be more frequently adulterated.

Practitioners have differed much with regard to the mode of operation of the Peruvian bark. Some have ascribed its virtues entirely to a stimulant power. But while the strongest and most permanent stimuli have by no means the same effect with bark in the cure of diseases, the bark itself shows hardly any stimulant power, either from its action on the stomach, or on other sensible parts to which it is applied. From its action on the dead animal fibre, there can be no doubt of its being a powerful astringent; and from its good effects in certain cases of disease, there is reason to presume that it is a still more powerful tonic. To this tonic power some think that its action, as an antiseptic, is to be entirely attributed; but that, independently of this, it has a very powerful effect in resisting the septic progress to which animal substances are naturally subjected, appears beyond all dispute, from its effects in resisting putrefaction, not only in dead animal solids, but even in animal fluids, when entirely detached from the living body.

But although it be admitted that the Peruvian bark acts powerfully as an astringent, as a tonic, and as an antiseptic, yet these principles will by no means explain all the effects derived from it in the cure of diseases. And accordingly from no artificial combination in which these powers are combined, or in which they exist even to a higher degree, can the good consequences resulting from Peruvian bark be obtained. Many practitioners, therefore, are disposed to view it as a specific. If, by a specific, we mean an infallible remedy, it cannot indeed be considered as entitled to that appellation; but as far as it is a very powerful remedy, of the operation of which no satisfactory explanation has yet been given, it may with great propriety be denominated a specific. But, whatever its mode of operation may be, there can be no doubt that it is daily employed with success in a great variety of diseases.

It was first introduced for the cure of intermittent fevers; and in these, when properly exhibited, it rarely fails of success. Practitioners, however, have differed with regard to the best mode of exhibition; some prefer giving it just before the fit, some during the fit, others immediately after it. Some, again, order it in the quantity of an ounce, between the fits; the dose being the more frequent and larger according to the frequency of the fits; and this mode of exhibition, although it may perhaps sometimes lead to the employment of more bark than is necessary, we consider as upon the whole preferable, from being best suited to most stomachs. The requisite quantity is very different in different cases; and in many vernal intermittents it seems even hardly necessary.

It is now given from the very commencement of the disease, without previous evacuations; which, with the delay of the bark, or under doses of it, by retarding the cure, often seem to induce abdominal inflammation, scirrhus, jaundice, hectic, dropsy, &c. symptoms formerly imputed to the premature or intemperate use of the bark, but which are best obviated by its early and liberal use. It is to be continued not only till the paroxysms

cease, but till the natural appetite, strength, and complexion return. Its use is then gradually to be left off, and repeated at proper intervals to secure against a relapse; to which, however unaccountable, there often seems to be a peculiar disposition; and especially when the wind blows from the east. Although, however, most evacnants conjoined with the Peruvian bark in intermittents are rather prejudicial than otherwise, yet it is of advantage, previous to its use, to empty the alimentary canal, particularly the stomach; and on this account, good effects are often obtained from premising an emetic.

It is a medicine which seems not only suited to both formed and latent intermittents, but to that state of fibre, on which all rigidly periodical diseases seem to depend; as periodical pain, inflammation, hæmorrhagy, spasm, cough, loss of external sense, &c.

Bark is now used by some in all continued fevers; at the same time attention is paid to keep the bowels clean, and to promote, when necessary, the evacuation of redundant bile; always, however, so as to weaken the patient as little as possible.

In confluent small pox, it promotes languid eruption and supuration, diminishes the fever through its whole course, and prevents or corrects putrescence and gangrene.

In gangrenous sore throats, it is much used, as it is externally and internally in every species of gangrene.

In contagious dysentery, after due evacuation, it has been used, taken internally and by injection, with and without opium.

In all those hæmorrhagies called passive, and which it is allowed all hæmorrhagies are very apt to become, and likewise in other increased discharges, it is much used; and in certain undefined cases of hæmoptysis, some allege that it is remarkably effectual when joined with an absorbent.

It is used for obviating the disposition to nervous and convulsive diseases; and some have great confidence in it, joined with sulphuric acid, in cases of phthisis, scrofula, ill conditioned ulcers, rickets, scurvy, and in states of convalescence.

In these cases, notwithstanding the use of the acid, it is proper to conjoin it with a milk diet.

In dropsy, not depending on any particular local affection, it is often alternated or conjoined with diuretics or other evacnants; and by its early exhibition after the water is once drawn off, or even begins to be freely discharged, a fresh accumulation is prevented, and a radical cure obtained.

Mr. Pearson, of the Lock Hospital, praises very highly the powers of this remedy in different forms of the venereal disease; in reducing incipient bubo, in cleansing and healing ulcers of the tonsils, and in curing gangrenous ulcers from a venereal cause. But in all these cases mercury must also be given to eradicate the venereal virus from the system.

Peruvian bark may be exhibited,

1. In substance.

The best form of exhibiting this valuable remedy is in the state of a very fine powder, in doses of from ten grains to two

drachms and upwards. As it cannot be swallowed in the form of a dry powder, it must either be diffused in some liquid, as water, wine, or milk; or mixed with some viscid substance, as currant jelly. Its taste, which is disagreeable to some people, is best avoided by taking it immediately after it is mixed up; for by standing any time, it is communicated to the vehicle. In this respect, therefore, it is better for the patients to mix it up themselves than to receive it from the apothecary already made up into a draught with some simple distilled water, or into an electuary with a syrup. A much more important objection to this form of giving Peruvian bark is, that some stomachs will not bear it, from the oppression and even vomiting which in these cases it excites. We must endeavour to obviate this inconvenience by the addition of some aromatic, and by giving it in small doses more frequently repeated. *If we are unable to succeed by these means, we must extract the most active constituents of the bark by means of some menstruum. It has therefore long been a pharmaceutical problem, what menstruum extracts the virtues of Peruvian bark the best. But the active constituents of this remedy, according to the best and latest analysis, are bitter extractive, tannin, and gallic acid, combined with some mucilage and resin. Of these, the two last are not soluble in any one menstruum; but they most probably contribute very little to the powers of the medicine. The three other constituents, on the contrary, on which all its activity depends, taken singly, are all of them very soluble both in water and in alcohol, and in every mixture of these. But it would be contrary to analogy to suppose, that these substances should exist so intimately mixed as they must be in an organic body, without exerting upon each other some degree of chemical affinity, and forming combinations possessed of new properties. Accordingly we find, whether it arise from this cause, or merely from the state of aggregation, that neither water nor alcohol extracts these constituents from Peruvian bark in the same quantity in which they are able to dissolve them separately, and that we must have recourse to direct experiment to determine the degree of action possessed by each menstruum upon it. With this view many experiments have been made, and by very able chemists. But most of them were performed when the science of chemistry was but in its infancy; and even at this time that branch of it which relates to these substances is so little understood, that the results of the late experiments are far from conclusive.

2. In infusion.

To those whose stomachs will not bear the powder, this is the best form of exhibiting Peruvian bark. Water, at a given temperature, seems capable of dissolving only a certain quantity, and, therefore, we are not able to increase the strength of an infusion, either by employing a larger quantity of the bark, or allowing it to remain longer in contact. One part of bark is sufficient to saturate sixteen of water in the course of an hour or two. To accelerate the action of the water, it is usual to pour it boiling hot upon the bark, to cover it up, and allow it to cool slowly.

After standing a sufficient length of time, the infusion is decanted off for use. The infusion in water is however liable to one very great objection, that it cannot be kept even a very short time without being decomposed and spoiled. Therefore, in some instances, we prepare the infusion with wine; and it fortunately happens that very often the use of the menstruum is as much indicated as that of the solvent.

3. In tincture.

The great activity of the menstruum in this preparation, prevents the bark from being given in sufficiently large doses to exert its peculiar virtues. It is, however, a powerful stimulant.

4. In decoction.

Water of the temperature of 212° is capable of dissolving a much larger proportion of the soluble parts of Peruvian bark than water at 60° . But the solvent powers even of boiling water have their limits, and by protracting the decoction we do not increase its strength, but rather, by diminishing the quantity of the menstruum, we lessen the quantity of the matter dissolved. Besides, at a boiling temperature, extractive absorbs oxygen rapidly from the atmosphere, and is converted into what seems to be an insoluble and inert resinous substance.

5. In extract.

In this preparation we expect to possess the virtues of Peruvian bark in a very concentrated state. The principal objections to its use are its great expense, and the decomposition and destruction of the active constituents of the bark during the preparation, when not properly conducted. It is convenient for the formation of pills and boluses, but we would always prefer a fresh infusion or decoction to any mixture in which the extract is redissolved.

Externally, Peruvian bark is used in substance, as an application to ill-conditioned, carious, or gangrenous ulcers.

In the form of clyster, it may be given in substance, decoction, or extract. The powder is used as a tooth powder for spongy and bleeding gums, and the decoction is an excellent astringent gargle or wash.

To increase the power of Peruvian bark, or to direct its efficacy to a particular purpose, or to correct some inconveniences occasionally produced by it, it is frequently combined with other remedies. When it produces vomiting, carbonic acid forms a useful addition; when it purges, opium; when it oppresses the stomach, aromatics; and when it induces costiveness, rhubarb. It may be also combined with other vegetable astringent or bitter remedies, without impairing its powers. But we are afraid that many additions are made, chiefly saline substances, of which the effects are not at all understood. Sulphuric acid, super-sulphate of alumina and potash (alum), muriate of ammonia, carbonate of potash, tartrate of potash, tartrate of antimony and potash (tartar emetic), iron, lime-water, &c. have been frequently prescribed with it; but we know that in many of these mixtures decomposition occurs, which renders the whole either inactive, or completely deceives us with regard to its expected effects.

In addition to Dr. Duncan's observations relative to this important article, the following taken from Murray will not be deemed superfluous.

The effects of Peruvian bark are those of a powerful and permanent tonic, so slow in its operation that its stimulating property is scarcely perceptible by any alteration in the state of the pulse, or of the temperature of the body. In a large dose, it occasions nausea and headach; in some habits it operates as a laxative; in others it occasions costiveness.

It is one of those medicines, the efficacy of which in removing disease is much greater than could be expected a priori, from its effects on the system in a healthy state.

Intermittent fever is the disease for the cure of which bark was introduced into practice, and there is still no remedy which equals it in power.

The disputes respecting the mode of administering it are now settled. It is given as early as possible, with perhaps the previous exhibition of an emetic to evacuate the stomach; it is repeated in the dose of one scruple or half a drachm every second or third hour, during the interval of the paroxysm; and it may even be given with safety during the hot fit, but it is then more apt to excite nausea.

In remittent fever it is given with equal freedom, even though the remission of the fever may be obscure.

In those forms of continued fever which are connected with debility, as in typhus, cynanche maligna, confluent small-pox, &c. it is regarded as one of the most valuable remedies. It may be prejudicial, however, in those diseases where the brain or its membranes are inflamed, or where there is much irritation, marked by subsultus tendinum, and convulsive motions of the extremities; and in pure typhus it appears to be less useful in the beginning of the disease than in the convalescent stage.

Even in fevers of an opposite type, where there are marks of inflammatory action, particularly in acute rheumatism, bark has been found useful, after blood-letting.

In erysipelas, in gangrene, in extensive suppuration, and venereal ulceration, the free use of bark is of the greatest advantage.

In the various forms of passive hæmorrhagy, in many other diseases of chronic debility, dyspepsia, hypochondriasis, paralysis, rickets, scrofula, dropsy, and in a variety of spasmodic affections, epilepsy, chorea, and hysteria, it is administered as a powerful and permanent tonic, either alone, or combined with other remedies suited to the particular case.

Its usual dose is half a drachm. The only inconvenience of a larger dose is its sitting uneasy on the stomach. It may, therefore, if necessary, be frequently repeated, and in urgent cases may be taken to the extent of one ounce, or even two ounces, in twenty-four hours*.

* In a case of mortification, Dr. Philip Syng Physick, of Philadelphia, exhibited bark to the quantity of from six to eight ounces in twenty-four hours, without its exciting any very unpleasant sensations.

The powder is more effectual than any of the preparations ; it is given in wine, in any spiritous liquor, or, if it excite nausea, combined with an aromatic. The cold infusion is the least powerful, but most grateful ; the decoction contains much more of the active matter of the bark, and is the preparation generally used when the powder is rejected ; its dose is from two to four ounces. The spiritous tincture, though containing still more of the bark, cannot be extensively used on account of the menstruum, but is principally employed occasionally, and in small doses of two or three drachms, as a stomachic.

The extract is a preparation of considerable power, when properly prepared, and is adapted to those cases where the remedy requires to be continued for some time. It is then given in the form of a pill, in a dose from five to fifteen grains.

When children cannot take the bark, it may be applied in the form of a quilted waistcoat with complete success.

CINCHONA CARIBÆA. *Cinchona of the Caribbean Islands.* The bark.

This species belonging to the same genus, a native of the Caribbee Islands, has been proposed as a substitute to Peruvian bark, and has, as such, been received into the Edinburgh Pharmacopœia. The bark comes in pieces about a span in length, rolled together, and a line or half a line in thickness, of a brown colour on the surface, which is most commonly covered with white moss. It has at first a sweetish taste, but after being chewed some time it becomes extremely nauseous and bitter. Dr. Wright says he made use of this bark in all cases where Peruvian bark was indicated, and with the greatest success.

CITRUS AURANTIUM. *Seville Orange.* The juice of the fruit and its external rind.

The juice of oranges is a grateful acid liquor, consisting principally of citric acid syrup, extractive, and mucilage ; of considerable use in febrile or inflammatory distempers, for allaying heat, quenching thirst, and promoting the salutary excretions ; it is likewise of use in genuine scorbutus, or sea scurvy. The china, or sweet orange, is to be preferred, as being more mild and less acid ; and it is employed in its most simple state with great advantage, both as a cooling medicine, and as an useful antiseptic in fevers of the worst kind. The outer yellow rind of the fruit of the orange has a grateful aromatic flavour, and a warm bitterish taste. Both are extracted by water ; and by distillation, a small quantity of essential oil is obtained. Its qualities are those of an aromatic and bitter. It has been employed to restore the tone of the stomach, and is a very common addition to combinations of bitters used in dyspepsia. It has likewise been given in intermittents, in a dose of a drachm twice or three times a day.

CITRUS MEDICA. *Lemon Tree.* The fruit, the rind of the fruit, and its volatile oil.

The juice of lemons is similar to that of oranges, from which it differs little otherwise, than in containing more citric acid, and less syrup. The quantity of the former is indeed so great, that the acid has been named from this fruit, acid of lemons, and is commonly prepared from it.

Lemon juice is one of the most cooling and antiseptic vegetable productions; and is of great utility in medicine. Sir John Pringle highly praises its efficacy in the sea scurvy; and it affords a grateful and cooling beverage for febrile patients; but it should be remarked, that this acid must never be freely given to persons whose breast, or respiration is affected. Citric acid is a powerful and agreeable antiseptic. Its powers are much increased, according to Dr. Wright, by saturating it with muriate of soda. This mixture he recommends as possessing very great efficacy in dysentery, remittent fever, the dry bellyach, putrid sore throat, and as being perfectly specific in diabetes and lien-teria. Citric acid is often used with great success for allaying vomiting; with this intention it is mixed, with carbonate of potash, from which it expels the carbonic acid with effervescence. This neutral mixture should be drunk as soon as it is made, or the carbonic acid gas, on which actually the anti-emetic powers of this mixture depend, may be extricated in the stomach itself, by first swallowing the carbonate of potash, dissolved in water, and drinking immediately afterwards the citric acid properly sweetened. The doses are about a scruple of the carbonate dissolved in eight or ten drachms of water, and an ounce of lemon juice, or an equivalent quantity of citric acid.

Lemon juice is also an ingredient in many pleasant refrigerant drinks, which are of very great use in allaying febrile heat and thirst. Of these the most generally useful is lemonade, or elicited lemon juice, properly sweetened. Lemonade, with the addition of a certain quantity of any good ardent spirit, forms the well known beverage, punch, which is sometimes given as a cordial to the sick. The acid of lemons is a known antidote against narcotic vegetable poisons, and among these in particular against opium. It has therefore been recommended that with every dose of opium a proportion of this acid in the quantity of two ounces to the grain, should be taken, by which means the uneasiness which that drug often communicates will be prevented, and its distressing consequences avoided. Hence the use of acids, to persons who are habitually obliged to take considerable doses of opiates, cannot be too strongly recommended. To the liberal use of vegetable acids are to be ascribed the slight effects which opium possesses over the Eastern nations, and not to the influence of coffee, as commonly alleged.

Either of the following methods is recommended for preserving the juice of lemons, or limes. Boil the juice after straining it, and bottle it; or squeeze the fruit; put the juice and pulp into a bottle; cover the top with an inch of oil; cork and rosin

the bottle. The juice is supposed to feed upon the pulp. Before using the juice, the pulp and oil must be carefully taken out.

The yellow peel is an elegant aromatic, and is frequently employed in stomachic tinctures, and infusions; it is considerably less hot than orange peel, and yields in distillation with water a less quantity of essential oil; its flavour is nevertheless more perishable, yet does not arise so readily with spirit of wine; for a spiritous extract made from lemon peel possesses the aromatic taste and smell of the subject in much greater perfection than an extract prepared in the same manner from the peels of oranges. In the shops a syrup is prepared from the juice, and the peel is candied; the peel is an ingredient in the bitter infusions and wines; the essential oil enters the volatile aromatic spirit, or spiritus ammoniæ compositus, as it is now called, and some other formulæ.

COCCUS CACTI. *Cochineal.*

Cochineal is a small, irregular, roundish body, of a dark red colour on the outside, and a deep bright red within. It consists of an insect which derives its nourishment from the leaves of the *cactus cochinillifer*, or, as it is differently called, *nopal*, or *nopelleca*. This plant is found most abundantly in Mexico, and other parts of New Spain; and from its leaves cochineal insects are collected, and killed either by being immersed in hot water, or put into an oven moderately heated, or more advantageously, by being exposed to the scorching rays of the sun. These singular insects in their successive generations, are taken by the Mexicans three times in a year, carefully preserving over the winter in their houses such as may be necessary for breeders, while attached to the succulent leaves of the plant. No less than 800,000 pounds, each pound containing at least 70,000 insects, are imported annually into Europe, as a highly valuable colouring drug. They are principally consumed by the scarlet dyers, and for the purpose of making carmine. The best sort has been sold for one guinea the pound. It is remarkable that the dried insect may be kept unimpaired for an indefinite length of time.

The true cochineal has been found in South Carolina, and Mr. K. Peal of Philadelphia asserts, that he has discovered it upon the Island of Little St. Simons, on the coast of Georgia. It is extremely desirable that the insect, and the cactus cochenillifer plant on which it breeds, should be cultivated in the southern states. The planter might find it a valuable source of revenue, when, from vicissitudes in the season, their crops of rice or cotton should fail.

Cochineal is not employed in medicine, except for the purpose of imparting a beautiful red colour to some tinctures. Their colour is easily extracted, both by alcohol and water.

“*Cochineal* flourishes on the native nopal, or prickly pear of South Carolina. The insect thrives well, and increases and spreads on every leaf rapidly.

"The breeding of the cochineal is, however, attended with precarious circumstances; the insect is exposed to a variety of dangers from the violence of the winds, the rains, fogs, frosts, and other causes, and also from the depredations of birds, who are very fond of these insects."

Rees' Cyclo.

COCOS BUTYRACEA. *The Mackaw Tree. Palm Tree.* The fixed oil of the nut, commonly called Palm Oil.

This oil is obtained from the kernel of the fruit of the palm tree; which is imported from the West Indies, whither the tree has been transplanted from Africa. It is of an orange colour, and of the consistence of ointment, emitting a strong agreeable odour, but having very little taste; both of which it entirely loses by long keeping, when it becomes unfit for use. It is chiefly employed externally, for mitigating pains, cramps, and similar affections: it is likewise used for the cure of chilblains, and, if early applied, has often proved successful. With camphor, palm oil makes a common, and very excellent liniment of the stimulating kind. Muriated ammonia, (sal ammoniac) in very fine powder, rubbed with camphorated palm oil, forms one of the most active and valuable liniments, as a discutient to indolent tumors, rigidity of the tendons, &c.

COCHLEARIA ARMORACIA. *Horse Radish.* The leaves and root.

An indigenous perennial plant, growing on the sides of ditches, the banks of rivers, and other damp places, flowering in the month of May. For medicinal and culinary uses, it is also cultivated in gardens. Horse radish root has a quick pungent smell, and a penetrating acrid taste; it nevertheless contains in certain vessels a sweet juice which sometimes exudes upon the surface. By drying, it loses its acrimony; but if kept in a cool place, covered with sand, it retains its qualities for a considerable time.

The medicinal effects of this root are to stimulate the solids, and promote the fluid secretions; it seems to extend its action through the whole habit, and affect the minutest glands. It is greatly recommended by Sydenham in dropsies, particularly such as succeed intermittent fevers. In paralytic complaints horse radish has sometimes been applied with advantage as a stimulating remedy to the parts affected. When steeped in vinegar during a fortnight, this root is said effectually to remove freckles in the face. A syrup made by boiling scraped horse radish in brown sugar, is an excellent remedy in the decline of colds and of pleurisies, to promote expectoration, and remove hoarseness.

COCHLEARIA OFFICINALIS. *Garden Scurvy Grass.* The plant.

This is an annual plant growing on the sea shore, and in mountainous situations, and is sometimes cultivated in gardens. It possesses a considerable degree of acrimony, and by distilla-

tion it affords an essential oil, the smell of which is so strong as to make the eyes water.

The fresh plant is a gentle stimulant and diuretic, and is chiefly used for the cure of the sea scurvy. It is employed externally as a gargle in sore throat, and scorbutic affections of the gums and mouth. It may be eaten in substance to any quantity, or the juice may be expressed from it, or it may be infused in wine or water, or its virtues may be extracted by distillation. Dr. Withering says it is a powerful remedy in the pituitous asthma, and in what Sydenham calls the scorbutic rheumatism. The juice is prescribed along with that of oranges, by the name of antiscorbutic juice.

COFFEA. *The Coffee Tree.* The fruit.

A shrub from twelve to eighteen feet high, originally a native of Arabia, but is now cultivated in the East and West-Indies, and in several parts of America. The Arabian, or Mocha coffee, imported from the Levant, is far the most aromatic and resinous, and, on account of its superior flavour, is the most esteemed. Very various have been the opinions entertained by different physicians relative to the medicinal qualities of the coffee-berry; some inveighing against its use as a pernicious indulgence, others, on the contrary, are as vehement in its praise. It has been suspected of producing palsies; and Dr. Percival assures us, from his own observations, that the suspicion is not, altogether, without foundation. According, however, to the experiments, and, in the language of the same respectable author, coffee is slightly astringent and antiseptic; it moderates alimentary fermentation, and is powerfully sedative. Its medicinal qualities seem to be derived from the grateful sensation it produces on the stomach, and from the sedative powers it exerts on the *vis vitæ*. Hence it assists digestion, and relieves the headach; but in delicate habits it often occasions watchfulness, tremours, and many of those complaints denominated nervous.

The celebrated Sir John Pringle, bestows high encomiums on coffee, as a remedy in paroxysms of the periodic asthma. He directs the best Mocha coffee, newly burnt, and made very strong immediately after grinding it, an ounce to one dish, without milk or sugar, to be repeated after the interval of a quarter or half an hour, until relief be obtained. We are assured also, that Sir John Floyer, during the latter year of his life, kept free from, or lived easy under this afflictive complaint, by the use of strong coffee.

With respect to the medicinal properties of coffee, says Dr. Willich, it is in general excitant and stimulating, though we doubt whether it relax the animal fibres, as has by some authors been supposed. Its more or less wholesome effect greatly depends on the climate, as well as the age, constitution, and other peculiarities of the individual. Hence it cannot be recommended to children, or persons of a hot, choleric, nervous, or phthisical habit; nor will it be so useful in warm, as in cold and temperate

climates ; but to the phlegmatic and sedentary, a cup of coffee, one or two hours after a meal, or, which is still better, one hour before it, may be of service to promote digestion, and prevent or remove a propensity to sleep. In cases of spasmodic asthma, hypochondriasis, scrofula, diarrhoea, agues, and particularly against narcotic poisons, such as opium, hemlock, &c. coffee often produces the best effects : nor is there a *domestic* remedy, better adapted to relieve periodical headaches which proceed from want of tone, or from debility of the stomach.

The heaviness, headach, giddiness, sickness, and nervous affections, which attack some persons in the morning, after taking an opiate at night, are abated by a cup or two of strong coffee.

COLOMBA. *Colomba*. The root.

Of the plant which furnishes this root, no botanical account has been obtained. It is brought from the town of Colombo in the island of Ceylon, in round pieces ; the sides covered with a bark ; the woody part of a bright yellow colour : It has an aromatic smell, and a bitter taste. It yields its bitterness to water, but proof spirit is its proper menstruum. The Colomba-root is a powerful antiseptic and bitter ; it is used with much advantage in affections of the stomach and intestinal canal, accompanied with redundance of bile ; it is also employed successfully in dyspepsia. Nor is it attended with any heating effect, and it may therefore be advantageously taken in pulmonary consumption and other hectic cases, both with a view to correct acrimony and strengthen the digestive organs. Its dose is half a drachm of the powder, which in urgent cases may be repeated every third or fourth hour. The use of this valuable drug has been particularly recommended to the attention of practitioners by Dr. Percival of Manchester, in his experimental essays ; and it has been found to answer expectation ; but it is to be regretted that it is not so regularly imported as to admit of our shops being supplied with it of good quality, it being frequently found either in a decayed or adulterated state. It has been discovered in the vicinity of the Ohio river in large quantities, and is said to be of an excellent quality.

CONIUM MACULATUM. *Hemlock*. *Cicuta*. The leaves and seeds.

This is a large biennial umbelliferous plant, which grows very commonly about the sides of fields and hedges, and in moist shady places. The root is white, long, of the thickness of the finger, contains when it is young a milky juice, and resembles both in size and form, the carrot. In the spring it is very poisonous, in harvest less so. The stalk is three, four, and often six feet high, hollow, smooth, and marked with red or brown spots. The leaves are large, and of a dark green colour, having a faint disagreeable smell, resembling the urine of a cat. The seeds are inferior in strength. The whole plant is a virulent poison, but varying very much in strength according to circumstances. When taken in an over dose, it produces vertigo, dimness of

sight, difficulty of speech, nausea, putrid eructations, anxiety, tremors, and paralysis of the limbs: to which may be added dilatation of the pupils, delirium, stupor, and convulsions. But the internal use of this narcotic medicine was introduced by Dr. Stork, who found that in small doses, it might be given with safety. He recommended it particularly in scirrhus and in cancerous sores, in which it received a very extensive trial. While its inefficacy towards effecting a radical cure is established, its utility as a palliative medicine is generally admitted. It has likewise been found serviceable in scrofulous and venereal ulcerations, cutaneous affections, glandular tumors, chronic rheumatism, and various other diseases. In open cancer it often abates the pains, and is free from the constipating effects of opium. The dose is two or three grains of the powdered leaves, or one or two grains of the inspissated juice. It requires to be increased, in general, to a very considerable extent: at the same time, this must be done with caution, as both the dried leaves and inspissated juice are variable in their strength. In some cases the former have been increased to upwards of two ounces a day without producing giddiness. Dr. L. Valentine has furnished the public with a remarkable case at St. Domingo, of an inveterate disease of the bladder, attended by tetters and erysipelas, in which he prescribed the latter from six or eight grains to a drachm, and afterwards to three drachms per day. At the end of one year his patient had taken the quantity of four pounds; by which a radical cure was effected.* In this and in other well attested instances, salivation was induced by the use of hemlock.

The dried leaves are less liable to injury from keeping, than the inspissated juice. The leaves should be collected in the month of June when the plant is in flower, and its peculiar smell strong. The drying of the leaves should be performed quickly before a fire on tin plates, and the powder should be kept in phials closely stopped and secluded from the light, for this soon dissipates the green colour, and with it the virtues of the medicine. The proof of the drying having been well performed is the powder's retaining the odour of the leaves, and the deepness and freshness of the colour. Dr. Joshua Fisher, a highly respectable and intelligent physician of Beverly, has experienced the beneficial effects of *cicuta* in a variety of cases of scrofulous affections of the abdominal viscera, and in phthisis pulmonalis. But in the hands of this accurate observer, *cicuta* has been found remarkably successful, as a remedy in jaundice occasioned by spasmodic contraction of the biliary ducts. He adduces a variety of instances in which the antispasmodic powers of this medicine were happily demonstrated, and cures completely effected.

CONVOLVULUS SCAMMONIA. *Scammony*. The gum resin.

This is a concrete gummy-resinous juice obtained from the roots of the *convolvulus scammonia*, or Syrian bind weed, an ex-

* (Med. Repository.)

otic plant growing in Asiatic Turkey. The best scammony is imported from Aleppo, in light, spongy, friable masses, of a shining blackish ash colour. It possesses a faint unpleasant smell, and a bitterish pungent taste. It consists of resin and gum, in general nearly in equal proportions. In its medicinal effects, scammony is an efficacious but violent purgative, employed chiefly in obstinate constipation. If triturated with sugar, almonds, or gum arabic, it becomes sufficiently mild, and safe in its operation. It may also be dissolved in a strong decoction of liquorice, in which form it is not disagreeable to the palate, and proves a gentle laxative. The common dose is from three to twelve grains. The true scammony plant has lately, it is said, been found in Sussex county, New Jersey ; but with what prospect of its being productive, is not ascertained.

CONVOLVULUS JALAPA. *Jalap.* The root.

The dried root of Jalap is imported from New Spain in thin transverse slices ; solid and heavy, of a dark gray colour, and striated texture. It has little smell, its taste is bitter and sub-acrid. The medicinal activity of Jalap resides principally if not wholly in the resin, which, though given in small doses, occasions violent griping. The gummy part bears an inconsiderable proportion to the resinous, and is found to have little or no cathartic power ; but as a diuretic it is extremely active. That Jalap is an efficacious and safe purgative, daily experience must evince ; and, except when given in very large doses, it is not heating to the system. If triturated with hard sugar it becomes in moderate doses a safe medicine for children, which in this form they will readily receive, as the Jalap itself has very little taste. Jalap in large doses, or when combined with mild muriate of mercury (calomel), is recommended as an anthelmintic and a hydragogue. The dose of the simple powder is commonly from one scruple to two, but its efficacy is considerably increased by the addition of crystals of tartar. Dr. Rush's celebrated purgative in yellow fever, consists of ten grains of Jalap and ten of calomel, but double the quantity of the former has been found to be a more suitable proportion.

CONVOLVULUS PANDURATUS. *Wild Potatoe.* The root.

This is supposed by professor Barton, to be the mechameck, or wild rhubarb of some of our Indians. In the state of Delaware it is called wild-potatoe-vine ; and the root kussander or kassader, (a corruption of the word cassada.) From one of our species of convolvulus, an extract has been procured, but little if any inferior to the scammony of the shops. In Virginia, and some other parts of the United States, the root of this plant has been much recommended in cases of gravel. It is used either in powder or in decoction. Dr. Harris, of New Jersey, has found an infusion, or decoction of the root, very useful in his own case.

He is persuaded, that it has enabled him to pass the calculi renales with much facility.

CORNUS FLORIDA. *Common dogwood. Box-wood.* The fruit and bark.

This is one of our most beautiful, and useful shrubs, growing in almost every part of the United States. In the New England States it is well known by the name of box-wood. It grows in swampy situations, and flowers very early in the spring, and with so much regularity, that some of our southern tribes were accustomed to name the spring season from its flowering. The ripe fruit or berries infused in spirits or brandy make an agreeable bitter. The bark, both of the stem and root, is considerably astringent, and has long been employed in intermittent fevers. And as possessing properties nearly allied to the Peruvian bark, this and the following article will probably be found excellent substitutes.

CORNUS SERICEA. *Red Willow. Swamp-dogwood. Blue-berried dogwood. Sgaw-wood.* The bark.

The leaves are ovate, ferruginous, silky underneath; it grows about six feet high, with an upright, round-branched gray stem; the shoots are of a very fine red colour in winter, and said to furnish our Indians with a beautiful red dye; the bunches of white flowers which come out in August and September, and grow at the extremity of every branch, give to this shrub a very elegant appearance. Both these American species of Cornel are found, by experiments instituted by Dr. John M. Walker, to possess the same ingredients with cinchona. The *cornus florida* possesses most of the gum, mucilage, and extract; the *sericea* the next, which appears to be an intermediate between the *florida* and *cinchona*, while the latter possesses most of the resin. The virtues appear equally similar in their residence. The extract and resin possess all their active virtues. The extract appears to possess all their tonic powers. The resin, when perfectly separate from the extract, appears to be purely stimulant. The bark of *cornus sericea* forms a beautiful tincture with proof spirit, which has been found useful in the latter stages of diarrhœa unaccompanied with fever. This and the powdered bark of both species, are well deserving a place in the apothecaries' shops, as valuable additions to our *Materia Medica*. The industrious and learned professor Barton says, "I believe, however, that it may with entire safety be asserted, that as yet we have not discovered within the limits of the United States, any vegetables which have been found so effectual to answer the purpose of the *Peruvian bark* in the management of intermittent fever, as the *cornus florida* and *cornus sericea*."

These articles have already attracted the attention of medical practitioners in the United States, many of whom have vouched for their astringent and tonic powers, as being little if any thing

inferior to those of *cinchona officinalis*. If our native productions are adequate to our exigencies, let expensive exotics be rejected.

COPAIFERA OFFICINALIS. *Copaiva tree.* The liquid resin, called balsam of copaiva.

The tree which produces the balsam copaiva is a native of the Spanish West Indies, and of some part of the continent of South America. It grows to a large size, and the resinous juice flows in considerable quantities from incisions made in the trunk. It is thick and tenacious, with a yellowish tinge, has a peculiar not disagreeable smell, and a pungent bitter taste. It is soluble in alcohol and in expressed and essential oils. Distilled with water it affords nearly half its weight of an essential oil, an insipid resin being the residuum.

Balsam of copaiva increases the urinary discharge, and communicates to the urine a violet odour. In too large a dose, it excites inflammation of the urinary passages. From its power of stimulating these parts, it frequently proves successful in the cure of gleet. It has also been given in leucorrhœa and in hæmorrhoidal affections with advantage. It is an useful corroborating detergent medicine. It strengthens the nervous system, tends to loosen the bowels; and in large doses proves purgative, promotes urine, and cleanses and heals exulcerations in the urinary passages, which it is supposed to perform more effectually than any of the other resinous fluids. It has also been recommended in dysenteries, and in diseases of the breast and lungs. Very dangerous coughs have been cured by the use of this balsam alone; but it ought never to be given in coughs where inflammatory symptoms are present. In catarrhal affections to which old people are liable, it is an useful medicine. The dose should not exceed from twenty to thirty drops twice or thrice a day. A convenient way to take it is, to mix it up in brown sugar, drinking a glass of water after each dose, or it may be diffused in water by the medium of a mucilage of gum arabic.

CROCUS SATIVUS. *Common saffron.* The summit of the pistils, called saffron.

Saffron is a bulbous rooted perennial plant, very generally cultivated in gardens in European countries. The smell of saffron is pleasant and aromatic, but narcotic; the taste a fine aromatic bitter, and it immediately gives a deep yellow colour to the saliva, when chewed.

The active matter is equally extracted by alcohol, water, proof spirit, and vinegar. Saffron is remarkably fragrant, and is highly esteemed, as it exhilarates the spirits when taken in small doses; but, if used in too large portions, it produces immoderate mirth, and all the consequences resulting from the abuse of spirituous liquors. This drug was formerly considered an excellent remedy in hysteric depressions originating from spasms,

or in obstruction of the uterine secretions; but in modern practice it is seldom employed, though it enters into several medicinal preparations. The best saffron is that raised in England: it ought to be of a deep red or orange colour, fresh and tough, though neither too dry nor too moist, and of a strong but pleasant aromatic odour.

CROTON ELEUTHERIA. *Cascarilla*. The bark.

This bark is imported from the Bahama Islands, particularly from one of them of the name of Elutheria, whence its title is derived. But Dr. Wright also found the tree on the sea shore in Jamaica, where it is common, and rises to about twenty feet. It is imported in the form of curled pieces, or rolled up into short quills about an inch in width, externally resembling the Peruvian bark. Divested of its whitish upper rind, the cascarilla possesses an agreeable smell, and a bitterish, pungent aromatic taste. This inflammable drug, when burning, emits a fragrant odour, not unlike that of musk.

The cascarilla is frequently and successfully administered in intermittent fevers, even as a substitute for the *cinchona*; being less liable to produce the inconveniences which the latter is apt to occasion by its astringency. Cascarilla, according to medical writers, has also been employed with uncommon advantage in dangerous epidemic and *petechial* fevers, in flatulent colics, internal hæmorrhages, dysenteries, and diarrhœas. The virtues of cascarilla are partially extracted by water, and totally by rectified spirit, though it is more efficacious given in powder from ten to thirty grains every four, six, or eight hours.

CUPRUM. *Copper*.

This has a more perceptible smell and taste than any other metal. Its effects when taken into the stomach, are highly deleterious, and often fatal. It particularly affects the primæ viæ, exciting excessive nausea, vomiting, colic pains, and purging, sometimes of blood, or, though more rarely, obstinate constipation. It also produces agitation of the mind, headach, vertigo, delirium; renders the pulse small and weak, the countenance pale, and causes fainting, convulsions, paralysis, and apoplexy. When any of these symptoms occur, we must endeavour to obviate the action of the poison by large and copious draughts of oily and mucilaginous liquors; or to destroy its virulence by solutions of potash, or sulphuret of potash.

Great care ought to be taken that acid liquors, or even water, designed for internal use, be not suffered to stand long in vessels made of copper; otherwise they will dissolve so much of it, as will give them very dangerous properties. But although copper be thus dangerous, some preparations of it, are in certain cases used with great advantage, both internally and externally. Its tonic power, like that of zinc, is estimated by its successful exhibition in epilepsy, and some other spasmodic diseases, depen-

dent on, or connected with debility. The several preparations of this metal will be found in their proper places in this volume.

CURCUMA LONGA. *Turmeric.* The root.

Turmeric is a perennial plant, a native of India. The roots are tuberous, knotty, long and wrinkled; externally of a pale yellow colour, internally of a shining saffron brown. They have a weak aromatic smell, and a slightly bitter aromatic taste. Turmeric, taken internally, tinges the urine of a deep yellow colour, and acts as a gentle stimulant. It has been celebrated in diseases of the liver, jaundice, cachexy, dropsy, intermittent fevers, &c. Its internal use is now generally dispensed with; and it is only esteemed as affording a valuable yellow dye. Turmeric is a production of the United States, being found on the borders of the Ohio river.

DAPHNE MEZEREUM. *Mezereon.* *Spurge Laurel.* The bark of the root.

An indigenous low shrub, growing in woods and shady places, and flowering in the month of February or March. When cultivated in gardens, it attains in a rich soil, the height of 16 feet. The whole of this plant is so corrosive, that six of its berries are said to kill a wolf. The bark of the root of this plant, is the part used in medicine; its taste, when chewed for sometime, is extremely acrid, exciting an insupportable sensation of burning in the mouth and throat. Its acrimony is somewhat impaired by drying. It is extracted by water and vinegar. Mezereon is a stimulating diaphoretic, which, by determining to the surface, has been found of service in chronic rheumatism, and in cutaneous diseases. Its principal use has been in syphilis, as being particularly efficacious in removing venereal nodes, and thickening of the ligaments and periosteum, and disposing ulcerations to heal. It is given in the form of decoction; two drachms of the bark, with half an ounce of liquorice root, being boiled in three pounds of water, to two pounds, and four or six ounces of this given four times in a day. It is generally combined with sarsaparilla: such a combination, forms the *decoctum sarsaparillæ compositum*, an improved formula for the Lisbon diet drink. Dr. Withering has found this bark serviceable in removing a difficulty of swallowing, and asserts, that a patient who lived under extreme difficulty of swallowing for three years, was effectually cured in two months, by chewing the root of mezereon as often as she could support its irritating effects. This bark, when applied to the skin in its recent state, or infused in vinegar, is effectual in raising a blister, and is sometimes employed for the purpose of keeping up a perpetual discharge, for the removal of some chronic local affections. From the ripe berries of this plant, an excellent red lake is prepared by painters. Mezereon grows plentifully in the vicinity of the Ohio river.

DATURA STRAMONIUM. *Thorn Apple.* The leaves and seeds.

The thorn apple is an annual plant, and a native of America. It grows wild among rubbish, and on dunghills; flowering in the month of July. Blossoms white with a tinge of purple. This plant grows to the height of four or five feet; its seeds are contained in a prickly pod, the leaves are dark green, large, egg-shaped, pointed, angular, and deeply indented; of a disagreeable smell and nauseous taste. In the southern states it is called Jameston or Jimson weed.

Every part of this plant is a strong narcotic poison, and numerous instances are recorded, of children having suffered the most alarming consequences from having swallowed the seeds. Immediately after their being received into the stomach, dilatation of the pupils, vertigo, delirium, tremor, itching, eruption, insupportable thirst, and palsy ensue; which, if not remedied soon, terminate in death. The most effectual antidote will be speedy emetics, followed by copious draughts of olive oil, aided by soap clysters, and cathartics. According to Baron Stork, and other German physicians, the inspissated juice of the leaves of this plant, has been successfully employed in maniacal cases, and in convulsive and epileptic affections. Professor Barton, of Philadelphia, esteems it as a good stimulant and diuretic, and as a medicine possessing great and invaluable powers. He has frequently exhibited it with success in cases of mania and epilepsy. The form in which he chiefly employed it, is that of an extract prepared from the fresh leaves, and this in large doses, beginning with a few grains, he increased it gradually to the extent of 15 or 20 grains. We have also the authority of Dr. Fisher, of Beverly, in favour of the efficacy of stramonium in the cure of epilepsy. From his extensive experience it appears, that great confidence may be reposed in the virtues of this medicine in effecting a radical cure in those cases of young persons where the fits occur daily, or monthly, at regular periods, especially if assisted by chalybeates, or such other medicines, as particular symptoms appear to require. He observes that the patient must be kept constantly under the influence of the medicine; for this purpose, he will require every day, one or two doses, according to the severity of the symptoms. The saturated tincture, he says, is the most convenient form for children. The requisite dose may be known by the dilatation of the pupils.

The extract may be made by boiling the bruised seeds, or fresh leaves in water for the space of four hours; then strain off the liquor; evaporate over a gentle fire, without taking off the scum, until it has acquired the thickness of syrup; then place it in a warm oven, in an earthen glazed vessel, until it becomes of a proper consistence for use. The dose is from half a grain to one or two grains for an adult. An ointment, prepared by simmering the fresh leaves in hogs lard, affords great relief in external inflammations, and especially in the piles. It is also highly beneficial in burns, and in allaying the swelling of a cow's udder.

The leaves applied to the feet or part affected, have been found efficacious in removing spasm.

DAUCUS CAROTA. *Wild Carrot.* The seeds.

The seeds of wild carrot have a moderately warm pungent taste, and an agreeable aromatic smell. They are carminative, and are said to be diuretic. The roots of the cultivated variety, *common carrot*, contains much mucilaginous and saccharine matter, and are therefore highly nutritious and emollient. When beaten to a pulp, they form an excellent application to cancerous and other ill-conditioned ulcers, allaying the pain, checking the suppuration and fœtid smell, and softening the callous edges. A marmalade of carrots, on account of their strong antiseptic qualities, has been successfully used for preventing and curing the sea-scurvey. An infusion of these roots, has also been found to afford considerable relief to persons afflicted with the stone and worms, but especially the tape worm.

DIGITALIS PURPUREA. *Common Fox-Glove.* The leaves.

This is an indigenous biennial plant, very common on hedge banks, and sides of hills, in dry, gravelly, or sandy soils, and the beauty of its appearance has gained it a place in our gardens and shrubberies. The leaves are large, oblong, egg-shaped, soft, covered with hairs, and serrated. They have a bitter, very nauseous taste, with some acrimony.

Its effects when swallowed are,

1. To diminish the frequency of the pulse.
2. To diminish the irritability of the system.
3. To increase the action of the absorbents.
4. To increase the discharge by urine.

In excessive doses, it produces vomiting, purging, dimness of sight, vertigo, delirium, hickup, convulsions, collapse, death. For these symptoms the best remedies are cordials and stimulants.

Internally, digitalis has been recommended,

1. In inflammatory diseases, from its very remarkable power of diminishing the velocity of the circulation.
2. In active hæmorrhagies, in phthisis.
3. In some spasmodic affections, as in spasmodic asthma, palpitation, &c.
4. In mania, from effusion on the brain.
5. In anasaruous, and dropsical effusions.
6. In scrofulous tumors.
7. In aneurism of the aorta, we have seen it alleviate the most distressing symptoms.

Externally, it has been applied to scrofulous tumors.

It may be exhibited,

- I. In substance, either by itself, or conjoined with some aromatic, or made into pills with soap and gum ammoniac. Withering directs the leaves to be gathered after the flowering stem has shot up, and about the time when the blossoms are coming forth.

He rejects the leaf-stalk, and middle rib of the leaves, and dries the remaining part, either in sunshine or before the fire. In this state they are easily reduced to a beautiful green powder, of which we may give at first one grain twice a day, and gradually increase the dose until it acts upon the kidneys, stomach, pulse, and bowels, when its use may be suspended.

II. In infusion. The same author directs a drachm of the dried leaves to be infused for four hours in eight ounces of boiling water, and that there be added to the strained liquor an ounce of any spirituous water, for its preservation. Half an ounce or an ounce of this infusion may be given twice a day.

III. In decoction. Darwin directs that four ounces of the fresh leaves be boiled from two pounds of water to one, and half an ounce of the strained decoction be taken every two hours, for four or more doses.

* IV. In tincture. Put one ounce of the dried leaves coarsely powdered into four ounces of diluted alcohol; let the mixture stand by the fire-side twenty-four hours, frequently shaking the bottle; and the saturated tincture, as Darwin calls it, must then be separated from the residuum, by straining or decantation. Twenty drops of this tincture may be taken twice or thrice a day. The Edinburgh college use eight ounces of diluted alcohol to one of the powder, but let it digest seven days.

V. The expressed juice and extract are not proper forms of exhibiting this very active remedy.

When the *digitalis* is disposed to excite looseness, opium may be advantageously conjoined with it; and when the bowels are tardy, jalap may be given at the same time, without interfering with its diuretic effects. During its operation in this way, the patient should drink very freely.

In a letter from Dr. Grey to Dr. Walmsley, published in the Philadelphia Medical and Physical Journal, two cases of phthisis are mentioned, in which the remedy induced a copious ptyalism, which lasted some time, but without producing any beneficial effect. In the second case, the ptyalism was a second time induced by its use.

From Murray's Elements of Materia Medica and Pharmacy, the following interesting and judicious observations are selected.

Of all the narcotics, *digitalis* is that which diminishes most powerfully the actions of the system; and it does so without occasioning any previous excitement. Even in a moderate dose, it diminishes the force and frequency of the pulse, and in a large dose, reduces it to a great extent, as from seventy beats to forty or thirty-five in a minute, occasioning, at the same time, vertigo, indistinct vision, violent and durable sickness, with vomiting. In a still larger quantity, it induces convulsions, coldness of the body, and insensibility, symptoms which have sometimes terminated fatally. Besides its narcotic effects, *digitalis* acts peculiarly on the absorbent system. As a narcotic, fox-glove has been recommended in epilepsy, insanity, and in some acute inflammatory diseases. Lately, it has been very extensively employed in phthisis, and the beneficial effects which it produces in that disease, are

probably owing to its narcotic power, by which it reduces the force of the circulation through the lungs and general system. It is administered so as to produce this effect. One grain of the powdered leaves, or ten drops of the saturated tincture, may be given night and morning. This dose is increased one half every second day, till its action becomes apparent. As soon as the pulse begins to be diminished, the increase of dose must be made with more caution, and whenever nausea is induced, it ought rather to be reduced, or if necessary, intermitted for a short time. If the sickness become urgent, and if vertigo, indistinct vision, and a great reduction of the force of the circulation follow, they are best relieved by stimulants, particularly small doses of opium, brandy, and aromatics, and by a blister applied to the region of the stomach. The tincture has been supposed to be the best form of administering digitalis, when the remedy is designed to act as a narcotic; it is also more manageable in its dose, and more uniform in its strength, than the dried leaves.

Digitalis, though one of the most powerful narcotics, acts likewise as one of the most certain diuretics in dropsy, apparently from its power of promoting absorption. It has frequently succeeded where the other diuretics have failed. It is given in substance, in the watery infusion, or in tincture. In substance, the dose is at first one grain of the dried leaves twice a day, and this form is perhaps preferable to any other. It excites absorption, perhaps, more effectually, and has less tendency to excite nausea, as it must act more gradually on the stomach. The administration of this remedy must be conducted with much caution. Its effects do not immediately appear, and, when the doses are too frequent, or too quickly augmented, its action is concentrated, so as to produce frequently the most violent symptoms.

Dr. Currie, of Liverpool, observes that "a remedy has lately presented itself, that greatly enlarges our power over the numerous diseases, which are arranged under the orders of phlegmasiæ and hæmorrhagiæ; I mean the digitalis purpurea. This medicine may almost be said to be possessed of a charm, for allaying inordinate action of the heart and arteries, and in this point of view, as well as for its efficacy in some kinds of dropsy, particularly hydrothorax, its introduction into medicine is one of the greatest benefits our science has received in modern times. The extraordinary power of digitalis in the hæmorrhagiæ, particularly in hæmoptysis, is pretty generally known, and if it were necessary, I could confirm it by some striking examples; its use in the phlegmasiæ is, so far as I know, in a great measure new. Digitalis does not indeed supersede the use of the lancet in these diseases; but it diminishes the extent to which it is required; and it may be used with safety and success, in cases where the lancet can no longer be employed. Under the precautions pointed out by Dr. Withering, without the strictest attention to which, no practitioner should prescribe this powerful and singular medicine, I have employed the digitalis to a very considerable extent in inflammations of the brain, of the heart, and of the lungs; and have succeeded with it in situations, where I should other-

wise have despaired. I have also found it an excellent remedy in inflammatory rheumatism, one of the most tedious and intractable of diseases.”*

In the United States, experimental inquiries into the medical properties of digitalis, have been prosecuted with uncommon zeal, and although uniformity of opinion is far from prevailing, every practitioner who has adopted the use of it, will allow that it is one of the most active medicinal agents; nor will it be denied, that the high character formed of it by its sanguine patrons, has suffered considerable diminution.

Among those to whose intelligence the public are indebted in this respect, besides Dr. Rush on dropsy, are, Dr. Isaac Rand, a physician of eminence in Boston,† and Dr. John Spence, a respectable practitioner in Virginia:‡ both these gentlemen furnish unquestionable attestations of its efficacy in the early stages of phthisis pulmonalis. Although Dr. Rand does not think with Dr. Beddoes, that it is as infallible a remedy in consumption as mercury in lues venerea, and bark in intermittents, he asserts that he has cured more by this medicine than by all and every other medicine conjoined. He has also experienced the most decisively good effects from the use of digitalis in hæmoptysis, epistaxis, and active hæmorrhages from the uterus. In one instance of hæmoptysis in a very athletic young man, where the discharge eluded the force of every other medicine, it reduced the pulse in eight hours, from one hundred in a minute, to fifty pulsations, and stopped the hæmorrhage. He has given it with complete success in a case of mental derangement. Such are the active and virulent qualities of this plant, that it ought not to be entrusted to the direction of the inexperienced practitioner; nor resorted to, without due attention to the state of the system; and when administered, its peculiar effects should be discriminated with the utmost vigilance and precision. Dr. Rand relates for admonition, one melancholy example of the fatal effects of digitalis, in a man, who having experienced relief from its use, adventurously exceeded the extent enjoined by his physician. Dr. Mease of Philadelphia,|| being of opinion, that not unfrequently, disappointment to the expectations of the prescriber, is to be attributed to the improper manner of preparing and exhibiting digitalis, advises physicians to cultivate the plant for their own use, and to observe the greatest care in preserving the leaves.

DOLICHOS PRURIENS. *Cowhage.* The stiff hairs which cover the pods.

An exotic plant growing in warm climates, especially the West Indies. The pods are about four inches long, round, and

* Currie's Med. Reports. vol. II. pages 418, 419.

† Observations on the Phthisis Pulmonalis, &c. read at the request of the Massachusetts Medical Society, June 6th, 1804.

‡ See Medical Repository, vol. 5th, page 13—17.

|| See Medical Repository, vol. 1. page 153.

as thick as a man's finger. The outside of the pods is thickly beset with stiff brown hairs, which, when applied to the skin, occasion a most intolerable itching. The ripe pods are dipped in syrup, which is again scraped off with a knife. When the syrup is rendered by the hairs as thick as honey, it is fit for use. It acts mechanically, as an anthelmintic, occasions no uneasiness in the primæ viæ, which are defended by mucus, and may be safely taken from a tea spoonful, to a table spoonful, in the morning, fasting. The worms are said to appear with the second or third dose, and, by means of a purge, in some cases the stools have consisted entirely of worms. A decoction of the roots of cowhage is esteemed a powerful diuretic, and a vinous infusion of the pods (twelve to a quart) is said to be a certain remedy for the dropsy; the dose half a pint when made into beer.

Mr. Kerr has given a botanical description of the plant in the Medical Commentaries, vol. ii.

DORSTENIA CONTRAJERVA. *Contrayerva.* The root.

This plant is perennial, and grows in South America, and some of the Caribbean Islands. The root is knotty, an inch or two in length, and about half an inch in thickness; externally of a reddish brown colour; and pale within; long, rough, slender fibres shoot out from all sides of it, and are generally loaded with small, round knots. It has a peculiar kind of aromatic smell and a somewhat astringent, warm, bitterish taste, with a slight, and sweetish kind of acrimony when long chewed. *Contrayerva* is a gentle stimulant and diaphoretic, and is sometimes given in exanthematous diseases, typhus, and dysentery. Its dose is about half a drachm of the powdered root.

EUGENIA CARYOPHYLLATA. *The Clove Tree.* The flower bud, and its volatile oil.

This is a beautiful tall tree, a native of the Molucca Islands. Cloves are the unexpanded flowers which are dried by fumigating them, and exposing them to the sun. They have a strong aromatic odour, and a pungent taste. They afford to water their flavour principally; to alcohol, their taste. By distillation with water, they yield a fragrant essential oil, not very pungent. The oil of cloves commonly met with, is rendered acrid by certain additions.

Cloves are among the most stimulating aromatics: the dose of them does not exceed from five to ten grains. They are employed principally as adjuvants, or corrigents to other medicines. The essential oil is used with the same intention, and likewise, as a local application in toothach; but from its pungent nature, it is apt to corrode the gums, and injure the adjacent teeth.

EUPATORIUM PERFOLIATUM. *Thorough-wort.* The plant, leaves, and flowers.

This plant sometimes called thorough-stem, cross-wort, bone-set, is annual, and rises from two to three feet high, is hairy,

and the leaves at each joint rough, from three to four inches long, and about one inch broad at their base, gradually lessening to a very acute point, of a dark green, and covered with short hairs. Thorough-wort certainly possesses active properties, and deserves the attention of American physicians. It acts powerfully as a sudorific and emetic, and sometimes as a purgative, and has been successfully employed in intermittents and other fevers, either in decoction or the leaves in powder. Every part of the plant may be advantageously employed, though the flowers appear most active. A watery infusion of the leaves is a powerful and not disagreeable bitter, and the flowers are deemed superior in this respect to those of camomile, and ought to be kept in the shops.

EUPATORIUM PILOSUM. *Wild Horehound.* The leaves.

This species of Eupatorium is also an annual plant, it rises from one to two feet. It grows wild in abundance in the southern states, where it has acquired great repute as a domestic remedy in the prevalent fevers of that climate. We are indebted to the honourable George Jones, Esq. president of the Georgia medical society for the following sketch of its medical virtues. "It serves as an excellent substitute for the Peruvian bark; indeed, among the planters on or near the sea board it supersedes the use of the bark in the cure of fevers. It is tonic, diaphoretic, diuretic, and mildly cathartic, and does not oppress the stomach as the Peruvian bark is apt to do; hence it may often be exhibited where the cinchona is inadmissible. It is usually exhibited in the form of infusion, one ounce of the dried leaves infused in a quart of water may be taken daily in doses of from two to four ounces every hour or two. It may be advantageously combined with Peruvian bark: and although it may sometimes fail of producing the desired effect, I think it well deserves a station among the articles of the Materia Medica."

FERRUM. *Iron.*

A metal very abundant in nature, of a bluish gray colour, highly ductile, scarcely fusible, but easily oxydated in atmospheric air, and subject to rust. It seems even to be a constituent of organic substances, and is the only metal, which, when taken into the stomach, exerts no deleterious action upon it.

The general virtues of this metal, and the several preparations of it, are, to constringe the fibres, to quicken the circulation, to promote the deficient secretions in the remoter parts, and at the same time to repress inordinate discharges into the intestinal tube. After the use of them, if they take effect, the pulse is very sensibly raised; the colour of the face, though before pale, changes to a florid red; the alvine, urinary, and cuticular excretions, are increased. Fetid eructations, and the feces voided of a black colour, are marks of their taking due effect.

When given improperly or to excess, iron produces headach, anxiety ; heats the body and often causes hæmorrhagies, or even vomiting, pains in the stomach, and spasms and pains of the bowels.

Iron is given in most cases of debility and relaxation,

1. In passive hæmorrhagies.
2. In dyspepsia, hysteria, and chlorosis.
3. In most of the cachexiæ.
4. In general debility produced by disease, or excessive hæmorrhagy.

When either a preternatural discharge, or suppression of natural secretions, proceed from a languor and sluggishness of the fluids, and weakness of the solids ; this metal, by increasing the motion of the former, and the strength of the latter, will suppress the flux, or remove the suppression ; but where the circulation is already too quick, the solids too tense and rigid, where there is any stricture or spasmodic contraction of the vessels, iron, and all the preparations of it, will aggravate both distempers.

Soft, malleable iron is the only kind fit for internal use, as steel and cast-iron, always contain impurities, and often arsenic : as its mechanical division is extremely difficult, it is directed to be kept in the shops in the state of filings or wire.

FERRI OXIDUM NIGRUM. *The black oxide of iron, such as are the scales of iron, formed at the foot of the blacksmith's anvil.*

When iron is heated to redness in the smith's forge, to render it more malleable, its surface becomes oxydized by the action of the atmospheric air ; and as the oxyde formed does not adhere to the iron, it is easily separated by percussion on the anvil, and flies off in the state of sparks, which, on cooling, constitute the scales of iron. In these, the iron is oxydized to that degree in which it is soluble in acids, without the production of hydrogen gas : therefore, when taken into the stomach, they do not produce the distention and flatulence occasioned by the use of the filings. These scales are purified for use by the application of the magnet. For the magnet will attract only the smaller and purer scales, and will leave those which are larger and less pure.

FERULA ASSA FOETIDA. *Assa fetida.* The gum resin.

The plant which furnishes *assa fœtida* is perennial and a native of Persia. It has, however, born fertile seeds in the open air, in the botanical garden of Edinburgh. The gum resin is procured from the roots of plants which are at least four years old. The top of the root is cut off transversely, and the juice suffered to exude, which is afterwards exposed to the heat of the sun to harden. It comes to us in large irregular masses, composed of various little shining lumps or grains, which are partly of a whitish colour, partly reddish, and partly of a violet hue. Those masses are accounted the best, which are clear, of a pale reddish colour, and variegated with a great number of elegant white tears. This drug has a strong fœtid smell, somewhat

like that of garlic ; and a bitter, acrid, biting taste. It looses some of its smell and strength by keeping ; a circumstance to be particularly regarded in its exhibition. It is the most powerful of all the foetid gums, and is a most valuable remedy. It acts as a stimulant, antispasmodic, expectorant, emmenagogue, and anthelmintic. Its action is quick and penetrating, and it affords great and speedy relief in spasmodic, flatulent hysteric, and hypochondriacal complaints, especially when they arise from obstructions of the bowels. Where spasms and constipations have weakened the powers of nature, and the functions are in a languid state, it generally affords effectual relief ; as it promotes digestion, enlivens the animal spirits, and by increasing the peristaltic motion of the intestines, tends to open them in persons of an advanced age. In the spasmodic, as well as humoral asthma, unattended with fever, it is an excellent remedy ; for, in the former, it counteracts the strictures of the respiring organs, and in the latter, greatly facilitates expectoration. The hooping cough has been cured, and worms have frequently been expelled, by the conjoined administration of assa foetida, both by the mouth and in the form of clyster. It is exhibited in the form of pills, in doses of from five to twenty grains, either alone, or combined with bitter extracts or purgatives ; or it may be given in tincture, or dissolved in some simple distilled water. In the form of clyster, it is frequently directed to the extent of two drachms, dissolved in eight ounces of water as an antispasmodic.

FICUS CARICA. *The fig tree.* The fruit.

This tree is probably a native of Asia, but grows plentifully in the south of Europe. As the fruit is very pulpy, it is dried when it is to be preserved. They consist almost entirely of sugar and mucilage, and are therefore demulcent. They are grateful to the stomach, and more easy of digestion than any other sweet fruit, and, abounding in saccharine matter, they are very nutritious, but apt to occasion flatulency, when eaten without bread, or other mealy substances. A decoction of figs affords excellent gargles to cleanse the throat and mouth. This fruit also forms an ingredient in lenitive electuaries, and pectoral draughts, and is likewise applied externally to soften, digest, and promote maturation.

Figs ripen very well by the middle of September in Philadelphia, when enjoying a free exposure to the sun. In the southern states they flourish luxuriantly, and might become an article of extensive exportation, and home consumption, if pains were taken to introduce the large Levant fig.

FRAXINUS ORNUS. *Manna ash.* The concrete juice, called manna.

Manna is obtained from other species of fraxinus besides the ornus, and especially from the rotundifolia. It is principally col-

lected in Calabria and Sicily. In the warmest season of the year, from the middle of June to the end of July, a clear juice exudes from the stem and branches of these trees, which, when naturally concreted on the plants and scraped off, is called manna. The best Calabrian manna is imported in oblong, light, friable flakes, or pieces of a whitish or pale yellow shade, and somewhat transparent. The inferior sorts are moist, unctuous, and of a darker colour.

Manna is a mild and agreeable laxative, which may be safely administered to children and the aged, though in some constitutions it is apt to induce flatulence, and to distend the bowels; but this inconvenience may be remedied by the addition of a little cinnamon water, or other warm aromatic. The dose for children is according to their age, from one to three drachms, and for adults, one ounce, or one ounce and an half; as, however, its operation when by itself, is very mild, and sometimes imperceptible, it is generally given in laxative mineral waters, or combined with salts, senna, rhubarb, or similar aperient medicines.

Manna is also one of the most useful demulcents in the humid asthma, and similar pituitous as well as inflammatory affections of the breast; it also beneficially promotes expectoration and is of peculiar service in the second stage of the small pox, or during the suppuration of the pustules.

GAMBOGIA. *Gamboge.* A gum resin.

A concrete vegetable juice, of a gummy, resinous nature. It issues from the cambogia gutta, a native of Cambia in the East Indies; whence it is imported in large cakes or rolls. The best sort is of a deep yellow colour; is divested of all smell, and has very little taste. When taken as a medicine it operates violently, both upwards and downwards. It has been used in dropsies with cream of tartar, or jalap, or with both, to accelerate their operation; but calomel has been found to be a useful addition to gamboge in dropsical cases. Gamboge is also recommended to be taken for the expulsion of the tape-worm, in doses of 15 grains, early in the morning, and, if the worm be not expelled in two or three hours, this powerful dose is said to have been repeated with safety and success, even to the third time, and in persons of delicate habits. Great precaution, however, is requisite in the use of this precarious and active medicine; and, if accidentally, too large a dose of it should be swallowed, the most effectual antidote will be copious draughts of a solution of pearl ashes in water.

GENTIANA LUTEA. *Gentian.* The root.

Gentian is a perennial plant which grows upon the Alps, Pyrennees, and other mountainous parts of Europe. The roots are long and thick, externally of a brown colour, and wrinkled; internally spongy, and of a yellow colour, without any remarka-

ble smell, but surpassing all other European vegetables in bitterness. Alcohol dissolves only the bitter extractive ; water, both the extractive and mucilage. Gentian possesses the general virtues of bitters in an eminent degree, and is wholly devoid of astringency. Taken into the stomach, it proves a powerful tonic, and in large doses, it evacuates the intestines. It is useful in debility of the stomach, in general debility, and in gout : combined with astringents, it cures intermittents. The dose of this drug in powder, is from 10 to 40 grains ; though it is more frequently taken as the chief ingredient in bitter wines, tinctures, and infusions.

GEOFFRÆA INERMIS. *Cabbage bark tree.* The bark.

The bark of this tree, which grows in Jamaica, is of a gray colour externally, but black, and furrowed on the inside. The powder resembles jalap, but is not so heavy. It has a mucilaginous and sweetish taste, and a disagreeable smell. Its medical effects are much greater than its sensible qualities would lead us to expect. It is given in cases of worms in form of powder, decoction, syrup, and extract. The decoction is preferable, and is made by slowly boiling an ounce of the fresh, dried bark in a quart of water, till it assume the colour of Madeira wine. This sweetened, is the syrup ; evaporated, it forms an extract. It commonly produces some sickness and purging ; sometimes more violent effects, as vomiting, delirium, and fever. These last are said to be owing to an over dose, or to drinking cold water ; and are relieved by warm water, castor oil, or a vegetable acid. It should always be given at first in small doses ; and, when properly and cautiously administered, it operates as a very powerful anthelmintic, particularly for the expulsion of the lumbrici, which are a very common cause of disease in the West India islands, and there it is very frequently employed, with singular success.

GLYCYRRHIZA GLABRA. *Liquorice.* The root and extract.

Liquorice is a perennial plant, and a native of the south of Europe, but is cultivated in considerable quantities in England, for medicinal purposes. The root of this plant has a sweet agreeable taste. This sweetness is extracted by water, by infusion or decoction ; and, by evaporation, a dark coloured extract, of the same sweet taste, is obtained, consisting principally of saccharine and mucilaginous matter. Liquorice root is a pleasant demulcent, which is frequently added to infusions of linseed or althæa.

There is no doubt of its gentle deterging qualities, which render it an excellent medicine in coughs, hoarseness, asthma, &c. for lubricating the throat, softening acrimonious humours, and affording relief to the organs of respiration. But with this intention it ought to be taken as a diet drink in considerable portions

by way of infusion. This plant is found in the state of Vermont, and on the borders of the Ohio river.

GUAIACUM OFFICINALE. *Officinal Guaiacum.* The wood and resin.

Guaiacum, or *lignum vitæ*, is a genus of plants producing three species, the principal of which is the officinale, or common *lignum vitæ*, a native of the West Indies. The wood of this tree, and the gum resin obtained by exudation from incisions in its trunk, are the parts of it used in medicine.

The wood is hard and heavy, of a yellow colour, has little smell, and a moderately bitter taste. Its virtues depend on the small portion of resinous matter which it contains.

Gum guaiacum is of a friable nature, of a deep greenish colour, and sometimes of a redish hue, and has a pungent acrid taste.

This medicine was introduced into practice as a remedy in the treatment of lues venerea, and was at one time considered capable of effecting a radical cure. Its powers are now better ascertained. It is employed, and with some advantage, in promoting the action of mercury in the confirmed state of the disease, and in alleviating the various symptoms which arise from a protracted mercurial course. The general virtues of guaiacum, are those of a warm aromatic medicine; it strengthens the stomach and other viscera, and greatly promotes the discharge of urine and perspiration. Hence it is of especial service in cutaneous eruptions, and disorders arising from obstructions of the excretory glands; in rheumatic, and other pains, unattended with fever, the liberal use of gum guaiacum has often afforded considerable relief. It is likewise a good laxative, and furnishes a more active medicine than either the wood or bark of this tree. This gum when dissolved in rum, or combined with water, by means of mucilage or the yolk of an egg, or in the form of tincture and elixir, has been found useful in chronic rheumatism, or even in such wandering pains of the stomach and other parts of the body, as could be attributed to the retrocedent gout.

The form in which guaiac wood is administered, is always that of decoction. A quart of it is drunk in the course of the day. If taken warm, it produces diaphoresis.

HÆMATOXYLUM CAMPECHIANUM. *Logwood Tree.* The wood.

This tree was introduced from Honduras into Jamaica, where it is now very common. Logwood is of a deep red colour; has scarcely any smell; its taste is sweetish, and astringent. It is used principally as a dye-wood, and also with considerable advantage in medicine. Its active matter is extracted by water, and by alcohol; both solutions strike a black colour with the salt of iron.

It has been employed in medicine as an astringent in diarrhœa, and chronic dysentery, under the form of decoction, or watery extract.

HELLEBORUS NIGER. *Black Hellebore.* The root.

This plant is perennial, and grows wild in the mountainous parts of Austria, and the Pyrennees. The root of this plant consists of small fibres attached to one head; externally dark coloured, internally white. Its taste is very acrid, but the acrimony is much impaired by drying and keeping.

Its medicinal power seems principally to depend on its resinous part. By decoction with water, it yields half its weight of gummy matter, with some resin; the extract obtained by inspissation is milder than the root itself.

Black hellebore root is a very violent cathartic, in a dose from ten to twenty grains; so violent, indeed, that it is seldom used. On its cathartic power probably depends any advantage that may be derived from its administration in mania and melancholia, in which diseases it was highly celebrated by the ancients. In dropsy it has been employed as an hydragogue cathartic. It was likewise strongly recommended by Mead as an emmenagogue, though with others it has seldom been successful.

HELLEBORUS FOETIDUS. *Bears Foot.* The leaves.

This species is a native of England. It is perennial, and grows in shady places, and under hedges. The leaves have an acrid, bitter, nauseous taste, and an unpleasant smell, especially when they are fresh. When dried they are frequently given as a domestic medicine to destroy worms; but they must be used sparingly, being so violent in their operation, that instances of their fatal effects are recorded. Snuffed up the nostrils in a very small quantity, it excites a violent sneezing, with a sense of heat, and a copious discharge. Taken internally in a dose of a few grains, it acts as a violent emetic and cathartic. Externally, when mixed with lard, or in the form of decoction, it is used as an application in some cutaneous diseases.

HERACLEUM SPHONDYLIIUM. *Common Cow-Parsnip.*

This article was brought into notice by the late Dr. Joseph Orne, of Salem. In a communication to the Massachusetts Medical Society, October, 1803, he thus describes it: *Common cow-parsnip.* (*Sphondylium vulgare hirsutum.* Park. C. B.) It grows in hedges; the stalk is large and tubular, invested with a down which also covers the leaves, that are large and jagged, five on each stalk, and of the colour of wormwood; it is umbelliferous, and flowers in June; the root is divided into several long and fibrous branches, resembling a large parsley root; and the height of the plant, in its maturity, may be from two to four feet: the

root has a rank strong smell, and a pungent and almost caustic taste; it should be carefully distinguished from the common parsnip, that grows wild in gardens, and hedges; and indeed, it has a very different appearance.

The particular disease in which Dr. Orne commends the cow-parsnip, is that of epilepsy. Three of the five cases which are exhibited in his communication, were cured by the use of this medicine. The author judiciously observes, that in the three successful cases, the patients were remarkably liable to flatulence, with symptoms of morbid sensibility of the stomach, and date their first relief from the sensation of a more firm and healthful tone of that organ, and the carminative effects of the medicine. He commonly prescribed two or three drachms of the pulverized root, to be taken every day for a great length of time, and a strong infusion of the leaves and tops to be drunk at bed time.

In the hands of other practitioners, this plant has manifested considerable efficacy, exerting its peculiar powers immediately on the stomach, as an excellent carminative, and, if it does not cure epilepsy, it generally mitigates the distressing symptoms attending that disease. In some cases of dyspepsia, accompanied with flatulencies and cardialgia, a strong decoction of this plant has been given by Dr. Mann with satisfactory success.

HORDEUM DISTICHON. *Barley.* The seed stripped of its husk, called pearl barley.

Barley has from the earliest ages been considered as a wholesome and nutritious food. Pearl barley is prepared by grinding off the husk of rough barley, and forming the grain into little round granules, which appear of a kind of pearl whiteness. In this state, barley consists almost entirely of amylaceous matter, and when boiled forms an excellent article of nourishment. In diseases of the kidneys and the breast, as well as in that state of the body where it is said to abound in acrimonious humors, decoctions made of this grain, sufficiently strong, and acidulated with vinegar, are eminently useful. As a cooling and diluent beverage, barley water is of essential service to febrile patients, and in all inflammatory cases, where preternatural heat and thirst prevail; but, to promote its salutary effects, the grosser parts which remain after decoction, ought not to be swallowed.

HUMULUS LUPULUS. *The Common Hop.* The flowers.

This is an agreeable bitter, anodyne, diuretic remedy; it is however but little used in medicine, except in the form of a saturated tincture; of which from thirty to one hundred drops, or more, may be taken to promote sleep, where opium is improper. A pillow filled with flowers, and laid beneath the head, has been found to promote sleep in patients afflicted with delirious fevers.

HYDRARGYRUS. *Quicksilver. Argentum Vivum. Mercury.*

Mercury is a mineral fluid about fourteen or fifteen times heavier than water: it is so remarkably thin, that it requires the intense cold of 40° below 0 of Fahrenheit to render it solid.

Quicksilver is sometimes found in a native state, as in the mines of India, South America, Hungary, &c. but more generally mixed with metals, stone, or other substances, from which it is extracted by various processes. Next to gold and platina, mercury is the heaviest of all the metals, with most of which it unites, excepting iron and antimony.

Mercury taken into the stomach in its metallic state, has no action on the body, except what arises from its weight or bulk.

It is not poisonous as was vulgarly supposed, but is perfectly inert. But in its various states of combination it produces certain sensible effects. It quickens the circulation, and increases all the secretions and excretions.

According to circumstances, the habit of body of the patient, the temperature in which he is kept, the nature of the preparation, and the quantity in which it is exhibited, its effects are indeed various; it sometimes increases one secretion more particularly, sometimes another; but its most characteristic effect is an increased flow of saliva, which it generally excites, if given in sufficient quantity. In the words of Dr. Cullen, it acts as a stimulus to every sensible and moving fibre of the body, and it produces the most permanent excitement. Hence it is the most general evacuant belonging to the *Materia Medica*; and, from its stimulant operation, its utility in many diseases may be explained.

Mercury, or some of its preparations, is exhibited,

1. As an errhine. The sub-sulphate of mercury.
2. As a sialogue. Mercury in almost any form.
3. As a cathartic. The sub-muriate of mercury (calomel).
4. As a diuretic. The oxydes, the muriate, and the sub-muriate, combined with other diuretics.
5. As a sudorific. Calomel conjoined with a sudorific regimen.
6. As an emmenagogue.
7. As an astringent. Muriate of mercury.
8. As a stimulant. Muriate of mercury.
9. As an antispasmodic.
10. As an anthelmintic.

With some of these views, mercury is frequently employed, and with the utmost advantage in various spasmodic diseases; in tetanus and hydrophobia; in the fevers of warm climates; in rheumatism, acute and chronic; in visceral obstructions, especially the glandular viscera, as the liver, spleen, &c. In inflammatory, and in exanthematous diseases, and in dysentery. In cachectic diseases, as the various species of dropsical affections; and also in cutaneous and local diseases of various descriptions, and in many chronic morbid affections. Its principal medicinal virtue, however, is that of curing lues venerea. Its mode of opera-

tion in this case has given rise to many disputes : some ascribing its efficacy to the evacuation it occasions ; others considering it as an antidote to the venereal poison ; while some ascribe its efficacy to its general and permanent stimulant operation, which they believe to be of a peculiar kind, and by which it induces and keeps up an action incompatible with that which constitutes lues venerea, till at length the virus is changed, or eliminated from the body by the usual discharges. The latter opinion, originally proposed by Mr. Hunter, seems to afford the most satisfactory solution. For the cure of syphilis, mercury is administered until moderate salivation is excited ; and this is kept up for sometime, longer or shorter, according to the kind and violence of the symptoms. Cold is to be guarded against, as tending to induce profuse salivation. When this occurs, it may be moderated by opium, a brisk cathartic, the application of a blister to the throat, and, as has been affirmed, by the administration of sulphuret of potash (liver of sulphur).

Mercury occasionally attacks the bowels, and causes violent purging, even of blood. This effect is remedied by intermitting the use of the medicine, or by exhibiting opium.

At other times it is suddenly determined to the mouth, and produces inflammation, ulceration, and an excessive flow of saliva. In this case, too, the use of mercury must be discontinued for a time ; while, according to Mr. Pearson's advice, the patient should be freely exposed to a dry cold air, with the occasional use of cathartics, Peruvian bark, and mineral acids, and the assiduous application of astringent gargles. On the other hand, the sudden suppression of ptyalism is not without danger. It is most frequently caused by cold liquids being taken into the stomach, or exposure to cold and moisture, while under the influence of mercury. The danger is to be obviated by the quick introduction of mercury, so as to affect the gums, with the occasional use of the warm bath.

Sometimes also a morbid condition of the system occurs during a mercurial course, and which tends to a fatal issue. Mr. Pearson has termed it Erethismus. It is characterized by a great depression of strength ; a sense of anxiety about the præcordia ; frequent sighing ; trembling, partial or universal ; a small, quick pulse ; sometimes vomiting ; a pale contracted countenance ; a sense of coldness, while the tongue is seldom furred, or the vital or natural functions much disordered. In this state, a violent or sudden exertion of muscular power, will sometimes prove fatal.

To prevent dangerous consequences, the mercury must be discontinued, whatever may be the stage, extent, or violence of the disease for which it has been exhibited, and the patient must expose himself freely to a dry, cool air, in such a manner as shall be attended with the least fatigue ; and in the course of ten or fourteen days, he will sometimes be so far recovered, that he may safely resume the use of mercury.

Quicksilver in its native state may be advantageously prescribed in the first stage of the iliac passion, before the bowels are too much weakened and corroded by the stagnant feces ; especially if it be given with castor oil, or fat broth, but no spice. There are instances in which several ounces, nay half a pound and upwards of pure quicksilver have been swallowed with the happiest effects. But in the last stage of obstinate and violent colics, when inflammation and gangrene have already taken place in the bowels, its specific gravity would infallibly rend the intestines, and accelerate the fatal crisis. [See Calomel.]

HYOSCYAMUS NIGER. *Black henbane.* The herb and seeds.

Henbane is a biennial plant, which abounds in villages, road sides, and among rubbish, and flowers in the month of July. The leaves of this plant, when recent, have a slightly fœtid smell ; and a mucilaginous taste ; when dried, they loose both taste and smell, and also part of their narcotic power. The root possesses the same qualities as the leaves, and even in a more eminent degree. Henbane, more than any other narcotic, resembles opium in its action. In a moderate dose, it increases at first the strength of the pulse, and occasions some sense of heat, which is followed by diminished sensibility and motion ; in some cases by thirst, sickness, stupor, and dimness of vision. In a larger quantity it occasions profound sleep, hard pulse, and sometimes fierce delirium, ending in coma or convulsions, with a remarkable dilatation of the pupil, distortion of the countenance, a weak, tremulous pulse, and eruption of petechiæ. On dissection, gangrenous spots have been found on the internal surface of the stomach. Its baneful effects are best counteracted by a powerful emetic ; and, after discharging the contents of the stomach, it will be necessary to administer emollient and oily clysters, and repeat them as often as they are ejected ; and to drink as large portions of vinegar and of the juice of lemons as the stomach will support.

Henbane has been used in various spasmodic and painful diseases ; as in epilepsy, hysteria, palpitation, headach, paralysis, mania, and scirrhus. It is given in the form of the inspissated juice of the fresh leaves, the dose of which is from one to two grains, which ought to be gradually increased. It is sometimes employed as a substitute for opium, where the latter, from idiosyncrasy, occasions any disagreeable symptoms. The henbane is also free from the constipating quality of the opium, and like this last also, its influence is very much diminished by habit. In open ulcers, the powder of the leaves, sprinkled on the part, has often a good effect.

HYSSOPUS OFFICINALIS. *Hyssop.* The herb.

The leaves of hyssop have an aromatic smell, and a warm pungent taste ; they are particularly recommended in humeral asthmas, coughs, and other disorders of the breast and lungs ; being supposed wonderfully to promote expectoration. According to Ray, these leaves are of great service when applied in cataplasms to bruises, the pain of which they speedily mitigate, and at the same time disperse every mark or spot from the part affected.

INULA HELENIUM. *Elecampane.* The root.

This is a very large downy perennial plant, sometimes found wild in moist rich soils. The root, especially when dry, has an agreeable aromatic smell ; its taste, on first chewing, is glutinous and somewhat rancid, quickly succeeded by an aromatic bitterness and pungency. The ancients entertained a high opinion of elecampane, which is recommended for promoting expectoration in humeral asthma and coughs ; liberally taken, it is said to excite urine, and loosen the belly.

In some parts of Germany, large quantities of this root are candied, and used as a stomachic, for strengthening the tone of the viscera in general, and for attenuating viscid humours. Its dose is from twenty to sixty grains powdered ; and in this form it has been found by experience to possess considerable efficacy.

IPECACUANHA. *Ipecacuan.* A root, either of the *cephælis ipecacuanha*, or *psychotria emetica*.

The root of ipecacuanha is brought from Spanish America. It is divided into two sorts, Peruvian and Brazilian ; the eye distinguishes three, ash coloured or gray, brown, and white. The ash coloured or Peruvian ipecacuanha of the shops, is a small wrinkled root, bent and contorted into a great variety of figures ; it has very little smell ; the taste is bitterish and subacid, covering the tongue with a kind of mucilage. The brown sort has been sometimes observed, even in a small dose, to produce violent effects. The white, though taken in a large one, has scarce any effect at all.

The first sort, the ash coloured or gray ipecacuanha is usually preferred for medicinal use. It contains both a resinous and gummy matter. It is generally stated, that its emetic power, and, indeed its principal virtues, reside in the former, though Dr. Irving has affirmed that they depend on its gum. Its active matter is completely extracted by alcohol, proof spirit, or wine. Vinegar likewise dissolves it, but at the same time greatly weakens its power. By decoction with water, its activity is greatly impaired, though the water distilled from it has scarcely any emetic

power. It is even injured by being kept long exposed in the state of powder to the air and light.

Ipecacuanha is the mildest of those emetics, which are at the same time certain in their operation ; and possesses this peculiar advantage, that, when it does not operate by vomiting, it passes off by the other emunctories. It merely evacuates the contents of the stomach, without exciting violent vomiting, or extending its action beyond the stomach ; and is hence adapted to many cases where violent vomiting would be useless or improper. The medium dose of it as an emetic is fifteen grains, though twenty or thirty may be taken with perfect safety. Ipecacuanha is employed with other intentions than as an emetic. It was at one time much celebrated as a remedy in dysentery, given either in such a dose as to produce full vomiting, or rather in the quantity of two or three grains, repeated every three or four hours, till it occasioned vomiting, diaphoresis, or purging. It has been given in a similar mode in obstinate diarrhœa. In spasmodic asthma, it is given in a full dose to relieve the paroxysm ; and in a dose of three or four grains, continued every morning for some weeks, to prevent the return of the disease. In hæmorrhagies, it is given in nauseating doses, the nausea diminishing the force of the circulation. Combined with opium, it forms a very powerful sudorific.

The primary effect of ipecacuanha, says Dr. Duncan, is that of stimulating the stomach. If the dose be sufficiently large, it excites vomiting, by inverting the peristaltic motion of the stomach and duodenum ; in a smaller dose, it only produces nausea, and operates by stool ; and in still smaller doses, it gently stimulates the stomach, increases the appetite, and facilitates digestion. Its secondary effects depend on the sympathy of the other parts with the stomach ; and in this way only can we explain its action as an antispasmodic, diaphoretic, expectorant, and in checking hæmorrhagies.

Its beneficial effects in some cases also, seem to be owing to the general concussion given to the whole system during the action of vomiting. It is found to increase the purgative virtue of jalap remarkably. Dr. Aiken asserts that fifteen grains of jalap, with two or three of ipecacuanha, purge more than twice the quantity of jalap by itself.

Ipecacuan properly administered, often proves serviceable,

1. In intermittent fevers. It has frequently succeeded in stopping these, when given about an hour before an accession was expected, and also when given so as to produce vomiting at the time of an accession, or at the end of the cold stage.

2. In continued fevers. We have never seen more decidedly beneficial effects from the use of any medicine whatever, than from the exhibition of ipecacuan in the commencement of typhus fever. An emetic, succeeded by a diaphoretic regimen, when administered sufficiently early in this disease, very frequently cuts it short at once ; and when it fails in this desirable

object, it always has a beneficial influence on the progress of the fever.

3. In inflammatory diseases, rheumatism, bubo, swelled testicle.

4. In exanthematous diseases, when the eruption is disposed to recede.

5. In hæmorrhagies, when given in nauseating doses.

6. In profluvia, especially in dysentery, so much so, that it was formerly esteemed a specific against that disease. But Cullen attributes its good effects in this instance, to its producing a steady determination of the peristaltic motion of the intestines downwards, when given in repeated small doses.

7. In many spasmodic diseases; in epilepsy; asthma; dyspnæa; pertussis; chronic diarrhœa; hysteria; melancholia; mania.

8. In cachectic diseases, as in some kinds of dropsy.

9. In impetiginous diseases; in jaundice.

10. In local diseases; in amaurosis, and several of the dysorexiæ.

11. In every instance when we wish to evacuate the stomach, as when it is overloaded with food, or when poison, especially opium, has been swallowed.

The use of ipecacuan, as an emetic, is contra-indicated,

1. Where there is a disposition to hæmorrhage.

2. Where there is an increased flow of blood toward the head.

3. In very irritable subjects.

4. In pregnant women, and persons afflicted with hernia.

Ipecacuan is exhibited,

1. In substance; in powder. Full vomiting will generally be produced in an adult by a scruple or half a drachm, and though less might answer the purpose, fortunately an over dose is scarcely attended with any inconvenience, as the whole of it is vomited with the contents of the stomach as soon as it operates. The vomiting is promoted and facilitated by drinking copiously of warm watery fluids. On the contrary, when vomiting is not intended, liquids must be rather drunk sparingly, and the dose must be diminished to a grain or less. In such small doses it is conveniently combined with any proper adjunct, in the form of powder, pill, or bolus.

2. In infusion. One drachm may be infused in four ounces of water, and taken in repeated doses till it operate.

3. Infused in wine. (See vinum ipecacuanhæ.)

Ipecacuan not only checks the narcotic effects of opium, and is therefore one of the best antidotes for its poison, but reciprocally the emetic powers of ipecacuan are checked by the addition of opium, and the combination operates by increasing the cuticular discharge. (See pulvis ipecacuanhæ et opii.)

IRIS PSEUDACORUS. *Water Flag. Flower de Luce. Blue Flag.*
The root.

This plant is perennial, and grows in great abundance by the brinks of rivers, and in other watery places. It blossoms in July; its flowers are blue, variegated with white, yellow, and purple; its leaves sword shaped. The root has an acrid taste, and when fresh is highly cathartic. The expressed juice of the root, recently gathered, given to the quantity of sixty or eighty drops, every hour or two, and occasionally increased, has been productive of very copious evacuations, after jalap, gamboge, and other strong purgatives had proved ineffectual; and it is in this form only that it is used; for by drying, it entirely loses its purgative effects.

JUGLANS CINEREA. *Butternut. White Walnut.* The unripe fruit, and the inner bark.

This tree is generally known throughout the United States, and is now introduced into the Materia Medica of the Massachusetts Pharmacopœia. During the American war, the extract, made from the inner bark of this tree, attracted the attention of Dr. Rush, and other medical men in our military hospital; and, being frequently administered to patients under the operation of inoculated small pox, it was proved to be an excellent substitute for jalap or other cathartics. It is now esteemed as a valuable purgative, in doses from ten to thirty grains, not occasioning heat or irritation; and is greatly commended in cases of dysentery. Conjoined with calomel it is rendered more active and efficacious, especially in bilious habits. As this extract is often very carelessly prepared by the country people, it ought to be prepared by the apothecaries, or practitioners themselves; and as a domestic medicine of considerable importance, it should be adopted by every physician. The bark of the root of this tree will excite a blister; and the bark and shells of the nuts dye a good brown colour. A decoction of the inner bark is advantageously employed as a cathartic in the disease of horses, called the *yellow water*.

JUNIPERUS COMMUNIS. *Juniper.* The berries and leaves.

This is an ever-green shrub, growing on heaths and hilly grounds in all parts of Europe; and, if planted in a good soil, will attain the height of fifteen or sixteen feet, and produce numerous branches. Juniper berries possess a strong not disagreeable smell, and a warm pungent sweet taste, which, if they be long chewed, or previously bruised, is followed by a bitterish one.

Their predominant constituents are, an essential oil, and a sweet mucilaginous matter. To the oil, they are indebted for their stimulating, carminative, diaphoretic, and diuretic properties.

They are most commonly used in the form of infusion, to which a little gin is added, as a diuretic drink in dropsy. The essential oil may be separated by distillation. It possesses the same properties in a higher degree, and imparts them to ardent spirits.

The peculiar flavour, and well-known diuretic effects of Holland gin, are owing to the oil of juniper.

JUNIPERUS SABINA. *Savine.* The leaves.

This is an ever-green shrub, which has small rather prickly leaves, and produces blue berries, only after it has arrived at a considerable age. Its stem attains the length of seven feet, and is apt to grow in a reclining posture: the wood is internally of a beautiful reddish shade, resembling that of mahogany. The leaves of savine possess a bitter, acrid taste; and their smell is so powerful and disagreeable, that it expels moths and similar vermin. When distilled with water, these leaves yield an uncommonly large proportion of essential oil.

Savine is a warm, stimulating medicine, capable of producing diaphoresis, and increasing all the secretions, but apt to excite hæmorrhage, especially from the uterus. It has long been considered as a powerful emmenagogue, and Dr. Home asserts, that in five cases of obstructions of the menses, four were cured by the savine, which he gave in powder, from a scruple to a drachm, twice in a day. But this acrid and heating substance, in the opinion of Dr. Cullen, is improper in plethoric habits, and should be employed with caution in those cases only which proceed from a relaxed state of the solids.

The oil distilled from this shrub is one of the most violent emmenagogues, and ought therefore to be used with the greatest caution in obstructions of the uterus or other viscera, proceeding from laxity or weakness. Savine is also recommended as an anthelmintic, and said to be very efficient in the cure of the gout.

Externally, the leaves are applied in the form of powder or infusion, to warts, carious bones, and old ulcers; and in cases of psora, gangrene, and tinea. Farriers apply this article with success to the ulcers of horses.

JUNIPERUS VIRGINIANA. *Common Red Cedar Tree.* The leaves.

The red cedar tree is a native of the United States, and grows to the height of fifteen or twenty feet. Its berries are smaller than those of the true juniper. In Virginia and Carolina the

berries are distilled into brandy. The leaves of this tree are now brought into notice by the investigation of Dr. Aaron Dexter, Professor of Chemistry, and Materia Medica, in the University at Cambridge. He has found this to be the only species of juniper in the United States, whose leaves agree in their properties with those of the savine, directed by Dr. Crowther, as the basis of the savine ointment.

KALMIA LATIFOLIA. *Broad Leaved Laurel. Calico Tree.* The leaves.

This plant kills sheep and other animals. The Indians use the decoction to destroy themselves. The powdered leaves are employed with success in tinea capitis, and in certain stages of fever. A decoction of it is used for the itch, but it should be cautiously applied. The brown powder attached to the foot stalks of the leaves, and about the seeds, is errhine. The powdered leaves with lard, form an ointment in herpes. In syphilis this plant has seemed useful. A saturated tincture of the leaves in proof spirit is an active remedy.

KINO. *Kino.* A gum resin.

This substance is the produce of a tree a native of Africa; the botanical characters of which have not been ascertained. It is of a dark-red colour, and has an astringent taste, with a degree of bitterness. It is more resinous than catechu, and is therefore less soluble in water. Its solution in water, as well as that in alcohol, strikes a deep purple colour with sulphat of iron, the latter even more so than the former. Its gallic acid seems therefore to be combined with its resinous part. It yields a precipitate with animal gelatin, but scarcely so copious as that from catechu. Kino is a powerful remedy in obstinate chronic diarrhœas and dysenteries; in all passive hæmorrhagies, especially from the uterus; in fluor albus; and in diseases arising from laxity of the solids. It is exhibited internally, in doses of from ten to thirty grains, in substance, or dissolved in diluted alcohol. Externally, it is applied as a styptic to check hæmorrhagies from wounds or ulcers, and to diminish the discharge of sanious or ichorous matter from ill-conditioned ulcers.

LACTUCA VIROSA. *Wild Lettuce.* The leaves.

This plant is biennial, and grows wild on rubbish and rough banks, in many places in Great Britain, and flowers in the month of August and September. It smells strongly of opium, and resembles it in some of its effects; and its narcotic power, like

that of the poppy heads, resides in its milky juice. An extract prepared from the expressed juice of the leaves of this plant, gathered when in flower, is recommended in small doses in dropsy. In dropsies of long standing, proceeding from visceral obstructions, it has been given to the extent of half an ounce in a day.

It is said to agree with the stomach, to quench thirst, to be gently laxative, powerfully diuretic, and somewhat diaphoretic. Plentiful dilution is allowed during its operation. Dr. Collin, of Vienna, asserts, that out of twenty four dropsical patients, all but one were cured by this medicine.

LACTUCA SATIVA. *Common Garden Lettuce.* The herb.

This plant, so valuable as an article of diet, abounds with a milky juice, which possesses all the characteristic properties of the opium of the shops, and may be procured from it in sufficient quantity, to repay any labour bestowed on it for this purpose. The laudanum made from the opium of the lettuce increases the pulse in force and frequency, and produces generally the same effects as result from similar doses of common laudanum. It has been used with advantage in allaying the pain of chronic rheumatism, and colic ; in checking the frequent stools accompanying diarrhoea ; in allaying cough, &c. &c. ; and doubtless the plant may be advantageously cultivated for medical purposes, especially as the opium is procured after the period in which the plant is useful for the table.

LAURUS CINNAMOMUM. *The Cinnamon Tree.* The bark and its volatile oil.

This valuable tree is a native of Ceylon, in the East Indies, and is now cultivated in Jamaica and other West-India islands. It grows from four to ten feet high, and is very bushy. The leaves resemble those of the laurel, and have the hot taste and smell of cloves when chewed. Cinnamon is the interior bark of the tree ; it is thin and convoluted, of a texture somewhat fibrous, of a slight brown colour, having an agreeable pungent taste, with a degree of sweetness and an aromatic flavour. Its virtues chiefly depend on the small quantity of essential oil which it contains. This bark is a very useful and elegant aromatic, more grateful both to the palate and stomach than most other substances of this class. Like other aromatics, the effects of cinnamon are stimulating, heating, stomachic, carminative, and tonic ; but it is rather used as an adjunct to other remedies, than as a remedy itself.

The essential oil of cinnamon has a whitish yellow colour, a pungent burning taste, and the peculiar fine flavour of cinnamon in a very great degree. It should sink in water, and be entirely

soluble in alcohol. It is principally prepared in Ceylon. This oil is one of the most powerful stimulants we possess, and is sometimes used as a cordial in cramps of the stomach, and in syncope; or as a stimulant in paralysis of the tongue, or to deaden the nerve in toothach. But it is principally used as an aromatic, to cover the less agreeable taste of other drugs.

LAURUS CASSIA. *The Cassia Tree.* The bark and flower buds, gathered before they open.

This tree is very similar to the former. The bark, which is imported from different parts of the East-Indies and from China, has a very exact resemblance to the cinnamon. It is distinguishable from the cinnamon, by being of a thicker and coarse texture, and by its breaking short and smooth, while the cinnamon breaks fibrous and shivery.

It resembles cinnamon still more exactly in its aromatic flavour and pungency than in its external appearance, and seems only to differ from it, in being considerably weaker, and in abounding more with a mucilaginous matter.

Cassia buds are the flower buds which are gathered and dried before they expand. They are of a brown colour; their taste and flavour is similar to the bark, and they are used for the same purposes.

Both the bark and buds of cassia possess the same properties with cinnamon, though in an inferior degree. The bark is very frequently, and sometimes unintentionally, substituted for the more expensive cinnamon; and the products obtained from cassia bark and buds by distillation, are in no respect inferior to those prepared from cinnamon.

LAURUS CAMPHORA. *Camphor Tree.* The camphor.

The camphor laurel grows in great abundance, and to a very considerable size, in the forests of Japan. It is not uncommon in green houses in England.

Camphor is a proximate principle of vegetables, contained in many plants, especially those of the aromatic kind. For the purposes of commerce, it is obtained from the *laurus camphora*. It exists in distinct grains in the wood of the root and branches of this tree. It is extracted by sublimation; in Europe it is purified by a second sublimation, with the addition of one twentieth of its weight of lime.

Pure camphor is colourless, semitransparent, tenacious, and somewhat unctuous to the touch; its smell is strong and fragrant; its taste pungent and bitter. It is volatile at every natural temperature; is fusible in a heat inferior to 212° ; is inflammable; scarcely soluble in water, but entirely soluble in alcohol,

ether, and oils, essential or expressed. It consists of carbon and hydrogen, and differs from the essential oils, in containing a larger proportion of carbon, with some oxygen. By combustion it affords carbonic and camphoric acids.

In a moderate dose, camphor produces effects similar to those of other narcotics. Its stimulant operation, however, is not considerable, even in a small dose ; and in a large dose, it always diminishes the force of the circulation ; induces sleep, and sometimes causes delirium, vertigo, and convulsions, ending in total insensibility. These violent effects of camphor are most effectually counteracted by opium. In a morbid state of the body, camphor allays inordinate actions. When the pulse is hard and contracted, it renders it fuller and softer.

It removes spasms and flitting pains arising from spasms ; and in delirium, when opium fails of producing sleep, camphor will often succeed.

The most general indication for the use of camphor, is the languor or oppression of the *vis vitæ*.

It may therefore be given with advantage,

1. In all febrile diseases of the typhoid type, especially when attended with delirium.
2. In inflammations with typhoid fever, as in some cases of peripneumonia and rheumatism.
3. In eruptive diseases, to favour the eruption, or to bring it back to the skin, if from any cause it has receded, as in small pox, measles, &c.
4. In many spasmodic diseases, especially mania, melancholy, epilepsy, hysteria, chorea, hiccough, &c.
5. In indolent local inflammations, not depending on an internal cause, to excite action in the part.

As a stimulant, says Murray, camphor has been used in typhus, cynanche maligna, confluent small pox, and other febrile affections accompanied with debility, in retrocedent gout, and to check the progress of gangrene. As a sedative it is used in affections of an opposite nature, as in pneumonia, rheumatism, and gonorrhœa, combined with nitre or antimonials, or by itself, where evacuations have been made. In mania, it has sometimes succeeded as an anodyne : as an antispasmodic, it has been employed with advantage in asthma, chorea, and epilepsy.

The dose of camphor is from five to twenty grains. It cannot be given with safety in a larger dose than half a drachm ; and Dr. Cullen has likewise remarked, that in too small a dose, as that of a few grains, it has very little effect. In divided doses, it may be given to the extent of a drachm or more in the day. Its power of checking the progress of gangrene is promoted by combination with musk, or carbonate of ammonia : combined with opium, it forms a powerful diaphoretic ; and its efficacy in inflammatory diseases is augmented by antimonials.

Camphor ought generally to be given in a state of mixture in some fluid form, as being then less apt to excite nausea. It may

be diffused in water by trituration with sugar, mucilage, or almonds. To reduce it previously to powder, a few drops of alcohol must be added. Magnesia, by being triturated with it, has the effect of dividing and rendering it smooth, and may be used for its suspension; a number of the gum-resins also act on it in such a manner, that, from their mixture, a soft uniform mass is formed, and this affords another mode of diffusing it in water.

Externally applied, camphor is used as an anodyne in rheumatism and muscular pains, and as a discutient in bruises and inflammatory affections; it is dissolved in alcohol or expressed oil, and applied by friction to the part. Added to collyria, or mixed with lard, it is of service in ophthalmia. Suspended in oil, it is used as an injection in ardor urinæ, and as an enema to relieve the uneasy sensations occasioned by ascarides. The combination of it with opium is useful as a local application in toothach.

Camphor is recommended as singularly efficacious in cases of *ardor urinæ*, or scalding of the urine, and nervous headaches. One of the most eligible forms in which camphor can be given, is, to rub about eighty grains in a mortar, with six or eight grains of myrrh, having previously dropped a few drops of spirits of wine in the camphor; then add ten or fifteen grains of gum arabic, and gradually as much water as will suspend the whole.

LAURUS SASSAFRAS. *Sassafras.* The wood, root, and its bark.

This tree is a native of North America, and is cultivated in Jamaica. The wood, root, and its bark are used; they have a moderately fragrant smell, and a sweetish aromatic taste. Sassafras is a warm aperient and strengthening medicine; it has often been successfully given in the form of infusion and decoction, for improving the tone of the stomach and bowels, in persons whose humours were in a vitiated state. The essential oil is highly stimulating and heating, and must be given only in very small doses, being a sudorific and diuretic remedy. The bark is useful in intermittents; and the oil is said to be efficacious, applied externally to wens.

LAVENDULA SPICA. *Lavender.* The flowering spikes.

Lavender is a well known small, shrubby, perennial plant, a native of the south of Europe, but frequently cultivated in our gardens for the sake of its perfume. There are two varieties. The flowers of both have a fragrant, agreeable smell, and a warm pungent, bitterish taste; the broad leaved sort is the strongest in both respects, and yields in distillation thrice as much essential oil as the other; it is also hotter and specifically heavier; hence in the southern parts of France, where both kinds grow wild, this

only is used for the distillation of what is called oil of spike. The narrow leaved, is the sort commonly met with in our gardens.

Lavender is considered as a warm stimulating aromatic. It is principally used as a perfume.

LEONTODON TARAXACUM. *Dandelion.* The root and leaves.

An indigenous, perennial plant, growing in meadows and pastures, on road sides, ditch banks, &c. It produces a yellow flower, which blows from April to September, and has the remarkable quality of expanding early in the morning, and closing in the evening. The root, leaves, and stalk, contain a large proportion of bitter milky juice, which possesses considerable activity. Its more immediate operation is, to remove visceral obstructions, and promote the urinary discharge: the dose prescribed by Boerhaave for this purpose, is four ounces, to be taken three or four times in a day; and later experience has corroborated its great efficacy in dropsical and other complaints connected with a disordered state of the first passages, even in much smaller doses.

LICHEN ISLANDICUS. *Iceland Moss.* The herb.

This is a species of liverwort or rock moss, of which there are many varieties. It is brought from Iceland, where the inhabitants make considerable use of it as an article of diet, and esteem it an excellent remedy in consumption. Of late years it has attracted the attention of physicians in the United States, and acquired considerable repute for its remarkable mucilaginous and nutritive properties. It has a bitter and somewhat astringent taste, which are in some measure destroyed by drying or infusing in water. As a medicine, *Scopoli* and *Haller* recommended it in coughs and consumptions, and it has proved efficacious in diarrhœas and dysentery. Docter Kerr found it so successful in dysentery, that, after repeated emetics and cathartics, he never used any other medicine, except that he occasionally added opium. Dr. Crichton has an high opinion of it only in two species of consumption: the *phthisis hæmoptoica* and the *phthisis pituitosa vel mucosa*; for by the use of this, he has seen patients get so far the better, as to be dismissed from the hospitals cured. It is given in decoction, boiling one ounce and an half in two pounds of milk, *over a slow fire, exactly one quarter of an hour.* If milk disagree, water may be used, to which after straining, a sufficient quantity of sugar may be added to make a syrup. Three or four ounces of this are to be taken frequently in a day. When continued for several months, it has been found extremely serviceable as a restorative in consumptive cases attended by debility, and an acrimonious state of the blood and juices.

LINUM USITATISSIMUM. *Common Flax.* The seeds and their fixed oil.

Linseed contains about one fifth of mucilage, and one sixth of fixed oil. It is therefore considered as emollient and demulcent. The entire seeds are only used in cataplasms. The mucilage resides wholly in the skin, and is separated by infusion or decoction. The infusion is used as a pectoral drink, and in ardor urinæ, nephritic pains, and during the exhibition of corrosive sublimate. Flaxseed syrup is made by adding to two pints of the mucilage one pint of honey ; while simmering away by a gentle heat observe to take off the scum as it rises. This is highly useful in all kinds of coughs, and other diseases of the breast and lungs. The oil is separated by expression. It is one of the cheapest fixed oils ; but is generally rancid or nauseous, and unfit for internal use.

The cake which remains after expression of the oil, contains the farinaceous and mucilaginous part of the seed, and is used in fattening cattle, under the name of oil cake.

LOBELIA INFLATA. *Lobelia Emetica.* *Emetic Weed.* *Indian Tobacco.* The leaves.

The leaves oblong, slightly serrated ; sessile ; alternate ; on the upper surface numerous tubercles. Stems branched. Blossoms solitary ; in a kind of spike ; pale blue. Common in dry fields, and flowers in August.

The leaves chewed are at first insipid, but soon become pungent, occasioning a copious discharge of saliva. If they are held in the mouth for sometime they produce giddiness and pain in the head, with a trembling agitation of the whole body ; at length they bring extreme nausea and vomiting. The taste resembles that of tartar emetic. A plant possessed of such active properties, notwithstanding the violent effects from chewing the leaves, may possibly become a valuable medicine. [Cutler's account of indigenous vegetables.]

It was employed by the aborigines as an emetic, and also by those empirics who affect to deal in Indian remedies only. As a new article it has lately excited much speculation in the New-England states, and its properties have very frequently been subjected to the test of practical experiment. It is found to operate as a speedy and active emetic, and it often induces a most profuse perspiration immediately after being received into the stomach. It has proved serviceable in cases of colic, where emetics were indicated ; and some evidence has been adduced of its having afforded relief in rheumatic complaints of the chronic kind. In a variety of instances it has been administered as a remedy in asthmatic affections, and on competent authority we are assured, that it has in general manifested considerable efficacy, and some-

times proved more beneficial in this distressing disease than any other medicine. From some of its effects, says an eminent physician, lobelia seems to be related to the narcotic plants ; to the mouth and first passages it proves acrid and highly stimulant ; its stimulus appears to be of the diffusive kind, as Dr. Cutler, on taking it, experienced an irritation of the skin over the whole body. It is probably one of the most powerful vegetable substances with which we are acquainted, and no rational practitioner will have recourse to it, but with the greatest precaution. The melancholy consequences resulting from the use of *lobelia inflata*, as lately administered by the adventurous hands of a noted empiric, have justly excited considerable interest, and furnished alarming examples of its deleterious properties and fatal effects. The dose in which he is said usually to prescribe it, and frequently with impunity, is a common tea spoonful of the powdered seeds or leaves, and often repeated. If the medicine does not puke or evacuate powerfully, it frequently destroys the patient, and sometimes in five or six hours.

Even horses and cattle have been supposed to be killed by eating it accidentally. The specific qualities of this highly active plant, promising to be of utility as a remedy, should be particularly investigated by ingenious and intelligent men, that its rank in the Materia Medica may be clearly ascertained.

The following highly interesting observations have been recently received from the Rev. Dr. M. Cutler.

When I was preparing my botanical paper, says the Dr. I had given it (the lobelia) only a cursory examination, and having some doubt about its specific characters, I suspected it to be a new species. Accidentally ascertaining its emetic property, I inserted it with the specific name, *emetic weed*. By chewing a small part of it, commonly no more than one or two of the capsules, it proves a gentle emetic. If the quantity be a little increased, it operates as an emetic, and then as a cathartic, its effects being much the same as those of the common emetics and cathartics. It has been my misfortune, the author observes, to be an asthmatic for about ten years. I have made trial of a great variety of the usual remedies with very little benefit. In several paroxysms I had found immediate relief more frequently than from any thing else, from the skunk-cabbage. (*Dracontium fetidum*. Lin. *Arum Americanum*. Catesby. See that article in this volume.) The last summer I had the severest attack I ever experienced. It commenced early in August, and continued about eight weeks. Dr. Drury, of Marblehead, also an asthmatic, had made use of a tincture of the Indian tobacco, by the advice of a friend, in a severe paroxysm early in the spring. It gave him immediate relief, and he has been entirely free from the complaint from that time. I had a tincture made of the fresh plant, and took care to have the spirit fully saturated, which I think is important. In a paroxysm which perhaps was as severe as I ever experienced, the difficulty of breathing extreme, and

after it had continued for a considerable time, I took a table spoonful. In three or four minutes my breathing was as free as it ever was, but felt no nausea at the stomach. In ten minutes I took another spoonful which occasioned sickness. After ten minutes I took the third, which produced sensible effects upon the coats of the stomach, and a very little moderate puking, and a kind of prickly sensation through the whole system, even to the extremities of the fingers and toes. The urinary passage was perceptibly affected by producing a smarting sensation in passing urine, which was probably provoked by stimulus upon the bladder. But all these sensations very soon subsided, and a vigour seemed to be restored to the constitution, which I had not experienced for years. I have not since had a paroxysm, and only a few times some small symptoms of asthma. Besides the violent attacks, I had scarcely passed a night without more or less of it, and often so as not to be able to lie in bed. Since that time I have enjoyed as good health as, perhaps, before the first attack.

I have given you this minute detail of my own case, from an apprehension that this plant, judiciously employed, may approach nearer to a specific in this most distressing complaint, than any other that has been yet discovered. But I am aware much further experiment is necessary to ascertain its real value. Several medical gentlemen have since made use of the tincture in asthmatic cases with much success, but the effects have not been uniformly the same. In all instances of which I have had information, it has produced immediate relief, but the effect has been different in different kinds of asthma. Some patients have been severely puked with only a tea spoonful, but in all cases some nausea seems to be necessary. The asthma with which I have been afflicted, I conceive to be that kind which Dr. Bree, in his *Practical Inquiries on disordered respiration, &c.* calls the first species—“a convulsive asthma from pulmonic irritation of effused serum.” My constitution has been free, I believe, from any other disorder, than what has been occasioned by an affection of the lungs, anxiety of the præcordia, and straitness of the breast, and other symptoms produced by that affection. In similar asthmas, the tincture has been as successful as in my case. It is extremely desirable that careful experiments should be made by men of real medical knowledge.

A particular case has been related to me of an effectual cure of the hydrophobia,* in the last stage of the disease, by the use of

* Upon the principle in the animal economy, that one irritation destroys another, it has been attempted to cure tetanus by exciting a strangury by means of the internal administration of cantharides; one remarkable instance of success by such practice has been announced, by Dr. S. Brown, of Lexington, Kentucky; and Dr. Mease, of Philadelphia, is extremely sanguine in his expectations, should this method be adopted † That there is a

† Medical Repository, vol. 5.

this plant. I had the information from a man of undoubted veracity, that received it from the father of the young man who was cured; but facts relating to the case have not been sufficiently ascertained to assert it to be a remedy in this disease. In a short time I expect to obtain a more circumstantial and satisfactory account of this case.

With the view of establishing a uniformity of strength in the preparation, the Essex district medical society have agreed, that the proportion for the tincture of lobelia shall be two ounces of the dried plant to one pint of diluted alcohol.

LOBELIA SYPHILITICA. *Lobelia*. The root.

This plant grows in moist places in Virginia. It is perennial, has an erect stalk, three or four feet high, blue flowers, a milky juice, and a rank smell. The root, which is the part used, consists of white fibres about two inches long, resembles tobacco in taste, which remains on the tongue, and is apt to excite vomiting.

Dr. Barton says, it is considerably diuretic; and Mr. Pearson found, that it generally disagreed with the stomach, and seldom failed of affecting the bowels as a strong cathartic. It certainly possesses no power of curing syphilis; even the Indians who have the disease, are glad of an opportunity of applying to the whites. It is said to have cured gonorrhœa.

LYTTA VITTATA. *Potatoe Fly*.

There are four species of meloe that blister, found in the United States. The lytta vittata was first brought into notice by

close analogy subsisting between hydrophobia and tetanus, is a position amply confirmed by experience. There appears evidently to be an affinity between cantharides and lobelia inflata, in their operation upon the human system. The latter acts as a stimulus of the diffusible kind, as evinced by its inducing a prickly sensation over the surface, and extending its influence to the urinary organs in the case of Dr. Cutler; and in preserving a regular excitement, and genial warmth, and producing a permanent vigour in the system in a variety of instances. According to the laws of the animal economy, the nervous system, under the impression of this medicine, may be rendered unsusceptible of spasmodic affections; and thus may the effects of canine poison, and the irritating cause of tetanus, be counteracted. It is therefore possible, that lobelia may ultimately prove a remedy in both of these kindred diseases. In the language of Dr. Mease—"Surely in a disease hitherto almost universally fatal, we are justified in attempting a cure by a plan, in favour of which, analogy, authority, and the well known laws of the system, plead so powerfully. Those who may finally be the happy instruments of disarming the awful disease of its terrors, will justly merit the thanks of their own country, and of the world in general." Another elegant writer observes—"The laurel of victory, and the gratitude of mankind, will be well bestowed upon him who shall enable us to triumph over this direful disease."

Dr. Isaac Chapman, of Buck's county, Pennsylvania. It feeds principally upon the potatoe vine, and, at the proper season of the year, may be collected in immense quantities. This insect has a very near resemblance, in its outward form, to the meloe vesicatorius, or Spanish fly ; but is rather smaller, and of a very different colour ; the head is of a very light red, with black antennæ ; the elytra or wing cases are black, margined with pale yellow, and a stripe of the same colour extends along the middle of them ; the tarsi have five articulations ; the mouth is armed with jaws, and furnished with tarsi.

In the abdomen of this fly, is a hard, white substance, about the size of a grain of wheat, which, when powdered, appears like meal, and, when rubbed with water, forms a milky emulsion.

The experiments and investigation of Dr. Chapman have proved, that, when applied to the human system, the effects of the potatoe fly, are perfectly analogous to those of the Spanish cantharis ; being equal, if not superior to them in medicinal powers.* The *lytta vittata* is now introduced into the *Materia Medica* of the Massachusetts Pharmacopœia, and its properties have been made the subject of a valuable communication to the Medical Society of Massachusetts, by Dr. John Gorham, of Boston. From this interesting paper it appears, that for some years past, the potatoe fly has been employed as a vesicatory by Dr. Israel Allen, of Sterling. That the insect in its dried state, is from four to six lines in length, its head and elytra are uniformly black, and the latter want the margin and stripe of yellow, observable in that described by Dr. Chapman. Its belly is ash coloured, and in the cavity of the abdomen is found the hard white substance already described. The thickness of the potatoe fly, which is nearly uniform throughout, is from one quarter, to one third its length. It generally appears on the vines, about the end of July, and the first week in August. They inhabit the soil at the foot of the plant ; they ascend in the morning and afternoon, but generally avoid the heat of the sun at noon. As they fly with great difficulty, they are easily caught, and are prepared for medicinal purposes, by shaking them from the plant into hot water, and afterwards drying them by the sun's rays. Dr. Gorham proceeds to observe, that he has instituted an extensive series of experiments with the *lytta vittata* ; and that they have never failed, even in a single instance, of producing all the immediate effects which he anticipated, from their external application, or internal exhibition : as a vesicatory, he has found them equal, if not superior to the cantharis usually employed for that purpose in this country. The saturated tincture has been administered internally in many cases of diminished sensibility of the urinary organs, in gleans, and as a diuretic in dropsy ; and it has been found, in all, to increase the discharge of urine, and to produce a considerable irritation in the urethra, and in the neck of the bladder.

* Med. Repos. vol. 2.

It appears, therefore, from the combined testimony of Drs. Chapman, Gorham, and Allen, that physicians, in various parts of the country, may collect from their own fields, an annual visitor, possessing all the properties of the genuine cantharis. This indigenous production cannot fail of being generally adopted, as an excellent substitute for an expensive exotic, not always to be obtained.

We shall notice another kind of indigenous blistering fly, the *meloe niger* of professor Woodhouse, or the *Pennsylvanicus* of Linnæus. This is not more than half the size of Chapman's fly, and is uniformly black. It feeds upon the *prunella vulgaris*, or self heal, and *ambrosia trifida*, or stick weed. During the month of August, the farmers of New England find them in immense quantities, extracting nourishment from the potatoe vine, which in some seasons they almost destroy. These flies, it is well ascertained, are not inferior in point of efficacy to any other species, whether of foreign or domestic production, and they seldom excite strangury when applied externally.

MALVA SYLVESTRIS. *Common Mallow.* The leaves and flowers.

This is an annual plant growing in hedges, foot paths, and among rubbish. The whole plant abounds with mucilage. The leaves were formerly often used in food, to prevent costiveness. At present, decoctions of the plant are sometimes prescribed in dysenteries and urinary complaints; though it is chiefly employed in emollient cataplasms, clysters, and fomentations.

MARANTA ARUNDINACEA. *Indian Arrow Root.* The root.

This plant was originally the production of the East Indies, and is now cultivated in Jamaica and other West India islands, and in South America. Arrow root agrees with sago, jalap, and tapioca in its general nutritious property, but is reckoned to excel them, so far as to afford a much larger proportion of mucilage than any vegetable hitherto discovered. Hence it is of superior utility as an article of diet for the sick and invalids, and particularly in cases of acrimony, either in the general habit, as in hectic fever or consumption; or in particular secretions, as in affections of the urinary passages, namely, inflammation, stone, or gravel; and also in affections of the bowels, as in looseness and dysentery. It furnishes also an excellent remedy for the bowel complaints, which so commonly prevail in the United States during the warm season, especially among children. The jelly is made by adding to a table spoonful of the powdered root as much cold water as will make it into a soft paste, then pour on boiling water, stirring it at the same time briskly, until it become a clear jelly, which may be seasoned with sugar and nutmeg, or a little wine or lemon

juice may be added. For children it may be prepared with milk, and if it ferment on the stomach, the addition of a little animal jelly will obviate that effect. Prepared in the form of pudding the arrow root powder is far preferable to any of the farinaceous substances, and affords a delicate and very proper food for convalescent patients. According to Dr. Wright, of Jamaica, a decoction of the fresh root makes an excellent ptisan in acute diseases. In a pamphlet published in 1796, by Mr. T. Rider, we find the culture of this valuable article highly recommended to the West Indian planters, and the new African colonists, as an object of commerce, and the most eligible substitute for starch made of wheat. By the authors computation eight millions of pounds weight of starch are made annually in Great Britain alone from that valuable grain. It appears also by the same authority that arrow root starch is of the finest quality, and that one pound of it is equal to two pounds and a half of that prepared from wheat. Fortunately the arrow root has of late years been introduced into the states of South Carolina and Georgia, and by practical experiment it is ascertained that the soil of the southern sea coast is well adapted to it. John Cooper, Esq. an opulent planter on St. Simon's, and Campbell Wyly, Esq. of Sapelo island, have, it is understood, so far succeeded in their attempts as to afford the most flattering encouragement, that this important article may be added to the numerous sources of wealth enjoyed by our southern planters. The latter gentleman asserts, that a spot of land on his plantation yielded arrow root sago in the proportion of 1840 pounds to the acre. No production it is presumed can promise a more ample remuneration, to stimulate the planter to attempt its cultivation; and when it is considered, that, in proportion to the produce, the demand will be extended, its claim as a rival staple with rice and cotton may, perhaps, be anticipated.

MARRUBIUM VULGARE. *White Horehound.* The leaves.

This is a perennial plant, which grows wild on road sides, and among rubbish. The leaves have a very strong, not disagreeable smell, and a roughish, very bitter taste. It is reputed to be both attenuant and resolvent; an infusion of the leaves in water, sweetened with honey, is recommended in asthmatic and phthisical complaints, as well as in most other diseases of the breast and lungs. They promote the fluid secretions in general, and liberally taken, loosen the belly.

Dr. Withering observes that it was a favourite medicine with the ancients in obstructions of the viscera. He says, that it is the principal ingredient in the negro Cæsar's remedy for vegetable poisons. That a young man who had occasion to take mercurial medicines, was thrown into a salivation which continued for more than a year. Every method, that was tried to remove it, rather

increased the complaint. At length Linnæus prescribed an infusion of this plant, and the patient got well in a short time.

MEL. *Honey.*

A sweet fragrant vegetable juice, collected by bees from the flowers of various plants, and deposited in the cells of the comb. The honey produced by young bees, and which flows spontaneously, is purer than that expressed from the comb; whence it is called virgin honey: the best sort is of a thick consistence, and of a whitish colour inclining to yellow; it possesses an agreeable smell and a pleasant taste. In some situations, where noxious plants abound, poisonous honey is met with, from the bees feeding on such flowers. As an article of food, when immoderately used, honey is pernicious to weak stomachs; it ought therefore to be avoided by persons liable to eruptions of the skin, or in whom there is a redundancy of bile. This vegetable substance contains an acid similar to that of sugar, but is more spiritous: hence it readily ferments, occasions flatulency, and in some habits produces gripes and looseness. As a medicine, however, it is a very useful aperient and expectorant, especially when it has been previously boiled; in which state, it may be used with safety and advantage by asthmatic patients; for it tends to dissolve viscid humours, and to promote the expectoration of tough phlegm.

Honey is also convertible into an agreeable liquor termed mead; and it may be advantageously employed in the following manner: dissolve one pound of honey in three or four quarts of water, and being exposed to a temperature between the 70th and 80th degree of *Fahrenheit's* thermometer, it will in a short time become a very agreeable acid liquor, which possesses an aromatic flavour and strength, superior to that of the best vinegar made of white wine. This cheap and agreeable substitute for white wine vinegar appears to deserve every attention in domestic economy.

MELALEUCA LEUCADENDRON. *The Cajeput Tree.* The volatile oil.

The tree which furnishes the cajeput oil is frequent in the East Indies. The essential oil, obtained by distillation from the leaves and fruit, has a green or yellowish colour, a strong fragrant odour, and an extremely pungent taste. It is highly volatile. This oil has been used as a highly diffusible stimulant and antispasmodic, in tympanites, hysteria, palsy, chronic rheumatism, and various other diseases of debility. Its dose is three or four drops. It is also applied externally to relieve rheumatic and gouty pains, and violent headaches. But its most remarkable effect is in that painful complaint the toothach. From whatever cause this affection may proceed, whether from a carious tooth, rheu-

matic acrimony, catarrh, &c. the cajeput oil has generally been found efficacious in removing it, if dropped on lint, and placed in the cavity of the tooth, or even around the gum.

MELIA AZEDARACH. *Poison Berry Tree. Pride of India or China.* The fruit and root.

This is not a native of America, but is now completely naturalized to the states of Carolina and Georgia; where it is highly valued for the beauty of its foliage, and agreeable shade, which it affords during the sultry season. In the city of Savannah the streets and public walks are ornamented by rows of this charming tree, and the compiler has recently been gratified with the enchanting view which they exhibit. The azedarach has also obtained considerable repute for the medicinal virtues which it is found to possess. Professor Barton says, it is one of the most valuable anthelmintics that has hitherto been discovered, and many respectable physicians in Savannah repose the fullest confidence in its efficacy. To Dr. L. Kollock, vice-president of the Georgia Medical Society, we are indebted for the following information. "It is a vermifuge of efficacy. Its use is in some measure general among the planters; and with many supersedes the use of all others. I have given it with success where all others in common use have failed of relieving. But when given in the months of March and April, while the sap is mounting into the tree, it has sometimes been followed by stupor, dilatation of pupil, stertorous breathing, subsultus, &c. But these symptoms, like those sometimes produced by spigelia, pass off without any perceptible injury to the system. This article, like the spigelia, is also a useful febrifuge medicine, in those affections usually denominated verminous fevers, but where no worms are voided. The common form is that of decoction. A large handful, say about four ounces of the bark of the fresh root is boiled in a quart of water, till it acquire the colour of strong coffee, i. e. to about a pint, of which from half an ounce to an ounce may be given every two or three hours till it operate. Given in this manner, its operation is powerful, sometimes both vomiting and purging. The strength of the decoction is however varied according to the intention." The dried berries of this tree have been advantageously employed as an anthelmintic, in Carolina; children being allowed to eat them at pleasure. The pulp of the fruit formed into an ointment with lard, it is said, has been successfully employed in tinea capitis.

MELISSA OFFICINALIS. *Blam.* The leaves.

Balm is much cultivated in our gardens on account of its pleasant aromatic smell, resembling that of the lemon, and its fra-

grant though roughish taste. It is principally employed in the form of a watery infusion, which is drunk in the manner of tea; and in acute fevers, when acidulated with the juice of lemon, it is an useful diluent.

MELOE VESICATORIUS. *Cantharis. Spanish Flies.*

The cantharis is an insect, collected from the leaves of plants in Spain and Italy, and dried in the sun. It is of a lively green colour; has a faint unpleasant smell, and a taste slightly acrid. The active matter of this insect inflames and excoriates the skin, and is used as the basis of the common vesicatories. Taken internally they often occasion a discharge of blood by urine, with exquisite pain: if the dose be considerable, they seem to inflame and exulcerate the whole intestinal canal; the stools become mucous and purulent; the breath fœtid and cadaverous; intense pains are felt in the lower belly: the patient faints, grows giddy, delirious, and dies. Applied to the skin, they first inflame, and afterwards excoriate the part, raising a more perfect blister than any of the vegetable acrids, and occasioning a more plentiful discharge of serum. But even the external application of cantharides is often followed by a stranguary, accompanied with thirst and feverish heat. The inconveniences arising from the use of cantharides, whether taken internally, or applied externally, are best obviated by drinking plentifully of bland emollient liquids, such as milk, decoctions of barley, linseed, solutions of gum arabic, &c. or by pouring warm water from a bottle, upon the lower part of the belly, as the person lies in bed. The specific property of counteracting cantharides ascribed to camphor, says Dr. Duncan, has no foundation. Internally administered, it acts with much violence on the urinary passages. In dropsy, it has been given as a diuretic, in a dose of one grain once or twice a-day, or a few drops of the tincture continued for some time: it has been prescribed in a similar manner in obstinate gleet and leucorrhœa, and in retention of urine arising from debility of the body, of the bladder, or in the opposite affection of incontinence of urine from debility of the sphincter. It is principally in these two last affections, that the internal administration of cantharides is attempted. The tincture has been of late much recommended in tetanus, &c. and in some instances has proved useful.

Applied externally, cantharides are one of our best and most powerful remedies. By proper management they may be regulated so as to act as a gentle stimulus, as a rubefacient, or as a blister.

Blisters are applied, 1. To increase the activity of the system in general, by means of their irritation.

2. To increase the activity of a particular organ.

3. To diminish morbid action in particular organs, by means of the irritation they excite in the parts to which they are applied.

They may be employed with advantage in almost all diseases accompanied with typhus fever, especially if any important viscus, as the brain, lungs, or liver, be at the same time particularly affected. In these cases the blisters are not applied to the diseased organs themselves, but as near them as may be convenient. When we wish to excite action in an organ, the blisters are, if possible, applied directly to the diseased organ.

Cantharides are employed externally, either in substance mixed up with wax and resin, so as to form a plaster, or ointment, or in the form of tincture.

After a blister has been raised, it is often of advantage to convert the serous into a purulent discharge, by exciting suppuration, which is done by applying to the blistering part any acrid stimulating ointment; one, for example, containing a small proportion of powdered cantharides; which answers the purpose by the irritation it keeps up.* It is a practice often employed with advantage in asthma, paralysis, and a variety of chronic affections. Dr. Philip S. Physick, and Dr. Rush have in several instances experienced the efficiency of blisters to arrest the progress of mortification when applied to the diseased part.

MENTHA VIRIDIS. *Spear-mint.* The herb.

Spear-mint grows on the banks of rivers, and in watery situations; and flowers in the months of July and August. The leaves have a warm roughish, somewhat bitterish taste; and a strong, not unpleasant, aromatic smell. Their virtues are stomachic and carminative.

MENTHA PIPERITA. *Peppermint.* The herb.

Of the different mints, this is the one which has the greatest degree of pungency. The leaves have a strong, rather disagreeable smell, and an intensely pungent aromatic taste, resembling that of pepper; and accompanied with a peculiar sensation of coldness. They afford an essential oil, rich in the aromatic quality of the herb. It also contains a small portion of camphor.

Peppermint is used as a stimulant and carminative, to obviate nausea or griping, or to relieve the symptoms resulting from flatulence, and very frequently to cover the taste and odour of other medicines. It is also an excellent stomachic, of great use in flatulent colics, languors, and hysteric cases, and in vomiting. It is used under the forms of the watery infusion, the distilled water, and the essential oil. This last being dissolved in a due proportion of rectified spirit of wine, and coloured with green grass, forms the essence of peppermint of the shops; a fashionable and

* See cerat. Juniper.

pleasant carminative, which when taken on sugar, imparts a glowing taste, sinking into the tongue, and extending its effects through the whole system, instantly communicating a glowing warmth.

MENTHA PULEGIUM. *Penny Royal.* The herb and flower.

This herb possesses properties similar to those of the mint; but it is more acrid, and less agreeable to the palate. It has long been esteemed as an aperient and deobstruent, particularly in hysteric and other female complaints. Dr. Withering observes, that the expressed juice of penny royal, with a little sugar, is an useful medicine in the whooping-cough.

MIMOSA CATECHU. *Catechu.* The extract of the wood, called extract of catechu.

This substance is obtained by boiling the interior wood of a cove tree with water, the decoction is poured off and evaporated, and the tenacious extract thus obtained, is dried by exposure to the air and sun. It was for a long time erroneously called *Terra Japonica*, from the earthy particles it contains; but which are entirely adventitious, and consist of impurities adhering to it.

The extract of catechu, when in its purest state, is in small pieces of a yellow or brown colour, which may be reduced to powder, and almost entirely dissolved in water, or in spirit of wine. It is a mild but excellent astringent, and leaves in the mouth an agreeable sweetness. This medicine is more particularly useful in alvine fluxes, and, where on this account astringents become necessary, it is perhaps the most salutary.

It is also successfully employed in complaints peculiar to females, laxity and debility of the viscera in general, and in various other diseases, which require strengthening remedies. When dissolved in the mouth, the catechu has frequently afforded relief for weak and ulcerated gums, for aphthous eruptions, or the thrush and similar affections. The best form, in which this medicine can be taken, is that of simple infusion in warm water, with the addition of cinnamon or cassia. It is given in doses from fifteen to forty grains, according to the age and constitution of the patient.

Mr. Davie has discovered that the *mimosa catechu* consists almost wholly of pure tannin, and that its action on leather is in proportion powerful.

MIMOSA NILOTICA. *Egyptian Mimosa. Gummi Arabicum.* The gum, called gum arabic.

This, the purest of the gums, is obtained by spontaneous exudation from the mimosa, and afterwards hardens in the sun. It is in small irregular pieces, white or yellowish, semipellucid, without taste or smell. It has all the properties of gum; is insoluble in alcohol or oils, and soluble in water, forming a viscid solution termed mucilage. The pieces, which are the most transparent and have least colour, are reckoned the best.

Gum arabic is used as a demulcent. In catarrh it is allowed to dissolve slowly in the mouth, and its mucilage is the basis of the mixtures usually employed to allay coughing. Its solution in water, more or less viscid, is frequently exhibited in diarrhœa, dysentery, tenesmus, strangury, and ardor urinæ. In pharmacy, mucilage of gum arabic is employed for a variety of purposes. It serves to suspend heavy powders in waters; it gives tenacity to substances made into pills, and it effects a partial union of oils, balsams, and resins, with water.

MOSCHUS MOSCHIFERUS. *The Musk Deer.* The substance contained in a follicle situated near the navel, called musk.

The musk animal is an inhabitant of China, India, and Tartary. It is a gentle and timid animal; its general form resembles the deer tribe, and is about three feet in length. In the male, behind the navel, and before the prepuce, there is situated an oval bag, flat on one side, and convex on the other, about three inches long and two broad. In the adult animal this sac is filled with a secreted matter, known by the name of musk.

Fine musk comes to us in round thin bladders; which are generally about the size of a pigeon's egg, covered with short brown hairs lined with a thin brown membrane, well filled, and without any appearance of having been opened. The musk itself is dry, with a kind of unctuousity, of a dark reddish brown, or rusty blackish colour, in small round grains, with very few hard black clots, and perfectly free from sandy or other visible foreign matter. If chewed, and rubbed with a knife on paper, it looks smooth, bright, yellowish, and is free from grittiness. Its taste is somewhat bitterish, and its smell extremely powerful and peculiar. Musk yields part of its active matter to water, by infusion; by distillation the water is impregnated with its flavour; alcohol dissolves it, the impurities excepted.

Musk is a medicine of very great efficacy, and for which, in some cases, there is hardly any substitute. When properly administered, it sometimes succeeds in the most desperate circumstances. It raises the pulse without heating much; it allays spasms, and operates remarkably on the brain, increasing the powers of thought, sensation, and voluntary motion. It is administered with

advantage in the greater number of spasmodic diseases, especially in hysteria and singultus, and also in diseases of debility. In typhus it is employed to relieve subsultus tendinum, and other symptoms of a spasmodic nature. In cholera it frequently stops vomiting, and, combined with ammonia, it is given to arrest the progress of gangrene. It is also used with the greatest benefit in exanthematous and phlegmonic diseases, accompanied with typhoid fever, and also in chin cough, epilepsy, trismus, &c. Its dose is from six to twenty grains, repeated, if necessary, every five or six hours. It is best exhibited in the form of bolus. To children, it is given in the form of enema, and is an efficacious remedy in the convulsions arising from dentition.

MURIAS AMMONIÆ. *Muriate of Ammonia. Sal Ammoniac.*

Muriate of ammonia is found native, especially in the neighbourhood of volcanoes. It was first prepared in Egypt, from the soot of camel-dung, by sublimation. But the greatest part of that now used, is manufactured in Europe, either by combining directly ammonia with muriatic acid, or by decomposing the sulphate of ammonia by means of muriate of soda, or the muriates of lime and magnesia by means of ammonia. It is prepared in solid masses, semitransparent, and somewhat ductile. It is volatile in a small degree of heat; its alkali is extricated in pungent vapours on the admixture of quick-lime; its acid is extricated in white fumes, on pouring concentrated sulphuric acid upon it. It dissolves in rather less than thrice its weight of water.

Sal ammoniac, when pure, promotes perspiration, and, in some cases, increases the secretion of urine. A drachm of it dissolved in water, if the patient be kept warm after taking it, generally proves sudorific. By moderate exercise in the open air, it operates beneficially on the kidneys; given in a large dose, it proves aperient; and in a still larger, it acts as an emetic.

As a cooling and diaphoretic medicine, the sal ammoniac, dissolved either in vinegar and water, or combined with small doses of the Peruvian bark, has often been attended with the best effects, when taken in fevers, and especially in intermittents, after the intestinal canal has been properly evacuated.

This salt has also been employed externally in lotions and embrocations, for scirrhus and other indolent tumours; for removing warts and other excrescences, and in gargarisms for inflammation of the tonsils. Externally applied, sal ammoniac is a valuable remedy. It may act in two ways, 1. By the cold produced during its solution. It is from this cause that fomentations of muriate of ammonia probably prove beneficial in mania, apoplexy from plethora, lesions of the head, and in violent headaches. When used with this intention, the solution should be applied as soon as it is made. 2. By the stimulus of the salt. On this principle we may explain its action as a discutient in indolent tumours

of all kinds, contusion, gangrene, psora, ophthalmia, cynanche, and in stimulating clysters. In some cases, as in chilblains, and other indolent inflammations, both modes of action may be serviceable. When first applied, the coldness of the solution will diminish the sense of heat and uneasiness of the part, and the subsequent stimulus will excite a more healthy action in the vessels.

MURIAS SODÆ. *Muriate of Soda. Common Sea Salt.*

This is the most common of all the neutral salts. It is not only found in immense masses, on, and under the earth's surface, and contained in great quantities in many salt springs; but it is the cause of the saltiness of the sea. Common salt differs from all other neutral substances of this nature, in its taste being purely saline, and occasioning thirst after it it has been swallowed. The primitive figure of its crystals is that of a cube; but, on evaporating a solution of salt, the small cubic particles assume the secondary form of hollow squares. When the crystals are perfectly pure, they are not affected by moist air; and in this state, one hundred parts, according to Bergman, contain fifty-two of muriatic acid, or spirit of salt; forty-two of soda, or mineral alkali; and six of water of crystallization.

Nature furnishes us with this neutral salt, either in a solid state; in mines; or dissolved in the sea; or in saline springs. If it be obtained from the bowels of the earth, it is called rock-salt; and is generally very hard and transparent, though it is sometimes opaque, white, and sometimes of red, green, blue, or other shades. The purest of this kind is colourless; the other species are purified by solution in water, and by recrystallization, before they can be employed for culinary purposes. The principal mines of rock-salt are in the vicinity of Cracow, in Poland, and at Northwich, in the county of Chester. The salt, however, which is thus easily procured, and in very large masses, by no means affords a sufficient supply: hence numerous persons are employed in extracting it from *sea-water*, or from *saline springs*. The former yields only from one 50th to one 30th part of its weight; but the latter produce the greatest quantities; and we are informed by Dr. Brownrigg, that the celebrated saline springs in Great Britain contain more than one 6th part of good salt.

Common salt is obtained from these natural solutions by three different methods: first, the saline fluid is speedily evaporated, till the salt begin to concrete, and settle in the form of grains at the bottom of the pans; after which it is put into proper vessels for draining the brine: and when the process is completed, it is called *bay salt*. By the second method the evaporation is slow and gradual; so that it is continued only till a saline crust is formed on the surface of the liquor, which soon shoots into crystalline cubes.

The manufacture of salt in the United States is of more importance than is generally imagined. It appears, that from the 1st of October, 1800, to the 30th of September, 1801, 3,282,063 bushels of salt were imported, and of this quantity more than one third was imported from England. This salt, which chiefly comes from Liverpool, and the Mersey, according to Dr. Mitchell, is both weak and impure; as sea-water, brine springs, and rock-salt, generally abound with various other earthy and saline ingredients, such as lime, magnesia, epsom-salt, gypsum, glaubers salt, &c. all of which injure the quality of salt, and disqualify it for preserving animal flesh.

On the shores of Cape Cod, and some other parts of Massachusetts, marine salt is manufactured to very considerable profit and extent, from sea-water, evaporated by the rays of the sun. The whole annual amount cannot be estimated, as great improvements having been made in the construction of the works, and in abridging the performance of labour, the manufacture is rapidly increasing. There is, however, every reason to conclude, that, with proper exertion and encouragement, this article might be furnished from our own shores, sufficiently abundant for the consumption of the New-England states.

This domestic salt excels in purity, whiteness, and weight; and is not inferior to the first quality of Isle of May salt. A circumstance which adds to its excellency, is, that during the process of evaporation, the lime is entirely separated from it, by subsiding to the bottom of the vats.

Basket salt, may be prepared from small fine crystals of common salt, which must be cleansed, or purified, by dissolving, and again evaporating to dryness; in which state it may be reduced to fine powder, and pressed hard into wicker-baskets, and dried at the stove or oven for use.

With respect to its medicinal properties, common salt, when taken in small quantities, promotes the appetite and digestion; but, if given in large doses, for instance half an ounce, it operates as a laxative. It is useful in some cases of dyspepsia; and in large doses, it is said to check vomiting of blood. According to Dr. Rush, a table spoonful of fine salt, taken dry, has frequently afforded instant relief in hæmoptysis and other hæmorrhagies. It is a common ingredient in stimulating clysters, and is sometimes applied externally, as a fomentation to bruises, or in the form of bath, as a gentle stimulus to the whole surface of the body. [See the articles vinegar and lemon juice.]

MYRICA CERIFERA HUMILIS. *Dwarf Candleberry Myrtle.*
Bayberry. The bark of the root.

There are in the United States several species of this plant, from which myrtle wax is obtained in abundance. The dwarf candleberry myrtle, commonly called in the New-England states,

bayberry, is a plant which possesses considerable medicinal virtues. The bark of the root is much employed by common people in jaundice, from obstructions to the flow of bile. This medicine has been employed by the aborigines as a mild emetic. According to Dr. James Mann, of Wrentham, who has used the bark in powder, its strength is equal to ipecacuanha. A more particular acquaintance with its medicinal properties ought to be attempted by practical experiments.

MYRISTICA MOSCHATA. *The Nutmeg Tree.* The kernel of the fruit, called nutmeg; its involucre, called mace; its fixed oil, called oil of mace; and its volatile oil.

Under the officinal name myristica, are comprehended nux moschata or nutmeg, and macis or mace; the former being the seed or kernel of the fruit, the latter the covering with which it is immediately surrounded. The tree which furnishes this elegant spice is a native of the Molucca islands. Nutmegs are round, of a grayish colour, streaked with brown lines, slightly unctuous; they have a strong aromatic flavour, and a pungent taste. They yield their active matter entirely to alcohol: distilled with water, they afford a fragrant essential oil; by expression, a sebacious oil is obtained from them, retaining their fragrant odour, and part of their pungency.

Nutmeg is used in medicine as a grateful aromatic, stomachic, and astringent: hence this drug has often been administered in diarrhoeas and dysenteries, in doses from ten to twenty grains in powder, or in larger quantities, when infused in port wine. In violent headaches arising from a debilitated stomach, small doses of this medicine have frequently been found of real service; but, if injudiciously employed, it is apt to infect the head not unlike opium, and other powerful narcotics.

Mace, the involucre of the nutmeg, is a thin unctuous membrane, of a yellowish colour, which it acquires by being dried in the sun. It emits a very fragrant agreeable odour, and has a pleasant though acrid and oleaginous taste.

It is reputed to be an excellent carminative, and stomachic, possessing all the virtues of the nutmeg, with less astringency. Its oil, whether distilled or expressed, is equally efficacious; and when taken internally, in doses from one to five drops, frequently affords relief in colics. Externally, it is of great utility, if rubbed on paralytic limbs; it also promotes digestion, and often prevents vomiting and hiccoughs on being applied to the region of the stomach.

MYROXYLON PERUIFERUM. *Sweet smelling Balsam Tree.* The balsam, called Peruvian balsam.

This tree grows in the warmest provinces of South America, and is remarkable for its elegant appearance. Every part of it abounds with resinous juice, even the leaves are full of transparent resinous points like those of the orange tree.

The balsam, as brought to us, is commonly of the consistence of thin honey, of a reddish brown colour, inclining to black, an agreeable aromatic smell, and a very hot biting taste. It is said to be obtained by boiling the cuttings of the twigs in water, and skimming off with a spoon the balsam which swims on the top. Peruvian balsam consists of a volatile oil, resin, and benzoic acid. It is accordingly entirely soluble in alcohol, and in essential oils.

Balsam of Peru is a very warm aromatic medicine, considerably hotter and more acrid than copaiva. Its principal effects are, to warm the habit, to strengthen the nervous system, and to attenuate viscid humours. Hence its use in some kinds of asthmas, gonorrhœas, dysenteries, suppressions of the uterine discharges, and other disorders proceeding from a debility of the solids. It is also employed externally for cleansing and healing wounds and ulcers. "In several cases of tetanus that have fallen under my notice arising from wounds," says Dr. L. Kollock, of Savannah, "I have attributed the cure to the external application, and internal use, of balsam of Peru, whose influence has in several instances almost immediately controlled the spasms, and of itself restored the patient when rapidly sinking under the very liberal use of opium, bark, and wine. Two drachms in twelve or twenty four hours is the largest quantity I have ever found it necessary to give."

MYRRHA. *Myrrh.* A gum resin.

A gummy resinous concrete juice, obtained from a shrub growing in the East Indies, but of which we possess no certain account.

The best myrrh is somewhat transparent, of a uniform brownish, or reddish yellow colour; of a slightly pungent, bitter taste; with a strong aromatic, not disagreeable odour, though nauseous to the palate.

In its medicinal effects, this aromatic bitter, when taken internally, is supposed to warm and strengthen the stomach and other viscera; it frequently occasions mild diaphoresis, and, in general, promotes the fluid secretions. Hence it has been used with advantage in cases of debility; in diseases arising from suppression of the urine, or from immoderate discharges, in cachectic habits, and those persons whose lungs and throat are oppressed by viscid phlegm. It is farther believed to resist putrefaction in all parts of the body; on which account it is highly recommend-

ed in malignant, putrid, and pestilential fevers ; and in the small pox. For these purposes it should be taken in doses of half a drachm or upwards ; and it may also be usefully combined with nitre, cream of tartar, or some other cooling salt. Myrrh is an expectorant, which has been regarded as too stimulating to be employed in pneumonic affections, or in phthisis, but which has been often employed in asthma and chronic catarrh. Its dose is from ten to twenty or thirty grains. The tincture of myrrh is in common use externally as a stimulating application to foul ulcers, and to spongy gums.

MYRTUS PIMENTA. *Pimento Tree.* The fruit, called Jamaica Pepper.

This is a native of Jamaica, and grows in all the wood lands on the north side. The berries are pulled before they are ripe, and dried in the sun. The smell of this spice resembles a mixture of cinnamon, cloves, and nutmegs : its taste approaches to that of cloves, or a mixture of the three foregoing ; whence it has received the name of *allspice*.

Pimento is a warm aromatic stimulant, and is much used as a condiment in dressing food. As a medicine it is advantageously substituted for the more costly spices, especially in hospital practice.

NICOTIANA TABACUM. *Tobacco.* The leaves.

The tobacco plant is a native of America, where considerable quantities are annually raised for exportation. The leaves have a strong, disagreeable, narcotic smell, and a very acrid burning taste. The active constituent of tobacco is an essential oil ; so active, that small animals are almost instantly killed, when wounded by a needle dipped in it ; and a few drops of this oil taken internally have operated as a fatal poison. Hence the pernicious effects, which may result from smoking the leaves of this noxious plant may be easily inferred.*

The effects of tobacco are those of a powerful narcotic. Along with severe nausea and vomiting, it reduces the force of the circulation, and occasions extreme muscular debility, with insensibility and cold sweats. As a diffusible stimulant, the smoke of tobacco, thrown into the intestines, was at one time employed in the recovery of drowned persons, a practice now exploded as per-

* The reader who is anxious to see its injurious effects on both body and mind, detailed in an ample manner, is referred to an excellent paper of Dr. Rush, in his *Essays, Literary, Moral and Philosophical*. Philadelphia, 1798 ; and to Dr. Waterhouse's *Lecture on the evil tendency of tobacco*, &c. Cambridge, Nov. 20, 1804.

nicious. It is employed with more advantage in ileus and incarcerated hernia, though it requires to be managed with much caution. The watery infusion, of the strength of two drachms of the tobacco to one pound of water, is a more convenient mode of exhibiting it, as an enema. The smoke received into the mouth relieves the pain of toothach by its narcotic power, or by exciting a profuse salivary discharge. Reduced to powder, it proves an excellent errhine and sternutatory, when snuffed up the nostrils. In infusion it is also applied externally for the cure of psora, tinea, and other cutaneous diseases.

In an inaugural dissertation by Dr. Brailsford of South Carolina, (Philadelphia 1799) the author asserts, that the evident operation of tobacco on the system, is that of a *sudorific* and *emetic*, a *cathartic*, and a diuretic. Hence the propriety of its use, in a variety of diseases. In cases of ascites and other dropsical affections, it appears to be an invaluable remedy. As a diuretic it is excelled by few if any of our indigenous plants. Dr. Fowler, by extensive experiments, has proved it to be a *powerful diuretic*, in cases of dropsies and dysuries. He prescribed it in the form of infusion; about eighty drops of which he considers as the average dose for an adult, or to begin with sixty drops, and increase the number by five, eight, or ten at a time, to one hundred; or till by their obvious effects on the system, the proper dose shall be ascertained. The properest times for administering the medicine, are two hours before dinner, and at bed time; it being observed to disagree the most with the stomach, in the morning fasting.

In cases of nephritis calculosa, or gravel, the infusion was given with astonishing effect. In many cases of asthma Dr. Fowler found the infusion to prove a good expectorant, and to afford great relief. The decoction of tobacco exhibited in cases of colic, procured relief almost instantaneously after other medicines had proved ineffectual. One ounce of the infusion, in half a pint of milk or gruel, is a medium dose in the form of injection for an adult of an ordinary constitution: this is to be repeated, or the strength of it increased, as occasion may require.

In the *iliac passion*, and in *hernia*, both the infusion and smoke of tobacco have been employed in the form of injection with the happiest effects. In *tympanites intestinalis* strong clysters of tobacco infusion have greatly relieved the patients. As a vermifuge it is deserving of being held in high repute, either taken internally, or, according to professor Barton, the leaves are to be pounded with vinegar, and applied in the shape of a poultice to the region of the stomach, or other part of the abdomen. In consequence of this application, worms are often discharged, after powerful anthelmintics have been exhibited internally in vain.

In cases of obstinate constipation of the abdominal viscera, the infusion of this medicine has been administered, and often with immediate relief, by occasioning a speedy expulsion of the ob-

structed indurated feces. In the tetanus, or lock jaw, injections of this infusion have been used with success ; they not only produce evacuations from the bowels, which are generally obstinately constipated, but from their antispasmodic powers, occasion a relaxation of the violent spasms so peculiar in this disease. Dr. James Currie, of Liverpool, has employed with remarkable success, a cataplasm formed chiefly of tobacco, applied to the scrobiculus cordis, about half an hour before the expected accession of the paroxysm, both in epilepsy, and in obstinate intermittents ; and in two cases of general convulsion, by means of the decoction in the form of enema, he performed cures altogether surprising and unexpected.

NITRAS POTASSÆ. *Nitrate of Potash.* *Nitre.* Salt Petre.

This salt, consisting of nitric acid and potash, is found ready formed on the surface of the soil in warm climates. In the south of Europe, its production is accelerated by artificial arrangements. Animal and vegetable substances, in a state of decomposition, are mixed with a quantity of carbonate of lime, and exposed to the air, but protected from the rain. After a certain period, the materials are found to contain nitrate of lime and nitrate of potash. These salts are extracted by lixiviation with water ; potash is added by which the nitrate of lime is decomposed, and the quantity of nitrate of potash increased ; and this salt is purified by repeated solutions and crystallizations. It is also found in several parts of the United States.

During the process by which the nitrate of potash is formed, it appears that the azot of the animal matter combines partly with the oxygen of the atmospheric air, and partly with the oxygen of the animal substances. The resulting compound, the nitric acid, is attracted in part by the lime present, and in part by a quantity of potash, which seems to be likewise formed during the process.

Nitre is of a sharp, bitterish, penetrating taste, followed by a sensation of coldness. When pure, it dissolves in about six times its weight of water, and on evaporating the latter concretes into transparent crystals. It easily melts in the fire, where it deflagrates with a bright flame, accompanied with a crackling noise, and afterwards deposits a large portion of alkaline earth.

Purified nitre is prescribed with advantage in numerous disorders. Its virtues are those of a refrigerant and diuretic. It is usually given in doses from two or three grains, to a scruple, being a very cooling and resolvent medicine, which, by relaxing the spasmodic rigidity of the vessels, promotes not only the secretion of urine, but at the same time insensible perspiration, in febrile disorders ; while it allays thirst and abates heat ; though in malignant cases in which the pulse is low, and the patients strength exhausted, it produces contrary effects.

When combined with the Peruvian bark, nitre affords a useful corrective to that drug, in the cure of spreading gangrenes ; as it prevents the additional heat which the bark frequently occasions : so that the efficacy of the latter is increased by the antiseptic quality of the former. But this cooling salt should never be administered in cases where the violence of the fever depends on bilious or putrid impurities in the abdomen, and where the patient is subject to hæmorrhagies or fluxes of blood, arising from a vitiated state of the fluids. On the contrary, salt petre will be most beneficially used in acute rheumatisms, inflammatory fevers, and even in those hæmorrhagies arising from congestions of the blood in general, or from a plethoric state.

This powerful salt, when inadvertently taken in too large quantities, is one of the most fatal poisons. There are several attested cases on record, and some recent instances might be added, in which from half to a whole ounce of salt petre has occasioned violent vomiting, convulsions, swelling, and other painful symptoms, in persons who, by mistake, had swallowed it in a dissolved state, instead of glauber, or similar salts. The most proper antidote in such distressing situations, will be a scruple or half a drachm of ipecacuanha, with a teacup full of sweet oil, and a large quantity of warm water to be drunk after it, to promote its operation, as an emetic. It will be necessary also to make use of copious and frequent draughts of mucilaginous decoctions, of marsh mallows, pearl barley, arrow root &c. after which a gentle opiate will afford the desired relief. For some interesting observations relative to the deleterious properties of salt petre, the reader is referred to Dr. Mitchell's letter to Dr. Priestly.*

OLEA EUROPÆA. *The Olive Tree.* The fixed oil of the fruit, called olive oil.

The olive tree is a native of the southern parts of Europe, especially Italy, Spain, France and Portugal, where it is cultivated to a very considerable extent, on account of its fruit, from which the sweet or salad oil is extracted ; and which also, when pickled, forms an article of food. Olives possess, in their natural state, an acrid, bitter, and extremely disagreeable taste ; which, however, is considerably improved when this fruit is pickled. On account of the great quantity of oil they contain, olives, if eaten by persons of delicate habits, are extremely hurtful, especially if taken by way of desert, after a solid or heavy dinner. As an article of food, olive oil is preferable to animal fat ; but it ought always to be mild, fresh, and of a sweet taste. It should not however be eaten by persons of weak stomachs ; for even in its mildest state, it produces rancidity and acrimony, which are extremely injurious to digestion.

Medicinally considered, olive oil has lately been found an excellent preventive of the plague, when rubbed over the whole body, immediately after the contagion is supposed to have taken place. The oil, when properly applied, and followed by a considerable degree of friction, occasioned a copious sweat over the whole body, by which, it is said, the patients were immediately cured.

Olive oil has also been employed with success as an antidote against the poison occasioned by the bite of serpents, especially that of the rattlesnake. In several cases apparently desperate, when a few spoonfuls of oil had been swallowed, the violent symptoms instantaneously subsided, and cures were soon effected. In gouty patients, sweet oil rubbed into the pained limb, proves a very soothing, safe, and useful application. It is also beneficially employed internally for recent colds, coughs, hoarseness, &c. and as a gentle laxative, it is sometimes given in cases of worms. It is also directed in large quantities to mitigate the action of acrid substances taken into the stomach. Externally it is used in frictions, in gargles, and in clysters; but its principal use is for the composition of ointments and plasters.

OSTREA EDULIS. *Oyster.* The shells.

These shell-fish cast their spawn in the month of May, when they become subject to a periodical affection; the male fish, having a black substance in the fin, is black-sick; and the female oyster, from a milky juice in its fin, is said to be white-sick: in June and July they begin to recover, and are in August perfectly sound. They are saltish in the pits, more saline in the beds or layers, and very salt in the sea.

Oysters are esteemed as excellent food, and are eaten both raw, and dressed, in various ways: in a fresh state, however, they are doubtless preferable; for, by cooking, they are in a great measure deprived of their nourishing jelly, and of the salt water which promotes their digestion in the stomach.

The shells of the oyster are composed like all the mother-of-pearl shells, of alternate layers of carbonate of lime, and a thin membranaceous substance, which exactly resembles coagulated albumen, in all its properties. By burning, the membrane is destroyed, and they are converted into lime, which, although very pure, possesses no advantage over that of the mineral kingdom.

OVIS ARIES. *The Sheep.* The fat, called mutton suet.

Mutton suet is officinal, for the purpose of giving consistency to ointments and plasters.

OXALIS ACETOSELLA. *Wood Sorrel.* The leaves.

This is a small perennial plant, growing wild in woods, and shady hedges. The leaves contain a considerable quantity of super-oxalate of potash, and have an extremely pleasant acid taste. They possess the same powers with the vegetable acids in general, and an infusion of them makes a very palatable diet drink in ardent fevers; and on being boiled in milk, they form an agreeable whey. But the most easy and efficacious way of preserving these leaves is that of converting them into a conserve with the addition of double their weight of sugar; in which form they are an excellent substitute for lemons, and may be given with advantage in all putrid and other fevers, where antiseptics are indicated.

The super-oxalate of potash is extracted in large quantities from the leaves of this plant, and sold under the name of *Essential salt of lemons*.

OXIDUM ARSENICI. *Oxyd of Arsenic.*

Arsenic is a heavy, opaque, crystalline substance, of a very singular nature, contained in greater or less quantity in the ore of most metalline bodies, particularly in those of tin and bismuth, and in the mineral, called *cobalt*, from which last most of the *arsenic* brought to us, is extracted in Saxony, by a kind of sublimation. It is in a white crystalline, brilliant, transparent mass, but soon becoming opaque, yet without losing its whiteness. Its true nature is so little known, that chemists have hesitated whether it ought to be ranked among the salts or semi-metals; because it may by various processes, be made to assume either a saline or metallic state. It is very volatile, and easily oxydated. By oxydation, it is converted into a white powder, which has been considered as an oxyd, and lately, perhaps more justly, as an imperfect acid.

Oxyd of arsenic is one of the most sudden and violent poisons we are acquainted with. In mines, it causes the destruction of numbers who explore them; and it is frequently the instrument by which victims are sacrificed, either by the hand of wickedness, or imprudence.

The fumes of arsenic are so deleterious to the lungs, that the artist ought to be on his guard, to prevent their exhalation by the mouth; for if they be mixed and swallowed with the saliva, effects will take place similar to those which follow its introduction into the stomach in a saline state; namely, a sensation of a piercing, gnawing, and burning kind, accompanied with an acute pain in the stomach and intestines, which last are violently contorted; convulsive vomiting; insatiable thirst, from the parched and rough state of the tongue and throat; hiccough, palpitation of the heart, and a deadly oppression of the whole breast, suc-

ceed next; the matters ejected by the mouth, as well as the stools, exhibit a black, fetid, and putrid appearance; at length, with the mortification of the bowels, the pain subsides, and death terminates the sufferings of the patient. Soon after death, livid spots appear on the surface of the body, the nails become blue, and often fall off along with the hair, and the whole body becomes very speedily putrid. When the quantity is so very small as not to prove fatal, tremors, paralysis, and lingering hectic, succeed.

On dissection, the stomach and bowels are found to be inflamed, gangrenous, and corroded, and the blood is fluid.

The antidotes which have been recommended to the poison of arsenic, are various. Vomiting must be immediately excited by giving some brisk emetics, as half a drachm of white vitriol, and after it, plenty of sweet, linseed, or almond oil; large draughts of milk, barley gruel, or warmed beer with a third part of oil, or fresh butter, should be taken.

Mr. Navier prescribes one drachm of sulphurate of potash (liver of sulphur), to be dissolved in a pint of water, which the patient is to drink at several draughts. The sulphur unites with the arsenic and destroys its causticity and effects. According to Hehneman, a solution of white soap is the best remedy. One pound of soap may be dissolved in four pounds of hot water, and a cup full of this solution may be drunk lukewarm every three or four minutes, that the patient may swallow several pounds in the course of two hours. To promote the evacuation of the poison by stool, clysters composed of the preceding liquids, and a third part of castor oil, ought to be speedily administered, and the whole abdomen fomented with soap water.

Though the most violent of mineral poisons, arsenic, according to Murray, equals, when properly administered, the first medicines in the class of tonics. Of all the diseases, says Dr. Duncan, in which white oxyd of arsenic has been used internally, there is no one in which it has been so frequently and so successfully employed, as in the cure of intermittent fevers. We have now the most satisfactory information concerning this article, in the Medical Reports, of the effects of arsenic in the cure of agues, remitting fevers, and periodical headaches, by Dr. Fowler, of Stafford. The medicine he employed was the arsenite of potash.

He directs that sixty-four grains of oxyd of arsenic, reduced to a very fine powder, and mixed with as much carbonate of potash, should be added to half a pound of distilled water, in a Florence flask; that it should then be placed in a sand heat, and gently boiled till the oxyd of arsenic be completely dissolved; that after the solution is cold, half an ounce of compound spirits of lavender be added to it, and as much distilled water as to make the whole solution amount to a pound. This solution is taken in doses regulated according to the age, strength, and other circumstances of the patient. Those from two to four years are to take from two to four drops; from five to seven, from five to seven drops; from eight to twelve, from seven to ten drops; from thirteen to

eighteen and upwards, may take twelve drops at a dose, in any proper vehicle, two or three times a day. The use of this solution is to be occasionally intermitted, and not persisted in, if it do not soon prove effectual; and immediately relinquished if it occasion nausea and purging.

In the diseases mentioned above, particularly intermittents, it has been found to be a safe and efficacious remedy, by Drs. Fowler, Withering, and other respectable practitioners.

A preparation similar to that directed by Dr. Fowler, and called the white tasteless *ague drops*, has lately been given with singular efficacy in the whooping cough.

The celebrated professor Barton observes, that he has for several years employed the oxyd of arsenic in substance, in preference to Dr. Fowler's solution. He commonly gives it in combination with opium. One grain of the arsenic is united to four or eight grains of the opium, and made into a mass with conserve of roses, or honey. This is divided into sixteen pills, of which an adult patient is to take two or three at different periods in the course of the day and night, *especially during the apyrexia*, in intermittent fevers.

Such are the powers of this medicine, that two grains of it are often sufficient to cure an intermittent, that has continued for weeks! For children, he directs that the arsenic be rubbed with honey, and molasses and water, and sometimes with a portion of gum arabic. In this form it is very conveniently given to children by drops; and the quantity of mineral, in each dose, may be estimated with considerable accuracy.

As an external remedy, arsenic has long been known as the basis of the most celebrated *cancer powders*; and it has frequently been resorted to in various forms, with the view of correcting the intolerable fætor attending cancerous and other foul ulcers, with great success. Arneman recommends an ointment of one drachm of arsenious acid, (oxyd of arsenic) the same quantity of sulphur, an ounce of distilled vinegar, and an ounce of white oxyd of lead, in cancerous, obstinate, ill-conditioned sores, and in suppurated scrofulous glands. Le Febvre washed cancerous sores frequently in the course of the day, with a solution of four grains of oxyd of arsenic in two pounds of water.

Arsenic has even been applied in substance, sprinkled upon the ulcer; but this mode of using it is excessively painful, and extremely dangerous. There have been fatal effects produced from its absorption.

The principal thing to be attended to in arsenical applications, is to diminish their activity to a certain degree. They then cause little irritation or pain; but rather excite a gentle degree of inflammation, which causes the diseased parts to slough off; and it has the peculiar advantage of not extending its operation laterally.

No other escharotic possesses equal powers in cancerous affections; it not unfrequently amends the discharge, causes the

sore to contract in size, and cases have been related of its having effected a cure.

But says Dr. Willich, "We are, on the combined testimony of many medical practitioners, conspicuous for their professional zeal and integrity, irresistibly induced to declare our opinion, at least, against the internal use of this active and dangerous medicine.

"Of the numerous authors which might be adduced in support of this declaration, we shall here avail ourselves only of the conclusive testimony of Dr. Black, the late professor of chemistry, in the university of Edinburgh, who maintains, that he has seen the internal exhibition of arsenic attended with fatal effects, such as hectic, &c. nay, he declares, that the external application of this substance has often produced dreadful consequences; so that, far from recommending it internally, he reprobates even the external use of this precarious drug. Unless, therefore, it could be proved by a plurality of cases, that patients after the taking of arsenic to some extent, have not only recovered from agues, cancers, hooping cough, &c. but that they have likewise attained to a considerable age without ever having been subject to paralytic, spasmodic, and phthisical disorders, we shall not be disposed to retract our opinion of its virulent and destructive tendency."

Mr. Morvealt, it is said, has brought arsenic to the state of a true neutral salt, readily soluble in water, by mixing it with equal quantities of nitre, and then submitting them to a chemical process. Mr. Milner, of Cambridge, England, has also produced an arsenical salt of the same nature, which has been employed with the greatest success in that neighbourhood by several practitioners.

The red and yellow arsenics, both native and factitious, have little taste, and are much less virulent in their effects than the white arsenic. Sulphur, which restrains the power of mercury and the antimonial metal, remarkably abates the virulence of this poisonous mineral also. Such of these substances as participate more largely of sulphur, seem to be almost innocent: the factitious red arsenic, and the native orpiments, have been given to dogs in considerable quantity, without being productive of any apparent ill consequences.

OXIDUM PLUMBI ALBUM. *White Oxyd of Lead. Cerusse.*

The white oxyd of lead is manufactured in several countries; it is prepared by exposing lead to the vapour of vinegar. To accelerate the oxydizement, the lead is cast into thin plates, which are suspended over a vessel containing vinegar, in a moderately warm place, that the vapour arising from the acid may circulate freely round the plates: a white powder settles in the course of two or three weeks on the surface of the metal, which is in due time removed; and the remains of the plates again exposed to the vapour of vinegar, until they be entirely corroded,

and converted into a white calx, when it is called *cerusse*, or white lead.

White oxyd of lead is used in surgery; and on account of its cooling, drying, and astringent properties, is of considerable service when sprinkled over running sores and ulcers. In pharmacy it is used only in the composition of ointments and plasters.

OXIDUM PLUMBI RUBRUM. *Red Oxyd of Lead.* Red Lead.

The preparation of red lead is so troublesome and tedious, as scarcely ever to be attempted by the apothecary or chemist. The makers melt large quantities of lead at once, upon the bottom of a reverberatory furnace built for this purpose, and so contrived, that the flame acts upon a large surface of the metal, which is continually changed by the means of iron rakes drawn backwards and forwards, till the fluidity of the lead be destroyed; after which the oxyd is only now and then turned.

The red oxyd of lead is obtained in the form of a very heavy powder, consisting of minute shining scales, of a bright scarlet, verging towards yellow, especially if triturated.

In medicine red lead is only employed externally; it obtunds the acrimony of humours; mitigates inflammations; and if judiciously applied, is of excellent service in cleansing and healing old ulcers.

OXIDUM PLUMBI SEMIVITREUM. *Semi-vitrified Oxyd of Lead.* Litharge.

If oxydized lead be urged with a hasty fire, it melts into the appearance of oil, and on cooling concretes into litharge. Greatest part of the litharge met with in the shops, is produced in the purification of silver from lead, and the refining of gold and silver by means of this metal. According to the degree of fire and other circumstances, it proves of a pale or deep colour: the first has been commonly called litharge of silver, the other litharge of gold.

The oxyds of lead dissolve by heat, in expressed oils; these mixtures are the bases of several officinal plasters and ointments. Lead and its oxyds when undissolved, have no considerable effects as medicines. Dissolved in oils, they are supposed to be (when externally applied) anti-inflammatory and desiccative. Combined with vegetable acids they are remarkably so; and taken internally, prove powerful though dangerous styptics.

OXIDUM ZINCI IMPURUM. *Impure Oxyd of Zinc.* Tutty.

It is moderately hard and ponderous; of a brownish colour, and full of small protuberances on the outside, smooth and yel-

lowish within; some pieces have a bluish cast, from minute globules of zinc in its metallic form.

Tutty is celebrated as an ophthalmic, and frequently employed as such in unguents and collyria.

PAPAYER SOMNIFERUM. *White Poppy.* The capsules and their inspissated juice, called opium.

The white poppy is an annual plant, and is sometimes found wild in Great Britain; but it is probably originally a native of the warmer parts of Asia. The leaves, stalks, and capsules, of the poppy, abound with milky juice, which may be collected in considerable quantity, by slighty wounding them when almost ripe. This juice exposed for a few days to the sun and air, thickens into a stiff tenacious mass, which in fact is opium. It is then worked up into masses, and covered with poppy or tobacco leaves.

A strong decoction of the dried heads, mixed with as much sugar as is sufficient to reduce it to the consistence of a syrup, becomes fit for keeping in a liquid form. It is, however, a very unequal preparation, as the real quantity of opium it contains is very uncertain, and by no means equal to syrup, to which a certain quantity of solution of opium is added. The seeds of the poppy are simply emulsive, and contain none of the narcotic principle. They yield a considerable quantity of oil by expression.

Two kinds of opium are found in commerce, distinguished by the names of Turkey, and East India opium.

Turkey opium is a solid compact substance, possessing a considerable degree of tenacity; when broken, having a shining fracture and uniform appearance; of a dark brown colour, and becoming yellow when reduced to powder; scarcely colouring the saliva when chewed, exciting at first a nauseous bitter taste, which soon becomes acrid, with some degree of warmth; and having a peculiar, heavy disagreeable smell. The best is in flat pieces, and besides the large leaves in which it is enveloped, is covered with the reddish capsules of a species of rumex, probably used in packing it. The round masses which have none of these capsules adhering to them, are evidently inferior in quality. It is bad if it be soft, friable, mixed with any impurities, or have an intensely dark or blackish colour.

East India opium has much less consistence, being sometimes not much thicker than tar, and always ductile. Its colour is much darker; its taste more nauseous, and less bitter; and its smell rather empyreumatic. It is considerably cheaper than Turkish opium, and supposed to be of only half the strength.

Opium is supposed to consist principally of gum and resin, in the proportions of about four and a half of each in twelve parts of the crude opium. The bitterness is said to reside in the gum; the astringency, flavour, and narcotic quality in the resin. It affords a volatile principle; water distilled from it having its nau-

seous taste and smell, but none of its narcotic quality. It contains also some saline matter, and a substance insoluble either in alcohol or water.

From its analysis may be estimated the effects of different solvents upon it. Alcohol and proof spirit, dissolving its resin, afford tinctures possessing all its virtues. Water dissolves its gummy part, which is much less active, but a part of the resin is at the same time taken up by the medium of the gum. Wines also afford solutions possessing the virtues of opium. Vinegar dissolves its active matter, but greatly impairs its power.

The attempts made by some pharmacutists, to obtain a preparation of opium, which should possess only its sedative, without its narcotic effects, only succeeded in so far as they diminished its activity.

The action of opium on the living system, has been the subject of the keenest controversy. Some have asserted that it is a direct sedative, while others have asserted as strongly, that it is a powerful stimulus, and that the sedative effects, which it certainly produces, depend entirely on the previous excitement. We cannot here pretend to give even an abstract of the arguments used by the supporters of each opinion. We regret still more, that the contradictory results of their experiments render it difficult to ascertain even its primary and visible effects.

Opium, when taken into the stomach to such an extent as to have any sensible effect, gives rise to a pleasant serenity of mind, in general proceeding to a certain degree of languor and drowsiness. The action of the sanguiferous system is diminished, the pulse becoming for the most part softer, fuller, and slower than it was before.

By many, on the contrary, it is said, in the first instance at least, to increase the frequency of the pulse, and the heat of the body. It diminishes all the secretions and excretions, except the cuticular discharge, which it frequently augments in a very sensible degree. It excites thirst, and renders the mouth dry and parched.

Opium taken into the stomach in a larger dose, gives rise to confusion of head and vertigo. The powers of all stimulating causes of making impressions on the body are diminished; and even at times, and in situations, when a person would naturally be awake, sleep is irresistibly induced. In still larger doses, it acts in the same manner as the narcotic poisons, giving rise to vertigo, headach, tremors, delirium, and convulsions; and these terminating in a state of stupor, from which the person cannot be roused. This stupor is accompanied with slowness of the pulse, and with stertor in breathing, and the scene is terminated in death, attended with the same appearances as take place in an apoplexy.

From these effects of opium in a state of health, it is not wonderful that recourse should have been had to it in disease, as mitigating pain, inducing sleep, allaying inordinate action, and di-

minishing morbid sensibility. That these effects result from it, is confirmed by the daily experience of every observer; and as answering one or other of these intentions, most, if not all, of the good consequences derived from it in actual practice are to be explained. If, therefore, by a sedative medicine, we mean an article capable of allaying, assuaging, mitigating, and composing, no substance can have a better title to the appellation of sedative than opium.

Some practitioners are averse to its use in active inflammation; but others have recourse to it in such cases, even at an early period, especially after bloodletting; and where such affections are attended not only with pain and spasm, but with watchfulness and cough, it is often productive of the greatest benefit. Opium combined with calomel has of late been extensively employed in every form of active inflammation, and with the greatest success. It is found also to be of very great service in allaying the pain and preventing the symptomatic fever liable to be induced by wounds, fractures, burns, or similar accidents.

In intermittents, it is said to have been used with good effect before the fit in the cold stage, in the hot stage, and during the interval. Given even in the hot stage, it has been observed to allay the heat, thirst, headach, and delirium, to induce sweat and sleep, to cure the disease with less bark, and without leaving abdominal obstructions or dropsy.

It is often of very great service in fevers of the typhoid type, when patients are distressed with watchfulness or diarrhœa. But where these or similar circumstances do not indicate its use, it is often distressing to patients by augmenting thirst and constipation.

In small pox, when the convulsions before eruption are frequent and considerable, opium is liberally used. It is likewise given from the fifth day onwards; and is found to allay the pain of supuration, to promote the ptyalism, and to be otherwise useful.

In dysentery, after the use of gentle laxatives, or along with them, opium, independent of any effect it may have on the fever, is of consequence in allaying the tormina and tenesmus, and in obviating that laxity of bowels which so frequently remains after that disease.

In diarrhœa, the disease itself generally carries off any acrimony that may be a cause, and then opium is used with great effect. Even in the worst symptomatic cases, it seldom fails to alleviate.

In cholera and pyrosis, it is almost the only thing trusted to.

In colic, it is employed with laxatives; and no doubt often prevents ileus and inflammation, by relieving the spasm. Even in ileus and incarcerated hernia, it is often found to allay the vomiting, the spasms, the pain, and sometimes to diminish the inflammation, and prevent the gangrene of the strangulated gut.

It is given to allay the pain and favour the descent of calculi, and to relieve in jaundice and dysuria proceeding from spasm.

It is of acknowledged use in the different species of tetanus ; affords relief to the various spasmodic symptoms of dyspepsia, hysteria, hypochondriasis, asthma, rabies canina, &c. and has been found useful in some kinds of epilepsy.

In syphilis it is only useful in combating symptoms, and in counteracting the effects resulting from the improper use of mercury, for it possesses no power of overcoming the venereal virus.

It is found useful in certain cases of threatened abortion and lingering delivery, in convulsions during parturition, and in the after pains and excessive flooding.

The only form perhaps necessary for opium is that of pill ; and as it is so soluble in every menstruum, there seems the less occasion for the addition of either gum or soap. It is more apt to sit on the stomach in this than any liquid form, but requires rather more time to produce its effects. The administration of opium to the unaccustomed, is sometimes very difficult. The requisite quantity of opium is wonderfully different in different persons, and in different states of the same person. A quarter of a grain will in one adult produce effects which ten times the quantity will not do in another ; and a dose that might prove fatal in cholera or colic, would not be perceptible in many cases of tetanus or mania. The lowest fatal dose to the unaccustomed as mentioned by authors, seems to be four grains ; but a dangerous dose is so apt to puke, that it has seldom time to occasion death. When given in too small a dose, it is apt to produce disturbed sleep, and other disagreeable consequences ; and with some constitutions it seems not to agree in any dose or form. Often, on the other hand, from a small dose, sound sleep, and alleviation of pain will be produced, while a larger one gives rise to vertigo and delirium. Some prefer the repetition of small doses, others the giving of a full dose at once. In some it seems not to have its proper effect till after a considerable time. The soporific operation of a moderate dose is supposed to last in general about eight hours from the time of taking it.

It is often given to promote healthy suppuration, and is a principal remedy in arresting the progress of certain kinds of gangrene.

Externally applied opium alleviates pain, and relieves spasmodic action. Hence the utility of it in colic, tetanus, toothach, &c. In the form of enema, it is of singular efficacy in tenesmus, and it is employed under the same form in other diseases, where its administration by the mouth is inconvenient or impracticable.

In his medical reports on the effect of water, Dr. James Currie, relates a case of tetanus, and general convulsion, in which the patient first took a grain of opium every other hour ; afterwards a grain every hour, and at last two grains every hour. But being no longer able to swallow pills, the tincture (liquid laudanum) was directed, of which in twenty four hours he took two and

a half ounces without sleep or alleviation of pain. The dose being increased in the next twenty six hours, he swallowed five and a half ounces of the laudanum, a quantity, which at that time says the doctor, was unexampled. He lay now in a state of torpor. The rigidity of the spasms was indeed much lessened; and the general convulsions nearly gone; but the debility was extreme; a complete hemiplegia had supervened; the patient's eyes were fixed, and his speech faltering and unintelligible. It seemed no longer safe to continue the laudanum, and the patient was afterwards cured by the cold bath and other remedies.

Dr. Joshua Fisher, in his interesting discourse read before the Massachusetts Medical Society, asserts, that a young lady aged seventeen, being seized with excruciating spasms, the consequence of a rupture of the sartorius muscle, took 12 grains of opium every ten minutes till she had taken seventy two grains. This quantity removed the spasms, produced a comatose insensibility, slow, stertorous breathing, and a slow full pulse. In eight hours the spasms returned, and the opium was given as before. In this manner the opium was repeated at intervals of eight hours, for three days, when the spasms ceased and she recovered. During this period of three days, she took nearly eleven drachms of excellent opium, and not a grain more than was absolutely necessary.

In the colica pictonum, or Devonshire colic, Dr. Fisher administers opium in doses from fifteen to forty grains; and has not for many years past, seen a single case of this distressing disease, which has not yielded to its efficacy in about an hour.

This experienced physician has prescribed opium in large doses in cases of cholera with equal success. A gentleman, of about sixty five years, was seized with this disease in so violent a manner, that, in a few hours after the attack, every symptom indicated his speedy dissolution. As soon as practicable sixty grains of opium were given, ten of which were returned by vomiting. The quantity retained, soon removed every distressing symptom: gradually and with difficulty he recovered his strength.

The soporific effects of opium may be checked, if a proper quantity of the vegetable acid be taken with, or immediately after it. Thus, if one ounce of pure lemon juice, or twice that quantity of good vinegar, be added to every grain of opium, or to twenty five drops of laudanum, such a compound will produce a very different effect. Instead of stupifying the head, and producing troublesome costiveness, it will not only relieve the bowels, but also occasion a degree of cheerfulness, never attainable by the use of opium alone, and afterwards induce a composed and refreshing sleep.

It is a melancholy consideration, that this excellent, kind assuager of our bodily pains and mental distress, is frequently resorted to for the horrid purpose of self destruction. The alarming symptoms induced by it, are, vomiting, delirium, stupor, deep and difficult breathing, convulsions, and death. The remedies

are in the first instance, powerful emetics of sulphate of zinc ; twenty grains of which should be given immediately, in a glass of warm water, and repeated every ten minutes, until copious vomitings are excited. Warm water is then to be freely given, together with a smart purgative of rhubarb or jalap, joined with a few grains of potash. These should be succeeded with water-gruel or butter-milk, sour whey, and particularly the vegetable acids, or strong coffee, which last appears to be the most effectual antidote.

The principal object to be kept in view, according to Dr. Seaman, of New-York, is, to produce such a degree of irritation, as may counteract the narcotic effects of this deleterious drug. Hence it is very useful to stimulate the nostrils with spirits of hartshorn, and to apply friction with salt over the whole body. When the symptoms of apoplexy have come on, the remedy is *copious bleeding*. This has been used in four cases by Dr. Rush, who remarks, that it should never be prescribed, until great morbid action, or the suffocation of action from the excess of stimulus, (manifested chiefly in the depressed state of the pulse), have taken place.

PHYSETER MACROCEPHALUS. *Spermaceti Whale.* The matter found within the cranium, called spermaceti.

Spermaceti is a fatty matter obtained from the head of the particular species of whale above mentioned. It is purified by melting and boiling with an alkaline solution. It is then in white flakes, is unctuous and friable, and has neither taste nor smell. Its chemical properties are the same as those of the expressed oils and fats, except that it does not easily unite with the alkalies.

Its medicinal virtues are those of a mild demulcent, and as such is given in catarrh and gonorrhœa, mixed with sugar, or diffused in water by the medium of the yolk of an egg.

PHYTOLACCA DECANDRA. *American Nightshade. Garget.* The leaves, berries, and root.

This is one of the most common North American plants, well known in New-England by the name of cunicum, skoke, or coakum. In the southern states it is called pokeweed. It has a thick, fleshy, perennial root as large as parsnips. From this rise many purplish herbaceous stalks, about an inch thick, and six or seven feet long ; which break into many branches irregularly set with large, oval, sharp pointed leaves, supported on short foot stalks. These are, at first, of a fresh green colour, but as they grow old they turn reddish. At the joints and divisions of the branches, come forth long bunches of small bluish coloured flowers, consisting of five concave petals each, surrounding ten stamina and

ten stiles. These are succeeded by round depressed berries, having ten cells, each of which contains a single smooth seed. The young stems when boiled are as good as asparagus, but when old they are to be used with caution, being a plant of great activity, operating both as an emetic and cathartic. A tincture of the ripe berries in brandy or wine, is a popular remedy for rheumatism and similar affections; and it may be given with safety and advantage in all cases where guaiacum is proper. The extract of the juice of the ripe berries has been employed in some cases of scrofula; and cancerous ulcers have been greatly benefited by its application. The juice of the leaves, however, is said to be more effectual.

Dr. Shultz in his ingenious inaugural dissertation on this subject, observes, that "scabies and herpes have been often removed by it. In these cases, a solution of the extract in water is generally substituted where the expressed juice cannot be had. In rheumatisms, the whole substance of this plant has at different times been of essential service; although the berries have generally been preferred. In those rheumatic affections which sometimes occur to syphilitic patients, its virtue far exceeds that of opium; and it seems more valuable than guaiacum, especially when combined with mercury.

"For medicinal purposes, the leaves should be gathered about July, when the foot stalks begin to assume a reddish colour, dried in the shade, and powdered for use. An extract may easily be obtained from the leaves when gathered at this period, by gently evaporating their expressed juice to a proper consistence."

A tincture may be made by dissolving either the extract or the leaves, in their green or dry state, in common brandy, or in the spirit distilled from the berries.

An ointment is also made by powdering the dried leaves, and mixing them well with hogs' lard, or simple cerate; or by boiling some hogs' lard and bees wax with fresh leaves, and straining the mass. The proper time for gathering the berries in this climate is in October, when they become soft and ripe, and are of a blackish colour.

The root is to be gathered about November or December, when the stalks of the plant are perfectly dead, and to facilitate drying, it should previously be divided into small pieces. An extract may be made from the root in the same manner as from the leaves or berries.

According to the experience of Drs. Jones and Kollock, of Savannah, this plant may be relied on as an effectual remedy for syphilis in its various stages, even without the aid of mercury; and they employ it with much confidence, both internally and externally in rheumatisms, and in cutaneous eruptions. One ounce of the dried root infused in a pint of wine, and given to the quantity of two spoonfuls, operates kindly as an emetic. The roots are sometimes applied to the hands and feet of patients in ardent

fevers. Many country people use the extract with great confidence in its efficacy in discussing indolent tumors, and in healing various kinds of ulcers. It is found to operate as a mild vegetable caustic, cleansing and healing foul ulcers better than most other remedies of that class. In three cases of apparent *fistula lachrymalis*, it is reputed to have performed cures, by being applied to the tumors twice a day for two or three weeks. This root has also been employed in compounds as an article of dying.

PIMPINELLA ANISUM. *Anise.* The seeds.

Anise is an annual umbelliferous plant, growing naturally in Crete, Syria, and other places of the East.

The seeds of anise have an aromatic odour, and a warm taste, with a share of sweetness. They afford by distillation with water, a considerable quantity of an essential oil, having a strong flavour, and a sweet taste without pungency.

Anise is used as a good carminative in dyspepsia, and in the flatulence to which children are subject. A drachm or two of the seeds may be taken, or a few drops of the oil rubbed with sugar.—[See volatile oils.]

PINUS ABIES. *Common Spruce Fir.* The resin which concretes spontaneously, called Burgundy pitch.

This substance is obtained by exudation, from incisions in the trunk of the tree. It is boiled with a small quantity of water; is strained; and when cold, forms a concrete resinous matter. This, spread upon leather, and applied to the skin, excites a slight degree of inflammation, and exudation of serous fluid.

In obstinate coughs, affections of the lungs, and other internal complaints, plasters of this resin, by acting as a topical stimulus, are frequently found of considerable service.

NUS BALSAMEA. *Balsam Fir. Hemlock Fir.* The liquid resin, called balsam of Canada.

This balsam exudes spontaneously from the trunk of the tree. It is of a light yellow colour, tenacious, and inflammable. By keeping, it becomes thicker; its smell is agreeable; its taste pungent. It is soluble in alcohol and oils, and affords an essential oil by distillation.

The medicinal virtues of this balsam seem to be the same as those of copaiba, and it is used for the same purposes. Its dose is from thirty to fifty drops.

PINUS LARIX. *The Larch Tree.* The liquid resin, called Venice turpentine, and volatile oil, called oil of turpentine.

This balsam exudes spontaneously, and in greater abundance from incisions in the tree. It is thick and tenacious, pellucid, of a yellowish colour, has a pleasant smell, and a bitterish, pungent taste. By distillation, with the addition of a small quantity of water, to prevent the temperature from rising too high, it affords a large quantity of essential oil (*oleum terebinthinæ*, oil of turpentine); the residuum being a resin nearly insipid, (common white, or yellow resin.)

Venice turpentine derives all its virtues from its essential oil, and it is this oil that is generally used in medicine. It is a powerful stimulant directed more particularly in its action to the urinary passages. It has been employed in gleet, and in chronic rheumatism, especially in that form of it termed sciatica and lumbago, in a dose of from five to twelve drops, gradually increased, generally mixed with a quantity of honey, by which its pungency is covered. It is apt, however, to induce violent symptoms. Externally, it is applied as a stimulant to parts affected with cramp and rheumatism. Oil of turpentine has of late been successfully applied to scalds. When seasonably applied to the scalded part, the pain has frequently been removed in an hour, and blisters effectually prevented. The turpentine itself is sometimes used internally for the same purposes as its oil. The white resin is somewhat stimulant and diuretic; but it is only employed in the composition of ointments and plasters, which it renders more adhesive, and perhaps more stimulating. Oil of turpentine has also been found to possess styptic powers in restraining epistaxis when applied up the nostrils.

PINUS SYLVESTRIS. *Scotch Fir.* The empyreumatic resin, called tar; and the liquid resin, called common turpentine.

Tar is a thick, black, unctuous matter, extracted from the wood of the *pinus sylvestris*, by combustion in a close smothering heat. By long boiling, tar is deprived of its volatile parts, and converted into pitch. Tar is a mixture of resin, empyreumatic oil, charcoal, and acetous acid. It was formerly in great repute as a medicine, both in its original state, and also in infusion with water.

It has been greatly recommended by bishop Berkley, in the murrain of cattle; and likewise in cold and phlegmatic habits of mankind; as it not only raises the pulse, and accelerates the circulation, but, at the same time, exhilarates the animal spirits. At present, however, tar water is seldom employed, though its external application proves to be an excellent remedy for the stings of wasps and bees. Tar is applied in the form of ointment, in *tinea capitis*, and some other cutaneous diseases.

The common turpentine obtained from this tree, is rarely given internally ; its principle use is in plasters and ointments among farriers, and for the distillation of essential oil.

A fluid extract, prepared by decoction from the twigs or cones of the *pinus sylvestris*, is the usual well known *essence of spruce*, which fermented with molasses, forms the fashionable beverage of spruce beer.

PIPER NIGRUM. *Black Pepper.* The fruit.

This tree is a native of the East Indies, where the fruit or berries in their unripe state, are gathered in the month of October, and dried, by being exposed to the sun for seven or eight days. Its smell is aromatic ; its taste pungent. Both are extracted completely by water ; partially by alcohol.

Pepper, from its stimulating and aromatic qualities, is employed, to promote digestion, to relieve nausea, to check vomiting, or to remove singultus, and as a remedy in retrocedent gout and paralysis. Its dose is ten or fifteen grains. Its infusion has been used as a gargle, in relaxation of the uvula.

White pepper is the ripe berries of the same vegetable, freed from the outer covering, and dried in the sun. It is less pungent than the black.

PIPER LONGUM. *Long Pepper.* The fruit.

This berry is obtained from another species of the same genus of trees. It is about half an inch in length, cylindrical, and indented on the surface. In flavour, taste, and other qualities, it is similar to the black pepper, and may be used for the same purposes.

PLUMBUM. *Lead.*

This is one of the imperfect metals, of a dull white, inclining to a blue colour ; and, though the least ductile and sonorous, it is the heaviest of metallic bodies, excepting mercury, gold, and platina. Lead is found in various countries ; but it abounds in England. It is obtained by various processes, from the ores dug from the earth. In its metallic form, it is scarcely an officinal article, and its different oxyds are purchased from the manufacturers, and never prepared by the apothecary.

Its effects on the body are emaciation, violent colics, paralysis, tremors, and contractions of the limbs ; as they generally come on gradually, the cause is sometimes overlooked, until it be too late. Poisoning from lead is occasioned, either from liquors becoming impregnated with it, by being improperly kept in vessels

lined with that metal, or to which lead has been criminally added to correct its acidity ; or among manufacturers, who work much with lead, as painters and plumbers, and who are not sufficiently attentive to avoid swallowing it. The only effectual antidotes to this insidious poison, are antimonial emetics ; and after them, the internal use of liver of sulphur, together with vegetable oils, both internally and externally, should be liberally continued.

For the medicinal virtues of lead, see its several preparations.

PODOPHYLLUM PELTATUM. *May Apple. Mandrake.* The root.

This plant is very common throughout North America. The fruit is esculent, and, by many, thought delicious. The leaves are poisonous. The root is an excellent purgative in doses of twenty grains. It is most advantageously used in combination with calomel, or crystals of tartar. The root, also, often operates as an anthelmintic, and as such, it is used by the Cherokee and other Southern Indians.

The best time of gathering the May apple, for medical purposes, is in autumn, when the leaves have turned yellow, and are about falling off. The Indians dry it in the shade, and powder it for use.

POLYGALA SENEGA. *Seneka. Rattle Snake Root.* The root.

Seneka is a perennial plant, which abounds in nearly all the United States, particularly in Virginia and Pennsylvania. This root is usually about the thickness of the little finger, variously bent, and contorted, and appears as if composed of joints, whence it is supposed to resemble the tail of the animal whose name it bears ; a kind of membranous margin runs on each side, the whole length of the root.

This root was first introduced into use in 1739, by Dr. Fennel, of Virginia, who wrote a pamphlet on the subject, and highly extolled it as a remedy for many complaints, and particularly, as a specific for the cure of the bite of the rattle-snake. It is an active stimulus, and increases the force of the circulation, especially of the pulmonary vessels. It has therefore been found useful in typhoid inflammation of the lungs, but it is apt to disorder the stomach, and to induce diarrhœa. Some have likewise employed this root in hydropic cases, and not without success.

There are examples of its occasioning a plentiful discharge by stool, urine, and perspiration ; and by this means removing the disease, after the common diuretics and hydragogues had failed.

It sometimes induces salivation, and it possesses diuretic, emetic, cathartic, expectorant, and diaphoretic powers. Dr. Archer, of Maryland, discovered the great utility of seneka snake-

root, as a remedy for that fatal disease, the *croup*, and speaks with confidence as to the general good effects produced by it. The decoction of the root is the manner in which he generally gives it; the strength must be determined by the physician; it must be so strong, as to act sensibly on his own mouth and throat, in exciting coughing, &c. for in this disease, the larynx (mouth of the wind pipe) in a manner loses its natural sensibility. Half an ounce of the root of seneka, bruised, and simmered in a close vessel, in half a pint of water, until reduced to four ounces, will, probably, in most cases be sufficiently strong. A teaspoonful of this to be given every hour or half hour, as the urgency of the symptoms shall demand; and during these intervals, a few drops occasionally, to keep up a sensible action of the medicine, in the mouth and throat, until it act as an emetic and cathartic; then repeated in small quantities, and so frequently as to keep up a constant stimulus in the same. By these means, in the course of two, four, six, or eight hours, a membrane is often times discharged by the mouth, one, two, and often three inches in length; sometimes it is swallowed and voided by stool.

Patients who use the medicine should not be permitted to drink any thing whatever, for some minutes after each dose. The reason must be obvious to all. The powder has lately been used by Drs. Archer and Son, in doses of four or five grains, mixed with a little water, with effects equally as pleasing as the decoction, and more so, unless the latter have been carefully prepared.

Seneka has been usefully employed in the decline of pleurisies and catarrhs, to promote expectoration. In suppressed coughs of aged persons, and in asthma, it is doubtless useful; a gentle and constant stimulus on the throat should be kept up in these diseases. It has also been exhibited as a powerful remedy in cases of female obstructions. For tincture;—half an ounce of the root, to half a pint of spirit; digest for ten days and strain; dose twenty to thirty drops, two or three times in a day.

The *polygala sanguinea*, a new species discovered at Savannah, has been used as a substitute for the *polygala seneka*.

POLYGONUM BISTORTA. *Great Bistort. Snake Weed.* The root.

This plant is perennial, and grows wild in moist meadows in several parts of Great Britain. The root is about the thickness of the little finger, of a blackish brown colour on the outside, and reddish within: it is writhed or bent vermicularly (whence the name of the plant) with a joint at each bending, and full of bushy fibres; the root of the species here mentioned, has, for the most part, only one or two bendings; others, three or more. All the parts of bistort have a rough austere taste, particularly the root, which is one of the strongest of the vegetable astringents.

The root of bistort is employed in all kinds of immoderate hæmorrhagies, and other fluxes, both internally and externally, where astringency is the only indication. It is certainly a very powerful styptic, and is to be looked on simply as such. To the sudorific, anti-pestilential, and other virtues attributed to it, it has no other claim but in consequence of its astringency, and of the antiseptic power which it has in common with other vegetable styptics. The largest dose of the root in powder, is one drachm.

POLYPODIUM FILIX MAS. *Male fern.* The root.

This fern is perennial, and grows in great abundance in almost every part of Britain, where the ground is not cultivated. The root when chewed, is somewhat mucilaginous and sweet, and afterwards astringent and bitter.

The vermifuge powers of fern, are well known. It appears to be particularly active in expelling the tape worm. Dr. G. Jones relates the case of a lady in New York, who after taking many worm medicines, with partial good effects, drank a decoction of fern in water, (a pint per day) until some gallons were taken, when a dose of castor oil brought away the remnant of the worm, measuring 45 feet.

The fern is the famous remedy of Madame Nuffer of Switzerland, for the tape worm. She acquired the knowledge of the remedy from her husband, who was a surgeon, and obtained a great price for the secret from Louis 15th of France, by whose order it was published.

The powdered plant was generally preferred by Mad. N. and may be given in doses of from 60 grains to 2 drachms.

PRINOS VERTICILLATUS. *Winter Berry. Black Alder.*
The bark and berries.

This is a very common shrub in many parts of the United States, and grows in the greatest perfection in swamps and marshy places. The bark is manifestly astringent. It is likewise considerably bitter, and pungent.

The berries, which are of a fine red colour, greatly partake of the bitter quality; and, if infused in wine or brandy, might be advantageously employed in cases where bitter tinctures are exhibited. The bark has been used as a substitute for the Peruvian bark, in intermittents and other diseases, both in substance and decoction. It is supposed to be chiefly useful in cases of great debility unaccompanied with fever, as a corroborant in anasarca and other dropsies, and as a tonic in cases of incipient sphacelus or gangrene. It is both given internally, and employed externally as a wash. On many occasions, it appears to be more useful than the Peruvian bark. Professor Barton says,

it ought to have a place in the shops, and in the pharmacopœia of this country, when such a desideratum shall be supplied. Dr. Mease observes, (Philadelphia Medical Museum, vol. 2.) it is useful in mortification, united with the root of sassafras, in decoction, &c. Care must be taken to distinguish our prinos from the swamp alder or candle alder.

PRUNUS DOMESTICA. *The French Prune Tree. Plumb Tree.*
The fruit, called French prunes.

Numerous varieties of prunes or plumb tree, are cultivated by gardeners, the fruit of which, when dried, are called prunes. Great quantities of the dried fruit are imported from the continent of Europe, but the French prunes are thought the best.

They contain much mucilaginous and saccharine matter, and their medical effects are, to abate heat, and gently loosen the belly, which they perform by lubricating the passages, and softening the excrement. They are of considerable service in costiveness, accompanied with heat or irritation, which the more stimulating cathartics would tend to aggravate. Where prunes are not of themselves sufficient, their action may be promoted by joining with them a little rhubarb, or the like; to which may be added some carminative ingredient, to prevent their occasioning flatulency.

PRUNUS VIRGINIANA. *Wild Cherry Tree.* The bark, both of the tree and root.

This tree is very commonly found in woods and hedges, but is probably produced from the stones of the garden varieties, dropped by birds. It delights in a sandy soil, and an elevated situation, and often grows from 15 to 30 feet in height, but is seldom more than nine inches in diameter. Its fruit is often infused in brandy, on account of its pleasant aromatic flavour.

The leaves are poisonous to certain animals, and even the berries intoxicate different kinds of birds. The Indians use the bark in the cure of syphilis. The bark of the wild cherry tree is powerfully tonic, and has been frequently substituted for the Peruvian bark with great success. It is slightly narcotic, and commonly produces drowsiness in those who take it.

From the experiments of Mr. C. Morris, of Virginia, (Inaugural Dissertation, 1802, Philadelphia) it appears, that the bark of the root was more powerful than the bark of the trunk. It has been very useful in dyspepsia, and in consumption of the lungs.

A strong decoction of the bark is anthelmintic. Very excellent effects have been produced by washing ill-conditioned ulcers with a decoction of the bark.

QUASSIA EXCELSA. *Quassia*. The wood, bark, and root.

The Quassia tree is a native of the West Indies, and of South America. Quassia derives its name from a negro named Quassi, who employed it with uncommon success as a secret remedy, in the malignant epidemic fevers which frequently prevail at Surinam. The root, wood, and bark of this tree, are all employed in medicine; but the latter, having a greater degree of bitterness, is more efficacious.

Quassia possesses no peculiar odour, but is one of the most intense, durable, pure bitters known. Its infusion, decoction, and tincture, are almost equally bitter, and yellowish, and are not blackened by chalybeates. It is an excellent tonic, antiseptic, and febrifuge: being one of the least heating drugs, it is found very serviceable in exciting appetite for food; expelling flatulency; assisting digestion; and particularly in removing costiveness, when produced by weakness of the intestines, such as is consequent to sedentary occupations.

Dr. Lettsom prescribed it with advantage, in cases of debility after febrile affections; in dyspepsia, arising from intoxication; and in diarrhœa; but he directed it with the greatest success, when combined with some absorbent in the histeric atony of females. It has been exhibited in intermittent, and bilious fevers, lienteria, cachexy, dropsies, leucorrhœa, and gout.

It may be given, either in infusion, or in pills composed of the watery extract; the former preparation, however, is generally preferred, in proportion of 3 or 4 drachms of the wood, to 12 ounces of water; which is to be taken in doses of one, or two table spoonfuls, frequently repeated.

QUASSIA SIMAROUBA. *Mountain Damson*. The bark.

This tree grows in Guiana, and in Jamaica. The bark of the root of this tree is brought to us, some feet long, and some inches in breadth, folded lengthwise. It is light, fibrous, very tough; of a pale yellow on the inside; darker coloured, rough, scaly, and warted on the outside; has little smell, and a bitter, not disagreeable taste. It imparts its bitterness to alcohol and water.

It has been much celebrated in obstinate diarrhœa, dysentery, anorexia, indigestion, lienteria, and intermittent fevers, but it is doubtful whether it is better than other bitters. It is given in powder, in doses of half, or a whole drachm; but its best form is in decoction.

QUERCUS ROBUR. *Oak.* The bark.

The bark of this valuable tree, is a strong astringent, and possesses tonic and antiseptic virtues. A chemical analysis of the white oak bark, as made by Mr. Davy, affords from one hundred and eighty grains of the inner bark in substance, seventy two grains of pure tannin (that remarkable vegetable principle, the common and general source of the astringent and antiseptic properties). In every astringent bark, says Mr. Davy, the interior white bark contains the largest quantity of tannin.

White oak bark exceeds in astringency the Peruvian bark, and falls but little, if any short of it, in its tonic powers. Hence, we have a valuable domestic substitute for Peruvian bark, which is successfully employed in hæmorrhagies, alvine fluxes, and other preternatural or immoderate secretions. On account of the great difficulty in reducing it to a sufficiently fine powder, it is most commonly given in decoction.

Dr. Rousseau, in a communication published in the Philadelphia Medical Museum, vol. 2. has mentioned the efficacy of the black oak bark in intermittents, and it appears to be well worthy the attention of physicians. The powder, as prepared by Mr. Benger, is of the most extreme degree of fineness.

The bark of the Spanish oak, *quercus rubra montana*, *red oak of the mountain*, Dr. Barton has used in a case of gangrene of the foot, with such success, that he thinks it equalled in power the best Peruvian bark. He gave it in decoction in very large quantities, and the affected part was constantly kept wet with the same decoction, or with a poultice made of bread and milk with the bark.

The medicinal virtues of the bark of Spanish oak, are probably, in no respect materially different, from those of the bark of the common white oak of New England. Debilitated patients, whose stomachs cannot retain this medicine, may experience the happiest effects from bathing twice or thrice a day in a strong decoction of the oak barks, about luke warm. It is particularly serviceable in the last stage of fevers.

QUERCUS CERRIS. *Oriental Oak.* The nest of the cynips quercifolii, called gall nut.

This species of oak is a native of the Levant, and of the warm countries of Europe.

An insect, the cynips quercifolii, deposits its eggs in the leaves, and other tender parts of the tree. Around each puncture an excrescence is presently formed, within which the egg is hatched, and the insect passes through all its stages of metamorphosis, until it become perfect, when it eats its way out of its prison.

These excrescences are called *galls*, or *gall nuts*. They are of different sizes, smooth or knotty on the surface, of a whitish, reddish, or blackish colour, and generally penetrated with a small hole. Galls have an austere styptic taste, without any smell; they are said to be the most powerful astringent we possess, and have therefore been often employed in medicine. It is asserted, that, by their internal use, in doses of half a drachm, or more, of the powder, intermittent fevers have been cured, even after Peruvian bark had failed.

An infusion, or decoction of galls, may be used with advantage as an astringent gargle; and an ointment of one part of finely powdered galls to eight of any simple ointment is applied with success in hæmorrhoidal affections.

RESINA PINI. *Resin of Pine.* A resin, which is procured from pines of various species, deprived of its volatile oil.

The proper turpentine contains a large proportion of volatile oil, which is often separated from them by distillation. The residuum of the distillation gets different names, according to some peculiarities in its treatment. When the distillation is performed without addition, and continued until the whole essential oil be driven off, and there appear some traces of empyreuma, the residuum is fiddler's resin, or colophony: but if, while the mass is still fluid, a quantity of water be added, and thoroughly blended with the resin, by long and constant agitation, it is then called yellow resin.

This article is employed as an ingredient in ointments and plasters.

RHAMNUS CATHARTICUS. *Purging Buckthorn.* *Spina Cervina.* The juice of the berries.

This tree, or shrub, grows in woods or hedges; it attains if cultivated, the height of sixteen feet; it flowers in June, and ripens its fruit in September and October.

Buckthorn berries have a faint disagreeable smell, and a nauseous bitter taste. They have long been in considerable esteem as cathartics; and celebrated in dropsies, rheumatism, and even in gout: though in these cases they have no advantage above other purgatives, but are more offensive, and operate more severely than many with which the shops are furnished.

They generally occasion gripes, sickness, dryness of the mouth and throat; and leave a thirst of long duration. A syrup, prepared from the berries, is still kept in the shops, though seldom prescribed. The dose is one ounce of syrup, or about twenty of the fresh berries, and twice or thrice this number in decoction.

The bark of the buckthorn is said to be a mild tonic, astringent, and antiseptic medicine, and is recommended for the cure of intermittents; and in general debility, after chronic diseases. The decoction is of great service; reducing inveterate inflammations of the eye; and curing the itch, as it cleanses the skin, and abates the burning heat, without repelling the humors.

RHEUM PALMATUM. *Palmated Rhubarb.* The root.

Palmated, true, or officinal rhubarb, is a native of China, and the East Indies; whence its culture has been introduced into Europe. The rhubarb hitherto employed in medicine, is imported from Turkey, Russia, China, and the East Indies. The first sort is brought in roundish pieces, perforated in the centre; and which are externally of a yellow colour, but, on being cut, they appear variegated with reddish streaks.

The Chinese rhubarb is imported in long pieces, which are harder, and more compact than the Turkey rhubarb; the former possessing a weaker aromatic flavour, is less esteemed, though, being more astringent, it is, for some purposes at least, equal to the latter. The general characters of good rhubarb are, its having a whitish or clear yellow colour; being dry, solid, compact, and moderately heavy; brittle, easy to be pulverized, forming a powder of a fine bright yellow, having a bitterish, somewhat astringent taste, and when chewed feeling gritty under the teeth, speedily colouring the saliva, and not appearing very mucilaginous.

The principal constituent of rhubarb is extractive matter, soluble both in alcohol and in water. By gentle decoction, it loses above one half its weight. The virtues of this root are destroyed by roasting, boiling, and in forming the extract.

Rhubarb is justly prized as a mild cathartic, and may be safely administered to children, invalids, and delicate women, in doses of from ten to twenty grains, though, in irritable, hysterical, and phthisical habits it is apt to occasion gripes, and aggravate febrile symptoms: hence it ought never to be given in the first stage of dysentery, when this invaluable remedy, by premature use, may occasion the most violent pain, and inflammation of the bowels; but, after the fever is suppressed, and the disease becomes a chronic diarrhœa, small doses of rhubarb are attended with the best effects.

Beside its purgative quality, it is celebrated as an astringent, by which it strengthens the tone of the stomach and intestines, and proves useful in diarrhœa, and disorders proceeding from laxity. Rhubarb exhibited in substance in the form of powder, operates more powerfully than in any other way. The dose for an adult is from a scruple to a drachm. On account of its great bulk it is sometimes unpleasant to the taste, and its laxative effects are often increased by the addition of neutral salts, or other more active purgatives. Combined with calomel, it is much more effi-

cacious as a cathartic. The infusion is considerably weaker than the powder, and requires double the dose to produce the same effect. It is well adapted for children, but must be always fresh prepared. In the form of tincture, its principal use is as a tonic, and stomachic. Small doses of the powder are frequently exhibited with the same intention.

Attempts have been successfully made to introduce the culture of this valuable drug into Britain, and it appears from authentic accounts, that sufficient quantities of it may be reared, and that the English root has proved to be fully equal to the best sort obtained from Turkey or China.

There can be no doubt that the climate of the United States is perfectly congenial to the growth of rhubarb, and considering the great value of the medicine, its cultivation ought to be attempted.

RHODODENDRON CHRYSANTHUM. *Yellow flowered Rhododendron.* The leaves.

This small shrub grows in the coldest situations in Siberia. The leaves are oblong, rigid, reflected at the edges, rough on the upper surface, smooth, and paler on the lower. When dried, they have no smell, but a rough, astringent, and bitterish taste. They also contain a stimulant narcotic principle; for they increase the heat of the body, excite thirst, and produce diaphoresis, or an increased discharge of the other secretions or excretions; and, in a larger dose, inebriation and delirium.

The Siberians use a decoction of it in rheumatism and gout. They put about two drachms of the dried shrub in an earthen pot, with about ten ounces of boiling water, keeping it near a boiling heat for a night, and this they take in the morning.

Besides its other effects, it is said to produce a sensation of prickling, or creeping in the pained parts; but in a few hours the pain and disagreeable symptoms are relieved, and two or three doses generally complete the cure. The use of liquids is not allowed during its operation, as they are apt to induce vomiting.

RHUS COPALLINUM. *Narrow leaved Sumach.* The berries.

Narrow leaved sumach, grows naturally in most parts of the United States; rising to the height of six feet in a slaty gravelly soil. The berries are very acid, and are sprinkled with a grayish pounce, of an agreeable acid taste.

RHUS GLABRUM. *Pennsylvanian Sumach.* The berries.

Rhus glabrum, smooth Pennsylvanian sumach, common or upland sumach, rising to the height of eight or ten feet. The

leaves are feathered, sawed, lanced, naked on both sides, and change to a beautiful red in autumn : it flowers in July. The seeds are arranged like the flowers, are red, and covered with a white powder of an agreeable acid taste.

The two species above described are considerably astringent. An infusion of the berries sweetened with honey is sometimes used for a gargle in sore throats, and for cleansing the mouth in putrid fevers. They are also recommended as useful in several of the arts. The leaves or berries are found a valuable substitute for *nut galls* in dyeing or making ink, they give a deep and permanent black. The plants in all their parts may be used as a succedaneum for oak bark in tanning, especially the white glove leather.

RHUS RADICANS. Poison Vine. Poison Creeper.

Poison vine, has a slender ascending stem, and frequently climbs up to the top of our tallest trees. The flowers, which appear in June, are produced along the whole course of the smaller branches ; they are small, are of a light yellow colour, and have a delightful odour.

RHUS TYPHINUM. Virginian Sumach. Stags Horn. Vinegar Plant. The berries.

This plant grows naturally in almost every part of the United States. In Virginia and Pennsylvania, it rises to the height of twelve or fifteen feet, with a trunk of six or eight inches in diameter. The young branches are covered with a soft velvet-like down, and from their resemblance to the horn of a stag, the common people have given it the appellation of stag's horn. The flowers are produced in close tufts at the end of the branches, and are succeeded by seeds inclosed in purple, woolly, succulent covers ; so that the branches are of a beautiful colour in autumn.

This plant resembles in its properties the *rhys copallinum* and *glabrum*.

RHUS TOXICODENDRUM. Poison Oak. Swamp Sumach. The leaves.

Poison oak, a low shrubby stalk : leaves trifoliate, with pretty large foot stalks, lobate, entire, smooth, and somewhat heart shaped. The flowers come out from the sides of the stalks, in loose panicles, are small, and of an herbaceous colour. This plant, sometimes called poison wood, is so acrimonious, that the touching of the leaves, or rubbing them on the skin, occasions itching, inflammation, and eruption.

Dr. Alderson, of Hull, has given the leaves in four cases of paralysis, in doses of half a grain, or a grain, three times a day, with marked success; all his patients recovered to a certain degree, the use of their limbs. The first symptom of amendment was always an unpleasant feeling of prickling or twitching in the paralytic limbs. It has been given in large doses, without experiencing the same success. It was not however inactive. In one case the patient discontinued its use on account of the disagreeable prickling it occasioned; and in general it operated as a gentle laxative, notwithstanding the torpid state of the bowels of such patients.

RHUS VERNIX. *Varnish Tree. Poison Oak. Swamp Sumach. White Sumach.*

Swamp sumach is the largest of our native species of rhus; grows in swamps, and makes a fine appearance. In New England this is commonly called dogwood.

The rhus radicans, toxicodendrum and vernix, are highly poisonous, and are particularly active in warm weather, after a meal, and when the part touching the plant is moist with sweat. The rhus vernix is more violent than the other species, the poison will be communicated by touching, and by smelling any part of the shrub, or even by the smoke while burning, or the steams of a decoction of the plant. In about forty-eight hours an inflammatory eruption appears on the surface of the skin, attended by pain, swelling, itching, and fever. The eruptions sometimes suppurate, after which, the inflammation subsides, and the ulcers heal in a short time, but the patient frequently remains blind for several days. It operates, however, somewhat differently in different constitutions; and what is singular, some constitutions are incapable of being poisoned with it at all. The remedies are bloodletting; when the symptoms are violent, smart purging, especially by sea water; cold water, or ice, or a wash of spirits of *sal ammoniac* diluted with water, or of lead water applied to the parts. Dr. Barton has always found a solution of *corrosive sublimate* in water, to answer the purpose of effecting a speedy cure.

One case of the remarkable effects of this poison has fallen under the observation of the compiler of this volume. The patient, having incautiously expressed a quantity of the juice from the leaves of a species of rhus, was soon after attacked with violent inflammation, eruption, and swelling of the whole body, with fever and extreme pain. The whole surface of the body, swelling of the head, and blindness, exhibited the appearance of the most malignant kind of small pox; and so obstinate were the dangerous symptoms, that with the loss of his hair and nails, it was several weeks before a cure was effected.

Dr. T. Horsefield, in his excellent inaugural dissertation on the rhus vernix, rhus radicans, and rhus glabrum, declares his full

conviction, after many judicious experiments, that the *rhus vernix* is the true varnish tree of Japanese, described by Kempfer. He found that the greatest quantity of juice was obtained from incisions made in the tree about the middle of May. Thunbery, and others, are also of opinion, that the Japanese varnish so much celebrated, may be obtained from our native *rhus*. It is a subject undoubtedly worthy of attention.

A singular instance is related in the Medical Repository, of the poisonous effects of the *rhus vernix* on a swarm of bees, the whole of which the day after they attached themselves to the branch, were found dead, and their bodies turned black, and swelled to nearly twice their natural size.

RICINUS COMMUNIS. *Palma Christi.* The seeds and their fixed oil, called castor oil.

The *palma christi* is a native of the West Indies, and flourishes extremely well in almost every part of the United States. In Georgia and South Carolina, its growth is very luxuriant, rising to the height of fifteen or twenty feet, even without the assistance of the hand of culture, and exhibiting a beautiful appearance. In Mr. Drayton's history of South Carolina, it is asserted that its produce is from one hundred to one hundred and fifty gallons of oil per acre. Estimating this at four dollars per gallon, the ordinary price, it will be found to afford ample encouragement for its extensive cultivation, especially since the plant is not liable to be greatly affected by the vicissitudes of the season. It answers best in a rich sandy soil, and the seed should be put in early in the spring. The seeds are about the size of small beans, which, in their brittle shells, contain white kernels, of a sweet, oily, but somewhat nauseous taste. The skin is extremely acrid, and one or two of the seeds swallowed entire, operate as a drastic purgative or emetic.

The kernels yield almost a fourth part of their weight of a bland fixed oil, commonly called castor oil.

It is obtained from them either by expression or decoction with water. The former method is practised in Europe; the latter in Jamaica. To increase the product, it is common to parch the seeds over the fire, before the oil is extracted from them; but the oil thus obtained, is greatly inferior to that prepared by cold expression, or simple decoction, and is apt to become rancid. The most eligible method is, to shell the seeds and boil them in water; as the oil rises, skim it off. This oil is sweet, without bad taste, or smell, and as clear as olive oil; and may be kept much longer than that obtained by expression, because the water detains the mucilage, which abounds in the expressed oil, and disposes it the sooner to become rancid, and unfit for internal use. Genuine castor oil is thick and viscid, of a whitish colour, insipid or sweetish to the taste, and without smell.

Castor oil is a gentle and useful purgative ; it in general produces its effects without griping, and may be given with safety, where acrid purgatives are improper, as in colic, calculus, gonorrhœa, &c. It is also one of the best vermifuges, and a most efficacious remedy for the dry bellyache and iliac passion, when administered in proper doses, to children and adults ; viz. the dose for the former, from one to two teaspoonfuls ; and the latter, a tablespoonful, repeated every two or three hours. Half a teaspoonful has been given with success to new-born infants, for lubricating the intestines, and expelling the *meconium*. As patients in general have a great aversion to this oil in its pure state, it may be taken swimming either in a glass of peppermint, or simple water, or in the form of an emulsion, with mucilage, or with the addition of a small quantity of rum.

ROSA GALLICA. Red Rose. The petals.

The Gallica, French or common red rose, has large, spreading, half double, deep red flowers. It has not the fragrance of the damask rose ; but the beautiful colour of its petals, and their pleasant astringency, have rendered them officinal. It must however be remarked, that their odour is increased by drying, while that of the damask and moss roses is almost destroyed.

ROSA DAMASCENA. Damask Rose. The petals.

This is justly termed the *queen of flowers*, and both its elegance and fragrance have rendered it the favourite ornament of every garden. It is sometimes called Dutch hundred leaved rose. The damask rose yields on distillation, a small portion of butyrous oil, together with a water, which possesses the odour and taste of the roses, and are greatly esteemed for the agreeable flavour they impart to culinary preparations, and also to cordials. A valuable perfume is obtained from the flowers by distillation, called *ottar* or *essence of roses*. The true ottar of roses is sold in the East Indies, at the exorbitant price of *twenty guineas* and upwards per ounce. It is doubtless the most elegant perfume in vegetable nature ; as a single drop imparts its fragrance throughout the room or dwelling, and suppresses other less agreeable odours.

ROSA CANINA. Dog Rose. The fruit, called hips.

The common wild briar, or hip tree, an indigenous plant, growing in woods and hedges. In the month of June it bears oval flowers, which are succeeded by red egg shaped berries. It is the fruit of this shrub, that is employed in Britain by the apothecaries.

cary for making the conserve of hips. The pulp of the fruit, besides saccharine matter, contains citric acid, which gives it an acid taste.

ROSMARINUS OFFICINALIS. *Rosemary.* The flowering tops.

Rosemary is a shrubby perennial, which grows wild in the south of Europe, and is cultivated in gardens. It has a fragrant smell, and a warm pungent bitterish taste, approaching to those of lavender: the leaves and tender tops are strongest; next to these the cup of the flower; the flowers themselves are considerably the weakest, but most pleasant. From the leaves, tops, and flowers of this plant an essential oil is prepared; or, when distilled with spirit of wine, they afford the celebrated *Hungary water*.

These liquid medicines are esteemed excellent cephalics, in nervous and hysterical affections, and have been found eminently serviceable in apoplexies, palsies, and vertigoes, in which cases they are sparingly applied to the temples and forehead.

RUBIA TINCTORUM. *Madder.* The root.

Madder is perennial, and grows wild in some parts of Britain, but the dyers are principally supplied with it from Zealand, where it is cultivated in large quantities.

The roots consist of articulated fibres, about the thickness of a quill, which are red throughout; have a weak smell, and a bitterish astringent taste. For the use of dyers, they are first peeled and dried, then bruised and packed in barrels.

The root of the common or wild madder is an excellent detergent, and aperient; on which account it has been highly recommended in visceral obstructions, particularly of the uterus; in coagulations of the blood, induced either by falls or bruises; in the beginning of dropsical complaints, and especially in the rickets. It may be given pulverized in doses of from five to fifteen grains to children; and from half to a whole drachm, three or four times in a day, to adults. When taken internally, it possesses the remarkable quality of tinging the urine of a deep red colour, and produces similar effects on the bones of animals, if eaten with other food. Madder might be profitably cultivated in the United States.

RUMEX AQUATICUS. *Water Dock.* The root and leaves.

It grows in peat marshes, wet ditches, pools, at the sides of rivers, and in shallow water. It flowers in July and August, and is succeeded by large seeds. This plant affords a medicine of considerable efficacy, when applied externally, as a wash for

spongy, putrid gums ; its roots when pulverized have been found excellent for cleaning the teeth. These roots are of a bitter, astringent taste, and have often been employed for the cure of scorbutic and cutaneous disorders, whether administered internally, or applied externally in ointments, cataplasms, lotions, or fomentations. Decoctions of the leaves are, likewise, an efficacious laxative, and have been taken with advantage in rheumatic pains, and chronical diseases occasioned by costiveness, or by visceral obstructions. The dose usually given, is a decoction of half an ounce of the fresh roots, or from one to two drachms of them, in a dry state.

The Indians, says Dr. Cutler, used the root of water dock with great success in cleansing foul ulcers. It is said, they endeavoured to keep it a secret from the Europeans.

Dr. Withering says, he saw an ill conditioned ulcer in the mouth, which had destroyed the palate, cured by washing the mouth with a decoction of this root, and drinking a small quantity of the same decoction daily.

SACCHARUM OFFICINARUM. *Sugar Cane.* Sugar.

a. brown, or impure.

b. double refined, or most pure.

The sugar cane grows wild in both the Indies, and forms the principal object of cultivation in the West-Indies.

It grows to the height of from three and a half to seven, and sometimes to twelve feet, in strong, deep lands. When ripe it assumes a fine straw colour, and is usually cut at the age of twelve or fifteen months, according to the season, or the nature of the soil.

Sugar is principally obtained from the plant by boiling down its expressed juice, with the addition of a certain proportion of lime or potash, until the greater part be disposed to concrete into brownish or yellowish crystalline grains. In this dry state, it is called *raw* or *muscovado* sugar, and is sent to Europe, where it is subsequently refined. This is performed by dissolving it in water, boiling the solution with lime water, clarifying it with blood or white of eggs, and straining it through woollen bags. The solution, when in a proper state, is poured into conical forms of unglazed earthen ware, where it concretes into a mass of irregular crystals. The syrup, which has not been crystallized, is then permitted to run off through a hole in the apex of the cone. The upper or broad end of the cone is then covered with moist clay, the water of which gradually penetrates into the sugar, and displaces a quantity of syrup, which would otherwise be retained in it, and discolour it. It is then carefully dried, and gets the name of *loaf* or *lump* sugar. When the solution, and other steps of the process are repeated, the sugar is

then said to be *double refined*. Sugar is sometimes made to assume a more regular form of crystallization, by carrying the evaporation only to a certain length, and then permitting the syrup to cool slowly: In this form it is called *brown* or *white sugar candy*, according to the degree of its purity.

Sugar is a very wholesome and powerful article of nourishment; for during crop time, the negroes in the West Indies, notwithstanding their increased labours, always grow fat. It produces no particular effect as a medicine, except that the coarser and impure kinds are slightly purgative. In pharmacy, it is principally employed to cover bad tastes, to give form, and to preserve more active substances. In using it for the last purpose, we must always remember, that if the proportion of sugar employed be too small, it will promote instead of retarding the fermentation of the articles it is intended to preserve. Molasses or treacle is a very impure syrup, which remains after refining the sugar. Treacle is applied to many domestic economical purposes; and, in hospital practice, may supersede the use of sugar in many instances. Sugar candy is used by persons labouring under hoarseness and coughs; the violence of which it contributes to relieve, by lubricating the membranes, and promoting expectoration.

SALIX ALBA. *White Willow.* The bark, and the bark of the root.

The species or varieties of the willow, which have been noticed by botanical writers, are very numerous; and it is probable that the bark of all of them possesses properties in many respects similar. In 1763, Mr. Stone, an English clergyman, presented a paper to the Royal Society, on the beneficial effects of the *salix alba*, or white willow, in intermittent fevers; and Dr. Cullen, on this authority, and from the sensible qualities it possesses, recommends it, in his *Materia Medica*, as a substitute for the cinchona. Mr. Stone gathered the bark in summer, when it was full of sap; dried it by a gentle heat, and gave a drachm of it powdered every four hours, betwixt the fits. In a few obstinate cases he mixed it with one fifth part of the cinchona. Some judicious physicians here, says Dr. Cutler, made trial of the bark of white willow, and recommend it as a valuable substitute for the Peruvian bark. They have used principally the bark of the root.

SALIX CATIFOLIA. *Broad leaved Willow.* The bark.

This possesses greater medicinal properties than any of the other species of *salix*; and is now substituted by many British physicians for the Peruvian bark. Three British pamphlets

upon this subject have been published within a few years ; the last, by Dr. Wilkinson (1803) is replete with encomiums on the remedy in question. This species of *salix* may be distinguished by the shape of its leaves from all others, except the *salix pentandra*, or bay leaved willow. But the leaves of the latter are smooth and shining, and of a deeper green ; nor have they the downy appearance on the under surface, which is so remarkable in the *salix caprea* or *latifolia*. It is found in woods and hedges on hilly situations, and delights in cold, clayey, moist ground. The most proper time to gather the bark, is in May or June ; it should be cut in small pieces, and dried in the shade. This bark is very astringent to the taste, and somewhat bitter, but it loses the latter quality when dry. Dr. Wilkinson directs one ounce and a half of the coarse powder of the bark to be infused in one quart of water for six hours ; then to boil it over a gentle fire for a quarter of an hour, and strain for use : of this the ordinary dose is two or three large spoonfuls, three or four times a day ; but in the ague and fever, one or two ounces may be given every third hour, in the interval of the fit. The strong decoction of this bark resembles port wine in colour, for which, by several who have seen it in vials, it has been mistaken.

Dr. Wilkinson relates sixteen cases of disease, in which this bark was employed with decided advantage, and from which he does not hesitate to assign to it virtues greatly superior to those of the *cinchona* : in particular he relates a case of extreme emaciation from an ulcerated foot, which was perfectly cured, after having resisted the continued use of Peruvian bark, and the exertion of the physicians of two public charities. It is doubtless a remedy of considerable efficacy, and is strongly recommended on account of its cheapness, and the facility of procuring it. It appears to be useful in most cases where the *cinchona* is usually resorted to.

The attention of medical men should be directed to the inquiry, whether the *salix latifolia* may be found in the United States, as it promises to afford a valuable substitute for the *cinchona* ; the price of which has become exorbitant, and its quality greatly impaired by base and fraudulent adulterations.

SALVIA OFFICINALIS. *Sage.* The leaves.

The leaves of the sage have a peculiar aromatic smell, and a warm aromatic taste, with some degree of bitterness and astringency.

In its effects, sage agrees with other aromatics. It is stimulant, carminative, and tonic. In cold, phlegmatic habits, it excites appetite, and proves serviceable in debilities of the nervous system. The best preparation for these purposes, is an infusion of the dry leaves, drank as tea ; or a tincture, or extract, made with rectified spirit, taken in proper doses ; these

contain the whole virtues of the sage ; the distilled water and essential oil, only its warmth and aromatic quality, without any of its roughness or bitterness.

Aqueous infusions of the leaves, with the addition of a little lemon juice, prove an useful diluting drink in febrile disorders, being sufficiently agreeable to the palate.

SAMBUCUS NIGRA. *Common Elder.* The inner bark, flowers, and berries.

This tree is frequent in hedges ; it flowers in May, and ripens its fruit in September. The berries contain malic acid, and have a sweetish, not unpleasant taste ; nevertheless, eaten in substance, they offend the stomach.

The expressed juice inspissated to the consistence of a rob, proves an useful aperient medicine ; it opens obstructions of the viscera, promotes the natural evacuations, and, if continued a length of time, does considerable service in various chronical disorders.

The inner green bark of its trunk is greatly cathartic. An infusion of it in wine, or the expressed juice, in the dose of half an ounce or more, is said to purge moderately ; and, in smaller doses to prove an efficacious deobstruent, capable of promoting all the fluid secretions.

The young leaf buds are strongly purgative, and act with so much violence, as to be deservedly accounted unsafe. The flowers are very different in quality ; these have an agreeable aromatic flavour, which they yield in distillation with water, and impart by infusion to vinous and spirituous liquors.

SANGUINARIA CANADENSIS. *Blood Root. Puuson.* The seeds and root.

This is a common plant in the United States, and is called also red root, Indian paint, turmeric. The leaves are roundish, and deeply indented ; stems naked, supporting single flowers ; blossoms white. It grows in rich wood land, and flowers in April. When the fresh root is broken, a juice issues in large drops resembling blood. The Indians used it for painting themselves, and highly esteemed it for its medicinal virtues. It is emetic and cathartic, but must be given with caution. An infusion of the root in rum or brandy, makes a good bitter. If it be planted in rich shady borders, it flourishes well in gardens ; and the large leaves and blossoms make an agreeable appearance soon after the frost is out of the ground.

[*Cutler's account of indigenous vegetables.*]

From an inaugural dissertation on *Sanguinaria*, by Dr. Downy (Philadelphia 1803), the following useful information is ob-

tained. "The root is from one fourth to half an inch in diameter, from three to four inches long, sending forth numerous stringy fibres, two or three inches long: a coloured liquor is thrown out when the root is broken. The stalk is six or eight inches long, and of the thickness of a quill. The leaves are cordate and lobate.

There is but one leaf to a stalk; on each lobe, one large fibre of a light yellow colour, may be seen running from the stalk, and many smaller ones branching from it in all directions. The powdered root, in doses of fifteen or twenty grains, is powerfully emetic. Eight grains is a mild dose, and is but little inferior to ipecacuan. It contains a large proportion of gum, some resin, and extractive matter. The first and last are the most active parts.

The leaves and seeds of the plant are powerful and diffusible stimuli; promote sweat, and are given in Maryland with that view to horses, to promote the shedding of their coats. A tincture of the root is used to prevent the intermittent fever; and a decoction of the roots to cure the dysentery. In one case, it operated powerfully upon the uterus, and produced abortion; hence it might be useful in female obstructions."

The seeds are said, by professor Barton (collection for *Materia Medica*) to possess nearly the same quality of those of stramonium, viz. they induce fever, delirium, dilated pupil, &c. A deleterious property resides also in the leaves. The root has been used in gonorrhœa, for the bites of serpents, and in bilious diseases; and the juice is employed to destroy warts. In some parts of New England, a spirituous tincture of the roots is used as a tonic bitter. It is expectorant, and is apparently allied in properties to rattle snake root.

The medical properties of *Sanguinaria* have been investigated by numerous trials in the hands of Aaron Dexter, M. D. professor of chemistry and *Materia Medica*, university at Cambridge. The experimental tests of this gentleman, corroborated by those of other respectable physicians, afford the most satisfactory evidence, that it possesses very active powers, and that in doses of one grain of the powdered root, or ten drops of a saturated tincture, it proves efficacious as a stimulant and diaphoretic. But in large doses, it excites nausea and vomiting, and if incautiously administered, it is of dangerous tendency.

It is said to be efficacious in removing jaundice, and is believed to be a chief ingredient in the quack medicine known by the name of Rawson's bitters.

Dr. Israel Allen, of Sterling, and others, have had recourse to this medicine as a substitute for digitalis, in coughs and pneumonic complaints; and on some occasions it is said to have proved equally efficacious, and less debilitating than foxglove, when exhibited with the same precautions.

The dose of the saturated tincture of the root is from thirty to eighty drops twice in the day, increasing or decreasing the number as particular circumstances may require.

Sapo. *Soapi.* Prepared with oil of olives and soda, called castile soap.

Soap, is a composition of fixed alkaline salt, in a state of combination with animal or vegetable oil ; it is sometimes dry, and hard ; at others, soft and liquid ; being manufactured various ways, with and without heat.

The only difference in the various kinds of manufactured soap, is, in the oils employed in the composition. Thus, the common hard soap is prepared from the caustic ley, with the addition of tallow. The *Venice*, *Alicant* or *Spanish* soap, with olive oil ; green soap, with that of rape, hemp, or linseed ; black soap, with train oil ; and, lastly, the ordinary soft soap, is formed by using potash as a substitute for soda, together with tallow, or train oil, to which is added a large quantity of common salt.

The perfumed compounds, known under the names of palm, violet, almond, or other soaps, are prepared in a similar manner ; the oils of such vegetable substances being employed instead of those of the usual kind.

The alkaline soaps have an unpleasant taste, and a peculiar smell ; form a milky solution with water, and a transparent one with alcohol, and are powerfully detergent.

The only species which is officinal in our pharmacopœia, is that composed of olive oil and soda. It is only prepared in the countries which produce the oil. For medicinal use, we prefer the Spanish.

It should be white and hard, dissolved entirely in water and in alcohol, forming with the former a milky, and with the latter a transparent solution ; the solution should froth freely on agitation. It should not be variagated in its colour, feel greasy or moist, or be covered with a saline efflorescence ; and the solutions should not have a rancid smell or taste. Some of the foreign dispensatories are so very particular about the nature of the soap, used in medicine, as to direct it to be prepared by the apothecary, by simply triturating (without the assistance of heat) Provence oil, with half its weight of a solution of soda, of the specific gravity of 1.375, until they unite.

Soap is decomposed by all the acids, earths, and earthy and metalline salts. The acids combine with the alkali and separate the oil. The earths form an insoluble earthy soap with the oil, and separate the alkali, while with the salts there is a mutual decomposition, their acid combines with the alkali, and earthy, or metalline soaps are formed.

The detergent property of soap, or the power it possesses of rendering oily and resinous substances miscible with water, has given rise to very erroneous notions of its medical virtues. It was supposed to render such substances more readily soluble in the juices of the stomach, and in the fluids of the body, and to be well fitted for dissolving such oily and unctuous matters as it may

meet with in the body, attenuating viscid juices, opening obstructions of the viscera, and deterging all the vessels it passes through.

It has likewise been supposed a powerful menstruum for the urinary calculus ; and a solution of soap in lime water, has been considered as one of the strongest dissolvents that can be taken with safety into the stomach ; for the virtue of this composition has been thought considerably greater than the aggregate of the dissolving powers of the soap and lime water when unmixed.

How erroneous these ideas are, appears evidently, when we recollect the very easy decomposition of soap, which renders it perfectly impossible that it should enter the circulating system, or indeed come into contact with the fluids even of the mouth, without being decomposed. As to the solution of soap in lime water, we may observe, that it is only a clumsy way of exhibiting a solution of soda ; for the soap is decomposed, an insoluble soap of lime is formed, and the soda remains in solution. The internal use of soap should therefore be confined, in our opinion, to the giving form to other substances which are not decomposed by it, and to decompose metallic poisons when they have been taken into the stomach. For this last purpose, a teacupful of a solution of soap, in four times its weight of water, may be drank every three or four minutes, until a sufficient quantity be taken.

Applied externally, it is a very powerful detergent, and combines the stimulating properties of the alkali with the lubricating nature of the oil. In this way it often proves a powerful discutient, and an useful application to sprains and bruises.

SCILLA MARITIMA. *Squill.* The root.

The squill is a perennial bulbous rooted plant, which grows wild on the sandy shores of Spain, Portugal, and the Levant. The best sea-onions ought to be sound, fresh, and to contain a viscid juice ; they are nauseous, bitter, and, if much handled, are so acrid as to ulcerate the skin. It is more commonly met with in the shops, in the form of dried scales, which should be brittle, semipellucid, smooth, but marked with lines, and when chewed, should feel tenacious, and taste very bitter, without manifest acrimony.

The active constituent of the squill is the acrid principle ; and, therefore, it becomes almost inert by drying, or by being kept too long in the form of powder. The squill is a powerful stimulant, promoting the discharge of urine ; and if the patient be kept warm, a profuse perspiration.

It is chiefly employed in cases where the organs of perspiration are clogged, or oppressd with mucus.

When combined with nitre, in the proportion of from five to ten grains of the dried root, with a double quantity of nitre, it has been greatly extolled for its efficacy in dropsical swellings, and in

inflammations of the kidneys. If the squill be taken in a large dose, it operates as an emetic; and, in some persons, as a purgative. In some cases it produces even strangury, bloody urine, inflammation, and erosion of the stomach. In smaller doses, however, it proves an useful expectorant and diuretic, and is peculiarly serviceable in phlegmatic habits, where the lungs are oppressed with viscid matter.

The dose of squill is one or two grains, two or three times a day; and the most commodious form, unless when designed as an emetic, is that of a bolus, or pill: though when mixed with honey into an *oxymel*, it affords an useful medicine in obstinate coughs.

SCUTELLARIA GALERICULATA. Blue Scull-Capt. Hooded Willow-Herb. The leaves.

A native perennial plant, growing on the banks of rivers, and the borders of ponds; flowering in the month of July or August. Its square stem is branched, and attains the height of two feet; the leaves are heart-shaped, narrow-pointed, on short foot stalks, and scalloped; the flowers are blue, in pairs, on pedicles from the axæ of the leaves, and pendulous. This herb is bitter, and has a garlic smell; it is eaten by cows, sheep, and goats; but is refused by horses and hogs. Cartheusen, a German writer, informs us, that the whole of this astringent vegetable may be employed for dyeing black, with the addition of green vitriol.

Botanic writers have ascribed no medicinal properties to this vegetable, nor would it occupy a place here, but for its recently reputed efficacy as an antidote against the effects of canine madness. Should this plant ultimately prove a successful remedy for a disease so truly deplorable in its nature, and dreadful in its consequences, no encomiums can surpass its merit, even if recorded in letters of gold. Our authority, however, is founded on newspaper intelligence, and verbal report. In the Salem Gazette of September 15th, 1809, we have, in "a letter from a friend in New York, to his correspondent in Salem," an interesting account of the unexampled success with which this remedy has been employed. The substance of that letter will now be cited in the handsome language of the writer, evincive of his own confidence, and animating to the hope of every benevolent mind.

"I conceive it of importance to make known what I believe to be a specific remedy for the canine madness, and a certain antidote against the poison by which it is produced. The remedy to which I allude has been made use of with great success by a poor man of the name of Lewis, a resident of West Chester county, in this state. It was known to his father many years since, and kept a secret in the family for a very considerable time. Whenever a mad dog appeared in the neighbourhood of Mamaroneck or the Purchase, and bit either man or beast, it had long been the custom,

previous to the secret being made public, to send for Lewis, (the father or son), who, as from long experience it was well known, would, by administering a simple powder, destroy with certainty the poison, and effectually cure the person or animal who had been bitten. Instances have, I am told, occurred of several creatures being bitten by dogs considered to be mad, and the Lewises, when applied to, have, in order to prove the value of the medicine, requested their owners to set one aside; which being done, they have cured all the rest, and the one so set aside has died with every symptom of the hydrophobia. This circumstance, if true, (and from the result of the inquiries I have made, I believe it to be so) places the character of the remedy made use of by them beyond a doubt. I have had opportunities of speaking to persons well acquainted with Lewis, and who had particularly observed the course he pursued in various instances, and they all concurred in expressing their full conviction of its efficacy.

"The remedy he made use of is nothing more than a plant that grows in the fresh meadows of our country. The botanic name of it is '*scutellaria galericulata*.' This plant Lewis used to gather, dry it, and reduce it to a powder, in order to prevent a discovery of what it actually was. It was found out by a person who obtained some of it from him in a powdered state; observing seeds in it, he planted them in his garden, where they came to perfection. Since then, J. M. or some one of his family, in order to remove every doubt as to the certainty of the plant, produced from the seeds, being the one actually made use of by Lewis, gave him five dollars to shew it to him, and it proved to be the same.

"Among the number of cases in which it has been applied with success, it may be necessary to mention only the following one; the relation of which I had from the persons hereafter mentioned, of whom I purposely inquired the particulars. U. F. father-in-law to R. M. had a few years since a number of his cows and hogs bitten by a mad dog. Being fully satisfied that the dog was mad, he sent immediately for Lewis; who, when he came, furnished him with a quantity of the powder before described, and directed him to make a tea of it, and give it to the animals every other day in any mess they were fond of; and, on the days intervening, a small portion of brimstone: this course was adopted and continued for two or three weeks. It happened that before the termination of that period, he disposed of one of the cows to a neighbour, who was acquainted with its being bitten, and to whom he gave some of the powder, with directions not to fail giving it to the creature: this, however, through carelessness was neglected, and the consequence was that it went mad and died, while all the others continued perfectly well. About two ounces of the herb when reduced to powder, and divided into several portions, is sufficient to cure man or beast, if administered in time. I cannot learn with certainty, that, if not given until the hydrophobia commence, it will have the desired effect: it is difficult, if not

wholly impossible, when the disorder has risen to a height, to induce the patient to take any kind of substance whatsoever: indeed in most cases when it is presented to them, they are seized with violent spasms, and fall backwards strongly convulsed: to attempt forcing them to receive it, is attended with great danger. I am credibly informed, that a man in New Jersey, endeavouring to give a drench to a cow in that situation, died from the poison communicated by the saliva of the animal falling on a wound he had previously received on his hand. It is therefore best to administer it as early as possible; it has, however, been in some instances deferred, till the patient have shewn some signs of illness, and then effected a cure. In cases of this nature, the decoction of the herb should be stronger than in others. In the instances which have come to my knowledge of animals being bitten by a mad dog, the periods between the times they were bitten and the commencement of the hydrophobia, varied very considerably. In some, the effects of the poison were discernible in a few days, and in others, not under two or three months.

"I am informed by a person acquainted with the family of the Lewises, that the old man came by his knowledge of this remedy, by being bit by a mad dog; and hearing of an old German who was famous for curing poisons, applied to him, and having by his assistance escaped the danger he had incurred, obtained from him in confidence the secret of the means by which his cure was effected. Thou mayest rest fully assured that every thing which I have stated respecting this remedy, I have the greatest confidence is correct. My information has been derived from the most respectable sources, from persons of probity, who were eye-witnesses to the facts which they related; and I have no doubt, but that in a very short time, I could collect more than one hundred instances of cures by the Lewises, since the remedy came to their knowledge. My confidence in the virtues of this herb is so great, that I would trust my life to it, rather than to the skill of all the physicians in this city, should I be so unfortunate as to stand in need of it. Physicians in general are, I believe, honest enough to confess, that they know of no remedy for the disease communicated by the bite of a mad dog."

The very important account in the foregoing letter, is, we are happy to learn, corroborated by Mr. Coleman, editor of the New York Evening Post, who remarks in his paper, that he himself had been witness of the cure of the hydrophobia by the use of this plant alone, and that there are a number of gentlemen of the most respectable characters in New York, who will attest that they have been witnesses of repeated cures by the same remedy. He also confirms the account given in the above letter. The Rev. Dr. Cutler also has received verbal information, which he considers as confirmatory of the above important particulars.

The field of experiment being thus fairly exposed, in which no medical skill is requisite, every humane person must consider himself warranted in resorting to this new remedy on any occa-

sion which may offer, either of alleviating the misery and distress of mankind, or of arresting the devastation among the brute creation.

SECALE CEREALE. *Rye. Ergot*, or Spurred Rye.*

This article never having been made a subject of consideration by writers on Materia Medica, would not have been introduced in this place but for the general inquiry which has lately been excited among the medical practitioners of the United States.

In the Encyclopædia, (Vol. 17. Art. Secale, Rye) we have some account of ergot, of which the following is an abstract.

Rye is subject to a disease which the French call *ergot*, and the English, horned rye, which sometimes happens when a very hot summer succeeds a rainy spring. According to Tissot, horned rye is such as suffers an irregular vegetation in the middle substance, between the grain and the leaf, producing an excrescence of a brownish colour, about an inch and a half long, and two tenths of an inch broad. Bread made of this kind of rye has a nauseous acrid taste, and produces spasmodic and gangrenous disorders. In 1596, an epidemic disease prevailed in Hesse, which the physicians ascribed to bread made of horned rye. Some were seized with epilepsy, and these seldom ever recovered; others became lunatic, and continued stupid the rest of their lives. The same disease was occasioned by the use of this bread in various parts of Europe at six several periods from the year 1648 to 1736, and has been very minutely described by Hoffman, and others. In the year 1709, no less than five hundred patients were in the hospital of Orleans in France afflicted with diseases in consequence of eating horned rye. The first symptom was a kind of drunkenness, then the local disorder began in the toes, and thence ascended sometimes to the thigh, and the trunk itself, even after amputation. In the year 1710, the celebrated Fontenelle describes the case of a peasant at Blois, who having eaten horned rye, in bread, was seized with a mortification, which, beginning at the toes, extended to the legs and thighs, destroying the flesh, and leaving the bones bare.

Horned rye is equally fatal to brutes: sheep, dogs, swine, and deer; nay, geese, ducks, and other poultry, that were fed with it by way of experiment, died in great agonies, some convulsed, others mortified and ulcerated.

Rye is affected with the disease in this country similar to that in Europe, particularly summer rye in low wet situations. This singular production, which our farmers call *smut*, is found projecting from among the leaves of the ear; it is a long round

* *Ergot* is French for a cock's spur, and horned rye was called *ergot* from the resemblance of its excrescence to that part.

excrescence, pointed at the extremities, of a dark brown colour externally, and white within. Some ears afford a considerable number of spurs, while others have two or three only, interspersed with genuine seeds of rye.

Although some European authors have noticed ergot in terms of reproach, as an empirical agent, or an inert substance, our own recent experience furnishes evidence of its very active powers, and the novelty of the subject renders it peculiarly interesting to every scientific physician in our country. The medicinal properties of this extraordinary substance were first announced to the public by Dr. John Stearns, of Saratoga county, state of New York. A letter from him to Dr. Akerly, physician to the New York City Dispensary, and one from this latter gentleman to Dr. Dewees, of Philadelphia, both published in the *Medical Repository**, are the principal sources from which our information is derived. The unexceptionable authority of these respectable physicians might suffice, even were we destitute of corroborating testimonies of its efficacy.

According to Dr. Stearns, *ergot* is capable of exciting a specific action upon the *uterus*, and while it augments the power of this organ, it appears to exert a peculiar effect in relaxing the rigidity of the contracted muscular fibres during the efforts of parturition. Hence in lingering and laborious cases, it is found to be an invaluable medicine; speedily inducing *forcible* pains, and greatly expediting delivery. The Doctor asserts that he has administered it to more than one hundred patients, threatened with difficult or lingering labours, and that in no instance has he been disappointed in his expectations. For obvious reasons, however, he cautions against employing this powerful parturient in cases of preternatural presentation. In the form of powder (*pulvis ad partum accelerandum*) he gives from five to ten or fifteen grains; but has found it more active in the form of decoction;—half a drachm of the powder being gently boiled in half a pint of water, one third may be given every twenty minutes, until proper pains shall have commenced. A large dose will excite nausea and vomiting.

Dr. Stearns affirms, that in his hands *ergot* has never induced deleterious effects, but is of opinion that it is capable of producing abortion at any stage of pregnancy. In one case of amenorrhœa, Dr. Beckman administered one drachm in decoction; bearing-down pains immediately ensued, and the suppression was the next day removed. Whether it has been employed in other cases of a similar nature, and whether successfully, or otherwise, we have not yet ascertained: curiosity is rather excited than gratified; but from the present spirit of investigation, we anticipate a disclosure of other facts relative to a novel production which promises to subserve important purposes in medicine.

* *Hexade* 2. vol. v. p. 308, and vol. vi. p. 341.

SESAMUM ORIENTALE. *Oily Grain. Benne.* The leaves and seeds.

This originally an African plant has become well known by the name of *benne* in South Carolina and Georgia, or the *Vangloe* of the West Indies. It is an annual plant, rising with an herbaceous four cornered stalk, two feet high, sending out a few short side branches; the leaves are oblong, oval, a little hairy, and stand opposite. The flowers terminate the stalk in loose spikes; they are small, of a dirty white colour, shaped somewhat like those of foxglove. After the flowers are past, germen turns to an oval acute pointed capsula, with four cells filled with oval compressed seeds, which ripen in autumn. Of late years the seeds have been introduced into the states of Georgia and South Carolina, by the African negroes, where the plant succeeds extremely well; and they boil a handful of the seeds with their allowance of Indian corn, which forms a nourishing food. But the excellency of these seeds consists in their yielding a larger proportion of oil than any other vegetable with which we are acquainted. One hundred weight of seed will produce ninety pounds of oil of an equal and even preferable quality to Florence oil. It will keep good many years without contracting any rancid smell or taste, and when the warm taste of the seed, discovered in the oil when first drawn, is worn off, it becomes quite mild, and is found to be a pleasant and agreeable substitute for all the purposes of salad oil. The benne oil in some parts of the southern states is esteemed as a gentle laxative, in those cases where the more nauseous castor oil is usually employed. It also burns well in lamps. The leaves of this plant by infusion or decoction are found to afford an excellent mucilage; well adapted to all the intentions of that class of remedies, and in 1803, was used with the most marked good effect, in an epidemic dysentery in South Carolina. Considering therefore the great utility and importance of the benne plant, its cultivation by our patriotic planters cannot be too strongly recommended.

SINAPIS ALBA. *White Mustard.*

SINAPIS NIGRA. *Black or common Mustard.*

} The seeds.

These plants are both annual, both grow wild in England, and possess similar virtues. They produce small round compressed seeds, which have an acrid bitterish taste, and a pungent smell when reduced to powder. The common mustard has blackish seeds, and is more pungent than the white. They impart their taste and smell in perfection to aqueous liquors, while rectified spirit extracts extremely little of either: The whole of the pungency arises with water in distillation. Committed to the press, they yield a considerable quantity of a soft insipid oil, perfectly

void of acrimony ; the cake left after the expression, is more pungent than the mustard itself.

The imported mustard, so common at tables, and which is generally preferred to our own, is the pulverized seed of the black species ; the difference consists only in the preparation of the powder.

The seeds unbruised are frequently given in palsies and chronic rheumatisms, and are found beneficial. They may be taken in the quantity of a tablespoonful or more, and will gently relax the bowels. Rheumatic pains in the stomach are often relieved by taking them in brandy. The powdered seeds, with crumbs of bread and vinegar, are made into cataplasms, and applied to the soles of the feet in fevers, when stimulants are necessary. They are also topically applied in fixed rheumatic and sciatic pains. Dr. Withering says, wherever we want a strong stimulus, that acts upon the nervous system without exciting much heat, we know none preferable to the mustard seed. An infusion of the seed, given in large quantities, vomits ; but, in smaller doses, operates as an aperient and diuretic. Mustard whey, with wine, is used as a drink in fevers. Its acrimony is said to consist in an essential oil.

Mustard whey is made by boiling one and half ounce of the bruised seeds in a pint of milk, and as much water, till the curd be perfectly separated. This is perhaps the most elegant form in which mustard can be exhibited. A little sugar may be added, and an ordinary teacupful given four or five times a day in cases of low nervous fever, greatly warms and invigorates the habit, and promotes the different secretions.

SMILAX SARSAPARILLA. *Sarsaparilla*. The root.

This root is brought from the Spanish West Indies. It consists of a great number of long strings hanging from one head : the long roots, the only parts made use of, are of a blackish colour on the outside, and white within, about the thickness of a goose quill.

They have a glutinous, bitterish, not ungrateful taste, and no smell. It was first brought into Europe by the Spaniards, about the year 1563, with the character of being a specific for the cure of the lues venerea, a disease which made its appearance a little before that time ; and likewise of several obstinate chronic diseases. It has been combined with sassafras, guaiacum, liquorice, and other substances, in a decoction of the woods. It is, however, a very inert, mucilaginous substance ; and the diaphoresis, which it is sometimes supposed to produce, is entirely owing to the warm and diluent regimen employed at the same time. Sarsaparilla is found in abundance in the vicinity of the Ohio river.

SOLANUM DULCAMARA. *Bitter Sweet. Woody Night Shade.*
The twigs.

This plant grows wild in moist hedges ; has woody, brittle stalks, and climbs on the bushes. But if there be no shrubs in their vicinity, the shoots creep along the ground, and frequently strike new roots. It flowers in the months of June and July. The taste of the twigs and roots, as the name of the plant expresses it, is both bitter and sweet ; the bitterness being first perceived, and the sweetness afterwards.

The dulcamara was formerly much esteemed as a powerful medicine. It is generally said to occasion some considerable evacuation by sweat, urine, or stool, particularly the latter. It has been recommended as a discutient and resolvent medicine ; and it has been said to have been attended with good effects in obstinate cutaneous diseases of the herpetic kind. It has also been used, and sometimes with advantage, in cases of rheumatism, jaundice, and obstructed menstruation.

The twigs are principally employed under the form of watery infusion, in doses of two teacupfuls, morning and evening. Dr. Hill has found it very efficacious in the asthma.

SPIGELIA MARILANDICA. *Carolina Pink.* The root.

This plant is perennial, and grows wild in most of our Southern states. The roots are celebrated as an anthelmintic, particularly for the expulsion of lumbrici from the alimentary canal. Every part is possessed of the anthelmintic property, though the root is most active. It is commonly administered in the form of infusion ; an emetic is generally premised, and its purgative effect assisted by some suitable addition, as senna or jalap. By some the powdered root is directed in doses of ten or fifteen grains ; while others prescribe it in drachm doses. But it should be observed that according to the late Dr. Lining, of Charleston, when exhibited in large doses, and without proper precautions, it sometimes produces very singular and distressing effects upon the nervous system, such as vertigo, pains over the eyes, and dilated pupil. As a vermifuge, spigelia has acquired a superior confidence, and it often affords relief and effects a cure, in cases where no worms are discharged. It is supposed by Dr. Barton, that it will be found highly useful in some febrile diseases of children, unaccompanied by worms, especially in the insidious remittent which so frequently lays the foundation of dropsy of the brain.

SPIRÆA TRIFOLIATA. *Indian Physic. Ipecacuanha, &c.*
The root.

This shrub grows plentifully in the United States, and is one of the few active plants of the class icosandria. The root, the part employed, consists, like that of the officinal *Ipecacuanha*, of a bark, and woody part. The active power seems to reside exclusively in the bark. It is a safe and efficacious emetic, in doses of about thirty grains. It also seems to possess a tonic power, and has accordingly been thought peculiarly beneficial in intermittent fevers. It is sometimes very injudiciously employed by the country people, insomuch that they are obliged to apply for medical aid, to remove the debility induced by the large doses of the root which they employ. Another species, it is said, grows in Kentucky, which is still more valuable as an emetic, than the one under notice.

SPONGIA OFFICINALIS. *Sponge.*

Sponge is principally found in the Mediterranean and Red Seas. It was long supposed to be a vegetable production, but is now universally allowed to belong to that remarkable class of animals called Zoophytes, which are negatively characterized by Cuvier, as having no vertebræ, no sanguiferous vessels, no spinal marrow, and no articulated limbs.

Sponge is a soft, light, very porous and compressible substance, which readily imbibes water. It is of extensive utility in domestic economy, medicine, and surgery. As it strongly adheres to the orifices of wounded vessels, it is advantageously employed as a styptic; often preventing the effusion of blood more effectually than the puff ball or *agaric*.

From its property of imbibing and distending by moisture, it is sometimes made use of as a tent for dilating wounds and ulcers. To fit it for these intentions, the sponge is immersed in melted wax, and subjected to pressure till cool. In this state it may be easily formed into proper tents, so as to be introduced where necessary. And from the gradual melting of the wax in consequence of the heat of the part, a dilatation of course takes place.

Sponge, cut in pieces, and burnt in a close iron vessel, till it become black and friable, and afterwards reduced to a very fine powder, has been successfully administered internally, in scrofulous complaints and cutaneous diseases, in doses of one scruple and upwards; it is also considered as a *specific*, on account of its efficacy in removing the glandular swelling of the neck, known under the name of *bronchocle*. But the virtues of burnt sponge probably depend on the presence of a little alkali. It also contains charcoal; and its use may be entirely superseded

by these substances, which may be obtained in other ways, and at a much cheaper rate.

If sponge be cut in small pieces, fried or dipped in honey, or salt butter, and given to rats, it distends their bowels, and effectually destroys those animals.

STANNUM. *Tin.* The filings and powder.

Tin is one of the imperfect metals, and is found most frequently mixed with other metallic ores. It is now only used as an anthelmintic, especially in cases of *tænia*, and probably acts mechanically.

Tin is reduced to powder, consisting of small rounded particles, by heating it nearly to its melting point, and agitating it briskly. This powder is often employed as a remedy against worms, particularly the flat kind, which too often elude the force of other medicines. The general dose is from a scruple to a drachm; but Dr. Alston assures us, in the *Edinburgh Essays*, that its success depends on its being given in much larger quantities. He directs an ounce of the powder on an empty stomach, mixed with four ounces of molasses; next day, half an ounce; and the day following, half an ounce more; after which, a cathartic is administered. He says the worms are usually voided during the operation of the purge, but that pains of the stomach occasioned by them, are removed almost immediately upon the first dose of the tin. This practice is sometimes successful in the expulsion of *tænia*, but by no means so frequently as Dr. Alston's observations would lead us to hope.

STATICE LIMONIUM. *Marsh Rosemary. Lavender Thrift. Sea Lavender.* The root.

This is well known in the New England states. It is indigenous and perennial, growing on the sea shore, in salt marshes; and the fissures or cliffs of rocks near the sea coast: it is in flower from July to September. The stem is naked, branched, and about a foot high. The radical leaves are long, pointed, and grow on foot stalks. The flowers are blue, and grow on long spikes on the tops of the branches. The roots of this plant are powerfully astringent. A decoction of them is given and used as a gargle with success in cankers and ulcerated sore throats. We learn from an authentic source, that the late Dr. Hews, of Providence, held the root of this plant in high estimation in cases of aphthous states of fever accompanying dysentery, ulcerous sore throats, or *scarlatina anginosa*. He valued it as the greatest antiseptic he was acquainted with, and said he could administer it in cases where the bark was inadmissible.

Dr. William Baylies, of Dighton, in a communication to the Massachusetts Medical Society, makes favourable mention of this root from his experience in the ulcerated sore throat, as it appeared in that town in 1785 and 1786. This judicious physician observes, "Among the many medicines in high estimation with the common people, and used by them without the advice of the physician, I know of none worth the least consideration, excepting the marsh-rosemary, or, as it is commonly called, marsh root. This in a large dose operates as a vomit; in a smaller, proves a powerful expectorant; and from its sensible qualities, one would suppose it to possess considerable antiseptic powers. I am well assured it was the basis of a medicine used by a physician in Providence, with very great success in this complaint. It is undoubtedly of great efficacy, and deserves a more thorough investigation."

STYRAX BENZOIN. *Benjamin Tree.* The balsam, called benzoin.

This balsam, obtained by exudation, is in brittle masses composed of brown and white fragments; its smell is fragrant; it has little taste. It consists almost wholly of resin, and is therefore nearly entirely soluble in alcohol. It likewise contains a portion of a peculiar acid, which, as it exists in greater quantity in it than in any other vegetable matter, is named acid of benzoin (flowers of benzoin). It is obtained from it by sublimation; is in white, brilliant scales; retains the flavour of the benzoin; and, with acidity, has also a degree of pungency. Benzoin is rarely employed in medicine: its acid is used as an expectorant in asthma, in a dose of ten or fifteen grains, but it is probably a medicine of little power. It enters into the composition of the ammoniated and camphorated tinctures of opium.

Storax resembles benzoin in its virtues. It was formerly used as an expectorant, but is now little regarded.

SUB ACETIS CUPRI. *Sub Acetite of Copper. Ærugo. Verdegris.*

This substance is a kind of rust of copper, prepared by corroding the metal with vinegar. Verdegris is rarely, or never used internally. Applied externally, it proves a gentle detergent and escharotic, and is employed to destroy callous edges, or fungous flesh in wounds. It is also advantageously applied to scorbutic ulcers of the mouth, tongue, and fauces, and deserves to be carefully tried in cancerous sores. With these intentions it is an ingredient in different officinal compositions.

SUB BORAS SODÆ. *Sub Borate of Soda. Borax.*

This salt, consisting of boracic acid, united with soda, (the soda being slightly in excess) is brought from Thibet, where it is found in a native state. It is purified in Europe by crystallization; its taste is cool; it is soluble in eighteen parts of cold and six of hot water. It is decomposed by several of the acids.

The medicinal virtues of borax have not been sufficiently ascertained by experience; it is supposed to be, in doses of half a drachm or two scruples, diuretic, emmenagogue, and a promoter of delivery. A solution of borax in water, is the best of all applications, for healing aphthous crusts, or the thrush in the mouths and fauces of children; or it may be applied for the same purpose in the form of powder mixed with sugar. There is not perhaps a more balsamic, or useful application to sore nipples, or chopped lips and hands in winter, than a few grains of borax dissolved in warm water, with the addition of a little pure honey. There are strong reasons to believe, that the virtues of borax are much greater than they are in general supposed to be; and that it may be more extensively used with advantage.

SUCCINUM. *Amber.*

This is a solid, brittle, bituminous substance, dug out of the earth, or found upon the sea shores; particularly along the coast of Polish Russia and Pomerania. It is of a white yellow, or brown colour; sometimes opaque, sometimes very clear and transparent. By distillation it affords a little acetous acid, an essential oil, and a peculiar acid, named from it, succinic.

Amber is regarded only for the empyreumatic oil and acid obtained from it.

SUPER SULPHAS ALUMINÆ ET POTASSÆ. *Super Sulphate of Alumina and Potash. Alum.*

This is a salt composed chiefly of argillaceous earth and sulphuric acid, the acid being in excess. It likewise contains a smaller portion of potash, and frequently of ammonia. It is found in a native state, or is prepared by exposing alum ores, which are native compounds of argillaceous earth and sulphur, to atmospheric air; the sulphur absorbing oxygen, forms sulphuric acid, which unites with the argillaceous earth, and the formation of the alum is completed by the addition of potash or ammonia. It is then obtained pure by crystallization.

This salt is in large transparent masses; it has a styptic taste, with a degree of sweetness. From the excess of its acid, it reddens the vegetable colours. It is soluble in eighteen parts of cold, and in less than two of boiling water. The variety

cooling Lotion

termed roche or rock alum (*alum rupeum*) has a reddish colour, from the presence of a portion of iron, but its other properties are the same as those of common alum.

Alum, from its astringent power, is employed to check hæmorrhagies and serous evacuations; it is thus given in menorrhagia, leucorrhœa, and diabetes. It has likewise been used, though less frequently, in intermittent fever, malignant small pox, and colica pictonum. Its dose is from five to fifteen grains. The addition of an aromatic is generally necessary, to prevent it from exciting nausea, when it is given in the solid form. The best form of administering it, however, is that of the alum whey, prepared by adding two drachms of powdered alum to a pint of hot milk; the dose of this is three or four ounces. In uterine hæmorrhage, and in diabetes, this whey taken to the quantity of three or four ounces, three times a day, has been attended with very favourable effects.

It is also used externally, in astringent and repellent lotions and collyria. But burnt alum taken internally, has been highly extolled in cases of colic. In such instances, when taken to the extent of a scruple for a dose, it has been said gently to move the belly, and give very great relief from the severe pain. Burnt alum is applied externally, as a gentle escharotic, to fungous ulcers.

SULPHAS BARYTÆ. *Sulphate of Baryta. Ponderous Spar.*

This salt has been omitted in the list of the Materia Medica of the Edinburgh college; but they afterwards employ it for the preparation of the muriate of baryta. It is found in great abundance in many countries, either in a loose earthy form, or compact, or foliated, or striated, or acicular.

The foliated is in general the purest. Heated to redness with charcoal, it is converted into a sulphuret, and it may be decomposed either by boiling, or in a crucible, with the carbonates of potash and of soda. It contains about eighty four of baryta, and sixteen of sulphuric acid and water.

SULPHAS CUPRI. *Sulphate of Copper. Blue Vitriol.*

This article is made by stratifying plates of copper with the sulphur; and, on slow combustion, the sulphuric acid corrodes the copper: the metal is then boiled in water, till the saline particles be dissolved; when, after repeated solution and subsequent evaporation, the whole is reduced to the chrystalline point.

The sulphate of copper has a strong, styptic, metallic taste, and is chiefly used externally as an escharotic for destroying warts, callous edges, and fungous excrescences, as a stimulant

application to ill-conditioned ulcers, and as a styptic to bleeding surfaces. Taken internally, it operates, in very small doses, as a very powerful emetic. It has, however, been exhibited in incipient phthisis pulmonalis, intermittent fever, and epilepsy; but its use is not free from danger. *

SULPHAS MAGNESIÆ. *Sulphate of Magnesia. Sal Catharticus Amarus Epsom Salt.*

This salt is found in mineral waters, whence it has been extracted, but is at present principally prepared by art, from the liquor remaining after the crystallization of muriat of soda (sea salt) from sea water, which holds a quantity of muriate of magnesia dissolved. It is commonly in needle-like crystals, and deliquescent; but when pure, it forms large, regular crystals, which are rather efflorescent. They are soluble in nearly an equal weight of water. Their taste is extremely bitter.

This salt is used as a purgative, in a dose of an ounce or more, dissolved in a large quantity of water. Though its taste is bitter, it has been remarked, that it remains better on the stomach than many other cathartics, especially when given in small repeated doses. Exhibited in this manner, it has been particularly recommended in ileus and colica pictonum. It is a mild and gentle purgative, operating with sufficient efficacy, and in general, with ease and safety, rarely occasioning any gripes, sickness, or the other inconveniences with which purgatives of the resinous kind are too often accompanied. Some allege that this salt has a peculiar effect in allaying pain, as in colic, even independently of evacuation.

Epsom salt may be manufactured from the bittern, or bitter water which remains in the vats, after the crystallization of common salts by evaporation. The Rev. Mr. E. Briggs, of Chatham, county of Barnstable, is probably the only person who has hitherto successfully attempted the manufacture of this domestic article. He deposits vessels containing the bitter water (leadens vessels are preferable) in a cellar, or other cool place, out of the influence of the sun; this salt will collect upon the bottoms and sides of them, in very considerable quantities, having the appearance of half melted snow: in this state it is to be laid aside until the weather becomes cold, and then crystallized afresh. The salt thus procured, is found to be genuine sulphas magnesiæ, and equal in quality to any imported from Europe.

In Dysentery & Chronic Diarrhoea: From $\frac{1}{2}$ gr. to 1 gr. with $\frac{1}{2}$ gr. opium to 1½ gr 3 times or twice a day;

SULPHUR SUBLIMATUM. *Sublimed Sulphur. Flowers of Sulphur.*

Sulphur is a simple, inflammable substance, found in nature nearly pure, and likewise in combination with several of the metals. The sulphur of commerce is the produce of volcanic countries. It is naturally mixed with earthy matter, from which it is freed by sublimation.

Pure sulphur is of a light yellow colour ; is insipid ; has a faint smell, when rubbed or heated ; is very fusible and volatile ; and, when heated in atmospheric air, burns with a blue flame, and suffocating fumes. It is insoluble in water or alcohol, but is dissolved by oils, and combines with the alkalies, several of the earths, metals, and metallic oxyds.

Pure sulphur loosens the belly, and promotes insensible perspiration : it seems to pass through the whole habit, and manifestly transpires through the pores of the skin, as appears from the sulphurous smell of persons who have taken it, and from silver in their pockets imbibing a blackish cast, which is the known effect of sulphurous fumes. It is a celebrated remedy against cutaneous diseases, both given internally, and externally applied. It has likewise been recommended in coughs, asthmas, and other disorders of the breast and lungs ; and particularly in catarrhs of the chronic kind. But it is probable, that the benefit derived from it in these cases, is principally, if not entirely, owing to its operation as a gentle laxative. And with this intention it is frequently used with great advantage in hæmorrhoidal affections, and many other diseases in which it is proper to keep the belly gently open. The dose is two or three drachms, in honey or molasses.

SULPHURETUM ANTIMONII. *Sulphuret of Antimony.*
Antimony. Stibium.

Antimony, in the modern nomenclature, is the name given to a peculiar metal. This metal is found in nature, most abundantly combined with sulphur ; and to this ore, the name of Antimony was once generally given. To distinguish it from the pure metal, it is named Crude Antimony, or more properly, native sulphuret of antimony, the simple name, antimonium stibium, being appropriated to the metal itself.

The native sulphuret is of a gray blue colour ; has a shining surface, and striated texture. To free it from the earthy matters with which it is mixed, when dug from the earth, it is fused. Its lustre is greater, the more it is purified. The proportions of its principles are various ; sometimes they are nearly equal ; in other specimens the quantity of metal is larger.

The pure metal obtained from the ore, is of a silvery, white colour, and plated texture, moderately hard, and very brittle ;

easily fusible, and even volatilized by a heat not very intense; oxydized by exposure to the air at a temperature moderately increased; and when oxydized, capable of combining with the greater number of the acids.

The antimonial metal is a medicine of the greatest power of any known substance; a quantity too minute to be sensible in the most delicate balance, is capable of producing violent effects, if taken dissolved, or in a soluble state.

Sulphureted antimony was employed by the ancients in collyria, against inflammations of the eyes; and for staining the eyebrows black. Its internal use does not seem to have been established till the end of the fifteenth century; and even at that time it was by many looked upon as poisonous. But experience has now fully evinced, that it has no noxious quality, being often used, particularly in chronic eruptions; that some of its preparations are medicines of great efficacy; and, that though many of them be most violently emetic and cathartic, yet even these by a slight alteration or addition, loose their virulence, and become mild in their operation.

All the metallic preparations are uncertain, as it entirely depends on the state of the stomach, whether they have no action at all, or operate with dangerous violence. The sulphuret is exposed, though in a less degree, to the same objections.

The preparations of antimony do not exert any general stimulant operation, but are always directed in their action to particular parts, so as to occasion some sensible evacuation.

The principal general medicinal application of antimony has been for the cure of febrile affections. It is given so as to induce vomiting or purging, diaphoresis being also promoted; and, exhibited in this manner in the commencement of the disease, it has been considered capable of cutting short its progress.

In the latter stage of fever, where debility prevails, its use is inadmissible. Its efficacy has been in general ascribed to the evacuation it occasions: others have considered it, apparently with little reason, as exerting an action specific or peculiar in itself, and not explicable on the known effects it produces.

Antimonials have been found to have the same good effects in intermittents as in continued fevers, as well as in several of the phlegmasiæ and exanthemata; and even in several of the profluviæ. The general effects of antimonials are, in small doses, diaphoresis and nausea; in large doses, full vomiting and purging. Some allege that antimonials are of more use in fever when they do not produce any sensible evacuation; as is said to be the case sometimes with James' powder. They therefore prefer this in typhus; and emetic tartar in synochus; in which there is the appearance at first of more activity in the system, and more apparent cause for evacuation. As an emetic, antimony is distinguished, for the certainty, extent, and permanence of its operation. The action it excites in the stomach is both more forcible, and continues for a longer time, than that from other

emetics ; and hence, it produces more complete evacuation, and occasions in a greater degree all those effects which result from the action of vomiting. Its action is also less local. It is very generally extended to the intestinal canal, so as to produce purging ; and very frequently to the surface of the body, so as to occasion diaphoresis, or sweat.

The virtues of antimony in the diseases of animals, are greatly extolled. Pigs, that have the meazles, are at all times recovered by it, which proves it to be a great purifier of the blood. Horses, which have the running heels, and cannot be cured by the common methods, will generally be cured by this medicine, in a little time. A horse that is lean and scabby, and not to be fatted by any other means, will become fat on taking one drachm of crude antimony every morning for two months together.

SUPER-TARTRIS POTASSÆ. *Super-Tartrite of Potash. Crystals of Tartar. Cream of Tartar.*

SUPER-TARTRIS POTASSÆ IMPURUS. *Impure Super-Tartrite of Potash. Tartar.*

Tartar is a concrete saline matter, which separates from wines, after they have undergone complete fermentation : it adheres to the top and sides of the cask, in red, or whitish gray crystals, according to the colour of the liquor. In this state, it is called *crude tartar* ; having a subacid taste, and being with difficulty soluble in water.

By repeated solution, filtration, and crystallization, crude tartar may be *defurated*, or divested of all gross and impure particles, when it is called *crystals of tartar* ; and, if these be reduced to powder, *cream of tartar*.

This salt is a mild, cooling, aperient, and laxative medicine : if half, or a whole ounce of it be taken in substance, with treacle or any other vehicle, it proves an effectual purgative. Farther, when dissolved in water, it affords, with the addition of sugar, an agreeable acidulated drink, which is of great service in ardent fevers ; and likewise forms a pleasant beverage during the summer. It is also to be regarded as a valuable diuretic, and, as one of those, most efficacious in the treatment of the dropsy. It is given under two modes of exhibition, in which its effects are somewhat different. When given dissolved in a large quantity of water, to the extent of four or six drachms in a day, it acts simply as a diuretic ; when given to the same extent, gradually increased, in the form of an electuary, without the free use of diluents, along with a more or less diuretic effect, it acts as a hydragogue cathartic. The latter is the more usual, and perhaps, more successful mode of exhibition.

TAMARINDUS INDICA. *Tamarind Tree.* The preserved fruit, called tamarinds.

This tree grows both in the East and West Indies. The pod of the tree includes several large hard beans, with a brown viscid pulp, very acid. This pulp, mixed with the seeds and small fibres, and with a quantity of unrefined sugar, forms the tamarinds of the shops. Vauquelin found it to contain, beside the sugar mixed with it, citric and malic acids, acidulous tartrate of potash, free tartarous acid, gelatin, mucilage, and fibrous matter.

The pulp of tamarinds, beside its virtues as an acid, proves laxative, when taken to the extent of an ounce and an half. It is generally added to other cathartics, which are given in the form of infusion, with the view of promoting their operation, and covering their taste. It increases the action of the purgative sweets, cassia, and manna, and weakens that of the resinous cathartics. By its acidity this fruit quenches thirst, and allays immoderate heat.

TOLUIFERA BALSAMUM. *Balsam of Tolu Tree.* The balsam, called balsam of tolu.

This tree grows in Spanish America, and the balsam flows from incisions made in its bark, during the hot season; and is brought to us in gourd shells. It is of a yellowish brown colour, inclining to red: in consistence, thick and tenacious: by age it grows hard and brittle, without suffering any great loss from its more valuable parts. The smell of this balsam is extremely fragrant, somewhat resembling that of lemons; its taste warm and sweetish.

Lewis says that he has sometimes procured benzoic acid from it; it yields very little volatile oil, although it impregnates the distilled water strongly with its flavour. By dissolving a proper quantity of sugar in this water, a syrup is obtained, greatly superior to that prepared in the common way, with a decoction of the balsam.

This is the mildest of all the balsams. It has been esteemed as an expectorant, but its powers are very inconsiderable, and it is employed principally on account of its flavour. It possesses, however, all the virtues of the other balsams, and is more fragrant than most of them.

TORMENTILLA ERECTA. *Septfoil.* The root.

Tormentil is perennial, and found wild in woods and on commons; it has long slender stalks, with usually seven long narrow leaves at a joint; the root is for the most part crooked and knotty, of a blackish colour on the outside, and a reddish within.

This root has an austere, styptic taste, accompanied with a slight kind of aromatic flavour ; it is one of the most agreeable and efficacious of the vegetable astringents, and is employed with good effect in all cases where medicines of this kind are proper. It has been used in diarrhœa, under the form of decoction, and in intermittent fever in substance, in a dose from half a drachm to a drachm.

TRITICUM ÆSTIVUM.. *Wheat.* The flour and starch prepared from the seeds.

Wheat flour consists principally of gluten, starch, albumen, and a sweet mucilage. It is the presence of gluten that characterizes wheat flour ; and on the due admixture of it with the other constituents, depends the superiority of wheat flour for baking bread. Bread is not only one of the most important articles of nourishment, but is also employed in pharmacy for making cataplasms, and giving form to more active articles. An infusion of toasted bread has a deep colour and pleasant restringent taste ; and is an excellent drink in febrile diseases, and in nausea and debility of the stomach ; and also in *cholera morbus* : examples are related of several cases of this kind cured by it, without the aid of any other medicine.

Starch, the fecula of wheat, forms a gelatinous solution when boiled with water, which is used as a demulcent. It is thus given as an enema in dysentery and diarrhœa, from irritation of the intestines, and is the common vehicle for giving opium in that form.

TUSSILAGO FARFARA. *Coltsfoot.* The leaves and flowers.

This grows wild in moist situations, producing yellow flowers in February and March : these soon fall off, and are succeeded by large, roundish leaves, hairy underneath ; their taste is herbageous, somewhat glutinous and subacid. It is recommended in coughs, phthisis and other disorders of the breast and lungs, and some use it in scrofula. It is chiefly directed to be taken with milk, and upon this, probably, more than on the tussilago itself, any benefit derived from it in practice is to be explained.

ULMUS AMERICANA. *American Elm.* The inner bark.

We have two species of ulmus or elm in the United States. The *red*, or *slippery elm*, on account of its many valuable properties deserves particular mention. It rises to the height of thirty

feet, with a pretty strong trunk, dividing into many branches, and covered with a light coloured rough bark. The leaves are oblong, oval, and sharp pointed, unequally sawed on their edges, unequal at the base, very rough on their upper surface, and hairy underneath. The flowers are produced thick upon the branches, upon short, collected foot stalks, and are succeeded by oval, compressed membranous seed vessels, with entire margins, containing one oval compressed seed. The inner bark, by infusion or gentle boiling in water, affords a great quantity of insipid mucous substance, that is applicable to a variety of important uses. Dr. Mitchell says it has been beneficially administered in catarrhs, pleurisies, and quinsies; it has been applied as a poultice to tumors, and as a liniment to chops and festers. [Letter to Dr. North, Amer. Museum, vol. 7th.]

The surgeons of our revolutionary army, and also those of general Wayne's army, who defeated the Indians in August 1794, experienced the most happy effects from the application of poultices of the elm bark to gun shot wounds, which were soon brought to a good suppuration, and to a disposition to heal. It was applied as the first remedy. When tendency to mortification was evident, this bark bruised, and boiled in water, produced the most surprising good effects. After repeated comparative experiments with other emollient applications, as milk and bread, and linseed poultice, its superiority was firmly established. In old ill-conditioned ulcers, and in fresh burns, equal benefit was derived from it. The infusion of the bark was used with advantage as a diet drink, in pleurisy, and catarrh, and also in diarrhœa and dysentery. Many of the above facts relative to the medicinal qualities of the red elm, were communicated, says the editor of the domestic Encyclopædia, by Dr. Joseph Strong, of Philadelphia, who served as surgeon in the western army; and adds, as a proof of the nutriment which it affords, that a soldier who lost his way supported himself for ten days upon this mucilage and sassafras. The editor of the above mentioned work, (vol. 2d, p. 448) proceeds to observe, that the red elm tree may be considered as a highly valuable addition to our stock of medicines, exclusively American, and ought to be carefully searched for by the medical gentlemen in the country, and preserved from the indiscriminate axe.

The inner bark of the slippery elm, or its mucilage, has been found by recent experience to be singularly beneficial when applied to chilblains, cutaneous eruptions and various kinds of sores and ulcers; and there is much reason to believe, that its internal use in dysentery, consumption, &c. may be attended with greater advantage than is generally imagined. This tree certainly may be recommended to the particular regard of medical practitioners as a new, and domestic article of our *Materia Medica*, whose medicinal virtues will probably be found to merit a large share of confidence.

URTICA DIOICA. *Common Nettle.* The plant.

This is a well known perennial weed. The leaves of the fresh plant stimulate, inflame, and raise blisters on the part of the skin which they touch. Hence, when a powerful rubefacient is required, stinging with nettles has been recommended. It has been said, sometimes to have succeeded in restoring sense and motion to paralytic limbs. M. Zannetini, in Italy, asserts, that the flowers and seeds of the common nettle, may, with efficacy be substituted for the Peruvian bark, in all febrile affections, especially in tertian and quartern agues. It operates more speedily than the bark; and in large doses, induces a lethargic sleep; the portion to be given should never exceed one drachm, and should be administered in wine, two or three times in twenty four hours. The same cautions that are necessary in the use of the Peruvian bark, are likewise to be observed in taking the seeds and flowers of the nettle.

VALERIANA OFFICINALIS. *Wild Valerian.* The root.

This plant is perennial, and grows wild in England. The root, which is the part used in medicine, consists of a number of slender fibres matted together, and attached to one head, of a brown colour, having a strong and unpleasant smell, and a warm bitter taste. Its active matter is extracted equally by water and by alcohol. Its infusion changes colour, on the addition of sulphate of iron. By distillation, water is impregnated with its flavour, but not with its taste. No essential oil is obtained.

Valerian is one of the principal modern antispasmodics, and is used with advantage in chorea, epilepsy, and hemicrania. Some recommend it as useful in procuring sleep, particularly in fever, even when opium fails; but it is principally useful in nervous and hysterical affections. The common dose is from a scruple to a drachm in powder; and in infusion, from one, to two drachms, three or four times in the day, which is increased gradually, as far as the stomach can bear it. Its unpleasant flavour is most effectually covered by a suitable addition of mace. Valerian is lately found in abundance on the borders of the Ohio river, not inferior to that imported from Europe.

VERATRUM ALBUM. *White Hellebore.* The root.

The root of this plant has a strong, disagreeable smell when fresh, which is lost by drying, and an acrid taste which is retained. Snuffed up the nostrils in very small quantities, it excites violent sneezing, with a sense of heat, and a copious discharge of mucus. Taken internally in a dose of a few grains, it acts as a violent emetic and cathartic. Externally, when

mixed with lard, it is used as an application in some cutaneous diseases.

VIOLA ODORATA. *March Violet.* The recent flower.

This plant is perennial, and found wild under hedges, and in shady places; but shops are generally supplied from gardens. Its flowers are so remarkable for their delightful odour, and their peculiar richness of colour, that they have given a name to both.

They impart their colour and flavour to aqueous liquors: a syrup made by this infusion has long maintained a place in the shops, and is said to be an agreeable and useful laxative for children; but is chiefly valued as a delicate test of the presence of uncombined acids or alkalies, the former changing its blue to a red, and the latter to a green colour.

VITIS VINIFERA. *The Vine.* The dried fruit, called raisins, and the fermented juice of the fruit, called Spanish white wine.

The vine grows in temperate situations in many parts of the world, and is cultivated very generally for the sake of its agreeable subacid fruit. Before they are ripe, grapes are extremely harsh and acid, and by expression furnish a liquor which is called verjuice. It contains malic acid, super tartrate of potash, and extractive, and may be made to furnish wine by the addition of sugar. As the grape advances to maturity, the quantity of sugar increases, while that of malic acid diminishes; it, however, never disappears entirely. When thoroughly ripe, the grape is one of the most agreeable fruits. It is cooling, antiseptic, and nutritious; and, when eaten in considerable quantity, diuretic, and gently laxative. In inflammatory diseases, and all others where acids are indicated, they form an excellent article of diet.

Raisins, *uva passa*, are grapes which have been carefully dried. By this means, not only the water they contain is dissipated, but the quantity of acid seems to be diminished. They become more saccharine, mucilaginous, and laxative, than the recent grape, but are less cooling.

Wine is the juice of the grape altered by fermentation. The numerous varieties of wine depend principally on the proportion of sugar contained in the must, and the manner of its fermentation. When the proportion of sugar is sufficient, and the fermentation complete, the wine is perfect and generous: If the quantity of sugar be too large, part of it remains undecomposed, as the fermentation is languid, and the wine is sweet and luscious; if, on the contrary, it be too small, the wine is thin and weak, and if it be bottled before the fermentation be completed,

it will proceed slowly in the bottle, and, on drawing the cork, the wine will froth and sparkle in the glass, as for example, Champagne. When the must is separated from the husk of the grape before it is fermented, the wine has little or no colour: these are called white wines. If, on the contrary, the husks are allowed to remain in the must while the fermentation is going on, the alcohol dissolves the colouring matter of the husks, and the wine is coloured: such are called red wines. Besides in these principal circumstances, wines vary very much in flavour. The red wines most commonly drunk in this country, are Port, which is strong and austere, and Claret, which is thinner and higher flavoured. Our white wines are called Madeira, Sherry, Lisbon, Malaga, and Hock. Of these the last is most acidulous, and Malaga the sweetest.

Wine, taken in moderate quantities, acts as a beneficial stimulous to the whole system. It promotes digestion, increases the action of the heart and arteries, raises the heat of the body, and exhilarates the spirits. Taken to excess, it produces inebriety and stupor, which are often succeeded by headach, nausea, and diarrhœa, which last for several days. Habitual excess in wine debilitates the stomach, produces inflammation of the liver, weakens the nervous system, and gives rise to dropsy, gout, apoplexy, tremours, and cutaneous affections.

To convalescents, and in all diseases of general debility, and deficiency of the vital powers, wine is the remedy on which we must place our chief dependance; and when properly administered, its effects are often scarcely credible.

In typhus fever, attended by low delirium arising from debility, wine administered to the extent of one bottle or more in twenty four hours, surprisingly mitigates the symptoms, and finally proves a sovereign remedy.

In the hands of Dr. Rush, and other eminent physicians in the United States, wine, aided by the use of bark, has frequently succeeded as a radical remedy in tetanus. Dr. Hosack, of New York, effected a cure in a case of lock-jaw, by administering wine alone to the extent of three gallons in four days. Dr. James Currie, of Liverpool, England, has also experienced the efficiency of wine in the same disease. He asserts that a horse affected with lock-jaw, having been made the subject of experiment, was completely cured by the liberal use of wine alone.

Wine has been emphatically termed "the milk of the aged," but parents are seriously advised to beware of giving wine to their children *indiscriminately*; because to them it can be of no service only when taken as a medicine; and those injudicious persons, who encourage young people to take wine *habitually* at their meals, are guilty of an abuse, which cannot be easily repaired by future abstinence.

Wine is often adulterated with lead or other deleterious drugs. In order to detect this fraud, take two drachms of cream tartar, and one drachm of liver of sulphur; put them into a two

ounce phial of soft water. The phial must be kept well corked, and occasionally shaken for about ten minutes : when the powder has subsided, decant the clear liquor, and preserve it in a well stopped bottle. From sixteen to twenty drops of this liquid are to be dropped in a small glass filled with the suspected wine ; and if the wine turns blackish or muddy, and deposits a dark coloured sediment, we may be certain it is impregnated with sugar of lead, or some other preparation of that metal equally destructive.

A Receipt to make an excellent American Wine, by Joseph Cooper, Esq. of Gloucester county, New Jersey.

“ I put a quantity of the comb from which the honey had been drained, into a tub, and added a barrel of cyder, immediately from the press ; this mixture was well stirred and left for one night. It was then strained before a fermentation took place ; and honey was added until the strength of the liquor was sufficient to bear an egg. It was then put into a barrel ; and after the fermentation commenced, the cask was filled every day, for three or four days, that the filth might work out at the bung-hole. When the fermentation moderated, I put the bung in loosely, lest stopping it tight might cause the cask to burst. At the end of five or six weeks, the liquor was drawn off into a tub ; and the whites of of eight eggs, well beat up, with a pint of clean sand, were put into it : I then added a gallon of cyder spirit ; and after mixing the whole well together, I returned it into the cask, which was well cleansed, bunged it tight, and placed it in a proper situation for racking off, when fine. In the month of April following, I drew it off into kegs, for use ; and found it equal, in my opinion, to almost any foreign wine : in the opinion of many judges, it was superior.

“ This success has induced me to repeat the experiment for three years ; and I am persuaded, that by using clean honey instead of the comb, as above described, such an improvement might be made, as would enable the citizens of the United States to supply themselves with a truly federal and wholesome wine, which would not cost a quarter of a dollar per gallon, were all the ingredients procured at the market price ; and would have this peculiar advantage over every other wine, hitherto attempted in this country, that it contains no foreign mixture, but is made from ingredients, produced on our own farms.”

XANTHORHIZA APIIFOLIA. *Shrub Yellow Root.* The stem and root.

Is a native plant of North Carolina, first brought by the late John Bartram, from that state, and planted in his garden at Kingsess, in the county of Philadelphia, where it has continued to

flourish in a most luxuriant manner. It is denominated *Simpli-
cissima* by Marshal, *Apiiifolia* by L'Herretier, and *Marbosia*, by
Mr. William Bartram, in honour of Mr. De Marbois. *Xanthor-
hiza tinctoria* is a more expressive name than any it has yet re-
ceived.

Dr. Woodhouse has given an excellent account of this valuable
plant, in the fifth volume of the Medical Repository of New York,
from which the present extract is taken.

"The stems are three feet high, and somewhat thicker than a
goose quill. The root is from three to twelve inches long, and
about the diameter of a man's little finger, sending off numerous
scions. The leaves are placed alternately, having long petioles
and pinnated, terminating in an odd one; the folioles sessile, and
lacerated deeply on their edges. The *peduncles* are branchy, and
placed immediately beneath the first leaves, from which cause
the flowers appear before the leaves, very early in the spring."

The stem and root are of a bright *yellow* colour, and possess
a strong bitter taste.

The *xanthorhiza tinctoria*, contains a gum and resin both of
which are intensely bitter; the resin is more abundant than the
gum.

It imparts a drab colour to cloth, and a handsome yellow to
silk, but the dye will not take on cotton or linen.

The watery extract of the grated roots mixed with alum, and
added to Prussian blue, was first used by Mr. James Bartram for
colouring plants, and the plumage of birds of a green colour.
The green is far more lively and elegant than that made with
gamboge and Prussian blue, which is generally used for painting
in water colours, and stands well in the shade, but soon contracts
a dull colour when exposed to a bright light, and to a high tem-
perature. Various subjects coloured by this green, and inclosed
in a book, were as lively after one year, as when first painted.

It is a strong and pleasant bitter, and preferable to all our na-
tive bitters. It sits easy on the stomach in the dose of two scru-
ples (forty grains.)

The colour of the leaves appears to reside in a resin which is
altered by the combined action of light and oxygen, by either of
which, separately, it cannot be affected.

As the *xanthorhiza* is a strong and pleasant bitter, and very
nearly allied to the columbo root, it promises to become a valua-
ble addition to the American Materia Medica. It is preferable to
all our native bitters. Dr. Woodhouse has often used the powdered
stem and root of the *xanthorhiza* with success, in the dose of two
scruples to an adult, in many of those diseases in which bitters
are recommended, but generally combined with other remedies.
It is a medicine, which sits easy on the stomach, and produces
no disagreeable effects. (*Dom. Ency.*)

XANTHOXYLUM CLAVA HERCULIS. *Prickly Yellow Wood.*
Yellow Hercules. The wood and root,

Is a native of Jamaica, and other tropical countries, where it grows to the height of sixteen feet, and is about twelve inches in diameter. This straight tree somewhat resembles the common ash: the bark of the trunk is covered with numerous prickles; and the wood is of a bright yellow cast.

The wood of the xanthoxylum is chiefly employed for the heading of hogsheads, for bedsteads, and numerous other purposes: it also possesses remarkable medicinal virtues. The fresh juice expressed from the roots, affords certain relief in the painful disease, termed *dry bellyache*. This important fact was discovered in the West Indies, by watching a female slave, who collected the root in the woods, and gave two spoonfuls of its juice to a negro, suffering under that colic, at an interval of two hours. Such medicine occasioned a profound, but composed sleep of twelve hours; when all sense of pain, and other distressing symptoms, had vanished: the cure was completed, by giving an infusion of such expressed roots in water, by way of diet drink. Farther, the juice of the prickly yellow wood, when preserved in rum, and administered in doses not exceeding a wine-glassful, has effectually removed the most obstinate epileptic fits; but Dr. Henry has not mentioned the *manner* in which this preparation ought to be managed.

To the above observations of Dr. Willick, the following by Dr. Mease are added: (*Dom. Ency.*)

Two species grow in the United States.

1. *Xanthoxylum fraxinifolium*, or ash-leaved xanthoxylum, growing in Pennsylvania, and Maryland: and xanthoxylum calvis herculis, or prickly yellow wood, which grows in the more southern states.

The bark and capsules are of a hot acrid taste, and when a small quantity is chewed, powerfully promotes the flow of saliva. It is used in this way to relieve the toothach. A tincture of the same parts of the tree is a common country remedy for the chronic rheumatism.

In the West Indies a decoction of the bark is used with great success as an internal remedy, and also as a wash for foul ulcers, which it powerfully cleanses, and disposes to healthy granulations. The powdered bark is also mixed with the dressings. In the *London Medical and Physical Journal*, volume second, and following, there are several cases related of the efficacy of this medicine in the above disease.

ZINCUM. Zinc.

This is a semimetal, naturally obtained in state of combination with different minerals, in England, Hungary, and other parts of the globe: it is of a whitish colour, nearly resembling that of lead, though it does not so speedily tarnish.

From zinc several preparations are made; under which the medicinal virtues of this article are described.

This is a common error, and one which is easily avoided. It is not the object of the present paper to discuss the merits of the various theories, but to point out the errors which are commonly committed in the discussion of them.

It was the observation of the fact that the same results are obtained in the various theories, that the present paper was written. The object of the paper is to point out the errors which are commonly committed in the discussion of the various theories, and to show that the results are the same in all cases. The paper is divided into two parts. The first part is devoted to a discussion of the various theories, and the second part is devoted to a discussion of the errors which are commonly committed in the discussion of them. The paper is written in a simple and straightforward manner, and it is hoped that it will be found useful to those who are interested in the subject.

The following table gives a summary of the results obtained in the various theories. It is to be observed that the results are the same in all cases, and that the errors which are commonly committed in the discussion of them are the same in all cases.

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CATALOGUE

OF NEW ARTICLES THAT MERIT A PLACE IN THE APOTHE-
CARIES' SHOPS.

It was the observation of professor Cullen, one of the most celebrated writers on the *Materia Medica* that any age has produced, that the writings on that subject are for the most part a compilation of mistakes and falshoods. And he adds, that these errors arise from the obstinacy of old professors, and their blind attachment to theory, as well as the vanity of young physicians, being the authors of observations that are hastily made, and dressed in the closet ; and besides, many of the operations of nature have been falsely imputed to the effects of medicines pretendedly founded on experience.* So distant are they from a true and faithful delineation of nature. Allied to these evils are the numerous frauds and sophistications of chemistry and pharmacy, and the reprehensible practice of administering nostrums or secret remedies, and other popular impositions, the fertile and disgraceful sources of empiricism. A knowledge of the medicinal powers, possessed by the indigenous vegetables, of which our own soil is so abundantly productive, should be deemed an acquisition of primary importance. However disparaging to medical erudition, it is but justice to confess, that we are indebted to the bold enterprize of illiterate pretenders for the discovery of some of our most active remedies. It is, therefore, extremely desirable, that our patriotic physicians and citizens should unite their exertions in the investigation of native substances, and institute such chemical analyses and experiments as will tend to elucidate their specific properties.

The following catalogue consists of a selection of new articles which merit a place in the apothecaries' shops ; many of which should be cultivated in our gardens, and claim the attention of every American practitioner, that the importation of expensive foreign drugs may be superseded :

Aralia Spinosa. Prickly-ash. Tooth-ach tree. The bark, root and berries.

Arbutus Uva Ursi. Bearberry. Bear's Wortleberry. The leaves.

Arum Americanum. Skunk Cabbage. The root and leaves.

Arum Triphyllum. Indian Turnip. The root.

Asclepias Decumbens. Pleurisy Root. The root.

Asculus Hipocastanum. Horse Chesnut. The bark and fruit.

Cassia Marilandica. American Senna. The leaves.

Convolvulus Panduratus. Wild Potatoe. The root.

* Vid. Cullen's treatise on the *Materia Medica*, vol. 1.

Cornus florida. Common-dogwood. Box-wood. The fruit and bark.

Cornus Sericea. Red Willow. Swamp-dogwood. Blueberried-dogwood. Sqaw-wood. The bark.

Datura Stramonium. Thorn Apple. The leaves and seeds.

Eupatorium Perfoliatum. Thorough-wort. The plant, leaves, and flowers.

Eupatorium Pilosum. Wild Horehound. The leaves.

Geranium Maculatum.* Cranes Bill. Crow Foot. The plant and root.

Heracleum Sphondylium. Common Cow-Parsnip.

Iris Pseudacorus. Water Flag. Flower de Luce. Blue Flag. The root.

Juglans Cinerea. Butternut. White Walnut. The unripe fruit, and the inner bark.

Juniperus Virginiana. Common Red Cedar Tree. The leaves.

Lobelia Inflata. Lobelia Emetica. Emetic Weed. Indian Tobacco. The leaves.

Lytta Vittata. Potatoe Fly.

Melia Azedarach. Poison Berry Tree. Pride of India or China. The fruit and root.

Myrica Cerifera Humilis. Dwarf Candleberry Myrtle. Bayberry. The bark of the root.

Phytolacca Decandra. American Nightshade. Garget. The leaves, berries, and root.

Prinos Verticillatus. Winter Berry. Black Alder. The bark and berries.

Prunus Virginiana. Wild Cherry Tree. The bark, both of the tree and root.

Quercus Robur. Oak. The bark.

Rhus Toxicodendrum. Poison Oak. Swamp Sumach. The leaves.

Sanguinaria Canadensis. Blood Root. Puuson. The seeds and root.

Salix Alba. White Willow. The bark, and the bark of the root.

Salix Catifolia. Broad leaved Willow. The bark. (Doubtful whether it is produced in the United States.)

Scutellaria Galericulata. Blue Scull-Cap. Hooded Willow-Herb. The leaves.

* *Geranium Maculatum*, or Cranes Bill. This is a common plant near Philadelphia, and in many other parts of the United States. It is commonly known by the English name of "Crowfoot," and flowers in the spring. It is a powerful astringent, and will stop very violent bleedings if applied to the wounded vessel. A decoction of this plant has also, on some trials, manifested great efficacy in restraining internal hæmorrhagy. The root boiled in milk is a common domestic remedy for the bowel complaints of children.

This article unfortunately omitted in our alphabetical catalogue, is recommended as well deserving attention.

- Secale Cereale*. Rye. Ergot, or Spurred Rye.
Sesamum Orientale. Oily Grain. Benne. The leaves and seeds.
Statice Limonium. Marsh Rosemary. Lavender Thrift. Sea Lavender. The root.
Ulmus Americana. American Elm. The inner bark.
Xanthorrhiza Apiifolia. Shrub Yellow Root. The stem and root.
Xanthoxylum Clava Herculis. Prickly Yellow Wood. Yellow Herculis. The wood and root.

Rx: Pulv. Chor. doct.
 " Rhei - aa ʒj
 " of Guaiac
 " Scilap aa ʒss

To Spts. 1 lb: -
 dose ʒ/2 or 1 cl: Dyspepsia

Each of the kingdoms of nature furnishes objects which are employed in medicine, either in their natural state, or after they have been prepared by the art of pharmacy. In collecting these, attention must be paid to select such as are most sound and perfect, to separate them from those which are injured or decayed, and to preserve them from all foreign matters which may be hurtful to them.

These precautions must be taken when the substances are to be preserved in their natural state. They must be protected from the effects of moisture, too great heat, or cold, and confined in such a manner as to prevent their being injured by the air. As the vegetable kingdom presents us with the greatest number of simple, and the substances belonging to it are the least constant in their properties, and most subject to decay, it is necessary to give a few general rules for their collection and preservation.

Vegetable matters should be collected in the countries where they are indigenous; and those which grow wild, in dry, airy, and high situations, fully exposed to the air and sun, and in general to be preferred to those which grow in moist, low, shady, or confined places.

Those which are annual, should be collected before they shoot out their stalks or flowers; biennial roots in the harvest of the year or spring of the second year; perennials, either in the spring, before the sap has begun to mount, or in harvest, when it has descended.

Those which are worn, either or decayed are to be rejected. The others are immediately to be cleansed with a brush and cold water, leaving them in it as long as time is possible; and the stems and little roots, when not essential, are to be cut away.

Roots which consist principally of fibres, and have few annual rings, may be immediately dried. If they be juicy and not so made, they may be done by heat, not exceeding 100° of Fahrenheit; but if aromatic, by simply exposing them, and frequently turning them in a current of cold dry air: If very thick and strong, they are to be split or cut into slices, and strung upon threads; if covered with a tough bark, they may be peeled

COLLECTION AND PRESERVATION

OF

SIMPLES.

EACH of the kingdoms of nature furnishes articles which are employed in medicine, either in their natural state, or after they have been prepared by the art of pharmacy.

In collecting these, attention must be paid to select such as are most sound and perfect, to separate from them whatever is injured or decayed, and to free them from all foreign matters adhering to them.

Those precautions must be taken which are best fitted for preserving them. They must in general be defended from the effects of moisture, too great heat, or cold, and confined air.

When their activity depends on volatile principles, they must be preserved from the contact of the air as much as possible.

As the vegetable kingdom presents us with the greatest number of simples, and the substances belonging to it are the least constant in their properties, and most subject to decay, it becomes necessary to give a few general rules for their collection and preservation.

Vegetable matters should be collected in the countries where they are indigenous; and those which grow wild, in dry soils, and high situations, fully exposed to the air and sun, are in general to be preferred to those which grow in moist, low, shady, or confined places.

Roots which are annual, should be collected before they shoot out their stalks or flowers; biennial roots in the harvest of the first, or spring of the second year; perennial, either in the spring before the sap has begun to mount, or in harvest, after it has returned.

Those which are worm eaten or decayed are to be rejected. The others are immediately to be cleansed with a brush and cold water, letting them lie in it as short time as possible; and the fibres and little roots, when not essential, are to be cut away.

Roots which consist principally of fibres, and have but a small tap, may be immediately dried. If they be juicy, and not aromatic, this may be done by heat, not exceeding 100° of Fahrenheit; but if aromatic, by simply exposing them, and frequently turning them in a current of cold, dry air: If very thick and strong, they are to be split or cut into slices, and strung upon threads; if covered with a tough bark, they may be peeled

fresh, and then dried. Such as lose their virtues by drying, or are directed to be preserved in a fresh state, are to be kept buried in dry sand.

No very general rule can be given for the collection of herbs and leaves, some of them acquiring activity from age, and others, as the mucilaginous leaves, from the same cause, losing the property for which they are officinal. Aromatics are to be collected after the flower buds are formed; annuals, not aromatic, when they are about to flower, or when in flower; biennials, before they shoot; and perennials, before they flower, especially if their fibres become woody.

They are to be gathered in dry weather, after the dew is off them, or in the evening before it falls, and are to be freed from decayed, withered, or foreign leaves. They are usually tied in bundles, and hung up in a shady, warm, and airy place; or spread upon the floor, and frequently turned. If very juicy, they are laid upon a sieve, and dried by a gentle degree of artificial warmth.

Sprouts are collected before the buds open; and stalks are gathered in autumn.

Barks and woods are collected when the most active part of the vegetables are concentrated in them, which happens in spring and in autumn. Spring is preferred for resinous barks; and autumn for the others, which are not resinous but rather gummy. Barks should be taken from young trees, and freed from decayed parts, and all impurities.

The same rules direct the collection of woods; but they must be taken from very young trees. Among the resinous woods, the heaviest, which sink in water, are selected. The alburnum is to be rejected.

Flowers are collected in clear, dry weather, before noon, but after the dew is off; either when they are about to open, or immediately after they have opened. Of some the petals only are preserved, and the colourless claws are even cut away; of others, whose calyx is odorous, the whole flower is kept. Flowers which are too small to be pulled singly, are dried with part of the stalk: These are called heads or tops.

Flowers are to be dried nearly as leaves, but more quickly, and with more attention. As they must not be exposed to the sun, it is best done by a slight degree of artificial warmth.

Seeds and fruits, unless when otherwise directed, are to be gathered when ripe, but before they fall spontaneously. Some pulpy fruits are freed from their core and seeds, strung upon threads, and dried artificially. They are in general best preserved in their natural coverings, although some, as the colocynth, are peeled; and others, as the tamarind, preserved fresh. Many of these are apt to spoil, or become rancid; and as they are then not fit for medical use, no very large quantity of them should be collected at a time.

The proper drying of vegetable substances is of the greatest importance. It is often directed to be done in the shade and slowly, that the volatile and active particles may not be dissipated by too great heat; but this is an error, for they always lose infinitely more by a slow, than by a quick drying. When, on account of the colour, they cannot be exposed to the sun, and the warmth of the atmosphere is insufficient, they should be dried by an artificial warmth, less than 100° Fahrenheit, and well exposed to a current of air. When perfectly dry and friable, they have little smell; but after keeping for some time, they attract moisture from the air, and regain their proper odour.

The boxes and drawers in which vegetable matters are kept, should not impart to them any smell or taste; and more certainly to avoid this, they should be lined with paper. Such as are volatile, or of delicate texture, or subject to suffer from insects, must be kept in well covered glasses. Fruits and oily seeds, which are apt to become rancid, must be kept in a cool and dry, but by no means a warm or moist air.

Oily seeds, odorous plants, and those containing volatile principles, must be collected fresh every year. Others, whose properties are more permanent, and not subject to decay, will keep for several years.

Vegetables collected in a moist and rainy season, are in general more watery, and apt to spoil. In a dry season, on the contrary, they contain more oily and resinous particles, and keep much better.

PART III

PREPARATIONS AND COMPOSITIONS

§ 11. The medical prescriber will have it in recollection that the most important pharmaceutical preparations in use are according to the Edinburgh Pharmacopoeia, and that the analogous preparations as directed by the College of London and Dublin are in many instances variant in their mode of carrying the process, but still more essentially so with respect to the proportion of the active ingredients which enter their compositions.

PART III.

PREPARATIONS AND COMPOSITIONS.

N. B. The medical prescriber will have it in recollection, that the most important pharmaceutical preparations in this work are according to the Edinburgh pharmacopœia, and that the analogous preparations as directed by the colleges of London and Dublin, are in many instances variant in their mode of conducting the process, but still more essentially so, with respect to the proportion of the active ingredients which enter their compositions.

WINTERS

THE NEW YORK BOTANICAL GARDEN

PREPARATIONS AND COMPOSITIONS

BY J. H. WINTERS

CHICAGO

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PART III.

PREPARATIONS AND COMPOSITIONS.

CHAPTER I.

SULPHUR.

SULPHUR SUBLIMATUM LOTUM. *Washed Sublimed Sulphur.*

* Washed Flowers of Sulphur.

Take of

Sublimed sulphur, one pound,
Water, four pounds.

Boil the sulphur for a little while in the water, then pour off this water, and wash away all the acid by affusions of cold water; lastly, dry the sulphur.

A small portion of sulphur in its sublimation sometimes suffers oxydation from the air of the chamber into which it is sublimed, and hence acquires a slight acidity, which the present process is designed to remove. This is so rarely the case, however, that it is one perhaps unnecessary.

* The translation of the ancient names are added in Roman letters. Tables are annexed containing the ancient names, with their synonymies, and the systematic names with their synonymies.

CHAPTER II.

ACIDS, ALKALIES, EARTHS, AND THEIR COMPOUNDS.

ACIDUM SULPHURICUM DILUTUM. *Diluted Sulphuric Acid.*
Diluted Vitriolic Acid.

Take of

Sulphuric acid, one ounce,
Water, seven ounces.

Mix them gradually.

The most simple form, in which sulphuric acid can be employed internally, is that in which it is merely diluted with water; for which it has a great attraction: and their bulk when combined, is less than that of the water and acid separately. At the same time there is a very considerable increase of temperature produced, which is apt to crack glass vessels, unless the combination be very cautiously made; and for the same reason, the acid must be poured into the water, not the water into the acid. Distilled water is preferable to spring water.

This preparation was formerly called weak spirit of vitriol, and has been considered as a useful astringent, taken to the extent of thirty drops; but its medicinal properties have already been mentioned under the article Acidum Sulphurium, in the *Materia Medica*.

ACIDUM NITROSUM. *Nitrous Acid.* Glauber's Spirit of Nitre.

Take of

Nitrate of potash in coarse powder, or bruised, two pounds,
Sulphuric acid, sixteen ounces.

Having put the nitrate of potash into a glass retort, pour upon it the sulphuric acid, and distil it in a sand bath, with a heat gradually increased, until the iron pot begin to be red hot.

The specific gravity of this acid is to that of distilled water as 1550 to 1000.

In this process, the sulphuric acid, by its superior affinity, combines with the potash of the nitre to form sulphate of potash, while the nitric acid is separated, and is not only converted into vapour by the application of the heat to the retort,

but is also partially decomposed. A portion of oxygen escapes in a gaseous form, and the nitric oxyd gas combines with the nitric acid; so that the liquor condensed in the receiver is nitrous, and not nitric acid.

ACIDUM NITROSUM DILUTUM. *Diluted Nitrous Acid.* Aqua Fortis Tenuis.

Take of
Nitrous acid,
Water, equal weights.

Mix them, taking care to avoid the noxious vapours.

In combining nitrous acid with water, the greater part of the nitrous gas of the former is disengaged. The diluted acid is employed in a number of the chemical processes of the Pharmacopœia.

ACIDUM NITRICUM. *Nitric Acid.* Aqua Fortis.

Take of
Nitrous acid, any quantity.

Pour it into a retort, and having adapted a receiver, apply a very gentle heat, until the reddest portion shall have passed over, and the acid which remains in the retort shall have become nitric acid.

By the heat applied, the nitrous gas contained in the nitrous acid, and which gives to it the yellow colour and highly fuming property, is expelled, and condenses in the receiver, combined still with a small portion of acid.

The nitric acid remains colourless. It is applied to the same purposes as the nitrous. Little or no difference can exist between them in medicinal powers, but the nitric is perhaps more uniform in strength.

These acids, the nitrous and nitric, have been long employed as powerful pharmaceutic agents. They are next in strength to the sulphuric, and dislodge all others from alkaline salts or earths. Under the name of *aqua fortis*, the nitrous acid of a certain strength has long been employed for various purposes in the arts and manufactures. Great caution should be observed in the use of this powerful liquid. In casualties where a person has, by mistake, swallowed a portion of *aqua fortis*, luke warm water ought to be drunk in the greatest possible quantity, even to the amount of several gallons, to weaken the causticity of the poison, and to avert the imminent danger of suffocation. Next, a solution of half an ounce of salt of tartar, or clear pearl ashes, in one pint of water, should be taken in about six or eight draughts; and as the effervescence thus occasioned in the stomach, greatly tends to weaken that organ, it will be necessary

to make use of more water, and other diluent, oily, or mucilaginous drinks.

The use of the nitrous and nitric acids in medicine, has lately been considerably extended.

In the state of vapour, they have been used to destroy contagion in jails, hospitals, ships, and other places where the accumulation of animal effluvia is not easily avoided. The fumigating such places with the vapour of nitrous acid has certainly been attended with success; but we have heard that success ascribed entirely to the ventilation employed at the same time. Ventilation may certainly be carried so far, that the contagious miasmata may be diluted to such a degree, that they shall not act on the body; but to us it appears no less certain, that these miasmata cannot come in contact with nitric acid or oxy-muriatic acid vapour, without being entirely decomposed, and completely destroyed. It is, besides, applicable in situations which do not admit of sufficient ventilation; and where it is, the previous diffusion of acid vapours is an excellent check upon the indolence and inattention of servants and nurses, as by the smell we are enabled to judge whether they have been sufficiently attentive to the succeeding ventilation. Nitric acid vapour, also, is not deleterious to life, and may be diffused in the apartments of the sick, without occasioning to them any material inconvenience. The means of diffusing it are easy. Half an ounce of powdered nitre is put into a saucer, which is placed in a pipkin of heated sand. On the nitre two drachms of sulphuric acid are then poured. The fumes of nitric acid immediately begin to rise. This quantity will fill with vapour a cube of ten feet; and by employing a sufficient number of pipkins, the fumes may be easily made to fill a ward of any extent. After the fumigation, ventilation is to be carefully employed. For introducing this practice, Dr. Carmichael Smyth has received from the British parliament a reward of five thousand pounds.*

The internal use of these acids has also been lately much extended. In febrile diseases, water acidulated with them forms one of the best antiphlogistic and antiseptic drinks we are ac-

* It is remarkable, that, while Dr. C. Smyth insists upon the efficacy of the *nitrous vapour*, M. Guyton de Morveau is equally positive, that the suffocating fumes of the *muriatic acid* are the most certain destroyers of contagion. The plans both of Morveau and Smyth, founded on the principles of the alkaline nature of contagion, are in direct opposition to the theory of *septic acid*, so clearly established by Dr. Mitchill, of New York, and universally received in the United States.

The editor of the Domestic Encyclopedia, Dr. Mease, agrees with Dr. Mitchill in the opinion, that alkaline substances, soap-suds, alkaline ley, and lime water, properly used, will much more effectually extinguish contagion and infection, than any acid fumigation, whether nitrous or muriatic.

This subject is ably treated by Dr. Mitchill in the several volumes of the Medical Repository.

quainted with. Hoffman and Eberhard long ago employed it with very great success in malignant and petechial fevers; and in the low typhus, which frequently rages among the poor in the suburbs of Edinburgh, it has been repeatedly given with unequivocal advantage, before the contemptible quackery of Reich was so undeservingly rewarded by the king of Prussia. In the liver complaint of the East Indies, and in syphilis, nitric acid has also been extolled as a valuable remedy, by Dr. Scott, and the evident benefits resulting from its use in these complaints, has given rise to a theory, that mercury only acts by oxygenizing the system. It is certain, that both the primary and secondary symptoms of syphilis have been removed by the use of these acids, and that the former symptoms have not returned, or been followed by any secondary symptoms. But in many instances they have failed, and it is doubtful if ever they effected a permanent cure, after the secondary symptoms appeared. Upon the whole, the opinions of Mr. Pearson on this subject, lately agitated with so much keenness, appear to us so candid and judicious, that we shall insert them here. He does not think it eligible to rely on the nitrous acid in the treatment of any one form of the lues venerea; at the same time, he by no means wishes to see it exploded as a medicine altogether useless in that disease. When an impaired state of the constitution renders the introduction of mercury into the system inconvenient, or evidently improper, the nitrous acid will be found, he thinks, capable of restraining the progress of the disease, while at the same time, it will improve the health and strength of the patient. On some occasions, this acid may be given in conjunction with a mercurial course, and it will be found to support the tone of the stomach, to determine powerfully to the kidneys, and to counteract in no inconsiderable degree the effects of mercury on the mouth and fauces.

ACIDUM MURIATICUM. *Muriatic Acid.* Spirit of Sea Salt.

Take of

Muriate of soda, two pounds,
Sulphuric acid, sixteen ounces,
Water, one pound.

Let the muriate of soda be kept at a red heat for some time in an iron vessel, and after it has cooled, put it into a retort; then pour upon the muriate of soda, the acid mixed with the water and allowed to cool. Lastly, distil in a sand bath, with a moderate fire, as long as any acid is produced.

The specific gravity of this acid is to that of distilled water, as 1170 to 1000.

This process is an example of single affinity. The sulphuric acid combines with the soda of the muriate of soda, and the muriatic acid is disengaged. It combines with the watery vapour,

and is thus easily condensed. It has generally a yellowish tinge, from the presence of a small quantity of iron, from which it can be freed by a second distillation.

The spirit of sea salt is the weakest of the mineral acids, but stronger than any of the vegetable. In its effects on the animal economy, and the mode of its employment, it coincides with the acids already mentioned, which almost proves that they do not act by oxygenizing the system, as the muriatic acid cannot be disoxygenized by any substance or process with which we are acquainted. This preparation is sometimes given, properly diluted, as an antiphlogistic, aperient, and diuretic, from ten to sixty or seventy drops.

Dr. Reich of Erlang, has cured the malignant putrid fevers, by the liberal use of mineral acids, and particularly the muriatic, or spirit of sea salt. Sir William Fordyce, also recommends it as the best remedy in all putrid diseases of the worst kind; in petechial, camp, and jail distempers, as well as the malignant sore throat, small pox, and plague.

Dr. Reich directs a mixture of from one drachm to half an ounce of the acid, eight ounces of water and two of syrup; the patient to take a table spoonful or more every hour or two hours. But in time of great danger, from forty to one hundred drops, properly diluted, may be given at once, and such doses often repeated. The internal exhibition, however, of this powerful remedy, is liable to many serious objections, which must ever prevent its general adoption. But it may in all cases be safely applied in the form of liniments, fomentations, and baths: thus a very large and much larger proportion than by swallowing it, may be daily, nay, hourly introduced into the system, especially in the earlier stages of the disorder, before the patient's strength is too much exhausted.

ACIDUM ACETOSUM DESTILLATUM. *Distilled Acetous Acid.*
Distilled Vinegar.

Let eight pounds of acetous acid be distilled in glass vessels with a gentle heat. The two first pounds which come over, being too watery, are to be set aside; the next four pounds will be the distilled acetous acid. The remainder furnishes a still stronger acid, but too much burnt by the fire.

Vinegar, as it is produced by fermentation, consists of acetous acid, largely diluted with water, and mixed with a number of other substances. From these it is purified by distillation, but it is still largely diluted with water, as the pure acid is not even so volatile as water; and, in general, it receives from the distillation somewhat of an empyreumatic odour. The process should be conducted in glass vessels, as directed in the pharmacopœia; as, from metallic ones, the acid would receive an impregnation that might prove noxious.

Distilled acetous acid is chiefly employed as a solvent of some vegetable substances, and in making some of the salts.

ACIDUM ACETOSUM FORTE. *Strong Acetous Acid.*

Take of

Sulphate of iron dried, one pound,
Acetite of lead, ten ounces.

Having rubbed them together, put them into a retort, and distil in a sand bath with a moderate heat, as long as any acid comes over.

The London pharmacopœia directs this acid to be procured by the distillation of verdigris, and it is somewhat uncertain whether the two products differ essentially from each other, and whether these concentrated acids differ except in strength, from the diluted acetous acid.

These strong acids are principally used as powerful stimulants, applied to the nostrils in languor and asphyxia. Their odour is pungent and grateful. They are capable of acting as powerful rubefacients.

ACIDUM BENZOICUM. *Benzoic Acid.* Flowers of Benzoin.

Take of

Benzoin, twenty-four ounces,
Carbonate of soda, eight ounces,
Water, sixteen pounds.

Triturate the benzoin with the carbonate, then boil in the water for half an hour, with constant agitation, and strain. Repeat the decoction, with other six pounds of water, and strain. Mix these decoctions, and evaporate, until two pounds remain. Filter anew, and drop into the fluid, as long as it produces any precipitation,

Diluted sulphuric acid.

Dissolve the precipitated benzoic acid in boiling water ; strain the boiling solution through linen, and set it aside to crystallize. Wash the crystals with cold water, dry and preserve them.

The benzoic acid when properly prepared has an agreeable taste and fragrant smell. It totally dissolves in alcohol, and likewise by the assistance of heat in water ; but separates again from the latter upon the liquors growing cold, shooting into saline spiculæ, which unite together in irregular masses. By the mediation of sugar, flowers of benzoin remain suspended in cold water, and thus form an elegant balsamic syrup. Some have held them in great esteem as pectoral and sudorific, in the dose of half a scruple or more ; but at present they are rarely used,

except as an ingredient in the composition of the paragoric elixir of the pharmacopœia.

OLEUM SUCCINI ET ACIDUM SUCCINICUM. *Oil of Amber and Succinic Acid.* Salt and Oil of Amber.

Take of

Amber reduced to powder, and of pure sand, equal weights.

Mix them, and put them into a glass retort, of which the mixture may fill one half; then adapt a large receiver, and distil in a sand bath, with a fire gradually increased. At first a watery liquor will come over, with some yellow oil; then a yellow oil with an acid salt, and lastly, a reddish and black coloured oil. Pour the liquor out of the receiver, and separate the oil from the water. Press the salt collected from the neck of the retort and sides of the receiver, between folds of blotting paper, to free it from the oil adhering to it; then purify it by solution in warm water and crystallization.

We are not acquainted with any experiments which determine whether the succinic acid exists as such in the amber, or whether it be a product of the decomposition of the amber by the action of heat, for in the process employed for obtaining succinic acid, the amber is completely decomposed.

Succinic acid, formerly salt of amber, has a penetrating sub-astringent acid taste. It dissolves both in water and in rectified spirit; though not readily in either, and scarcely at all in the latter without the assistance of heat. It effervesces with alkalies, and forms with them neutral compounds much resembling those composed of the same alkalies and vegetable acids. It was formerly in repute as an aperient, diuretic, and antihysterical, but in modern practice it is little regarded.

The oil of amber is sometimes employed externally as a stimulant, and internally as an antispasmodic, but is also falling into disuse. A process is ordered in the pharmacopœia for its purification.

AQUA ACIDI CARBONICI. *Water of Carbonic Acid.* Water impregnated with fixed Air.

Take of

Water, six pounds; place this in the middle part of a Nooth's apparatus, and expose it to a stream of carbonic acid gas arising from
Carbonate of lime, in powder,
Sulphuric acid, each three ounces,
Water, three pounds, gradually and cautiously mixed.

If a larger quantity of the liquor be required, the apparatus of Dr. Woulfe is preferable.

In this and similar preparations, where carbonic acid gas is combined with liquids, the liquor is better in proportion to the coldness of the air, and to the pressure to which it is subjected. It should be preserved in glass vessels well closed, and should not be exposed to any high temperature.

In this process the carbonic acid is separated from the carbonate of lime by the superior affinity of sulphuric acid. As it is disengaged, it assumes a gaseous form, and would be dissipated in the atmosphere, if it were not made to pass through water, which, at a medium temperature, is capable of absorbing about an equal bulk of this gas, and, by the assistance of pressure, a much greater proportion.

Various contrivances have been made for this purpose. Of these the most easily managed, and most convenient for general use, in the apparatus of Nouth, and for larger quantities that of Woulfe, or some modification of it. By the proper application of pressure, Mr. Paul is able to impregnate water with no less than six times its bulk of carbonic acid gas.

Water, impregnated with carbonic acid, sparkles in the glass, has a pleasant acidulous taste, and forms an excellent beverage. It diminishes thirst, lessens the morbid heat of the body, and acts as a powerful diuretic. It is also an excellent remedy in increased irritability of the stomach, as in advanced pregnancy; and it is one of the best anti-emetics we possess.

AQUA POTASSÆ. Solution of Potash. Water of Potash. Caustic Ley.

Take of

Lime recently burnt, eight ounces,
Carbonate of potash, six ounces.

Throw the lime into an iron or earthen vessel, with twenty-eight ounces of warm water. After the ebullition is finished, instantly add the salt; and having thoroughly mixed them, cover the vessel till they cool. When the mixture has cooled, agitate it well, and pour it into a glass funnel, whose throat must be stopt up with a piece of clean rag. Let the upper mouth of the funnel be covered, while the tube of it is inserted into another glass vessel, so that the solution of potash may gradually drop through the rag into the lower vessel. When it first gives over dropping, pour into the funnel some ounces of water; but cautiously, so that the water may swim above the matter. The water of potash will again begin to drop, and the affusion of water is to be repeated in the same manner, until three pounds have dropped, which will happen in the space of two or three days; then by agitation mix

the superior and inferior parts of the liquor together, and put it up in a well stopt phial.

The principle of mildness in all alkaline salts, whether fixt or volatile, vegetable or fossil, is very evidently carbonic acid. But quick lime has a stronger attraction for the acid than any of the salts. Of course, when lime comes in contact with carbonate of potash, as in the above process, the carbonic acid quits the potash to unite with the lime, and the results of the mixtures are potash and carbonate of lime. Now as the carbonate of lime is insoluble in water, and the potash is very soluble, they may be separated by filtration. The method of filtrating through sand as employed by Dr. Black, is preferable to any other.

The caustic ley is to be considered as a solution of pure alkali in water. It is colourless, and will neither effervesce with acids, nor form a precipitate with carbonate of potash. The solution of caustic potash, under various names, has at different times been celebrated as a lithontriptic, and as often fallen again into disuse. The very contradictory accounts of its effects as a solvent are now in some degree explicable, since it has been discovered that urinary calculi are very different in their natures, so that some of them are only soluble in acids, and others only in alkalies. Of the last description are the calculi of uric acid, which are very frequent, and those of urate of ammonia. On these, therefore, alkalies may be supposed to make some impression, and that alkalies, or alkaline carbonates, taken by the mouth, have occasionally relieved calculous complaints, is certain. It is, however, said, that their continued use debilitates the stomach; and M. Fourcroy has proposed applying the remedy immediately to the disease, by injecting into the bladder a tepid solution of potash or soda, so dilute that it can be held in the mouth. Before the alkaline solution be injected, the bladder is to be completely evacuated of urine, and washed out with an injection of tepid water. After the alkaline injection has remained in the bladder half an hour or more, it is to be evacuated and allowed to settle. If, on the addition of a little muriatic acid, a precipitate be formed, we shall have reason to conclude that the calculus contains uric acid, and that the alkali has acted on it.

Very dilute alkaline solutions may also be taken into the stomach as antacids, but we possess others which are preferable. The dose is from ten to thirty drops. Externally, alkaline solutions have been more frequently used, either very dilute, simply as a stimulus, in rickets, gouty swellings, gonorrhœa, and spasmodic diseases, or concentrated as a caustic to destroy the poison of the viper and of rabid animals.

POTASSA. *Potash.* Strongest Common Caustic.

Take of

Solution of potash, any quantity.

Evaporate it in a covered very clean iron vessel, till, on the ebullition ceasing, the saline matter flow gently like oil, which happens before the vessel becomes red. Then pour it out on a smooth iron plate; let it be divided into small pieces before it hardens, and immediately placed in a well stopped phial.

Potash in this form is used as a caustic. It quickly erodes animal matter, and, mixed with soap, has been used to open an ulcer. But its use as a caustic is inconvenient, from its being so quickly affected by the air, and from its rapid deliquescence, which renders it apt to spread.

POTASSA CUM CALCE. *Potash with Lime.* Milder Common Caustic.

Take of

Solution of potash, any quantity.

Evaporate this in a covered iron vessel till one third remain; then mix with it as much new slack lime as will bring it to the consistence of a pretty solid pap, which is to be kept in a vessel closely stopped.

The addition of the lime in this preparation renders it less apt to deliquesce, more easily managed, and milder in its operation than the former.

CARBONAS POTASSÆ. *Carbonate of Potash.* Fixed vegetable Alkaline Salt purified.

Let impure carbonate of potash, put into a crucible, be brought to a low red heat, that the oily impurities, if there be any, may be consumed; then triturate it with an equal weight of water, and mix them thoroughly by agitation. Filtrate the liquor through paper into a very clean iron pot, and boil to dryness, stirring the salt towards the end of the process, to prevent its sticking to the vessel.

The Pearl ashes of commerce are obtained by the incineration of the wood of land vegetables. They contain a considerable proportion of foreign salts, from which they are in a great degree purified by the present process. The salt thus obtained is a sub-carbonate of potash, or potash imperfectly saturated with carbonic acid. It is in white grains, is deliquescent, and possesses the alkaline properties. In like manner is purified impure kali from the ashes of any kind of vegetable.

The same salt may be prepared from tartar, which should be burnt till it become of an ash colour.

CARBONAS POTASSÆ PURISSIMUS. *Pure Carbonate of Potash.*
Salt of Tartar.

Take of

Impure super-tartrite of potash, any quantity.

Burn it to a black mass, by placing it among live coals, either wrapped up in moist bibulous paper, or contained in a crucible. Having reduced this mass to powder, expose it in an open crucible to the action of a moderate fire, till it become white, or at least of an ash gray colour, taking care that it do not melt. Then dissolve it in warm water; strain the liquor through a linen cloth, and evaporate it in a clean iron vessel, diligently stirring it towards the end of the process with an iron spatula, to prevent it from sticking to the bottom of the vessel. A very white salt will remain, which is to be left a little longer on the fire, till the bottom of the vessel become almost red. Lastly, when the salt is grown cold, keep it in glass vessels well stopped.

By exposing the super-tartrite of potash to heat, the tartarous acid is decomposed. Parts of its carbon and oxygen unite, and form carbonic acid, which is attracted by the potash; and, by continuing the heat, the remaining carbonaceous matter is burnt out. By dissolving the saline matter, the portion of lime, and any other earthy or metallic matter which the super-tartrite may have contained, are separated, and, by evaporation, a salt is obtained, which, like the former, is a sub-carbonate of potash, but more pure.

Carbonate of potash, formerly called *sal tartari*, is frequently employed in medicine, in conjunction with other articles, particularly for the formation of saline neutral draughts and mixtures: but it is used also by itself in doses from three or four grains to fifteen or twenty; and it frequently operates as a powerful diuretic, particularly when aided by proper dilution. [See Carbonas Potassæ impurus in the Materia Medica.]

AQUA SUPER-CARBONATIS POTASSÆ. *Solution of Super-carbonate of Potash.*

Take of

Water, ten pounds,

Pure carbonate of potash, one ounce.

Dissolve and expose the solution to a stream of carbonic acid gas, in the same manner as directed for the water of carbonic acid.

The colder the air is, and the greater pressure, the better is the liquor, which should be kept in well closed vessels. As soon as the preparation is finished, the liquor should be drawn off into pint bottles, which are to be well corked and kept in a cool situation, with the head down, or laid on one side. It should be perfectly transparent, and have an acidulous, not at all alkaline taste; and when poured out of the bottles, it should have a sparkling appearance.

Potash, when used as a lithontriptic, irritates the stomach and bladder so much, that its use cannot be well long continued. But when super-saturated with carbonic acid, as it is in this preparation, it is much more pleasant and less irritating; and, though its lithontriptic or real solvent power is diminished, or perhaps entirely lost, it is capable of acting as a palliative, and of being continued for any length of time. Indeed, it is the only form in which we can exhibit potash in sufficient doses, and for a sufficient length of time, to derive much benefit from its use in calculous complaints. It has certainly been frequently of advantage in these affections, but probably only in those instances in which the stone consists of uric acid, or urate of ammonia; for although super-saturated with carbonic acid, yet the affinity of that acid for potash is so weak, that it really operates in a degree as an alkali.

Six or eight ounces of this liquor may be taken two or three times a day. It in general proves powerfully diuretic, and sometimes produces inebriation. This last effect is ascribed to the carbonic acid.*

* The following easy and cheap method of saturating the vegetable alkali with carbonic acid is recommended by that venerable and eminent physician, E. A. Holyoke, M. D. of Salem.

Take a cylindrical box of wood about nine or ten inches in diameter, bore eight or ten holes, half an inch in diameter in the side of it, just below the lower edge of the cover, at nearly equal distances all round; bore also as many holes in the circular bottom of the box, close to the edge of it: then take another box of the same kind, but of a smaller diameter by half or three quarters of an inch; place this in the larger, and to keep it steady, thrust three or four wooden wedges between the two boxes. The two boxes being thus prepared, fill the inner one with the purest salt of tartar, or clean, well calcined pearl ashes, or any clean, pure fixed vegetable alkali: put its cover on the outer box, leaving the inner one uncovered; sling this double box thus filled, with a cord, and suspend it in a distiller's vat or cistern, while the wash is fermenting, a little above the liquor, or in an empty cistern, if it has been much used, and still retains the fixed air (carbonic acid); let it remain in this situation for six weeks or two months, or longer if it is wanted; let it then be taken out, and the salt now fully saturated with the acid, be exposed to the sun and air to dry.

The salt thus prepared, does neither effloresce nor deliquesce in the open air, and for all common purposes is, I believe, equal to that prepared by crystallization.

Note. The pearl ashes had better be put into the box in moderate sized lumps than in powder, that the fixed air may have free access to it.

The salt is much more tolerable to the palate, and may be taken in larger doses than the naked alkali; and as it is decomposed by vegetable acids, as

ACETIS POTASSÆ. *Acetite of Potash.* Diuretic Salt.

Take of

Pure carbonate of potash, one pound.

Boil it with a very gentle heat, in four or five times its weight of distilled acetous acid; add more acid at different times, till, on the watery part of the preceding quantity being nearly dissipated by evaporation, the new addition of acid cease to raise any effervescence; which will happen, when about twenty pounds of the distilled acetous acid have been consumed. It is then to be slowly dried. The impure salt remaining, is to be melted with a gentle heat, for a short time; and afterwards dissolved in water, and filtered through paper. If the liquifaction have been properly performed, the filtered liquor will be limped; but if otherwise, of a brown colour. Afterwards evaporate this liquor with a very gentle heat in a very shallow glass vessel, occasionally stirring the salt as it becomes dry, that its moisture may be sooner dissipated. Lastly, the acetite of potash ought to be kept in a vessel very closely stopped, to prevent it from deliquescing.

It is obvious, that, in this process, the acetous acid combines with the potash, disengaging the carbonic acid.

The acetite of potash, obtained by the evaporation, is of a brownish colour, from the presence, either of some extractive matter contained in the vinegar, or of carbonaceous matter, from

well as the mineral, it may be exhibited instead of the alkali, in perhaps every case where the latter is proper, unless the fixed air is judged improper.

It is much superior to common alkali in forming Riverius' anti-emetic effervescing draught, as it contains a much larger proportion of carbonic acid (in which the principal virtue of that medicine is supposed to reside) than the mildest fixed alkali, and is at the same time much more palatable.

The doctor commonly directs two drachms or rather more of this salt, to be dissolved in three ounces of fair water; a large spoonful of this solution, added to the same quantity of good vinegar, or lemon juice, at the instant of swallowing it, makes an agreeable dose. But the taste of this solution is so mild, that, if the prescriber choose, a spoonful of it may be swallowed alone at first, and as much vegetable acid immediately upon it, in which case, none of the gas will be lost.

When acidity abounds in the first passages, a little of this salt added to any bitter infusion, or the dry salt added to powder of columbo, or any peptic powder, is an effectual antacid.

In calculous cases, this salt is recommended by writers, particularly by the celebrated Dr. Cullen, in his *Materia Medica*, as being a happy expedient for conveying larger quantities of alkali into the stomach, than it can bear in its natural state. Hitherto, says the doctor, the common mode of preparing the salt for this purpose, I believe, has been by impregnating a solution of fixed alkali with fixed air, by means of Dr. Nooth's machine; but any one who has prepared the medicine in both ways, will readily give the most decided preference to that above described, on account both of ease and cheapness.

a partial decomposition of the acid. It is freed from this by the fusion which is directed; and, by the second solution and evaporation, it is obtained in the form of a white foliated mass, extremely deliquescent.

Acetite of potash, formerly called *sal diureticus*, provided it be properly made, is a medicine of great efficacy, and may be so dosed and managed as to prove either mildly cathartic, or powerfully diuretic: few of the saline deobstruents equal it in virtue. The dose is from half a scruple to a drachm or two. A base mixture, however, of alkaline salt and vinegar, without exsiccation, is perhaps not inferior as a medicine to the more elaborate salt. Two drachms of the alkali, saturated with vinegar, have been known to occasion, in hydropic cases, ten or twelve stools, and a plentiful discharge of urine, without any inconvenience.

SULPHAS POTASSÆ. *Sulphate of Potash.* Vitriolated Tartar.

Take of

Sulphuric acid diluted, with six times its weight of water, any quantity.

Put it into a capacious glass vessel, and gradually drop into it, of pure carbonate of potash, dissolved in six times its weight of water, as much as is sufficient thoroughly to saturate the acid. The effervescence being finished, strain the liquor through paper; and after due evaporation set it aside to crystallize.

Sulphate of potash may be also conveniently prepared from the residuum of the distillation of nitrous acid, by dissolving it in warm water, and saturating it with carbonate of potash.

In the former of these processes, the sulphuric acid unites with the potash of the carbonate of potash, and expels the carbonic acid with effervescence. In the latter, which is the one generally followed, the excess of sulphuric acid attached to the sulphate of potash, which remains after the distillation of nitrous acid, is saturated by the addition of a sufficient quantity of potash. The salt forms an irregular crystalline mass; it has a very bitter taste, and is sparingly soluble in water.

Sulphate of potash, formerly *vitriolated tartar*, forms small transparent very hard crystals, generally aggregated in crusts, and permanent in the air. It has a bitter taste, and is slowly soluble in water. In small doses, as a scruple, or half a drachm, it is a useful aperient; in larger ones, as four or five drachms, a mild cathartic, which does not pass off so hastily as the sulphate of soda, and seems to extend its action further.

SULPHAS POTASSÆ CUM SULPHURE. *Sulphate of Potash with Sulphur.* Sal Polychrest.

Take of

Nitrate of potash in powder,
Sublimed sulphur, of each equal parts.

Mix them well together, and inject the mixture, by little and little at a time, into a red hot crucible; the deflagration being over, let the salt cool, after which it is to be put up in a glass vessel well stopped.

The nitrate of potash being decomposed by the red heat, affords oxygen to the sulphur, in such proportions as to convert it into sulphuric and sulphurous acids. Both acids are attracted by the potash. In its medicinal qualities, this saline compound, formerly called *sal polychrestus*, does not appear to differ from the sulphate of potash; and it is soon converted into it by exposure to the air.

SULPHURETUM POTASSÆ. *Sulphuret of Potash.* Liver of Sulphur.

Take of

Carbonate of potash,
Sublimed sulphur, each eight ounces.

Having ground them well together, put them into a large coated crucible; and having fitted a cover to it, and applied live coals cautiously around it, bring them at length to a state of fusion.

Having broken the crucible as soon as it has grown cold, take out the sulphuret, and keep it in a well closed phial.

During the fusion of these two substances, the sulphur and potash combine, and the carbonic acid is disengaged. The compound is easily fusible, and is of a brown colour, and inodorous. It is immediately partially decomposed by water, and portions of sulphate of potash and sulphurated hydrogen formed.

This preparation, formerly called *hepar sulphuris* (liver of sulphur), has been proposed to be used as an antidote to some of the metallic poisons, from the supposition that the sulphur would combine with the metallic preparation, and render it inert. From a similar theory it has been imagined that it might obviate the effects of mercury on the system when these are too violent; but is very seldom had recourse to with either intention. The dose in which it has been proposed to be given, is from ten to twenty grains, three or four times a-day. It is said in some cases of cancer, to have increased the efficacy of cicuta as a palliative, in doses of five grains.

TARTRIS POTASSÆ. *Tartrite of Potash.* Soluble Tartar.

Take of

Carbonate of potash, one pound,
Super-tartrite of potash, three pounds, or as much as
may be sufficient,
Boiling water, fifteen pounds.

To the carbonate of potash dissolved in the water, gradually add the super-tartrite of potash in fine powder, as long as it raises any effervescence, which generally ceases before three times the weight of the carbonate of potash has been added; then strain the cooled liquor through paper, and, after due evaporation, set it aside to crystallize.

The excess of tartarous acid in the super-tartrite of potash, is saturated by the potash of the carbonate of potash, and the proper neutral salt formed. It is not easily crystallized. In its preparation, therefore, the solution is usually evaporated to dryness. It has an unpleasant bitter taste. It is soluble in four parts of cold water, and still more soluble in boiling water; and it is also soluble in alcohol.

This neutral salt, formerly called *soluble tartar*, is totally or partially decomposed by all acids. On this account it is improper to join it with tamarinds, or such like acid fruits, which is too often done in the extemporaneous practice of those physicians who are fond of mixing different cathartics together, and know little of chemistry.

In doses of a scruple, half a drachm, or a drachm, this salt is a mild cooling aperient; two or three drachms commonly loosen the belly; and an ounce proves pretty strongly purgative. It has been particularly recommended as a purgative for maniacal and melancholic patients. It is an useful addition to the purgatives of the resinous kind, as it promotes their operation, and at the same time tends to correct their griping quality.

CARBONAS SODÆ. *Carbonate of Soda.* Purified fixed fossil Alkaline Salt.

Take of

Impure carbonate of soda, any quantity.

Bruise it; then boil in water till all the salt be dissolved. Strain the solution through paper, and evaporate it in an iron vessel, so that after it has cooled, the salt may crystallize.

Impure carbonate of soda, the Barilla of commerce, is obtained from the incineration of certain marine plants. It consists of carbonate of soda, with charcoal, oxyd of iron, and various other impurities. From these it is in a great measure freed by solution and crystallization. It was formerly called *purified fixed*

fossil alkaline salt, and has been used principally as a lithontriptic, under the form of the watery solution super-saturated with carbonic acid, or made into pills with soap; of which half a drachm or a drachm, are taken in the course of the day.

AQUA SUPER-CARBONATIS SODÆ. *Solution of Super-Carbonate of Soda.*

Take of

Water, ten pounds,
Carbonate of soda, two ounces.

Dissolve and expose the solution to a stream of carbonic acid gas, in the same manner as directed for the water of carbonic acid.

It is used as a lithontriptic, in the same dose as the water of super-carbonate of potash, and has generally been preferred to it, on the supposition of being more pleasant.

PHOSPHAS SODÆ. *Phosphate of Soda.*

Take of

Bones burnt to whiteness, and powdered, ten pounds,
Sulphuric acid, six pounds,
Water, nine pounds.

Mix the powder with the sulphuric acid in an earthen vessel; then add the water and mix again. Then place the vessel in a vapour bath, and digest for three days; after which dilute the mass with nine pounds more of boiling water, and strain the liquor through a strong linen cloth, pouring over it boiling water, in small quantities at a time, until the whole acid be washed out.

Set by the strained liquor, that the impurities may subside, decant the clear solution, and evaporate it to nine pounds. To this liquor, poured from the impurities, and heated in an earthen vessel, add carbonate of soda, dissolved in warm water, until the effervescence cease. Filter the neutralized liquor, and set it aside to crystallize. To the liquor that remains, after the crystals are taken out, add a little carbonate of soda, if necessary, so as to saturate exactly the phosphoric acid, and dispose the liquor by evaporation to form crystals as long as these can be produced. Lastly, the crystals are to be kept in a well closed vessel.

The white residuum of burnt bones consists chiefly of phosphate of lime. The sulphuric acid decomposes it, by combining with the lime; the phosphoric acid, which is disengaged, dissolves, however, a portion of undecomposed phosphate of lime, forming a soluble compound. When carbonate of soda is added to the acidulous liquor, obtained by washing the materials, the

soda combines with the free phosphoric acid; the neutral phosphate of lime, which was combined with that acid, is precipitated, and the phosphate of soda crystallizes on evaporation of the strained liquor. Its crystals are rhomboidal, efflorescent, and require for solution only four parts of cold water. They consist, according to Thernard, of nineteen of soda, fifteen of acid, and sixty-six of water. Its taste is purely saline, without any bitterness.

Phosphate of soda was introduced into the practice of physic by the ingenious Dr. Pearson, of London. It possesses the same medical qualities as the sulphate of soda, and the tartrate of potash and soda, being an excellent purge in the quantity of an ounce or ten drachms; and has the peculiar advantage over these two salts in being much less nauseous than they are. Its taste is extremely similar to that of common salt; and when given in a bason of water gruel, or veal broth without salt, it is scarcely perceptible by the palate, and consequently is well adapted for patients whose stomachs are delicate, and who have an antipathy against the other salts.

SULPHAS SODÆ. *Sulphate of Soda.* Glauber's Salt.

Dissolve the acidulous salt which remains after the distillation of muriatic acid, in water; and having mixed chalk with it to remove the superfluous acid, set it aside until the sediment subside; then decant the liquor, strain it through paper, and evaporate it so that it may crystallize.

In the decomposition of muriate of soda by sulphuric acid, to prepare muriatic acid, more sulphuric acid is used than is barely sufficient; and hence the necessity of saturating this excess by the addition of chalk or carbonate of lime. The neutral sulphate of soda crystallizes in hexhædral prisms; they are efflorescent and soluble in rather less than three parts of cold water. Their taste is at first salt, and afterwards disagreeably bitter. They consist, when dried, of fifty-six parts of sulphuric acid, and forty-four of soda.

Taken from half an ounce to an ounce, or more, it proves a mild and useful purgative; and in smaller doses largely diluted, a serviceable aperient and diuretic. It is commonly given in solution; but it may also be given in powder, after it has effloresced. In this form the dose must be reduced to one half.

The very disagreeable taste of cathartic salts may be in a great measure destroyed by dissolving them in hot lemonade, or by adding to the solution a little of the vegetable acid.

At the salt works in the county of Barnstable, Glauber's salt is prepared to great advantage from the bittern that remains after the crystallization of common salt. This bitter liquor is preserved in the vats; and during the cold in winter the salt is found collected in fine crystals at the bottom. This is purified by

moderately boiling in fresh water, and the salt is again crystallized in large shallow vessels. The sulphate of soda prepared at these works is equal in quality to any that is imported, and may be made abundant enough for the whole home market, and the West India Islands. It has been sold at the low price of three dollars per hundred weight; and has been exported to the East and West Indies, where it has come to a profitable market.

Like European salts, it is apt to effloresce, but if secluded from the air and light, for twelve or eighteen months, it becomes hard and permanent.

TARTRIS POTASSÆ ET SODÆ. *Tartrite of Potash and Soda.*
Rochelle Salt.

It is prepared from the carbonate of soda and super-tartrite of potash, in the same manner as the tartrite of potash.

The excess of tartarous acid in the acidulous tartrite of potash, being saturated in this preparation with soda, a triple salt is formed. It crystallizes in rhomboidal prisms. Under the name of *Rochelle salt*, it has been employed as a cathartic, in a dose of one ounce; and is often preferred, as being less disagreeable than the greater number of the saline cathartics. It consists of fifty-four parts of tartrite of potash, and forty-six of tartrite of soda.

AQUA AMMONIÆ. *Water of Ammonia.* Water of Caustic Ammonia.

Take of

Muriate of ammonia, one pound,
Lime, fresh burnt, one pound and an half.
Distilled water, one pound,
Water, nine ounces.

Pour the water on the powdered lime contained in an iron or earthen vessel, which is then to be covered up till the lime fall to powder. Then mix the muriate previously ground into very fine powder, thoroughly with the lime, by trituration together in a mortar, and immediately put the mixture into a retort of bottle glass. Put the retort in a sand bath, and connect with it a Woulfe's apparatus. In the first and smallest bottle, furnished with a tube of safety, put two ounces of the distilled water, and in the second the rest of the distilled water.

The fire is now to be kindled, and gradually increased, until the bottom of the sand pot become red. Mix the fluid contained in each of the bottles, and preserve it in small phials accurately closed.

The theory of this process is precisely the same with that directed for the preparation of the *lixivium causticum*. The lime attracts the muriatic acid of the *muriate of ammonia*, and the ammonia, or volatile salt, is disengaged, and arises in a liquid form. By itself it is incondensable, but it combines with the watery vapour, and forms an aqueous solution. To conduct the process to advantage, a series of receivers is necessary, in which water is disposed, to absorb entirely, the ammoniacal gas.

When water is perfectly saturated with ammonia, one hundred grains are found to combine with thirty-four; but, in the usual mode of preparing this solution, this perfect saturation is never effected. The solution has a strong pungent smell, a very acrimonious taste, and inflames the skin. It is used in medicine as a powerful stimulant and diaphoretic internally, in a dose of twenty drops largely diluted. Externally, it is applied to the skin as a rubefacient, and in the form of gas to the nostrils, and to the eyes as a stimulant, in cases of torpor, paralysis, rheumatism, syncope, hysteria, and chronic ophthalmia.

ALCOHOL AMMONIATUM. *Ammoniated Alcohol; or Spirit of Ammonia.*

Take of

Alcohol, thirty-two ounces,
Lime, fresh burnt, twelve ounces,
Muriate of ammonia, eight ounces,
Water, eight ounces.

From these ingredients, ammoniated alcohol is prepared, in exactly the same manner as the water of ammonia.

Though in this process carbonate of ammonia be the principal product, from the decomposition of the *muriate of ammonia*, by the carbonate of potash, yet, from the potash not being fully saturated with carbonic acid, a quantity of pure ammonia is disengaged, and combines with the alcohol. A part of the water also of the diluted alcohol distilling over, dissolves a portion of the carbonate of ammonia.

The compound has the pungent ammoniacal smell. It is used principally as the menstruum of some vegetables, with which ammonia coincides in medicinal operations.

CARBONAS AMMONIÆ. *Carbonate of Ammonia. Prepared Ammonia.*

Take of

Muriate of ammonia, one pound,
Pure soft carbonate of lime dried, two pounds.

Having triturated them separately, mix them thoroughly, and sublime from a retort into a refrigerated receiver.

This process is an example of double elective attraction. The muriatic acid of the muriate of ammonia combines with the lime of the carbonate of lime, and the carbonic acid of the latter unites with the ammonia of the former. The carbonate of ammonia which is formed, is sublimed, and is obtained in a white crystalline cake. When the process is carried on in the large way, the sublimation is generally performed from an iron pot, to which the heat is directly applied.

Carbonate of ammonia has the smell and taste of ammonia, but weaker. It is soluble in twice its weight of cold water, and is more soluble as the temperature of the water increases; but when it approaches to a boiling heat, the carbonate is volatilized. It is efflorescent when exposed to the air; and is decomposed by most of the acids.

The volatile alkali and spirit obtained from sal ammoniac are the purest of all the medicines of this kind. They are somewhat more acrimonious than those produced directly from animal substances, which always contain a portion of the oil of the subject, and receive from thence some degree of saponaceous quality.

The volatile salt and spirit prepared from hartshorn and animal bones, are now entirely superseded by those obtained from sal ammoniac, and the process for preparing them is rejected by the Edinburgh college.

Volatile alkaline salts, and their solutions called spirits, agree in many respects, with fixt alkalies and their solutions or leys: as in changing the colours of a blue flower to a green: effervescing, when in their mild state, with, and neutralizing acids; and corroding the fleshy parts so as to act as caustics. By their stimulating smell, they prove serviceable in languors and faintings. Taken internally, they stimulate, greatly promote perspiration, and act particularly on the nervous system. They prove useful in lethargic cases; in hysterical and hypochondriacal disorders, and in the languors, leadachs, flatulent colics, and other symptoms which attend them. In some fevers, particularly those of a low kind, in aged persons, and those of phlegmatic habits, and accompanied with a cough, hoarseness, &c. they are of great utility, raising the *vitalis*, and exciting a salutary diaphoresis. The dose of the salt is from five to fifteen grains, and of the spirit thirty or forty drops in cold water.

The use of the volatile ammonia has lately been attended with uncommon success in cases of the bite of venomous serpents. Mr. John Williams speaks in the most positive manner of the good effects of the volatile alkali, (spirits of hartshorn or spirit of sal ammoniac) in curing the effects of the bite of venomous snakes in the East Indies. Dr. Wright, who practised many years in Jamaica, directs forty drops of the caustic volatile alkali, as soon as possible after the accident; the dose

being repeated every five minutes, while the parts affected are continually washed with the same preparation. A remarkable instance is reported to have occurred at Savannah, in which was experienced the most decided benefit from the use of alkalies in a negro who was bitten by a venomous snake in the foot. The patient was ordered one or two tea spoonfuls of an alkaline solution every fifteen minutes, and the part affected to be kept moist with the solution. The first dose produced immediate good effects, in mitigating the excessive pain and swelling which were making rapid progress up the limb to the body; and a proper repetition of the remedy soon effected a complete cure. The efficacy of this remedy in similar alarming cases, has lately been confirmed, by a publication of Dr. Ramsey, of South Carolina.

Ammonia is well known to possess a like antiseptic quality with other alkaline salts, and is employed for similar purposes.

AQUA CARBONATIS AMMONIÆ. Solution of Carbonate of Ammonia. Water of Ammonia.

Take of

Muriate of ammonia,
Carbonate of potash, each sixteen ounces,
Water, two pounds.

Having mixed the salts and put them into a glass retort, pour the water upon them, and distil to dryness in a sand bath, gradually increasing the heat.

In this preparation of carbonate of ammonia by the humid way, carbonate of lime (chalk) could not be employed to decompose the muriate of ammonia; because the addition of the water prevents the application of the necessary heat, whereas carbonate of potash acts at a moderate temperature. The potash attracts the muriatic acid, the ammonia the carbonic acid. The carbonate of ammonia is volatilized, and dissolved by the watery vapour. The solution is applied to the same medicinal purposes as the concrete ammoniacal carbonate.

AQUA ACETITIS AMMONIÆ. Water of Acetite of Ammonia. Spirit of Mindererus.

Take of

Carbonate of ammonia in powder, any quantity.

Pour upon it as much distilled acetous acid as may be sufficient to saturate the ammonia exactly.

In this preparation, the acetous acid combines with the ammonia, and the carbonic acid is disengaged with effervescence.

The acetite of ammonia remains dissolved in the water of the acetous acid. As the strength of distilled vinegar is not always the same, that of this solution must be variable ; an inconvenience not easily obviated.

The following cheap and expeditious method of saturating the common solution obtained by dissolving sal ammoniac [carbonate of ammonia] in vinegar, with fixed air, or *carbonic acid gas*, is too valuable to be omitted.*

Take an ounce of pure sal ammoniac [carbonate of ammonia] and one pint and a half of distilled vinegar ; put the latter in a decanter, provided with a close glass stopper ; then introduce the salt, previously broken into lumps, but not too small, as by plunging it too suddenly into the liquor, the extrication of the gas would be too quick, and a quantity of it dissipated. Next, the stopper of the bottle should be tied over with a bit of leather, and the whole be left undisturbed. It would be further useful, to add on the top of the bottle some weight or pressure, by which means the combination of the carbonic acid gas with the water will be greatly facilitated. After having stood a few hours, the ammonia will be dissolved, and the carbonic acid gass will be absorbed by the liquor. By this simple process, the water of acetite of ammonia becomes strongly impregnated with fixed air, while it is almost entirely deprived of that disagreeable taste, which is peculiar to this medicine, when prepared in the usual way.

Dr. Lynam, an English practitioner, speaks from experience of the superior qualities this preparation possesses as a febrifuge ; besides the very great advantage, that it tends to keep the bowels open, even under the immediate influence of opiates. It likewise generally agrees with weak and irritable stomachs, which can retain scarcely any other medicine.

Acetite of ammonia, when assisted by a warm regimen, proves an excellent and powerful sudorific ; and as it operates without quickening the circulation or increasing the heat of the body, it is admissible in febrile and inflammatory diseases, in which the use of stimulating sudorifics is attended with danger. Its action may likewise be determined to the kidneys by walking about in a cool air. The common dose is half an ounce, either by itself, or along with other medicines adapted to the same intention.

Pure vinegar is sometimes employed instead of the distilled acetous acid in this preparation.

* Vide Rees' Cycloped. Article Ammonia.

HYDRO-SULPHURETUM AMMONIÆ. *Hydro Sulphuret of Ammonia.*

Take of

Water of ammonia, four ounces, subject it in a chemical apparatus to a stream of the gas, which arises from

Sulphuret of iron, four ounces,

Muriatic acid, eight ounces, previously diluted with two pounds and a half of water.

Sulphuret of iron is conveniently prepared for this purpose, from

Purified filings of iron, three parts,

Sublimed sulphur, one part.

Mixed and exposed to a moderate degree of heat in a covered crucible, until they unite into a mass.

The sulphureted hydrogen is produced in this process by the muriatic acid disposing the iron to decompose part of the water. The hydrogen disengaged, immediately combines with a portion of the sulphur present, and this compound escaping in the state of gas, is passed through the water of ammonia, with which it unites, and forms a liquor of a dark green colour, and very foetid odour.

Hydro sulphuret of ammonia acts powerfully on the living system. It induces vertigo, drowsiness, nausea, and vomiting, and lessens the action of the heart and arteries. It therefore seems to be a direct sedative. The principal application of it is in diabetes, with the view of reducing the morbid appetite and increased action of the stomach. It is given in a dose of from five to fifteen drops twice a-day.

MURIAS BARYTÆ. *Muriate of Baryta.*

Take of

Carbonate of baryta,

Muriatic acid, each one part,

Water, three parts.

Add the carbonate, broken into little bits, to the water and acid, previously mixed. After the effervescence has ceased, digest for an hour, strain the liquor, and set it aside to crystallize. Repeat the evaporation as long as any crystals are formed.

If the carbonate of baryta cannot be procured, the muriate may be prepared in the following manner from the sulphate.

Take of

Sulphate of baryta, two pounds,

Charcoal of wood in powder, four ounces.

Roast the sulphate with fire, that it may be more easily reduced to a very fine powder, with which the charcoal is to be inti-

mately mixed. Put the mixture into a crucible, and having fitted it with a cover, heat it with a strong fire for six hours. Then triturate the matter well, and throw it into six pounds of water, in an earthen or glass vessel, and mix them by agitation, preventing as much as possible the access of the air.

Let the vessel stand in a vapour bath until the part not dissolved shall subside, then pour off the liquor; on the undissolved part pour four pounds more of boiling water, which, after agitation and deposition, are to be added to the former liquor. Into the liquor while still warm, or if it shall have cooled, again heated, drop muriatic acid as long as it excites any effervescence. Then strain it and evaporate it so as to crystallize.

Sulphate of baryta may be decomposed by carbonate of potash by double affinity, and perhaps this is the least troublesome process; but, when done with the view to the medicinal application of the baryta, it has been supposed defective, as it does not separate the metallic substances with which the native sulphate is so frequently intermixed. The process of decomposing it, therefore, by charcoal, has been deemed preferable. The carbonaceous matter attracts the oxygen of the sulphuric acid; the sulphur remains united with the barytes. This sulphuret of barytes, as well as a portion of hydro-sulphuret formed during the solution, are soluble in water; on dropping in muriatic acid, it combines with the barytes, the sulphur is precipitated, and the sulphurated hydrogen disengaged. By straining and evaporating the liquor, the muriate of barytes is obtained crystallized. It is used under the form of solution, for which also the following formula is given.

SOLUTIO MURIATIS BARYTÆ. *Solution of Muriate of Baryta.*

Take of

Muriate of baryta, one part,
Distilled water, three parts.

Dissolve.

The saturated solution of muriate of barytes was introduced by Dr. Crawford, as a remedy in scrofula, and it has since been used in various forms of hectic fever. Its effects are to improve the appetite and general strength; sometimes it occasions diaphoresis or diuresis. Its dose is five drops, gradually increased to twenty or more. In too large a dose it occasions sickness, vertigo, tremors, and insensibility. The solution is also used externally as a stimulating and gentle escharotic application in cutaneous diseases, fungous ulcers, and specks upon the cornea.

AQUA CALCIS. *Lime Water.*

Take of

Lime recently burnt, half a pound.

Put it into an earthen vessel, and sprinkle on it four ounces of water, keeping the vessel shut, while the lime grows hot, and falls into powder. Then pour on it twelve pounds of water, and mix the lime thoroughly with the water, by agitation. After the lime has subsided, repeat the agitation ; and let this be done about ten times, always keeping the vessel shut, that the free access of the air may be prevented. Lastly, let the water be filtered through paper, placed in a funnel, with glass rods interposed between them, that the water may pass as quickly as possible.

It must be kept in very close bottles.

The caution to exclude the air in this process, arises from the supposition that the lime would combine rapidly with the carbonic acid of the atmosphere. After the solution is strained, it is at least necessary, that it should be kept in vessels well stopped. Lime is not more soluble in hot water, than in cold ; therefore it is unnecessary to use boiling water. Only a very small quantity of lime is dissolved ; about two grains to the ounce.

Lime water is transparent and colourless. It has an austere, acrid taste, and affects vegetable colours as the alkalies do. When applied to the living fibre, lime water corrugates, and shortens it ; it therefore possesses astringent powers. It is also a powerful antacid ; or, at least, it combines with and neutralizes acids when it comes in contact with them. It also dissolves mucus, and kills internal worms. From possessing these properties, it is used in medicine, in diseases supposed to arise from laxity or debility of the solids, as diarrhœa, diabetes, leucorrhœa, scrofula, and scurvy ; in affections of the stomach, accompanied with acidity and flatulence, when the intestines are loaded with mucus ; and in worms. Lime water is scarcely capable of dissolving, even out of the body, any of the substances of which urinary calculi consist ; it has therefore no pretensions to the character of a lithontriptic. It has been also recommended in crusta lactea, cancer, and chronic cutaneous diseases. Externally it is applied to ill-conditioned ulcers, gangrenous sores, as a wash in tinea capitis and psora ; and as an injection in gonorrhœa, fistulas, and ulcers of the bladder. When taken internally, its taste is said to be best covered by luke warm milk. Its dose is commonly from two to four ounces, frequently repeated ; but when long continued, it weakens the organs of digestion.

Lime water is an excellent remedy for a broken winded horse.

CARBONAS CALCIS PRÆPARATUS. *Prepared Carbonate of Lime.*

Carbonate of lime, whether the variety, commonly called chalk, or that called crab's eyes and crab's stones, after having

been triturated to powder in an iron mortar, and levigated on a porphyry stone, with a little water, is to be put into a large vessel, and water to be poured upon it; which, after agitating the vessel repeatedly, is to be again poured off, while loaded with fine powder. On allowing the water to settle, a subtile powder will subside, which is to be dried.

The coarse powder which the water could not suspend, may be levigated again, and treated in the same manner.

Carbonate of lime, formerly prepared chalk, is commonly called an absorbent earth. It certainly is an antacid, that is, it combines with and neutralizes most acids, while its carbonic acid is expelled in the form of gas. It is therefore exhibited in affections of the stomach, accompanied with acidity, especially when at the same time there is a tendency to diarrhœa. The fear of its forming concretions in the bowels, is probably imaginary; for it is not warranted either by theory or experience.

Applied externally, carbonate of lime may be considered as an absorbent in another point of view; for its beneficial action on burns and ulcers, probably arises entirely from its imbibing the moisture or ichorus matter, as a sponge would do, and thus preventing it from acting on the abraded surfaces, and excoriating the neighbouring parts.

Red coral, (*corallium rubrum*) is ordered to be prepared in the same manner, in the London Pharmacopœia; but, as it has no qualities but those of carbonate of lime, there is no necessity for retaining it in the lists of the *Materia Medica*.

SOLUTIO MURIATIS CALCIS. *Solution of Muriate of Lime.*

Take of

Hard carbonate of lime, that is white marble, broken
into pieces, nine ounces,
Muriatic acid, sixteen ounces,
Water, eight ounces.

Mix the acid with the water, and gradually add the pieces of carbonate of lime. When the effervescence has ceased, digest them for an hour; pour off the liquor and evaporate it to dryness. Dissolve the residuum in its weight and a half of water; and, lastly, filter the solution.

The muriatic acid obviously combines with the lime, and disengages the carbonic acid. Its taste is pungent, bitter and disagreeable. It is one of the most deliquescent salts that we know, and is soluble in water; that fluid seems capable of dissolving twice its weight, or at least forms with it a viscid liquid.

It was first proposed as a medicine by Fourcroy, in scrofulous and glandular diseases, and has been lately extravagantly extolled by Dr. Beddoes, in the same affections. A drachm, diluted with an ounce of water, he considers as a medium dose. In an

over dose, it has produced qualms and sickness; and three drachms and an half, killed a dog, whose stomach, upon dissection, had its villous coat blood-shot, and in many parts almost thick, and converted into a gelatinous slime.

The solution of muriate of lime, has been strongly recommended as a tonic, similar and not inferior to the muriate of barytes.

PHOSPHAS CALCIS IMPURUS. *Impure Phosphate of Lime.*

Burn pieces of hartshorn till they become perfectly white; then reduce them to a very fine powder.

In the burning of hartshorn, a strong fire, and the free admission of air are necessary. The potter's furnace was formerly directed for the sake of convenience, but any common furnace or stove will do. If the pieces of horn be laid on some lighted charcoal, spread on the bottom of the grate, they will be burnt to a whiteness, still retaining their original form.

Burnt hartshorn, from its white earthy appearance, was formerly considered as an absorbent earth. But since it has been accurately analyzed, that idea has been given up, and its use has been suggested as a remedy in the rickets, a disease, in which the deficiency of the natural deposition of phosphate of lime in the bones, seems to be the essential, or at least, most striking symptom. Mr. Bonhomme, therefore, gave it to the extent of half a scruple, mixed with phosphate of soda, in several cases, with apparent success. Whatever objection may be made to his theory, the practice certainly deserves a trial.

CARBONAS MAGNESIÆ. *Carbonate of Magnesia.* Magnesia Alba.

Take of

Sulphate of magnesia,

Carbonate of potash, equal weights.

Dissolve them separately in double their quantity of warm water, and let the liquors be strained or otherwise freed from the feces; then mix them and instantly add eight times their quantity of warm water. Let the liquor boil for a little on the fire, stirring it at the same time; then let it rest till the heat be somewhat diminished; after which strain it through linen; the carbonate of magnesia will remain upon the cloth, and it is to be washed with pure water till it become altogether void of saline taste.

In this process there is a mutual decomposition of the two salts employed. The potash unites itself to the sulphuric acid, while the carbonic acid combines with the magnesia.

The large quantity of water used, is necessary for the solution of the sulphate of potash formed; and the boiling is indispensably necessary for the expulsion of a portion of the carbonic acid, which retains a part of the magnesia in solution.

Sulphate of potash may be obtained from the liquor which passes through the filter, by evaporation. This is not pure, however, but mixed with undecomposed carbonate of potash: for one hundred parts of crystallized carbonate of potash, are sufficient for the decomposition of one hundred and twenty-five parts of sulphate of magnesia; and as the carbonate of potash of commerce contains a larger proportion of alkali than the crystallized carbonate, a still less proportion should be used. From these quantities, about forty-five parts of carbonate of magnesia are obtained. Boiling the liquor gives the carbonate of magnesia a smoothness, which it has not when this precaution is not observed.

The ablutions should be made with pure water; for nicer purposes, distilled water may be used; and soft water is in every case necessary. Hard water for this process, is peculiarly inadmissible, as the principle of water's giving the property called *hardness*, is generally owing to a salt of lime, which decomposes the carbonate of magnesia by compound affinity, giving rise to carbonate of lime, while the magnesia unites itself to the acid of the calcareous salt, by which the quantity of the carbonate is not only lessened, but is rendered impure by the admixture of the carbonate of lime. Another source of impurity, is the silica which the sub-carbonate of potash generally contains. It is most easily got rid of, by exposing the alkaline solution to the air for several days, before it is used. In proportion as it becomes saturated with the carbonic acid, the silica is precipitated and may be separated by filtration.

Carbonate of magnesia, however, is generally prepared on a large scale from the bittern, or liquor remaining after the crystallization of the muriate of soda, from sea water, which is principally a solution of muriate of magnesia: and there are some nicities of manipulation requisite to give it the lightness and smoothness, which are marks of its goodness.

The carbonate of magnesia is a very light, white, opaque substance, without smell or taste, effervescing with acids. It is not, however, saturated with carbonic acid. By decomposing sulphate of magnesia by an alkaline carbonate, without the application of heat, carbonate of magnesia is gradually deposited in transparent, brilliant crystals, and soluble in about four hundred and eighty times its weight of water. The crystallized carbonate of magnesia, consists of fifty acid, twenty-five magnesia, and twenty-five water; the sub-carbonate consists of forty-eight acid, forty magnesia, and twelve water; and the carbonate of commerce of thirty-four acid, forty-five magnesia, and twenty-one water.

Carbonate of magnesia is principally given to correct acidity of the stomach, and in these cases to act as a purgative; for so-

lutions of magnesia in all acids are bitter and purgative ; whilst those of the other earths, are more or less austere and astringent. A large dose of magnesia, if the stomach contain no acid to dissolve it, neither purges, nor produces any sensible effect ; a moderate one, if an acid be lodged there, or if acid liquors be taken after it, procures several stools ; whereas, the common absorbents, under the same circumstances, instead of loosening, bind the belly.

When the carbonate of magnesia meets with an acid in the stomach, there is extricated a considerable quantity of carbonic acid gas, which sometimes causes uneasy distention of the stomach, and the symptoms of flatulence. In such cases, therefore, magnesia is preferable to its carbonate ; but on other occasions, good effects arise from the action of the gas evolved, as in nausea and vomiting. It is given as an antacid, in a dose of, from a scruple to a drachm.

Some attempts have been made by the manufacturers of common salt, at Cape Cod, to prepare carbonate of magnesia from the bittern, which is well known to hold a quantity of the muriate of magnesia in solution, and could the artists acquire the necessary practical skill, this article might be procured at those works in a state of purity, and to an extent adequate to every demand. The due proportion of alkali to the bittern, may be ascertained by experiment. This subject having already arrested the attention of the Rev. Mr. Briggs, of Chatham, it is presumed, that through his ingenuity and chemical knowledge, an object so interesting to our country, will at some future time be effectuated.

MAGNESIA. *Magnesia.* Calcined Magnesia.

Let carbonate of magnesia, put into a crucible, be kept in a red heat for two hours ; then put it up in close stopped glass vessels.

By this process the carbonate of magnesia is freed from its acid and water ; and, according to the late Dr. Black's experiment, loses about seven twelfths of its weight. A kind of opaque, foggy vapour is observed to escape during the calcination, which is nothing else than a quantity of fine particles of magnesia, buoyed off with a stream of the disengaged gas. About the end of the operation, the magnesia exhibits a kind of luminous, or phosphorescent property, which may be considered as a pretty exact criterion of its being deprived of its acid.

It is to be kept in close vessels, because it attracts, though slowly, the carbonic acid of the atmosphere.

In medicine, it is used for the same general purposes as the carbonate. In certain affections of the stomach, accompanied with much flatulence, magnesia is preferable, both because it contains more magnesia in a given bulk, and, being deprived of its acid, it neutralizes the acid of the stomach, without any extri-

cation of gas, which is often a troublesome consequence when carbonate of magnesia is employed in these complaints.

SUPER-SULPHAS ALUMINÆ ET POTASSÆ EXSICCATUS. *Dried Super-Sulphate of Alumina and Potash.* Burnt Alum.

Melt super-sulphate of alumina and potash in an earthen or iron vessel, and keep it over the fire until it cease to boil. By this process the alum loses its water of crystallization, and becomes more active as an escharotic, for which purpose this preparation is used.

CHAPTER III.

METALLINE PREPARATIONS.

THE following metals are employed in medical practice: Silver, Quicksilver, Copper, Iron, Tin, Lead, Zinc, Antimony and Arsenic.

It has already been observed, that metals, in their pure state, do not appear to exert any action on the living system; their combinations only possess medicinal virtues.

The oxydation of metals, and the combination of their oxyds with acids, are the chemical changes which communicate to them activity. In general they are more active, in proportion as they are more highly oxydated, and are still more so when combined with acids. Oxygen is not, however, to be regarded, according to a modern hypothesis, as the source of their activity: each metal possesses powers, which, though increased or diminished according to the degree of oxydation, are peculiar to itself, and remain in all its preparations.

ANTIMONY.

SULPHURETUM ANTIMONII PRÆPARATUM. *Prepared Sulphuret of Antimony.*

Sulphuret of antimony is prepared in the same manner as carbonate of lime. [See page 269.]

OXIDUM ANTIMONII CUM SULPHURE, PER NITRATEM POTASSÆ. *Oxyd of Antimony, with Sulphur, by Nitrate of Potash.*
Crocus of Antimony.

Take of

Sulphuret of antimony,
Nitrate of potash, equal weights.

After they are separately powdered and well mixed, let them be injected into a red hot crucible; when the deflagration is over, separate the reddish metallic matter from the whitish crust; powder it, and edulcorate it by repeated washings with hot water, till the water come off insipid.

During the deflagration, the nitric acid of the nitrate of potash is decomposed; its oxygen is attracted, partly by the sulphur, and partly by the antimony. The sulphurous acid which is the principal product of the oxygenation of the sulphur, is in part dissipated, and in part combined with the potash, and forms the white crust which is directed to be removed. By the union of another portion of the oxygen with the antimony, a brown and reddish oxyd is formed. It appears also, that part of the sulphuret of antimony escapes decomposition or oxygenation, and unites with the oxyd. The preparation, therefore, is an imperfect oxyd of antimony.

As an antimonial, this preparation is so uncertain in its operation, that it is never prescribed; it is used in making some of the other preparations of this metal.

OXIDUM ANTIMONII, CUM SULPHURE, VITRIFICATUM. *Vitrified Oxyd of Antimony with Sulphur.* Glass of Antimony.

Strew sulphuret of antimony beat into a coarse powder like sand, upon a shallow unglazed earthen vessel, and apply a gentle fire underneath, that the sulphuret may be heated slowly; keeping it at the same time continually stirring, to prevent it from running into lumps. White vapours of sulphurous smell will arise from it. When they cease with the degree of heat first applied, increase the fire a little, so that the vapours may again arise; go on in the same manner, till the powder, when brought to a red heat, exhale no more vapours. Melt this powder in a crucible with an intense heat, till it assume the appearance of melted glass; then pour it out on a heated brass plate.

In the first stage of this process the greatest part of the sulphur of the sulphuret of antimony is dissipated, and the antimony is imperfectly oxydized. This oxyd is then vitrified by the more extensive heat applied. According to Thenard, it contains sixteen of oxygen to the one hundred.

This preparation is violent, and at the same time uncertain in its operation; and is not used, but in preparing some of the other antimonials.

OXIDUM ANTIMONII VITRIFICATUM, CUM CERA. *Vitrified Oxyd of Antimony with Wax.* Cerated Glass of Antimony.

Take of

Yellow wax, one part,

Vitrified oxyd of antimony with sulphur, eight parts.

Melt the wax in an iron vessel, and throw into it the powdered oxyd; roast the mixture over a gentle fire for a quarter of an

hour, continually stirring it ; then pour it out, and when cold, grind it into powder.

The glass melts in the wax with a very gentle heat. After it has been about twenty minutes on the fire, it begins to change its colour, and in ten more, comes near to that of Scottish snuff, which is a mark of its being sufficiently prepared ; the mixture loses about one ninth of its weight in the process.

The cerated glass of antimony was for some time much esteemed in dysenteries. The dose is from two or three grains, to twelve, or more, according to the age and strength of the patient. In its operation, it is both emetic and cathartic ; though it has sometimes effected a cure without occasioning any evacuation or sickness. It is now, however, much less used than formerly.

SULPHURETUM ANTIMONII PRÆCIPITATUM. *Precipitated Sulphuret of Antimony.* Golden Sulphur of Antimony.

Take of

Solution of potash, four pounds,
Water, three pounds,
Prepared sulphuret of antimony, two pounds.

Boil them in a covered iron pot, over a slow fire for three hours, adding more water if necessary, and frequently stirring the mixture with an iron spatula ; strain the liquor while warm through a double cloth, and add to it when filtered, as much diluted sulphuric acid as is necessary to precipitate the sulphuret, which must be well washed with warm water.

When the liquor, obtained by boiling the solution of potash on the sulphuret of antimony, is strained, and allowed to cool, before the sulphuric acid is added, it deposits a red coloured powder, which has been known by the name of *Kermes mineral*, and has been much esteemed in Europe, as an active preparation. When the sulphuric acid is added, it unites with the potash, and the antimonial oxyd, combined with parts of the sulphurated hydrogen and sulphur, is precipitated in the form of a light or orange coloured powder, called *sulphur auratum antimonii*.

In its action on the body, the sulphuret of antimony coincides with the kermes mineral : but on account of the larger proportion of sulphur, it must be given in somewhat larger doses ; the former not exceeding a grain, or grain and an half ; the latter to the extent of five or six grains. They have been employed principally as diaphoretics and sudorifics, but are always uncertain in their operation.

A composition of equal parts of sulphur auratum antimonii and mercurius dulcis, has been found a powerful, yet safe alterative in cutaneous disorders ; and has completed a cure, after

salivation had failed. In venereal cases, likewise, this medicine has produced excellent effects. [See *Pilulæ Plummeri*.] ✱

OXIDUM ANTIMONII CUM PHOSPHATE CALCIS. *Oxyd of Antimony with Phosphate of Lime.* Antimonial Powder.

Take of

Sulphuret of antimony in coarse powder,
Shavings of hartshorn, equal weights.

Mix, and put them into a wide red-hot iron pot, and stir the mixture constantly, until it be burnt into a matter of a gray colour, which is then to be removed from the fire, ground into powder, and put into a coated crucible. Lute to this crucible another inverted over it, and perforated in the bottom with a small hole, and apply the fire, which is to be raised gradually to a white heat, and kept in that increased state for two hours. Lastly, grind the matter, when cold, into a very fine powder.

This has been introduced into the *Pharmacopœias*, as affording a preparation, similar to the celebrated empirical remedy, *James' powder*. For the process, we are indebted to Dr. Pearson, of London. By analysis, he found the genuine powder of Dr. James, to consist of forty-three parts of phosphate of lime, and fifty seven of an oxyd of antimony, part of which was vitrified; and by the above formula he was enabled to prepare a powder, similar to it in qualities and chemical composition.

The theory of the process is sufficiently obvious. During the first stage, the animal matter of the bone is decomposed and burnt out; the sulphur of the sulphuret of antimony, is expelled, and the metal is imperfectly oxydated. In the second, the metal is more completely oxydated, partially vitrified, and perhaps brought in combination with the phosphate of lime, which is the residuum of the bones. From Mr. Chenevix's experiments, it appears, that, in this preparation, more of the oxyd of antimony is vitrified, than in the genuine James' powder.

The oxyd of antimony with phosphate of lime, (*James' powder*), is one of the best antimonials we possess. It has been long celebrated as a remedy in febrile affections. It acts as a very general evacuant, occasioning sweat, purging, and frequently vomiting; and, by this general action, appears to arrest the progress of the disease. Its dose is five or six grains, repeated every six hours, until its effects are obtained. It is better adapted to fevers of an inflammatory nature, than to those of the typhoid kind. It has been affirmed, that the preparation obtained by the above process, is neither so certain, nor so powerful in its operation, as the powder of James; eight grains of the former, being not more than equal to six of the latter. The difference, if it exist, may be owing to some peculiarity in the process, by which, perhaps, a difference of oxygenation, or of vitrification of the oxyd may

be occasioned ; or according to the opinion of Dr. Fordyce, to the intermixture of a portion of tartarized antimony in the empirical preparation.

MURIAS ANTIMONII. *Muriate of Antimony.* Butter of Antimony.

Take of

Oxyd of antimony with sulphur, by nitrate of potash,
Sulphuric acid, each one pound,
Dried muriate of soda, two pounds.

Pour the sulphuric acid into a retort, gradually adding the muriate of soda and oxyd of antimony previously mixed. Then perform the distillation in a sand bath. Expose the distilled matter for several days to the air, that it may deliquesce, and then pour the liquid part from the feces.

In this mode of forming muriate of antimony, the muriate of soda is decomposed by the sulphuric acid combining with the soda ; the muriatic acid disengaged, unites with the oxyd of antimony, and the compound is volatilized. It is at first of a soft consistence, from which it takes the name of butter of antimony, but soon attracts a sufficient quantity of humidity, to render it fluid. If water be poured upon it, it is decomposed, and a sub-muriate of antimony is precipitated.

This preparation is unfit for internal use ; externally, it has sometimes been used as a caustic. Decomposed by potash, it affords an oxyd, which has been used in preparing the tartrite of antimony.

TARTRIS ANTIMONII. *Tartrite of Antimony.* Emetic Tartar.

Take of

Oxyd of antimony with sulphur, by nitrate of potash, three parts,
Super-tartrite of potash, four parts,
Distilled water, thirty-two parts.

Boil in a glass vessel for a quarter of an hour, strain through paper, and set aside the strained liquor to crystallize.

The excess of tartarous acid in the super tartrite of potash, is capable of combining with a number of the metallic oxyds, and forming ternary compounds. With oxyd of antimony, when not too highly oxydized, it unites with facility, forming a combination of this kind, which constitutes the present preparation. As the tartarous acid is saturated, partly by potash, and partly by oxyd of antimony, it is not a pure tartrite of antimony, but a tartrite of antimony and potash. According to the analysis of it

by Thenard, it consists of thirty-eight parts of oxyd of antimony, thirty-four of tartarous acid, sixteen of potash, and eight of water.

As this is the most important of the antimonial preparations, the processes for obtaining it, have been often varied, principally, in the solution of the oxyd of antimony employed.

The vitrified oxyd is, perhaps, the most unexceptionable ; it contains, indeed, a portion of siliceous earth, which accompanies the oxyd of antimony in its combination with the tartarous acid ; and, when the liquor is considerably evaporated, gives to it a gelatinous consistence : but, before this happens, the greater part of the tartarite of antimony and potash may be procured by crystallization ; or, according to Vauquelin's method, the solution may be directly evaporated to dryness, and, on again dissolving the saline matter in water, the silex remains undissolved. The solubility of tartar emetic, has been variously stated, and appears to vary, according to the quantity of antimonial oxyd contained in it, from proper preparations.

According to Dr. Saunders, one ounce of water at 60°, dissolves fifty-two grains of the fully saturated salt, while of that generally met with, it dissolves from thirty-two to thirty-five. This affords, even a mode of judging of the strength of this preparation. It is very susceptible of decomposition, suffering it not only from alkalies, earths, acids, and a number of neutral salts, but even from vegetable infusions and decoctions ; the vegetable matter, attracting apparently part of the oxygen of the oxyd. If kept dissolved in water, it is also decomposed, from the spontaneous decomposition of the tartarous acid. Of all the preparations of antimony, this is the most certain in its operation ; and, it is almost indispensable in the practice of medicine. In doses from one to eight grains, it operates as an emetic, and sometimes as a cathartic. In smaller doses, it excites nausea, and proves a powerful diaphoretic and expectorant. As an emetic, it is chiefly given in the beginning of fevers, and febrile diseases, in chin cough ; and, in general, whenever we wish to evacuate the stomach quickly. When great debility is present, and in the advanced stages of typhoid fever, its use is improper, and even sometimes fatal. As a diaphoretic, it is given in small doses, of from an eighth to a quarter of a grain ; as an expectorant in doses still smaller.

The only proper form for exhibiting it, is in solution ; and as the intensity of its action on the body, is liable to variation, from difference in its own strength, and in the constitution of the patient, it should almost always be given in divided doses, at short intervals, if we wish to excite vomiting ; and, at longer intervals, if we only wish it to act on the skin and lungs.

PANACEA ANTIMONII. *Panacea Antimony.*

Take of

Antimony, six ounces ;
Nitro, two ounces ;
Common salt, one ounce and an half ;
Charcoal, an ounce.

Reduce them to a fine powder, and put the mixture into a red hot crucible, by half a spoonful at a time, continuing the fire a quarter of an hour after the last injection : then, either pour the matter into a cone, or let it cool in the crucible ; which, when cold, must be broken to get it out. In the bottom will be found a quantity of regulus ; above this, a compact, liver coloured substance ; and on the top, a more spongy mass : this last is to be reduced into powder,edulcorated with water, and dried ; when it appears of a fine golden colour.

This preparation is found in a former Edinburgh Pharmacopœia, and is supposed to have been the basis of the long celebrated *Lockyer's pills*. Ten grains of the powder, mixed with an ounce of white sugar candy, and made into a mass, with mucilage of gum tragacanth, may be divided into an hundred small pills ; of which, one, two, or three, taken at a time, are found to work gently by stool and vomit. The dose should be gradually increased, until the proper effect be produced. Under certain circumstances of the patient, they moderately evacuate the stomach, and in dropsical cases, they have frequently succeeded as one of the most efficacious catharics. In many cutaneous affections, the use of these pills, when duly persisted in, has been attended with the happiest effects.

SILVER.

NITRAS ARGENTI. *Nitrate of Silver.* Lunar Caustic.

Take of

Purest silver, flatted into plates, and cut in pieces,
four ounces,
Diluted nitrous acid, eight ounces,
Distilled water, four ounces.

Dissolve the silver in a phial with a gentle heat, and evaporate the solution to dryness. Then put the mass into a large crucible, and place it on the fire, which should at first be gentle, and afterward increased by degrees, till the mass flow like oil ; then pour it into iron pipes, previously heated and anointed with tallow. Lastly, let it be kept in a glass vessel well closed.

The silver, in this process, is oxydized and dissolved by the nitrous acid. By the subsequent fusion, part of the acid is expelled ; so that this is rather a sub-nitrate, than a nitrate of silver. It is a strong caustic, and possesses the advantage of being easily

applied. It is therefore, the one in most general use, for consuming fungous excrescences, callous edges, warts, strictures in urethra, and the like. It is also employed to destroy the venereal poison in chancres, before it has operated on the system. A weak solution of it may be applied as a stimulus to indolent ulcers, or injected into fistulus sores.

Notwithstanding its causticity, it has been given internally. Boerhaave, Boyle, and others, commend it highly in hydropic cases. The former assures us, that made into pills, with crumb of bread, and a little sugar, and taken on an empty stomach, (some warm water sweetened with honey, being drank immediately after) it purges gently, without griping, and brings away a large quantity of water, almost without the patient's perceiving it; that it kills worms, and cures many ulcerous disorders. He nevertheless cautions against using it too freely, or in too large a dose, and observes, that it always proves corrosive and weakens the stomach.

It has been more recently employed, and with success in epilepsy, and angina pectoris. On account of its great activity, each pill should not contain above an eighth, or one fourth of a grain.

COPPER.

AMMONIARETUM CUPRI. *Ammonia ret of Copper.* Ammoniacal Copper.

Take of

Purest sulphate of copper, two parts,
Carbonate of ammonia, three parts.

Rub them carefully together in a glass mortar, until after the effervescence have entirely ceased; they unite into a violet coloured mass, which must be wrapped up in blotting paper, and first dried on a chalk stone, and afterwards by a gentle heat. The product must be kept in a glass phial well closed.

The sulphate of copper is decomposed by the carbonate of ammonia. One portion of ammonia combines with the sulphuric acid, another portion of it unites with the oxyd of copper; and the violet coloured mass which is formed, is a mixture of the two resulting compounds: the carbonic acid is disengaged with effervescence.

This preparation has sometimes been serviceable in epilepsies, but, from its frequent want of success, and the disagreeable consequences with which its use is sometimes attended, it has not lately been much prescribed. It is employed by beginning with doses of half a grain twice a day; and increasing them gradually to as much as the stomach will bear. Dr. Cullen sometimes increased the dose to five grains.

SOLUTIO SULPHATIS CUPRI COMPOSITA. *Compound Solution of Sulphate of Copper.* Styptic Water.

Take of

Sulphate of copper,
Super-sulphate of alumina and potash, each three ounces,
Water, two pounds,
Diluted sulphuric acid, an ounce and a half.

Boil the sulphates in the water to dissolve them, and then add the acid to the liquor filtered through paper.

This is merely a combination of powerful astringents. It has been applied topically to check hæmorrhagy, and, largely diluted with water, as a wash in purulent ophthalmia.

IRON.

FERRI LIMATURA PURIFICATA. *Purified filings of Iron.*

Let a piece of pure iron be filed with a clean file, then place a sieve over the filings, and apply a magnet, so that the filings may be attracted upwards through the sieve.

The iron is in this manner obtained nearly pure, the interposition of the sieve in a great measure preventing particles of other metals, or impurities which are generally mixed with the iron filings, got from the work-shops, from being entangled in the cluster which adheres to the magnet. The scales of the oxyd of iron, which are to be found at the foot of the blacksmith's anvil, are also to be purified by the application of the magnet. For the magnet will only attract the smaller, and purer scales, and will leave those which are larger, and less pure.

OXIDUM FERRI NIGRUM PURIFICATUM. *Purified Black Oxyd of Iron.* Purified Iron Scales.

Let the scales of the oxyd of iron, which are to be found at the foot of the blacksmith's anvil, be purified by the application of a magnet. For the magnet will attract only the smaller and purer scales, and will leave those which are larger and less pure.

CARBONAS FERRI. *Carbonate of Iron.* Rust of Iron.

Moisten purified filings of iron frequently with water, that they may be converted into rust, which is to be ground into an impalpable powder.

During exposure to air and moisture, iron is oxydated, and this

oxyd is found to be combined with carbonic acid, absorbed, probably from the atmosphere.

As a chalybeate, it is more active than the pure metal, and more mild than the other saline combinations of iron. Its dose is from ten to twenty grains.

CARBONAS FERRI PRÆCIPITATUS. *Precipitated Carbonate of Iron.*

Take of

Sulphate of iron, four ounces,
Carbonate of soda, five ounces,
Water, ten pounds.

Dissolve the sulphate in the water, and add the carbonate of soda, previously dissolved, in a sufficient quantity of water, and mix them thoroughly.

Wash the carbonate of iron, which is precipitated, with warm water, and afterwards dry it.

On mixing the solutions of these salts together, there is an immediate mutual decomposition. Sulphate of soda is formed, which remains in solution, and carbonate of iron, which is precipitated of a green colour. The precipitate, when first formed, is the carbonate of black oxyd of iron, or contains the iron, in the state of black oxyd, the state in which it exists in the green sulphate of iron; but in the process of drying, it absorbs more oxygen, becomes of a red colour, and is converted into the carbonate of red oxyd of iron.

The carbonate of iron is an excellent and safe chalybeate. It may be given as a tonic, in doses of from five to thirty grains; but all chalybeates answer better in small doses frequently repeated, than in large doses. The formula of Dr. Griffiths, which has been highly celebrated as a chalybeate, is an extemporaneous preparation of this kind.

AQUA SUPER-CARBONATIS FERRI. *Solution of the Super-Carbonate of Iron.*

It is prepared in the same manner as the water of carbonic acid, by suspending in the water half an ounce of iron wire.

This is a very elegant chalybeate. The iron is in a state of black oxyd, and is dissolved by means of carbonic acid. It was first prepared by Bergman, in imitation of the natural chalybeate waters, and it forms an excellent substitute for them.

SULPHAS FERRI. *Sulphate of Iron.* Salt of Steel.

Take of

Purified filings of iron, six ounces,
Sulphuric acid, eight ounces,
Water, two pounds and a half.

Mix them, and after the effervescence ceases, digest the mixture for some time upon warm sand ; then strain the liquor through paper, and after due evaporation, set it at rest to crystallize.

The sulphuric acid, by a disposing affinity, enables the iron to attract the oxygen of the water with rapidity, and unites with the oxyd thus formed. This oxyd is at the *minimum* of oxydation, and the salt which it forms is named the green sulphate of iron, to distinguish it from the red sulphate, in which the metal is more highly oxydized. This green sulphate is prepared for the various purposes for which it is used in the arts, on a large scale, by exposing the native sulphuret of iron to air and moisture ; but it is impure : By the present process, it is obtained in a state of greater purity.

Sulphate of iron is one of the most active preparations of the metal, and is frequently employed in cachectic and chlorotic cases, for exciting the uterine discharges, strengthening the tone of the viscera, and destroying worms. Its medium dose is from three to five grains.

The common green vitriol or copperas, is sometimes substituted for this preparation ; but the former, often containing zinc or copper, is too impure for internal use.

SULPHAS FERRI EXSICCATUS. *Dried Sulphate of Iron.* Cal-
cined Vitriol.

Take of

Sulphate of iron, any quantity.

Expose it to the action of a moderate heat in an unglazed earthen vessel, until it become white and perfectly dry. The heat applied here must not be so great as to decompose the sulphate of iron, but only to deprive it of its water of crystallization.

This is merely the sulphate of iron, freed from its water of crystallization. It was never medicinally employed, and has a place in the Pharmacopœia, only from being employed in one or two pharmaceutical preparations.

OXIDUM FERRI RUBRUM. *Red Oxyd of Iron.* Colcothar of Vitriol.

Expose dried sulphate of iron to an intense heat, until it be converted into a very red matter.

By an intense heat, sulphate of iron is decomposed ; its acid is partly expelled, and in part suffers decomposition. The red oxyd is the residuum. It is scarcely medicinally employed, but is used in some pharmaceutical preparations.

MURIAS AMMONIÆ ET FERRI. *Muriate of Ammonia and Iron.* Martial Flowers.

Take of

Red oxyd of iron, washed and again dried,
Muriate of ammonia, equal weights.

Mix them thoroughly and sublime.

Oxyd of iron decomposes muriate of ammonia, by attracting the muriatic acid, and, in the present process, this decomposition takes place. But, from the proportion of the substances employed, part of the muriate of ammonia escapes decomposition ; it is sublimed by the heat applied, and elevates along with it, part of the muriate of iron, that had been formed. The process, therefore, is rather an unscientific mode of obtaining a muriate of iron : the preparation too, has been found uncertain in strength, more or less of the muriate of iron being sublimed, according to the heat applied ; and, accordingly, it has now fallen into disuse. It has been found serviceable in hysterical and hypochondriacal cases, and in distempers proceeding from a laxity and weakness of the solids ; as the rickets. From two or three, to ten grains, may be conveniently taken in the form of bolus.

QUICKSILVER.

HYDRARGYRUS PURIFICATUS. *Purified Quicksilver.*

Take of

Quicksilver, four parts,
Purified filings of iron, one part.

Rub them together, and distil from an iron vessel.

Quicksilver is sometimes adulterated with other metals. To obtain it perfectly pure, is the design of this process. The addition of the iron filings renders the distilled quicksilver more bright and mobile, an effect not perfectly explained, but ascribed

to the iron retaining combined with it any foreign metal, or any portion of carbon that might have been contained in the quicksilver.

ACETIS HYDRARGYRI. *Acetite of Quicksilver.*

Take of

Purified quicksilver, three ounces,
Diluted nitrous acid, four ounces and a half, or a
little more than may be required for dissolving the
quicksilver,
Acetite of potash, three ounces,
Boiling water, eight pounds.

Mix the quicksilver with the diluted nitrous acid, and after the effervescence has ceased, digest if necessary with a gentle heat, until the quicksilver be entirely dissolved. Then dissolve the acetite of potash in the boiling water, and immediately to this solution, still hot, add the former, and mix them by agitation. Then set the mixture aside to crystallize. Place the crystals in a funnel, and wash them with cold distilled water; and, lastly, dry them with as gentle a heat as possible.

In preparing the acetite of quicksilver, it is important that all the vessels and tunnels employed, be of glass.

For making the acetite of mercury, the nitrate is prepared with a very gentle heat; and with excess of acid, that it may be retained in perfect solution, and that there may be no possibility of any admixture of subnitrate with the acetite formed. A larger proportion of acid is used by the Edinburgh College, than by the other Colleges; but we believe it to be unnecessary. In mixing the solutions, we must be careful to pour the mercurial solution into the acetite of potash, because by adopting the contrary procedure, subnitrate of mercury will be precipitated undecomposed, if any of it be contained in mercurial solution.

For dissolving the acetite of potash, the London and Dublin Colleges only use as much water as is capable of retaining the nitrate of potash in solution: the acetite of mercury is therefore precipitated, and is purified by again dissolving it in boiling water and crystallizing it. This part of the process is simplified by the Edinburgh College, who use as much water for dissolving the acetite of potash, as is capable of retaining, as long as it is hot, the acetite of mercury in solution, and of allowing it to crystallize as it cools. In this way, therefore, it is procured at once sufficiently pure.

The exsiccation of the acetite of mercury, is an operation of great delicacy; for it is so spongy, that it retains the moisture with great obstinacy; and it is decomposed so easily, that heat can scarcely be employed. It is best dried, by compressing it between several folds of bibulous paper.

Acetite of mercury is scarcely soluble in cold water, but dissolves very readily in boiling water.

As an anti-syphilitic remedy, it is very mild in its operation; but its effects are not considered as sufficiently permanent, to warrant its effecting a radical cure; although it was the active ingredient of the celebrated Keyser's pills. Its dose is a grain, night and morning. In solution, it has also been recommended externally, to remove freckles and cutaneous eruptions.

MURIAS HYDRARGYRI. *Muriate of Quicksilver.* Corrosive Sublimate.

Take of

Purified quicksilver, two pounds,
Sulphuric acid, two pounds and a half,
Dried muriate of soda, four pounds.

Boil the quicksilver with the sulphuric acid in a glass vessel, placed in a sand bath, until the matter be dried. Mix the matter when cold, in a glass vessel, with the muriate of soda, then sublime in a glass cucurbit, with a heat gradually increased. Lastly, separate the sublimed matter from the scoriæ.

In the first stage of this process, the sulphuric acid oxydizes the mercury, and combines with the oxyd; and, by the heat applied, the salt thus formed is that which contains the metal in a high state of oxydizement. This salt, in its dry state, is mixed with muriate of soda, and, by the application of heat, a double decomposition is effected; the soda attracts the sulphuric acid, and the muriatic acid combines with the oxyd of mercury. The muriate of mercury being easily volatilized, is separated from the sulphate of soda by sublimation.

According to the analysis of muriate of mercury, by Mr. Chenevix, it consists of eighty-two of oxyd of mercury, (this oxyd being composed of eighty-five of mercury and fifteen of oxygen,) and eighteen of muriatic acid; or, its ultimate constituents are—quicksilver, 69.7, oxygen 12.3, and muriatic acid, 18. It is soluble, both in water, and in alcohol. Its taste is acrid and metallic. It turns several vegetable colours to a green; is decomposed by the alkalies and earths, and by a number of compound salts, and likewise by vegetable infusions.

Muriate of mercury is one of the most violent poisons with which we are acquainted. Externally it acts as an escharotic or a caustic; and in solution, it is used for destroying fungous flesh, and for removing herpetic eruptions; but even externally, it must be used with very great caution. It has, however, been recommended to be given internally, by the respectable authorities of Boerhaave and Van Swieten; and it is the active ingredient of all the empirical anti-venereal syrups. Were it really capable of curing the venereal disease; or equal in efficacy to

the common modes of administering mercury, it would possess many advantages over them in other respects : But, that it cannot be depended upon, is almost demonstrated by its use as an anti-venereal, being very much confined to the quacks ; and by the testimony of the most experienced practitioners. Mr. Pearson says, that it will sometimes cure the primary symptoms of syphilis, especially if it produce considerable soreness of the gums, and the common effects of mercury ; but that it will often fail in removing chancre ; and where it has removed it, that the most steady perseverance will not secure the patient from a constitutional affection. It is on some occasions, however, a useful auxiliary to a mercurial course, in quickly bringing the system under the influence of mercury, and in supporting its action after the use of frictions, and is peculiarly efficacious in relieving venereal pains, in healing ulcers of the throat, and in promoting the desquamation of eruptions. It is given in the form of solution, in water or alcohol, the dose being increased from the sixth to the fourth of a grain, night and morning, mucilaginous diluents being taken freely, with the occasional use of opium. As the solution has a very disagreeable taste, it is sometimes made into pills, with crumb of bread.

Externally, its solution is employed as an escharotic, in chancre and venereal ulcers of the mouth ; and a very dilute solution of it has been used as an injection, to excite inflammation in obstinate gleans.

SUB-MURIAS HYDRARGYRI. *Sub-Muriate of Quicksilver.*
Calomel.

Take of

Muriate of quicksilver, ground to powder in a glass mortar, four ounces,
Purified quicksilver, three ounces.

Rub them together in a glass mortar, with a little water, to prevent the acrid powder from rising, until the quicksilver be extinguished ; and having put the powder, after being dried, into an oblong phial, of which it fills one third, sublime from warm sand. After the sublimation is finished, having broken the phial, throw away both the red matter found near the bottom of the phial, and the white matter near its neck, and sublime the rest of the mass. Grind this into a very minute powder, which is, lastly, to be washed with boiling distilled water.

In this process, the directions for performing which are sufficiently explicit, an additional quantity of quicksilver is brought into chemical union with the constituent principle of muriate of mercury. In that compound, the metal is highly oxydized, and the oxyd is combined with a considerable quantity of muriatic acid. In converting it into the sub-muriate of mercury, as it is

named, the portion of metal which is added attracts part of the oxygen of the oxyd, and the whole becomes an oxyd of mercury with a comparatively small portion of oxygen ; and this oxyd, requiring less muriatic acid for its saturation than the one more highly oxydated, finds a sufficient quantity in the pre-existing muriate. The one is merely imperfect oxyd of mercury combined with muriatic acid ; the other perfect oxyd of mercury united to the same acid, the latter at the same time containing more acid in its composition than the former. Mr. Chenevix's analysis, has fixed the proportions with accuracy.

Those of the muriate, as it has been named, have been already stated ; those of the submuriate are, muriatic acid, 11.5, oxyd of mercury, 88.5, [this oxyd being composed of quicksilver, 89.3, and oxygen 10.7 ;] so that the ultimate constituent parts of sub-muriate of mercury are, quicksilver, 79, oxygen, 9.5, and muriatic acid, 11.5.

The names which have been chosen to distinguish these two muriates of mercury, are not, in the opinion of Mr. Murray, the best that might have been selected. In a chemical point of view, the prefixing the syllable sub, to denote the one, is incorrect, since the use of that syllable is restricted to those salts, in which the case is the same, but when there is a deficiency of acid ; and, in the muriate to which it is here applied, the case is not the same, and there is no deficiency of acid, the metallic oxyd being saturated, or combined with as much as it is disposed to unite with. As a medical nomenclature, the adoption of it is still more to be regretted, as the merely prefixing the syllable to the same name is insufficient to guard effectually against the dangerous mistake of confounding preparations which differ so widely in their powers.

The epithets *corrosive* and *mild*, have long been made use of, to discriminate them ; they do so more clearly, and, as systematic names, they are preferable, as according with the established nomenclature of the metallic salts, which draws the distinctions between the salts formed from the different oxyds of the same metal, united with one acid, from some quality in which they differ. The one preparation ought to have been named *urias hydrargyri corrosivus* ; the other, *urias hydrargyri mitis*.

This preparation of mercury, differs from the former, in being perfectly insipid, and insoluble in water or in alcohol. By sublimation it may be obtained in small, short prisms, but it is usually in the form of a mass, somewhat ductile, semi-transparent, and very heavy. It is decomposed by the alkalies, earths, and various compound salts.

Sub-muriate, or mild muriate of mercury, is one of the most useful preparations of the metal. By proper management, it may be made to increase, in a remarkable manner, almost any of the secretions, or excretions. As an anti-venereal, it is given in the dose of a grain, night and morning ; or in larger doses, its

usual determination to the intestines being prevented, if necessary, by opium. Thus directed, this preparation is capable of curing syphilis in every form. It is the preparation, which is, perhaps, most usually given in the other diseases in which mercury is employed, as in affections of the liver, or neighbouring organs, in cutaneous diseases, chronic rheumatism, tetanus, hydrophobia, hydrocephalus, and febrile affections, especially those of warm climates. It is employed as a cathartic alone, or to promote the operation of other purgatives. With jalap it forms the favorite cathartic of Dr. Rush, in bilious and in yellow fevers; with rhubarb, it is highly extolled by sir John Pringle, in dysentery. Its anthelmintic power is justly celebrated; and it is perhaps superior to the other mercurials, in assisting the operation of diuretics in dropsy. Combined with diuretics, it proves diuretic; and with sudorifics, sudorific. It also produces very salutary effects in obstructions, and chronic inflammations of the viscera, especially of the liver; and in general, either with or without opium, it is applicable to every case, in which mercurials are indicated. Combined in the proportion of one part of opium to four of calomel, it is administered with very great success in almost every form of active inflammation. As a vermifuge, says a late writer,* "repeated experience has convinced me, that no remedy is so safe, so mild, or so certain, as *calomel*. Procure the medicine from an apothecary of character, give it in the dose suited to the age and constitution of the child, and keep him warm during the operation, avoiding cold and sour drinks, for two or three days, and no danger can ever attend the use of the remedy. Rhubarb or jalap may be mixed with the calomel to quicken the operation. A nausea, which sometimes comes on during the operation, may be relieved by mint water; and an unnecessary purging may be restrained by two or three drops of *laudanum*. A child, between the ages of two and four years, in general, may take from one to three grains at a dose in syrup." From its great specific gravity, it ought always to be given in the form of bolus or pill.

In *cholera infantum*, its superior efficacy is confirmed by ample experience, as appears by an excellent dissertation upon that disease, by Dr. James Mann, which gained the Boylstonian prize for the year 1803.

As a cathartic, its dose for an adult may be from five to ten or twenty grains or more. Calomel within a few years, has been extensively used as a medicine. It should never be trifled with; and, during its exhibition, confinement to an equable temperature in a room, is indispensable. The best way to give it, is in small doses regularly, so that the effects may be gradually exerted on the system; and the impression once made, should be carefully kept up as long as is necessary, to prevent much loss of time. The last disease in which mercury has been

* Dr. James Mease.

used with success, is consumption: and several cases of its happy exhibition are related by Dr. Rush, in the *Medical Repository*, vol. 5.

One grain of calomel mixed with sugar, and snuffed up the nostrils, is recommended as a powerful errhine in amaurosis. The same mixture is blown into the eye to remove specs from the cornea.

The general use of that excellent medicine *calomel*, says the judicious writer above referred to, renders its perfect preparation a matter of great importance.

The following method to determine its purity is given by an able chemist, Mr. Frederick Accum.

“Calomel ought to be perfectly saturated with mercury. Complete saturation can only be known, by boiling for a few minutes, one part of calomel and one twelfth part muriate of ammonia in ten parts of distilled water. The fluid must then be filtrated and examined by means of carbonate of potash. If the calomel be well prepared, no change will take place on the addition of this re-agent; but, if the preparation be imperfect, a precipitate will ensue, forty-seven parts of which indicate forty-eight of muriatic acid. One hundred and fourteen parts of calomel perfectly saturated with mercury contain ninety-seven of metal, and nineteen of acid. It should be perfectly inodorous and tasteless, and when rubbed in a stone mortar with ammoniac, become intensely black.” [James Mease, M. D. editor of *Dom. Encyclop.* See that work, vol. 4.]

SUB-MURIAS HYDRARGYRI PRÆCIPITATUS. *Precipitated Sub-Muriate of Quicksilver. Calomel.*

Take of

Diluted nitrous acid,
Purified quicksilver, each eight ounces,
Muriate of soda, four ounces and a half,
Boiling water, eight pounds.

Mix the quicksilver with the diluted nitrous acid, and towards the end of the effervescence digest with a gentle heat, frequently shaking the vessel in the mean time. But it is necessary to add more quicksilver to the acid than it is capable of dissolving, that a perfectly saturated solution may be obtained.

Dissolve at the same time, the muriate of soda in the boiling water, and into this solution pour the other, while still hot, and mix them quickly by agitation. Pour off the saline liquor after the precipitate has subsided, and wash the sub-muriate of quicksilver by repeated affusions of boiling water, which is to be poured off each time after the deposition of the sub-muriate, until the water come off tasteless.

Mild muriate of mercury is in this process obtained by a double elective attraction. On mixing together the solutions of nitrate of mercury and muriate of soda, the nitric acid is attracted by the soda, and the muriatic acid by the oxyd of mercury. In order that the mild, and not the corrosive muriate should be formed, it is evident, that the mercury in the nitrous acid should be in its least oxydated state. Mild muriate of mercury, prepared in this mode, is precisely the same in its chemical composition, as when formed by the former process of sublimation. It has been supposed, however, that it differs somewhat in its operation, and that in particular it is more liable to purging. If such difference ever existed, it is probably owing to the presence of the subnitrate of mercury, which, when the usual directions are observed, may be mixed with the mild muriate. If the latter be pure, its operation must be the same as that of the muriate prepared by sublimation, as it differs from it only in being of a much finer powder than the other can be reduced to, and this has been supposed to give it some superiority.

SUB-MURIAS HYDRARGYRI ET AMMONIÆ. *Sub-Muriate of Quicksilver and Ammonia.* White Precipitate of Mercury.

Take of

Muriate of quicksilver,

Muriate of ammonia,

Solution of carbonate of potash, each half a pound.

Dissolve first the muriate of ammonia, afterwards the muriate of quicksilver, in distilled water, and add to these the solution of carbonate of potash. Filtrate and wash the powder until it become insipid.

The theory of this process is somewhat complicated. The potash decomposes the muriate of ammonia, by combining with the muriatic acid; and the disengaged ammonia decomposes the muriate of mercury. Hence, if ammonia be added to a solution of corrosive muriate of mercury, the same preparation is obtained as by this process. The action of the ammonia in decomposing the corrosive muriate of mercury, is also somewhat peculiar. It does not merely attract the muriatic acid, and separate the pure mercurial oxyd, but this oxyd retains combined with it a portion both of the ammonia and acid. It is, therefore, a triple compound, consisting, (according to Fourcroy's analysis of it by decomposing it by heat,) of eighty-one parts of oxyd of mercury, sixteen of muriatic acid, and three of ammonia.

This preparation, sub-murias hydrargyri et ammoniæ, formerly known by the name of *white precipitate of mercury*, is used, only externally in the form of ointment, as an application in some cutaneous affections.

OXIDUM HYDRARGYRI CINEREUM. *Ash-coloured Oxyd of Quicksilver.* Ash-coloured powder of Mercury.

Take of

Purified quicksilver, four parts,
Diluted nitrous acid, five parts,
Distilled water, fifteen parts,
Solution of carbonate of ammonia, a sufficient quantity.

Dissolve the quicksilver in the nitrous acid ; then gradually add the distilled water, and pour into the mixture as much water of the carbonate of ammonia as shall be sufficient to precipitate the whole of the oxyd of quicksilver ; which is then to be washed with pure water and dried.

In this process, the nitric acid oxydizes the mercury, and combines with the oxyd. The action of ammonia on the nitrate of mercury, is peculiar : it does not merely decompose it by combining with the acid, and separating the oxyd, but it exerts a farther action on the oxyd, partially deoxydizing it, by part of its hydrogen attracting a part of the oxygen. The oxyd precipitated, therefore, is that in which the metal is combined with the least proportion of oxygen.

In order, however, that this may be the nature of the precipitate, it is necessary that the solution of the mercury in the nitric acid should have been made in the cold, and with a diluted acid. When, from these circumstances not having been attended to, the mercury has been too highly oxydized, ammonia throws down from the solution a white precipitate ; and the present preparation is often met with, of a light gray colour, from the intermixture of this precipitate, with the dark coloured oxyd. When properly prepared, it is of a dark blue colour.

Ash-coloured oxyd of mercury, is very similar in its operation, to the preparations in which quicksilver is oxydized by trituration. It is given as an anti-venereal, in a dose of one grain night and morning, generally in the form of pill.

OXIDUM HYDRARGYRI RUBRUM, PER ACIDUM NITRICUM. *Red Oxyd of Quicksilver, by Nitric Acid.* Red precipitated Mercury.

Take of

Purified quicksilver, one pound,
Diluted nitrous acid, sixteen ounces.

Dissolve the quicksilver, and evaporate the solution, with a gentle heat, to a dry white mass ; which, after being ground into powder, is to be put into a glass cucurbit, and to have a thick glass plate laid upon its surface. Then, having adapted a capital,

and placed the vessel in a sand bath, apply a gradually increased heat, until the matter be converted into very red scales.

The quicksilver is in this preparation first oxydized by the nitrous acid, and then combined with a portion of it. By the increase of heat, this nitrate is decomposed, and the greater part of the acid expelled : it is doubtful, however, if it be ever wholly expelled, so as to leave a pure oxyd, the preparation being different in appearance from the red oxyd, obtained by the heat, and being always much more acrid. It is too much so for internal use. It is principally used externally, as an escharotic.

SUB-SULPHAS HYDRARGYRI FLAVUS. *Yellow Sub-Sulphate of Quicksilver.* Turpeth Mineral.

Take of

Purified quicksilver, four ounces,
Sulphuric acid, six ounces.

Put them into a glass cucurbit, and boil them in a sand bath to dryness. Throw into boiling water the white matter, which is left in the bottom, after having reduced it to powder. A yellow powder will immediately be produced, which must be frequently washed with warm water.

The quicksilver is first oxydized by the sulphuric acid, and afterwards combined with it, forming super-sulphate of mercury, by the continuance of the heat, this is partially decomposed, and a sub-sulphate of mercury remains. On this, boiling water is poured ; a portion of sulphate of mercury still present in the saline matter is dissolved ; and the yellow powder which remains is an oxyd of mercury, with a small quantity of sulphuric acid combined with it.

It is a strong emetic, and with this intention, operates more powerfully than any of the mercurials which can be safely given internally. Its action, however, is not confined to the primæ viæ ; it will sometimes excite a salivation if a purgative be not taken soon after it. This medicine is chiefly used in virulent gonorrhœas, and other venereal cases, when there is a great flux of humors to the parts. Its chief use at present is in swellings of the testicle from a general affection ; and it seems not only to act as a mercurial, but also, by the vomiting it occasions, to perform the office of a discutient, by accelerating the motion of the blood in the parts affected.

It is said, likewise, to have been employed with success, in robust constitutions, against leprous disorders, and obstinate glandular obstructions ; the dose is from two to six or eight grains. It may be given in doses of a grain or two, as an alterative and diaphoretic. It is a violent errhine, and has been employed as such, mixed with any mild vegetable powder.

On the whole, however, Dr. Duncan considers it as a superfluous preparation, whose place may be more securely supplied by other mercurials, or emetics.

SULPHURETUM HYDRARGYRI NIGRUM. *Black Sulphuret of Quicksilver.* Æthiops Mineral.

Take of

Purified quicksilver,
Sublimed sulphur, each equal weights.

Grind them together in a glass mortar, with a glass pestle, till the globules of quicksilver totally disappear.

It is also prepared with twice the quantity of quicksilver.

By this trituration, a chemical combination appears to be effected between the quicksilver and sulphur, and perhaps the metal is at the same time imperfectly oxydized. It is in the form of a very black powder.

This is, perhaps, the most inactive of the mercurial preparations. It is principally used as an alterative in glandular affections, and in cutaneous diseases. As an anthelmintic, it is sometimes given in a dose of five or ten grains, according to the age. But even in doses of several drachms, continued for a considerable length of time, it has scarcely produced any sensible effect.

SULPHURETUM HYDRARGYRI RUBRUM. *Red Sulphuret of Quicksilver.* Factitious Cinnabar.

Take of

Purified quicksilver, forty ounces,
Sublimed sulphur, eight ounces.

Mix the quicksilver with the melted sulphur, and if the mixture take fire, extinguish it by covering the vessel; afterwards reduce the mass to powder, and sublime it.

In this preparation it was conceived, that, during the inflammation of the materials, the quicksilver was oxydized, and, that therefore the resulting compound was a combination of sulphur and oxyd of mercury. The extrication of heat and light, which arises from the mutual action of the ingredients, appears, however, not to be an example of oxygenation, but, to be rather of the same kind, as that which takes place from the combination of different metals with sulphur; and, according to the analysis of Proust, cinnabar consists of sulphur with metallic mercury, in the proportion of fifteen of the former, to eighty-five of the latter.

Red sulphuret of quicksilver is sometimes used in fumigations, against venereal ulcers in the nose, mouth, and throat. Half a drachm of it burnt, the fume being imbibed with the breath, has occasioned a violent salivation. This effect is by no means owing to the medicine as a sulphuret; for, when set on fire, it is no

longer such, but mercury dissolved into vapour, and blended with sulphurous acid gas; in which circumstances, this mineral has a very powerful effect.

Mr. Pearson, from his experiments on mercurial fumigation, concludes, that where checking the progress of the disease suddenly, is an object of great moment, and where the body is covered with ulcers, or large and numerous eruptions, and in general, to ulcers, fungi, and excrescences, the vapour of mercury is an application of great efficacy and utility; but, that it is apt to induce a ptyalism rapidly, and great consequent debility; and, that for the purpose of securing the constitution against a relapse, as great a quantity of mercury must be introduced into the system by inunction, as if no fumigation had been employed.

LEAD.

ACETIS PLUMBI. *Acetite of Lead.* Sugar of Lead.

Take of

White oxyd of lead, any quantity; put it into a cucurbit, and pour upon it of

Distilled acetous acid, ten times its weight.

Let the mixture stand upon warm sand till the acid become sweet; when it is to be poured off, and fresh acid added until it cease to become sweet. Then evaporate all the liquor, freed from impurities, in a glass vessel, to the consistence of thin honey, and set it aside in a cold place, that the crystals may be formed, which are to be dried in the shade. The remaining liquor is again to be evaporated, that new crystals may be formed; and the evaporation is to be repeated until no more crystals concrete.

The oxyd of lead is in this preparation combined with acetous acid; the salt formed concretes in acicular crystals. The process is generally carried on on a large scale, to furnish it for various purposes in the arts.

Like the other preparations of lead, this is a violent poison. It has been used internally however, as a styptic, in profuse menorrhagia, in a dose of half a grain repeated every half hour. But its employment requires much caution. The internal use of acetite of lead, says Dr. Duncan, notwithstanding the encomiums some have been rash enough to bestow upon it, is entirely to be rejected. It forms, however, a valuable external application, in superficial and phlegmonic inflammations, bruises, and diseases of the skin. It is always applied in solution, either simply, as to the eyes, or by means of cloths soaked in it, or mixed with bread crumb. A drachm, with five ounces of any distilled water, forms a strong solution, and with ten ounces of water, a weak solution. If common water be used, the addition of about a drachm of acetous acid will be necessary to keep the lead in solution. It is

frequently employed as an injection in gonorrhœa, and a collyrium in ophthalmia. Lately, acetite of lead has been exhibited internally with satisfactory success, in obstinate cases of diarrhœa; Dr. John Archer, jun. of Maryland, and some others speak of it in terms of great praise. Professor Rush has made some successful trials of this medicine in the epelipsy of children, and it has been exhibited with advantage in hysteria and chorea. The dose for adults is from one to three or four grains, and for children, from one quarter to one grain, according to the strength and exigency of the case. [See Med. Repos. vol. 3.]

AQUA LITHARGYRI ACETATI. *Water of Acetated Litharge.*
Extract of Lead.

Take of

Litharge, one pound,
Strong vinegar, two pints.

Put them together into a glazed earthen pepkin, and let them boil, or rather simmer, for an hour, or an hour and a quarter, taking care to stir them all the while, with a wooden spatula. After the whole has stood to settle, pour off the liquor, which is upon the top, into bottles for use.

This is the original preparation of Goulard, a French surgeon, who many years since introduced it into practice under the name of *extract of saturn*; one hundred drops of which, with four teaspoonfuls of brandy, mixed with a quart of water, form his famous *vegeto-mineral water*. The proportion of the extract may be increased or diminished, according to the nature of the disorder, or the greater or less degree of sensibility of the part affected. In his treatise on the virtues of lead, the author has bestowed on this preparation high commendation, as a remedy in various external diseases, such as inflammations, burns, bruises, strains, and ulcers. He likewise prepares with his extract, a number of other compositions, as cataplasms, plasters, ointments, cerates, &c. which he affirms are happily adapted to the indications, in phlegmon, scirrhus and indolent tumors, and in ankylosis, and other rigid states of the joints and tendons. Every purpose, however, to be answered by these, may probably be obtained from the employment of the other preparations of lead in common use. Goulard's extract may be considered as analogous to a solution of acetite of lead in water, with an excess of acid, and must be always variable in strength. It is applied to the same external purposes as the acetite of lead, but from long experience we are disposed to admit its superior utility in many particulars.

ZINC.

OXIDUM ZINCI. *Oxyd of Zinc.* Flowers of Zinc.

Let a large crucible be placed in a furnace filled with live coals, so as to be somewhat inclined towards its mouth; and when the bottom of the crucible is moderately red, throw into it a small piece of zinc, about the weight of a drachm. The zinc soon inflames, and it is at the same time converted into white flakes, which are from time to time to be removed from the surface of the metal with an iron spatula, that the combustion may be more complete; and at last, when the zinc ceases to flame, the oxyd of zinc is to be taken out of the crucible. Having put in another piece of zinc, the operation is to be repeated, and may be repeated as often as is necessary. Lastly, the oxyd of zinc is to be prepared in the same way as the carbonate of lime.

Zinc is the most inflammable of the metals. At the temperature of ignition, it attracts the oxygen of the atmospheric air, and burns vividly. The product is a white oxyd, insipid, insoluble, and infusible.

White oxyd of zinc is applied externally, as a detergent, and exsiccant remedy. With twice its weight of axunge, it forms an excellent application to deep chops, or excoriated nipples. But, besides being applied externally, it has also of late been used internally. In doses from one, to seven or eight grains, it has been much celebrated in the cure of epilepsy, and several spasmodic affections; and there are sufficient testimonies of their good effects, where tonic remedies in those cases are proper.

CARBONAS ZINCI IMPURUS PRÆPARATUS. *Prepared Impure Carbonate of Zinc.* Prepared Calamine.

The impure carbonate of zinc, after being roasted by those who make brass, is prepared in the same way as carbonate of lime.

Calamine is an ore of zinc, in which, sometimes the metal is merely oxydized, and in other varieties combined with carbonic acid. It is used as an application to superficial inflammation, dusted on the part, and as the basis of the common healing cerate. For these purposes, it ought to be very finely levigated.

OXIDUM ZINCI IMPURUM PRÆPARATUM. *Prepared Impure Oxyd of Zinc.* Prepared Tutty.

This is prepared in the same manner as carbonate of lime.

Tutty is a substance of which the origin is doubtful, but it appears to be artificial, and to consist chiefly of oxyd of zinc with argillaceous earth. It is used externally for the same purposes as calamine; and hence requires to be very finely levigated.

SULPHAS ZINCI. *Sulphate of Zinc.* White Vitriol.

Take of

Zinc, cut into small pieces, three ounces,
Sulphuric acid, five ounces,
Water, twenty ounces.

Mix them, and when the effervescence is finished, digest the mixture for a little while on hot sand; then strain the decanted liquor through paper, and after proper evaporation, set it apart, that it may crystallize.

The sulphuric acid, by a disposing affinity, enables the zinc to oxydize itself by decomposing the water, and then combines with the oxyd. The salt is obtained in acicular crystals. The process, however, is scarcely ever performed in the shops, the sulphate of zinc being prepared on a large scale, from certain varieties of the native sulphuret of the metal. As the crystallization of it is difficult, it is always in the form of hard white masses. The London Pharmacopœia orders this salt to be purified, by dissolving it in water, adding a small portion of sulphuric acid, and crystallizing.

Sulphate of zinc in doses of from ten grains to half a drachm, operates almost instantly as an emetic, and is at the same time perfectly safe. It is therefore given, when immediate vomiting is required, as in cases when poison has been swallowed. By administering it internally, in small doses, it acts as a good tonic, and some physicians in the southern states employ it to cure intermittent fevers, which it frequently does even after the bark has been given without success. Dose for adults from two to five grains, for children in proportion. Dr. Mosely, of Jamaica, states that, in chronic dysentery unattended with fever, there is not a more efficacious remedy than the following solution, taken every morning, and an opiate at bed time. Take
* sulphate of zinc three drachms, alumen two drachms, spirit lavender half an ounce, boiling water one pint. Dose for adult from four to six drachms on an empty stomach without diluting it, in some cases to be repeated every six hours. When evacuations are required, the quantity of alum may be diminished, or entirely omitted; and when astringency is required, the alum increased, and the sulphate of zinc diminished. Externally this medicine is used as a styptic application to stop hæmorrhagies, diminish increased discharges, as gonorrhœa; and to cure the external inflammations arising from debility and relaxation of the blood vessels, as in some cases of ophthalmia.

$$\frac{1}{8} = 22\frac{1}{2} \text{ grs}$$

$$30$$

$$\frac{1}{8} 5''$$

SOLUTIO ACETITIS ZINCI. *Solution of Acetite of Zinc.*

Take of

Sulphate of zinc, a drachm,
Distilled water, ten ounces.

Dissolve.

Take of

Acetite of lead, four scruples,
Distilled water, ten ounces.

Dissolve.

Mix the solutions ; let them stand at rest a little, and then filter the liquor.

The sulphuric acid of the sulphate of zinc, is attracted by the oxyd of lead ; the acetous acid of the acetite of lead, by the oxyd of zinc ; the sulphate of lead, being insoluble, is precipitated ; the acetite of zinc remains in solution.

This solution is used as an injection in gonorrhœa ; it is considered as more astringent than the acetite of lead, and less irritating than the sulphate of zinc.

CHAPTER IV.

ETHER, AND ETHERIAL SPIRITS.

ÆTHER SULPHURICUS. *Sulphuric Ether.* Vitriolic Ether.

Take of

Sulphuric acid,
Alcohol, each thirty-two ounces.

Pour the alcohol into a glass retort fit for sustaining a sudden heat, and add to it the acid in an uninterrupted stream.

Mix them by degrees, shaking them moderately and frequently: this done, instantly distil from sand previously heated for the purpose, into a receiver kept cool with water or snow. But the heat is to be so managed, that the liquor shall boil as soon as possible, and continue to boil till sixteen ounces be drawn off: then let the retort be removed from the sand.

To the distilled liquor add two drachms of potash; then distil from a very high retort, with a very gentle heat, into a cool receiver, until ten ounces have been drawn off. If sixteen ounces of alcohol be poured upon the acid remaining in the retort after the first distillation, and the distillation be repeated, more ether will be obtained, and this may be repeated several times.

In the formation of sulphuric ether, it is found by experiment, that the alcohol suffers decomposition; a portion of its carbon is separated in a sensible form, and renders the residual liquor thick and dark coloured; a quantity of water is formed, and the remaining elements of the alcohol unite to form the ether. Ether differs from alcohol in containing less carbon, or rather more hydrogen; and this difference is established, not only by the facts with regard to its formation, but likewise by the comparative products of their combination. With regard to the agency of the sulphuric acid, by which these changes are effected in the composition of the alcohol, two opinions are at present maintained by chemists. According to the older doctrine, part of the sulphuric acid is decomposed; its oxygen combines with a portion of the hydrogen of the alcohol, and forms water; the balance of attractions among the elements of the alcohol being broken, carbon is deposited, and ether formed from a new combination of these remaining elements.

The ether obtained by the first distillation is impure. It is diluted with water and alcohol, and impregnated generally with

sulphurous acid. It is rectified, according to the directions in the Pharmacopœia, by distilling it a second time with a very gentle heat, with the addition of potash, which attracts the sulphurous acid; or, what succeeds better, with the addition of black oxyd of manganese, which converts that acid into sulphuric.

Ether properly prepared, has a penetrating diffusive odour, and a very pungent taste. It is highly volatile, evaporating rapidly at the common temperature of the atmosphere. It is soluble in ten parts of water, and combines with alcohol in every proportion. The different ethers, as produced by the different acids, vary in their composition and proportions. They are the lightest and most volatile of all known fluids, and are highly inflammable; their smell is fragrant, and taste hot and pungent.

In their medicinal powers, the ethers resemble alcohol; but they are rather less permanent in their action.

Sulphuric ether, or that obtained from the action of sulphuric acid on alcohol, is principally used. As a medicine taken internally, it is an excellent antispasmodic, cordial, and stimulant. It has been used in cases of rheumatism, gout, and whooping-cough, with great success. In a paroxysm of suffocating asthma, and all those diseases where the organs of respiration are affected, half a teaspoonful of ether in a table spoonful of water, quickly swallowed and occasionally repeated, has often produced instant relief. Even the simple evaporation of this volatile fluid, a spoonful of which may be placed at a time in a shallow vessel contiguous to the patient, has frequently been found of service, and alleviated the most distressing shortness of breath. Or in catarrhal and asthmatic complaints, its vapour may be inhaled with advantage, by holding in the mouth a piece of sugar, on which ether has been dropped. It is given as a cordial in nausea, and in febrile diseases of the typhoid type; as an antispasmodic in hysteria, and in other spasmodic and painful diseases; as a stimulus in soporose and apoplectic affections; and to mitigate the unpleasant sensation of sea sickness; regular practitioners seldom give so much as half an ounce, much more frequently only a few drops for a dose; but empirics have sometimes ventured upon much larger quantities, and with incredible benefit. When applied externally, it is capable of producing two very opposite effects, according to its management; for, if it be prevented from evaporating, by covering the place to which it is applied closely with the hand, it proves a powerful stimulant and rubefacient, and excites a sensation of burning heat. In this way it is frequently used for removing pains in the head, and Dr. Conyers declares, that a teaspoonful applied to the affected jaw, and repeated till the pain cease, is a never failing remedy for the tooth-ach. But, if it be dropped on any part of the body, exposed freely to the contact of the air, its rapid evaporation produces an intense degree of cold; and as this is attended with a proportional diminution of bulk in the part, appli-

ed in this way, it has frequently facilitated the reduction of strangulated hernia. The great utility of ether in effecting this last purpose, has been confirmed by recent experience.

ÆTHER SULPHURICUS CUM ALCOHOLE. *Sulphuric Ether with Alcohol.* Dulcified Spirit of Vitriol.

Take of

Sulphuric ether, one part,
Alcohol, two parts.

Mix them.

By this dilution of ether with alcohol, little is gained, except that it is more soluble in water. It was formerly known by the name of spirit of vitriolic ether. The London College apply that name to ether obtained by the first distillation, and unrectified. But this, and some other similar preparations directed by that College, may be regarded as superfluous.

SPIRITUS ÆTHERIS NITROSI. *Spirit of Nitrous Ether.* Dulcified Spirit of Nitre.

Take of

Alcohol, three pounds,
Nitrous acid, one pound.

Pour the alcohol into a capacious phial, placed in a vessel full of cold water, and add the acid by degrees, constantly agitating them. Let the phial be slightly covered, and placed for seven days in a cool place; then distil the liquor with the heat of boiling water into a receiver kept cool with water or snow, as long as any spirit comes over.

This is a solution of nitrous ether in alcohol. To prepare pure nitrous ether is difficult, and not without danger, from the violent chemical action which takes place when so much nitrous acid is added as is necessary to convert the whole alcohol into ether. This pharmaceutic preparation, therefore, has been preferred, and, as a medicine, answers perhaps all the purposes which could be derived from the ether. Even it requires caution in its preparation.

The theory of the action of acids on alcohol, and of the formation of ethers, is, notwithstanding modern researches, obscure; and that of nitrous ether is very imperfectly elucidated. It is ascertained, however, that during its production, portions of oxalic and acetous acids are formed; and the experiments of Bayen have clearly proved, that a very considerable portion of the nitric acid is decomposed or combined in such a manner with the principles of the alcohol, that it is no longer capable of

saturating an alkali. Perhaps it may be inferred, that the acid, by parting with oxygen to the elements of the alcohol, causes the formation of the oxalic and acetous acids, and that the remaining elements of the alcohol unite to form the ether. It appears to contain more carbon than sulphuric ether.

The spirit of nitrous ether always contains a very sensible portion of acid, from which it may be freed by a second distillation, with the addition of magnesia or potash. But on this acid, perhaps, some of its virtues depend.

Its odour is extremely fragrant, its taste pungent and acidulous; it is very volatile and inflammable; soluble in alcohol and water.

Dulcified spirit of nitre has been long deservedly held in great esteem. It quenches thirst, promotes the natural secretions, expels flatulences, and moderately strengthens the stomach. It may be given in doses of from twenty drops to a drachm, in any convenient vehicle. Mixed with a small quantity of spiritus ammoniæ aromaticus, it proves a mild, yet efficacious diaphoretic, and often remarkably diuretic; especially in some febrile cases, where such a salutary evacuation is wanted. It is employed as a refrigerent and diuretic, sometimes as an antispasmodic. Dulcified spirit of nitre given to the extent of half an ounce, combined with one drachm of liquid laudanum, and repeated every half hour has been found remarkably efficacious in the removal of strangury from what ever cause it may arise. A small proportion of this spirit added to malt spirits, gives them a flavour approaching to that of French brandy.

CHAPTER V.

EXPRESSED AND INSPISSATED JUICES.

VEGETABLE juices are obtained by expression. They consist of various proximate principles of the plant, particularly of mucilage, extractive matter, tannin, fecula, and some saline substances dissolved or suspended in water, and when recent, may possess the medicinal virtues which belong to any of these principles. It is impossible, however, to preserve vegetable matter in solution in water for any length of time without suffering decomposition, and hence juices are unfit for officinal preparations. Where the virtues of any vegetable reside in a principle which is contained in the juice obtained from it by expression, and where this principle is at the same time not volatile, inspissation by a moderate heat will contribute to its preservation, as the soft mass obtained by this process is much less liable to chemical changes than when the re-action of its constituent parts is favoured by dilution with water. The preparation, however, is still liable to disadvantages. By the heat employed in the inspissation, part of its active matter is generally dissipated; and another source of injury is derived from the oxygenation which the extract is liable to suffer when thus heated in contact with the atmospheric air; and the preparation itself being still soft and humid, must gradually undergo chemical alterations. Hence, inspissated juices are generally variable in their medicinal qualities.

SUCCUS COCHLEARIAE COMPOSITUS. *Compound Juice of Scurvy Grass.*

Take of

Juice of garden scurvy grass,
——— water cresses, expressed from fresh gathered
herbs,
——— Seville oranges, of each two pounds,
Spirit of nutmegs, half a pound.

Mix them, and let them stand till the feces have subsided; then pour off the clear liquor.

This composition is of considerable use for the purposes expressed in the title: the orange juice is an excellent assistant to the scurvy grass and other acrid antiscorbutics; which, when thus mixed, have been found from experience to produce much

better effects than when employed by themselves. It may be taken in doses from an ounce or two, to a quarter of a pint, two or three times in the day; it generally increases the urinary secretion, and sometimes induces a laxative habit. But since the powers of the citric acid have been fully ascertained, it is very seldom prescribed, and is never kept in the shops.

SUCCUS SPISSATUS ACONITI NEOMONTANI. *Inspissated Juice of Monkshood, or Wolfsbane.*

Bruise the fresh leaves of monkshood; and including them in a hempen bag, compress them strongly till they yield their juice; which is to be evaporated in flat vessels heated with boiling water, saturated with muriate of soda, and immediately reduced to the consistence of thick honey. After the mass has become cold, let it be put up in glazed earthen vessels, and moistened with alcohol.

This inspissated juice is the form under which wolfsbane has been usually administered. It has been given principally in obstinate chronic rheumatism, in a dose of half a grain night and morning, and gradually increased to five or six grains.

In the same manner are prepared the following inspissated juices from the leaves of their respective plants.

SUCCUS SPISSATUS ATROPÆ BELLADONNÆ. *Inspissated Juice of Deadly Nightshade.*

This has been recommended in scirrhus and some convulsive affections, in a dose of one grain gradually increased.

SUCCUS SPISSATUS CONII MACULATI. *Inspissated Juice of Hemlock.*

Under this form, hemlock was employed by Störck in scirrhus and cancer. The dose given is at first two grains, but it can be largely increased, and has at length been taken to the extent of several drachms in the day. In the preparation of it, the narcotic power of the hemlock seems always to be more or less impaired, and it is injured by keeping. It is, therefore, uncertain with regard to strength, more so, perhaps, than the dried leaves of the plant.

SUCCUS SPISSATUS HYOSCYAMI NIGRI. *Inspissated Juice of
Black Henbane.*

This plant, resembling opium in its powers, has been employed frequently as a substitute for it. The dose is one grain, which requires, if continued, to be increased.

SUCCUS SPISSATUS DATURÆ STRAMONII. *Inspissated Juice of
Thorn Apple.*

The inspissated juice of the leaves is the form in which Störck, and other German physicians usually employed the stramonium in maniacal, and in epileptic affections, but of late the saturated tincture is generally preferred.

The other inspissated vegetable juices inserted in the Massachusetts, and other Pharmacopœias, are so seldom regarded by medical practitioners, that they may be dispensed with in this place.

PULPARUM EXTRACTIO. *The Extraction of Pulps.*

Boil unripe pulpy fruits, and ripe ones, if they be dry, in a small quantity of water until they become soft; then press out the pulp through a hair sieve, and afterwards boil it down to the consistence of honey in an earthen vessel, in a water bath, stirring the matter continually, that it may not burn.

The pulp of cassia fistularis is in like mannner to be boiled out from the bruised pod, and reduced afterwards to a proper consistence, by evaporating the water.

The pulps of fruits that are both ripe and fresh, are to be pressed out through the sieve, without any previous boiling.

CHAPTER VI.

FIXED OILS, AND OILY PREPARATIONS.

THE chemical properties of these oils have already been described. They exist unmixed in the fruit and seeds of vegetables, and are obtained by expression, or decoction with water. The former is in general to be preferred; and to afford the oil pure it must be performed without heat, which, though it favours the separation of the oil, communicates to it an unpleasant flavour. To preserve them from becoming rancid, they ought to be kept secluded from the air.

A process in Pharmacy somewhat difficult is to mix these oils with any watery fluid, so that they may be conveniently exhibited. It is usually done by the medium of mucilage, or of an alkali. If triturated with mucilage, and a small quantity of sugar, the oil is diffused through the water, and a milky liquor formed. A combination still more permanent is effected, by adding a few drops of water of ammonia, or two or three grains of carbonate of potash.

OLEUM AMYGDALI COMMUNIS. *Oil of Almonds.*

Take of

Fresh sweet almonds, any quantity.

After having bruised them in a stone mortar, put them into a hempen bag, and express the oil without heat.

The oil thus obtained is the purest of the expressed oils, being entirely free from odour or taste, and is used for the general purposes of expressed oils.

In the same manner is to be expressed from its seeds,

OLEUM LINI USITATISSIMI. *Oil of Linseed.*

From the seeds of the plant. Being rather less pure, it is used only as an external application.

For the preparation of *oleum ricini*, and *oleum olivarum*. [See those articles in the *Materia Medica*.]

OLEUM AMMONIATUM. *Ammoniated Oil.* Volatile Liniment.

Take of

Olive oil, two ounces,

Water of ammonia, two drachms.

Mix them together.

The above preparation may be made with three or four times the quantity of water of ammonia.

This preparation is very frequently used externally as a stimulant and rubefacient. Dr. Pringle observes, that in inflammatory sore throats, a piece of flannel moistened with this liniment, applied to the throat, and renewed every four or five hours, is one of the most efficacious remedies. By means of this warm stimulating application, the neck, and sometimes the whole body, is put into a sweat, which after bleeding either carries off, or lessens the inflammation. When too strong, or too liberally applied, it sometimes occasions inflammations, and even blisters. Where the skin cannot bear the acrimony, a larger proportion of the oil may be used.

OLEUM LINI CUM CALCE. *Linseed Oil with Lime.*

Take of

Linseed oil,

Lime water, of each equal parts.

Mix them.

This liniment is extremely useful in cases of scalds or burns, being singularly efficacious in preventing, if applied in time, the inflammation subsequent to burns or scalds; or even in removing it, after it has come on.

OLEUM SULPHURATUM. *Sulphurated Oil.* Balsam of Sulphur.

Take of

Olive oil, eight ounces,

Sublimed sulphur, one ounce.

Boil them together in a large iron pot, stirring them continually till they unite.

Sulphurated oil, formerly balsam of sulphur, has been strongly recommended in coughs, consumptions, and other disorders of the breast and lungs. But the reputation which it had in these cases, does not appear to have been derived from any fair trial or experience. It is manifestly hot, acrimonious, and irritating; and should therefore be used with the utmost caution. It has frequently been found to injure the appetite, offend the stomach and viscera, parch the body, and occasion thirst and febrile heats. The dose of it is from ten to forty drops.

OLEUM CAMPHORATUM. *Camphorated Oil.*

Take of

Olive oil, two ounces,
Camphor, half an ounce.

Mix them so that the camphor may be dissolved.

This is a simple solution of camphor in fixed oil, and is an excellent application to local pains from whatever cause, and to glandular swellings.

CHAPTER VII.

DISTILLED WATERS, AND SPIRITS.

By distillation of water from vegetable substances, it is frequently impregnated with their flavour and taste. This is owing to their essential oil being volatilized at the temperature at which water boils, and being dissolved in small proportion by the water condensed. It is very seldom that any important virtue of vegetables resides in that principle, and hence the different distilled waters are more used as vehicles of other remedies, than as being themselves active medicines. It is evident that it is only those vegetables which contain a sensible quantity of essential oil, that can be subjected with advantage to this process, and that any quality in the other principles of the vegetable will not be obtained in the distilled water. To preserve the distilled waters from decomposition, to which they are liable, from the small quantity of vegetable matter they contain, a proportion of alcohol, about one fiftieth of their weight, may be added to them; and they require to be secluded from the air.

Distilled Spirits are prepared by distilling pure alcohol, or diluted alcohol, from vegetable substances. Alcohol in its pure state, seldom receives any sensible impregnation; because, although it is capable of dissolving the essential oils of plants, there are very few of them which it can bring over in distillation; a higher temperature being necessary to volatilize them than the alcohol. But, by employing diluted alcohol, a liquor is obtained more odorous and pungent. When heated with the vegetable, the alcohol first distils over, and afterwards the water with the essential oil, and the whole, when condensed, forms a transparent fluid. These distilled spirits, like the distilled waters, are in general merely agreeable vehicles for the exhibition of other medicines, or grateful stimulants, sometimes used to relieve nausea and flatulence. The directions for preparing them are given in the Pharmacopœia, under the spirit of Caraway.

AQUA DESTILLATA. *Distilled Water.*

Let water be distilled in very clean vessels, until about two thirds of it have come over.*

* In nature no water is found perfectly pure. Spring or river water always contains a portion of saline matter, principally sulphate of lime; and, from this impregnation, is unfit for a number of Pharmaceutic preparations. By distillation a perfectly pure water is obtained.

AQUA CITRI AURANTII. *Orange Peel Water.*

Take of

Fresh orange peel, two pounds.

Pour upon it as much water as shall be sufficient to prevent any empyreuma, after ten pounds have been drawn off by distillation.

After due maceration, distil ten pounds.

The same quantity of water is to be distilled in the same manner, from

Six pounds of the recent petals of the
Damask rose, to prepare *Aqua rosæ damascenæ*.
Damask rose water.

Three pounds of
Peppermint in flower.....*Aqua menthæ piperitæ*.
Peppermint water.

Three pounds of
Pennyroyal in flower.....*Aqua menthæ pulegii*.
Pennyroyal water.

One pound and a half of
Spearmint in flower.....*Aqua menthæ viridis*.
Spearmint water.

One pound of
The bark of cinnamon.....*Aqua lauri cinnamomi*.
Cinnamon water.

One pound of
The bark of cassia.....*Aqua lauri cassiæ*.
Cassia water.

Half a pound of
The fruit of pimento.....*Aqua myrti pimentæ*.
Pimento Water.

To each pound of these waters add half an ounce of diluted alcohol.

The virtues of all these waters are nearly alike; and the peculiarities of each will be easily understood by consulting the account given in the *Materia Medica* of the substances from which they are prepared.

SPIRITUS CARI CARUI. *Spirit of Caraway.* Spirituous Caraway Water.

Take of

Caraway seeds bruised, half a pound,
Diluted alcohol, nine pounds.

Macerate two days in a close vessel; then pour on as much water as will prevent empyreuma, and draw off by distillation nine pounds.

In the same manner is prepared the same quantity of spirit from

One pound of *Spiritus*
Bark of cinnamon, bruised.....*Lauri cinnamomi*.
Spirit of cinnamon.

One pound and a half of
Peppermint in flower.....*Mentha piperita*.
Spirit of peppermint.

One pound and a half of
Spearment in flower.....*Mentha viridis*.
Spirit of spearmint.

Two ounces of
Nutmeg, well bruised.....*Myristica moschata*.
Spirit of nutmeg.

Half a pound of
The fruit of pimento bruised...*Myti pimenta*.
Spirit of pimento, or allspice.

SPIRITUS LAVANDULÆ SPICÆ. *Spirit of Lavender*. Simple
Spirit of Lavender.

Take of
Flowering spikes of lavender, fresh gathered, two
pounds,
Alcohol, eight pounds.
Draw off by the heat of boiling water, seven pounds.

By these directions, and in the same quantity is prepared,

SPIRITUS ROSMARINI OFFICINALIS. *Spirit of Rosemary*.

SPIRITUS JUNIPERI COMPOSITUS. *Compound Spirit of Juniper*.

Take of
Juniper berries, well bruised, one pound,
Caraway seeds,
Sweet fennel seeds, each bruised, one ounce and a
half,
Diluted alcohol, nine pounds,
Water, sufficient to prevent empyreuma.

Macerate two days, and draw off nine pounds by distillation.

It is unnecessary to make particular observations on each of these simple spirits, as their virtues are the same with those of the substances from which they are extracted, united to the stimulus of the alcohol.

ALCOHOL AMMONIATUM FOETIDUM. *Fetid Ammoniated Alcohol.*
Fetid Spirit of Ammonia.

Take of

Ammoniated alcohol, eight ounces,
The gum resin of assa foetida, half an ounce.

Digest in a close vessel twelve hours; then distil off with the heat of boiling water eight ounces.

This spirit is designed as an anti-hysteric, and is undoubtedly a very elegant one. Volatile spirits, impregnated for these purposes with different fetids, have been usually kept in the shops. The ingredient here chosen, is the best calculated of any for general use, and equivalent in virtue to them all. The spirit is pale when newly distilled, but acquires a considerable tinge by keeping. Its dose is thirty drops.

CHAPTER VIII.

VOLATILE OILS. DISTILLED, OR ESSENTIAL OILS.

VOLATILE oils are prepared nearly in the same manner as the distilled waters, except that less water is to be added. Seeds and woody substances are to be previously bruised or rasped.

The oil comes over with the water, and is afterwards to be separated from it, according as it may be lighter than the water, and swim upon its surface, or heavier, and sink to the bottom. Besides, in preparing both distilled waters and oils, it is to be observed, that the goodness of the subject, its texture, the season of the year, and similar causes, must give rise to so many differences, that no certain or general rule can be given to suit accurately each example.

Therefore, many things are omitted, to be varied by the operator according to his judgment, and only the most general precepts are given.

According to these directions are prepared the

Volatile oils of	<i>Olea volatilia</i>
Anise seeds.*	<i>Pimpinellæ anisi.</i>
Fennel seeds.	<i>Anethi fœniculi.</i>
Juniper berries.	<i>Juniperi communis.</i>
Pimento.	<i>Myrti pimentæ.</i>
Rosemary.	<i>Rorismarini officinalis.</i>

* The following extemporaneous preparation is deserving attention, and should be promulgated.

To one ounce of white sugar candy, or refined sugar, add one hundred and twenty drops of the best oil of aniseed; having rubbed them together in a marble mortar, let them be well mixed with one ounce of spermaceti in powder.

This preparation was originally published in an English magazine, and highly extolled as a remedy in such cases of convulsions in children prior to the age of dentition as proceed from acrid irritating humours in the first passages, and having been preceded by gripings, green stools, flatulence, and pain. From the nature of these ingredients, salutary effects may be anticipated, and practical experience authorize the assertion, that no medicine can be better adapted to the indications under circumstances as above described. After the intestinal canal has been properly evacuated, about twenty grains of this compound is to be administered in a little milk, every three or four hours, according to the urgency of the symptoms. One instance of violent convulsions of ten days continuance recently occurred, in which evacuations had been premised, and antacids employed without the desired effect: by the use of twelve doses of this medicine in thirty hours, the recurrence of the fits was entirely prevented, and a cure effected.

Lavender.
Peppermint.
Spearmint.
Pennyroyal.

Lavendula spica.
Mentha piperita.
Mentha viridis.
Mentha pulegii.

OLEUM VOLATILE PINI PURISSIMUM. *Purified Volatile Oil of Pine.* Rectified Oil of Turpentine.

Take of

Oil of turpentine, one pound,
Water, four pounds.

Distil as long as any oil comes over.

The spirit of turpentine, as this essential oil has been styled, is frequently taken internally as a diuretic and sudorific; and it has sometimes a considerable effect when taken to the extent of a few drops only. It has, however, been given in much larger doses, especially when mixed with honey. Recourse has principally been had to such doses in cases of chronic rheumatism, particularly in those modifications of it which are termed sciatica and lumbago, but sometimes they induce bloody urine.

OLEUM SUCCINI PURISSIMUM. *Purified Oil of Amber.*

Distil oil of amber in a glass retort, with six times its quantity of water, till two thirds of the water have passed into the receiver; then separate this very pure volatile oil from the water, and keep it for use in well closed vessels.

The rectified oil has a strong bituminous smell, and a pungent acrid taste. Given in a dose of ten or twelve drops, it heats, stimulates, and promotes the fluid secretions. It is chiefly celebrated in hysterical disorders, and in deficiencies of the uterine purgations. Sometimes it is used externally, in liniments for weak or paralytic limbs and rheumatic pains.

Volatile oils, medicinally considered, agree in the general qualities of pungency and heat; in particular virtues, they differ as much as the subjects from which they are obtained, the oil being the direct principle in which the virtues, or at least a considerable part of the virtues of the several subjects reside. Thus the carminative virtue of the warm seeds, the diuretic of juniper berries, the emmenagogue of savin, the nervine of rosemary, the stomachic of mint, the antiscorbutic of scurvy grass, the cordial of aromatics, &c. are supposed to be concentrated in their oils. The more grateful oils are frequently made use of for reconciling to the stomach medicines of themselves disgusting. Volatile oils are never given alone, on account of their extreme heat and pungency; which in some is so great, that a single drop let fall upon the tongue, produces a gangrenous eschar.

They are readily imbibed by pure dry sugar, and in this form may be conveniently exhibited. Ground with eight or ten times their weight of sugar, they become soluble in aqueous liquors, and thus may be diluted to any assigned degree. Mucilages also render them miscible with water into a uniform milky liquor. They dissolve likewise in spirit of wine; the more fragrant in an equal weight, and almost all of them in less than four times their own quantity. These solutions may be either taken on sugar, or mixed with syrup, or the like. On mixing them with water, the liquor grows milky, and the oil separates. The more pungent oils are employed externally against paralytic complaints, numbness, pains, aches, cold tumors, and in other cases where particular parts require to be heated or stimulated. The toothach is sometimes relieved by a drop of these almost caustic oils, received on cotton, and cautiously introduced into the hollow tooth. Volatile oils should be kept in small bottles, closely stopped, in a cool place.

CHAPTER IX.

INFUSIONS AND DECOCTIONS.

INFUSION is a term employed in pharmacy, to denote that operation in which water on remaining for sometime on vegetable matter dissolves part of it; and also to express the preparation which results from that operation. It is obvious, that infusion, understood in this sense, can be applied with propriety only to those plants whose virtues depend on principles soluble in water. The strength of the infusion is considerably influenced by the temperature of the fluid, hot water dissolving more of the soluble matter than cold; while cold water, from this circumstance, frequently affords a preparation which, if weaker, is more grateful. From dried vegetables, the soluble matter is in general more easily obtained than from those which are recent. Infusions are always extemporaneous preparations, and cannot be preserved in a sound state for more than a few days.

By *boiling* vegetable substances in water, their active matter is more abundantly dissolved than by simple infusion. The preparation thus obtained is termed a *decoction*. In a number of cases, part of the matter dissolved by the assistance of the high temperature separates as the liquor cools, especially where it is of a resinous matter; in others, however, it is retained.

Though a large portion of matter is dissolved by the water in this mode of preparation, yet it cannot be always advantageously employed. Wherever the virtues of the substance subjected to it depend, in whole or in part, on any volatile principle, they are necessarily injured by this being dissipated. At the temperature of 212° , humid extractive matter combines too with oxygen from the atmospheric air; and perhaps at the same temperature, some vegetable principles suffer decomposition from the reaction of their constituent parts: hence many vegetables suffer injury from boiling, even where this cannot be ascribed to the dissipation of their volatile parts. These circumstances limit considerably the application of this form of preparation.

Decoctions are always extemporaneous preparations. In general, during the boiling, the air should be excluded, and the liquor ought to be strained while hot.

INFUSUM CINCHONÆ OFFICINALIS. *Infusion of Cinchona.*

Take of

Bark of cinchona, in coarse powder, one ounce,
Mucilage of gum arabic, two ounces,
Water, one pound.

Triturate the cinchona with the mucilage, and add the water during the trituration. Macerate for twenty-four hours, and decant the pure liquor.

This is a very elegant form of exhibiting the active principles of the Peruvian bark, and that in which it will sit lightest on weak and delicate stomachs. The trituration will promote the solution, and the addition of the mucilage will suspend the finest particles of the substance of the bark itself.

This preparation is used principally in dyspepsia, in a dose of two ounces occasionally.

INFUSUM DIGITALIS PURPUREÆ. *Infusion of Common Fox-glove.*

Take of

Dried leaves of common fox-glove, one drachm,
Boiling water, eight ounces,
Spirit of cinnamon, one ounce.

Macerate for four hours, and filtrate.

Infusion is the form under which Dr. Withering, who introduced the use of digitalis in dropsy, recommended it to be given. The dose is half an ounce taken twice a day, and gradually increased till the effects of the remedy appear. The spirit of cinnamon is added to improve its flavour, and to counteract its sedative effects.

INFUSUM GENTIANÆ COMPOSITUM. *Compound Infusion of Gentian. Bitter Infusion.*

Take of

Root of gentian sliced, half an ounce,
Rind of Seville oranges dried and bruised, one drachm,
Coriander seeds bruised, half a drachm,
Diluted alcohol, four ounces,
Water, one pound.

First pour on the alcohol, and three hours after add the water; then macerate without heat for twelve hours and strain.

This infusion is an extremely good bitter, and is of great service in dyspepsia, and in all cases where bitters in general are

necessary. It strengthens the stomach, and increases the appetite ; besides acting as a tonic on the other parts of the body, and on the vascular system. The alcohol is a useful addition, both in promoting the extraction of the virtues of all the ingredients, and in preserving the infusion longer from spoiling. Its dose is two ounces occasionally.

INFUSUM MIMOSÆ CATECHU. *Infusion of Catechu.* Japonic Infusion.

Take of

Extract of catechu in powder, two drachms and a half,
Bark of cinnamon bruised, half a drachm,
Boiling water, seven ounces,
Simple syrup, one ounce.

Macerate the extract and cinnamon in the hot water, in a covered vessel, for two hours ; then strain it and add the syrup.

The extract of catechu is completely soluble in water. This preparation, therefore, formerly called Japonic infusion, possesses all its virtues uninjured, and rendered more grateful by the addition of the cinnamon. It is a powerful astringent solution. Its principal use is in diarrhœa. Dose one ounce every third or fourth hour.

INFUSUM RHEI PALMATI. *Infusion of Rhubarb.*

Take of

Root of rhubarb, bruised, half an ounce,
Boiling water, eight ounces,
Spirit of cinnamon, one ounce.

Macerate the rhubarb in a close vessel with the water for twelve hours ; then having added the spirit, strain the liquor.

This appears to be one of the best preparations of rhubarb, when designed as a purgative ; water extracting its virtue more effectually than either vinous or spirituous menstrua. The infusion of rhubarb is supposed to have more of the purgative than of the astringent power. It is accordingly used as a mild cathartic. Dose two ounces.

INFUSUM ROSÆ GALLICÆ. *Infusion of Roses.* Formerly Tincture of Roses.

Take of

Petals of red roses, dried, two ounces,
Boiling water, five pounds,
Sulphuric acid, one drachm,
Double refined sugar, two ounces.

Macerate the petals with the boiling water in an earthen vessel, which is not glazed with lead, for four hours; then having poured on the acid, strain the liquor and add the sugar.

The rose leaves have very little effect, except in giving the mixture an elegant red colour. Its sub-acid and astringent virtues depend entirely on the sulphuric acid. Altogether, however, it is an elegant medicine, and forms a very grateful addition to juleps in hæmorrhagies, and in all cases which require mild coolers and sub-astringents. It is sometimes taken with boluses or electuaries of the bark, and likewise makes a good gargle in cases of cynanche.

INFUSUM TAMARINDI ET SENNÆ. *Infusion of Tamarinds and Senna.*

Take of

Preserved tamarinds, one ounce,
Leaves of senna, one drachm,
Coriander seeds bruised, half a drachm,
Brown sugar, half an ounce,
Boiling water, eight ounces.

Macerate them for four hours, occasionally agitating them in a close earthen vessel, not glazed with lead, and strain the liquor.

It may also be made with double, triple, &c. the quantity of senna.

This combination affords a very pleasant purgative, mild in its operation. The whole quantity may be taken at intervals as a dose. The taste of the senna is well covered by the aromatic, sugar, and by the acidity of the tamarinds. It is excellently suited for delicate stomachs, and inflammatory diseases. Ginger may be used instead of coriander seeds.

DECOCTUM ALTHÆÆ OFFICINALIS. *Decoction of Marsh-Mallow.*

Take of

Root of marsh-mallow, dried and bruised, four ounces,
Raisins stoned, two ounces,
Water, seven pounds.

Boil to five pounds ; place apart the strained liquor till the feces have subsided, then pour off the clear liquor.

Marsh-mallow roots contain nothing soluble in water, except mucilage, which is very abundant in them. This decoction is therefore to be considered merely as an emollient, rendered more pleasant by the acidulous sweetness of the raisins.

DECOCTUM CINCHONÆ OFFICINALIS. *Decoction of Cinchona.*

Take of

Bark of cinchona in powder, one ounce,
Water, a pound and a half.

Boil for ten minutes in a covered vessel, and strain the liquor while hot.

Peruvian bark readily yields its active principles to the action of boiling water, and in greater quantity than cold water is capable of retaining dissolved ; therefore, when a saturated decoction cools, it becomes turbid, and there is always a deposition of a yellowish or reddish powder, while the supernatant liquor is reduced to the strength of a saturated cold infusion. Decoction, therefore, presents us with an easy means of obtaining immediately an active preparation of cinchona bark, and one of greater strength than a cold or even a warm infusion, provided it be drunk while tepid, and before it forms any deposition, or if the precipitate be diffused by agitation, after it is formed.

Formerly it was supposed that the strength of a decoction of cinchona bark, and similar substances, was increased by continuing the boiling for a great length of time, but this is now known to be a mistake ; and, indeed, after a certain time, the decoction becomes weaker instead of stronger, because water at different temperatures is capable of dissolving only a determinate proportion of their active principles ; and, therefore, as soon as it is saturated, any further decoction is unnecessary. But moreover, these principles, when dissolved in water, are liable to be decomposed and become inert, by the absorption of atmospheric oxygen, and their decomposition is increased by increase of temperature ; and as boiling constantly presents new surfaces to the action of the air, it is evidently hurtful when protracted longer than what is just necessary to saturate the water. Ten minutes is supposed by the colleges to be sufficient for that purpose. This decoction is given in general when bark in considerable doses is requisite, and where the powder does not remain on the stomach. The dose is two ounces repeated occasionally.

DECOCTUM DAPHNES MEZEREI. *Decoction of Mezereon.*

Take of

Bark of the root of mezereon, two drachms,
Root of liquorice bruised, half an ounce,
Water, three pounds.

Boil with a gentle heat to two pounds, and strain.

The use of the liquorice is to cover the pungency of the mezereon. The decoction is given in a dose of six or eight ounces, three or four times a day, in the cases in which mezereon is employed, principally in the secondary symptoms of syphilis, and in rheumatic affections. It operates chiefly by perspiration.

DECOCTUM GUAIACI COMPOSITUM. *Compound Decoction of Guaiacum. Decoction of the Woods.*

Take of

Raspings of the wood of guaiacum, three ounces,
Raisins, two ounces,
Root of sassafras sliced,
Root of liquorice bruised, each one ounce,
Water, ten pounds.

Boil the guaiacum and raisins with the water, over a gentle fire, to the consumption of one half ; adding towards the end the sassafras and liquorice. Strain the liquor without expression.

This decoction is of use in some rheumatic and cutaneous affections. It may be taken by itself, to the quantity of a quarter of a pint, two or three times a day, or used as an assistant in a course of mercurial or antimonial alteratives ; the patient, in either case, keeping warm, in order to promote the operation of the medicine.

DECOCTUM HORDEI DISTICHI. *Decoction of Barley.*

Take of

Pearl barley, two ounces,
Water, five pounds.

First wash the barley from the mealy matter that adheres to it, with some cold water ; then boil it a little with about half a pound of water, to extract the colouring matter. Throw this away, and put the barley thus purified into five pounds of boiling water ; which is to be boiled down to one half and strained.

This decoction is to be used freely, as a diluting drink in febrile and other acute disorders. However trivial medicines of this class may appear to be, they are of greater importance in the cure of acute diseases than many more elaborate preparations.

DECOCTUM POLYGALÆ SENEGÆ. *Decoction of Seneka.*

Take of

Root of seneka, one ounce,
Water, two pounds.

Boil to sixteen ounces and strain.

The virtues of this decoction will be easily understood from those of the root from which it is prepared. The dose in hydropic cases, and rheumatic or arthritic complaints, is two ounces, three or four times a-day, according to its effect. It is given also as an expectorant in pneumonia, and as a stimulant in croup.

DECOCTUM SMILACIS SARSAPARILLÆ. *Decoction of Sarsaparilla.*

Take of

Root of sarsaparilla sliced, six ounces,
Water, eight pounds.

Macerate for two hours with a heat of about 195° ; then take out the root and bruise it ; return the bruised root to the liquor, and again macerate it for two hours. Then the liquor, being boiled to the measure of four pints, press it out and strain.

Under this form sarsaparilla has been given in the secondary symptoms of syphilis. It is indeed a very doubtful remedy, and its diaphoretic effects are probably owing to its being drunk warm. It is totally incapable of curing syphilis ; but by some it is thought useful in the sequelæ of that disease.

CHAPTER X.

EMULSIONS AND MUCILAGES.

EMULSIONS are preparations in which the expressed oil of seeds or kernels is suspended in water by the medium of the mucilage, and perhaps also of the fecula which the seeds contain. They are always opaque and milky : as the oil is merely diffused through the water, it gradually collects and rises to the surface ; and owing to the vegetable matter dissolved in the liquor, they are also liable to become sour. They likewise suffer decomposition from vinous spirits or acids.

EMULSIO AMYGDALI COMMUNIS. *Emulsion of Almonds.* Almond Milk.

Take of

Sweet almonds blanched, one ounce,
Water, two pounds and a half.

Beat the almonds very thoroughly in a stone mortar, gradually pouring on them the water ; then strain off the liquor.

This is used merely as a demulcent in catarrh and gonorrhœa, or to obviate strangury during the application of a blister, being drunk *ad libitum*.

EMULSIO CAMPHORATA. *Emulsion of Camphor.*

Take of

Camphor, one scruple,
Sweet almonds blanched, two drachms,
Double refined sugar, one drachm,
Water, six ounces.

This is to be made in the same manner as the almond emulsion.

Camphor is less apt to induce nausea when given in liquid than when in a solid form ; and this is one of the best forms of preparation. Its dose is two ounces

EMULSIO AMMONIACI. *Emulsion of Ammoniacum.* Ammoniacum Milk.

Take of

Ammoniacum, two drachms,
Water, eight ounces.

Rub the gum resin with the water, gradually poured on, until it become an emulsion.

In this mixture the resin and oily matter are suspended in the water by the medium of the gum, and a milky like fluid formed, from which the resin gradually subsides. It is given as an expectorant, in a dose from half an ounce to an ounce at a time. *

MISTURA CARBONATIS CALCIS. *Mixture of Carbonate of Lime.*
Chalk Mixture.

Take of

Prepared carbonate of lime, one ounce,
Double refined sugar, half an ounce,
Mucilage of gum arabic, two ounces.

Triturate together, and then gradually add of
Water, two pounds and a half,
Spirit of cinnamon, two ounces.

Mix them.

This is a very elegant form of exhibiting chalk, and is an useful remedy in diseases arising from, or accompanied with acidity in the primæ viæ. It is frequently employed in diarrhœa proceeding from that cause. The mucilage not only serves to keep the chalk uniformly diffused, but also improves its virtues. The dose of this medicine requires no nicety. It may be taken to the extent of a pound or two in the course of a day.

MUCILAGO AMYLI. *Mucilage of Starch.*

Take of

Starch, half an ounce,
Water, one pound.

Triturate the starch, gradually adding the water; then boil them a little.

The mucilage thus formed is very useful in those cases where a glutinous substance is required. It is often successfully employed with opium, as a clyster, in diarrhœa depending on acrimony in the intestines.

* Cough Med.
Take Direct Opi: ℥ij
Wine of Ipecac: ℥ss
Cinnamon & Aquilla 1/2 oz.
Dose 1 tea spoonful
every 2 hours

MUCILAGO ASTRAGALI TRAGACANTHÆ. *Mucilage of Gum
Tragacanth.*

Take of

Gum tragacanth in powder, one ounce,
Boiling water, eight ounces.

Macerate twenty-four hours ; then triturate them carefully, that the gum may be dissolved, and press the mucilage through linen cloth.

Gum tragacanth is difficultly soluble in water. When macerated in it, it swells, but does not dissolve. To effect the solution it must be beaten into a paste with some of the water ; and the rest of the water must be added gradually, and incorporated with the paste by beating them together. It is used principally in making troches.

MUCILAGO MIMOSÆ NILOTICÆ. *Mucilage of Gum Arabic,*

Take of

Gum arabic in powder, one part,
Boiling water, two parts.

Digest with frequent agitation, until the gum be dissolved ; then press the mucilage through linen.

This is the mucilage that is usually employed for pharmaceutical purposes ; such as suspending substances insoluble in water, rendering oils miscible with watery liquors, &c. It is also much used for properties peculiar to those substances of its own class, and of all the gums this seems to be the purest.

CHAPTER XI.

SYRUPS.

SYRUPS are solutions of sugar in water, either pure, or containing other substances dissolved. They are seldom active medicines, but are principally designed to render others pleasant. The proportion of sugar with which they are generally made, is about two parts to one of fluid.

SYRUPUS SIMPLEX. *Simple Syrup.*

Take of

Double refined sugar, fifteen parts,
Water eight parts.

Let the sugar be dissolved in the water by a gentle heat, and boiled a little, so as to form a syrup.

This solution of sugar is used merely to communicate sweetness of taste. It is more convenient in extemporaneous prescription than sugar undissolved.

SYRUPUS ALTHÆÆ OFFICINALIS. *Syrup of Marsh-Mallow.*

Take of

Fresh roots of marsh-mallow sliced, one pound,
Water, ten pounds,
Double refined sugar, four pounds.

Boil the water with the roots to the consumption of one half, and strain the liquor strongly expressing it. Suffer the strained liquor to rest till the feces have subsided; and to the depurated liquor add the sugar; then boil so as to make a syrup.

This is merely a mucilaginous syrup, and is chiefly used in nephritic cases for sweetening emollient decoctions.

SYRUPUS AMOMI ZINGIBERIS. *Syrup of Ginger.*

Take of

Roots of ginger bruised, three ounces,
Boiling water, four pounds,
Double refined sugar, seven pounds and a half.

Macerate the ginger in the water in a close vessel, for twenty-four hours ; then to the liquor strained, add the sugar in powder, so as to make a syrup.

This is an agreeable and moderately aromatic syrup, impregnated with the flavour and virtues of the ginger.

SYRUPUS CITRI AURANTII. *Syrup of Orange Peel.*

Take of

The fresh outer rind of Seville oranges, six ounces,
Boiling water, three pounds,
Double refined sugar, four pounds.

Macerate the rind in the water for twelve hours ; then add to the filtrated liquor the sugar in powder, and apply a gentle heat, so as to form a syrup.

This syrup is a very elegant and agreeable one, possessing a great share of the fine flavour of the orange peel.

SYRUPUS CITRI MEDICÆ. *Syrup of Lemons.* Syrup of Lemon Juice.

Take of

Juice of lemons, suffered to stand till the feces have subsided, and afterwards strained, three parts,
Double refined sugar, five parts.

Dissolve the sugar in the juice, so as to make a syrup.

This pleasant syrup is used to sweeten and acidulate mixtures, especially those of the mucilaginous kind.

SYRUPUS PAPAVERIS SOMNIFERI. *Syrup of White Poppies.*
Diacodium.

Take of

Capsules of white poppy dried, and freed from the seeds, two pounds,
Boiling water, thirty pounds,
Double refined sugar, four pounds.

Macerate the sliced capsules in the water for twelve hours ; next boil till only one third part of the liquor remain ; then strain it by expressing it strongly. Boil the strained liquor to the consumption of one half, and strain again. Lastly, add the sugar, and boil a little, so as to form a syrup.

This syrup, impregnated with the opiate matter of the poppy heads, is given to children in doses of two or three drachms, to adults, from half an ounce to an ounce, for easing pain, procuring rest, and answering the other intensions of mild opiates. It is uncertain in its strength.

SYRUPUS RHAMNI CATHARTICI. *Syrup of Buckthorn.*

Take of

Juice of ripe buckthorn berries depurated, two parts,
Double refined sugar, one part.

Boil them so as to form a syrup.

This preparation, in doses of three or four spoonfuls, operates as a brisk cathartic. The principle inconveniences attending it are, being very unpleasant, and occasioning a thirst and dryness of the mouth and fauces, and sometimes violent gripes: these effects may be prevented by drinking liberally of water gruel, or other warm liquors, during the operation.

SYRUPUS ROSÆ DAMASCENÆ. *Syrup of Damask Roses.*

Take of

Fresh petals of the damask rose, one pound,
Boiling water, four pounds,
Double refined sugar, three pounds.

Macerate the roses in the water for a night; then to the liquor strained and freed from the dregs, add the sugar; boil them into a syrup.

This syrup is a very mild purgative, and as such, is given to children in a dose of two or three teaspoonfuls.

SYRUPUS ROSÆ GALLICÆ. *Syrup of Red Roses.*

Take of

Dried petals of red roses, seven ounces,
Double refined sugar, six pounds,
Boiling water, five pounds.

Macerate the roses in the water for twelve hours, then boil them a little and strain the liquor; add to it the sugar, and boil them again for a little, so as to form a syrup.

In this preparation the slight astringency of the red rose is supposed to be preserved; and where a syrup having this quality is indicated, this is generally preferred.

SYRUPUS SCILLÆ MARITIMÆ. *Syrup of Squills.*

Take of

Acetous acid with squills, two pounds,
Double refined sugar in powder, three pounds and a
half.

Dissolve the sugar with a gentle heat, so as to form a syrup.

This is an active remedy, and is the form under which squill is generally given as an expectorant.

Its dose is one or two drachms. It is also given to children as an emetic, especially in pertussis.

SYRUPUS TOLUIFERÆ BALSAMI. *Syrup of Balsam of Tolu.*
Balsamic Syrup.

Take of

Simple syrup, two pounds,
Tincture of balsam of tolu, one ounce.

With the syrup recently prepared, and when it has almost grown cold, after it has been removed from the fire, gradually mix the tincture, with constant agitation.

This syrup can be valued only on account of the agreeable flavour of the balsam with which it is moderately impregnated.

SYRUPUS VIOLÆ ODORATÆ. *Syrup of Violets.*

Take of

Flowers of fresh violets, one pound,
Boiling water, four pounds,
Double refined sugar, seven pounds and a half.

Macerate the violets in the water for twenty-four hours in a glass or a glazed earthen vessel, close covered; then strain without expression, and to the strained liquor add the sugar, powdered, and make into a syrup.

This syrup is a very gentle laxative, and as such is given to infants in a dose of one or two teaspoonfuls.

It is apt to lose in keeping the elegant blue colour, for which it is chiefly valued.

When pure it forms an excellent test of the presence of acids and alkalies; the former changing it to a red, the latter to a green colour. It is obvious that a prescriber would be deceived if he should expect to give any blue tinge to acidulated or alkalized juleps or mixtures, by the addition of the blue syrup.

CHAPTER XII.

MEDICATED VINEGARS.

VINEGAR is capable of dissolving several of the principles of vegetables. It frequently, however, alters their powers, or does not coincide with them in virtue. There are, therefore, few medicated vinegars in use.

ACETUM AROMATICUM. *Aromatic Acetous Acid.* Aromatic Vinegar.

Take of

Tops of rosemary dried,
Leaves of sage dried, each four ounces,
Flowers of lavender dried, two ounces,
Cloves in coarse powder, two drachms,
Distilled acetous acid, eight pounds.

Macerate for seven days, express the liquor and filtrate through paper.

From the impregnation of the vinegar with the flavour of these aromatic vegetables, it becomes a grateful perfume, to which purpose chiefly this preparation is applied.

ACETUM SCILLÆ MARITIMÆ. *Acetous Acid with Squills.*
Squill Vinegar.

Take of

Dried root of squills, two ounces,
Distilled acetous acid, two pounds and a half,
Alcohol, three ounces.

Macerate the squills with the acetous acid for seven days; then press out the liquor, to which add the alcohol; and when the feces have subsided, pour off the clear liquor.

A preparation similar to that formerly kept under the name of *oxymel of squills*, may be made by mixing extemporaneously any quantity of honey with the above preparation.

Vinegar is the proper menstruum of squill; and this preparation possesses all its powers unimpaired. It is a very powerful stimulant; and hence it is frequently used, with great suc-

cess, as a diuretic and expectorant. The dose is from a drachm to half an ounce; where crudities abound in the first passages, it may be given at first in a larger dose, to evacuate them by vomiting. It is most conveniently exhibited along with cinnamon, or other agreeable aromatic waters which prevent the nausea it would otherwise, even in small doses, be apt to occasion.

★ **ACIDUM ACETOSUM CAMPHORATUM.** *Camphorated Acetous Acid.*

Take of

Strong acetous acid, six ounces,
Camphor, half an ounce.

Reduce the camphor to powder, by trituration with a little alcohol; then add it to the acid, in which it should be dissolved.

This solution is a powerful analeptic remedy. Its vapour snuffed up the nostrils, which is the only method of using it, is one of the most pungent stimuli we possess. It is so extremely volatile, that it cannot be preserved without excluding it from the contact of the air; and it is so powerful a menstruum, that it corrodes cork, and almost all common metals except gold. It should therefore be kept in glass phials, with ground glass stoppers.

*Counter Irritant, in
lieu of blisters -
= diluted with $\frac{1}{2}$ water -
for children & very del-
icate nervous females
Applied by friction.*

CHAPTER XIII.

TINCTURES.

TINCTURES are solutions of vegetable, animal, and sometimes of mineral substances, in spirituous liquors. The solvent may be either pure alcohol, diluted alcohol, or alcohol impregnated with ammonia or ether. They generally contain the virtues of the substances dissolved, in a concentrated state, though sometimes altered, or lost in those of the menstruum. They are little liable to decomposition, and this gives them a superiority over those preparations in which the solvent power of water is employed. Alcohol is the solvent of a number of the immediate principles of vegetables; of resin, camphor, essential oil, and extract; and hence is capable of extracting the virtues of many important remedies. Tinctures made with it are in general decomposed on the addition of watery liquors.

Diluted alcohol, or proof spirit, is a still more general solvent; as the water it contains dissolves several principles which are not soluble in pure alcohol. It is therefore more generally employed. Alcohol, impregnated with ammonia, or ether, is employed in forming tinctures only of a few substances, whose operations are supposed to be promoted by these agents.

TINCTURA ALOES SOCOTORINÆ. *Tincture of Socotorine Aloes.*

Take of,

Socotorine aloes in powder, half an ounce,
Extract of liquorice, an ounce and a half,
Alcohol, four ounces,
Water, one pound.

Digest for seven days in a closed vessel, with a gentle heat and frequent agitation, and when the feces have subsided, decant the tincture.

These directions are to be observed in preparing all tinctures.

In this simple tincture, all the active parts of the aloes are suspended in the menstruum. The extract of liquorice serves both to promote the suspension and to cover the taste of the aloes; and in those cases where we wish for the operation of the aloes alone, this is perhaps one of the best formulæ under which it can be exhibited in a fluid state. About an ounce may be taken for a dose.

TINCTURA ALOES ET MYRRHÆ. *Tincture of Aloes and Myrrh.* 2
Elixir Proprietatis.

Take of

Myrrh in powder, two ounces,
Alcohol, one pound and a half,
Water, half a pound.

Mix the alcohol with the water, then add the myrrh ; digest for four days ; and lastly add of

Socotorine aloes in powder,
Saffron sliced, each two ounces.

Digest again for three days, and pour off the tincture from the sediment.

This may be considered as being the *Elixir Proprietatis* of Paracelsus, improved with regard to the manner of preparation. It has long been in repute as a warm stimulant and aperient. It strengthens the stomach and other viscera, cleanses the first passages from tenaceous phlegm, and promotes the natural secretions in general. Its continued use has frequently done much service in cachectic and icteric cases, uterine obstructions, and other similar disorders ; particularly in cold, pale, phlegmatic habits. The dose may be from one drachm to two, twice in a day. This preparation is rendered more pleasant and efficacious by age.

TINCTURA AMOMI REPENTIS. *Tincture of Cardamom.*

Take of

Lesser cardamom seeds bruised, four ounces,
Diluted alcohol, two pounds and a half.

Digest for seven days, and filtrate through paper.

Tincture of cardamom has been in use for a considerable time. It is a pleasant warm cordial, and may be taken, along with a proper vehicle, in doses of from a drachm to a spoonful or two.

TINCTURA ARISTOLOCHIE SERPENTARIÆ. *Tincture of Virginian Snakeroot.*

Take of

Root of Virginian snakeroot bruised, three ounces,
Cochineal in powder, one drachm,
Diluted alcohol, two pounds and a half.

Digest for seven days, and filtrate through paper.

This tincture, which contains the whole virtues of the root, may be taken to the quantity of a spoonful or more every five or six hours; and to this extent it often operates as an useful diaphoretic.

TINCTURA FERULÆ ASSÆ FOETIDÆ. *Tincture of Assa Fœtida.* Fetid Tincture.

Take of

Gum resin of assa fœtida, four ounces,
Alcohol, two pounds and a half.

Digest for seven days, and filtrate through paper.

This tincture possesses the virtues of the assa fœtida itself; and may be given in doses of from ten drops to fifty or sixty as a remedy in hysteria.

TINCTURA BENZOIN COMPOSITA. *Compound Tincture of Benzoin.* Traumatic Balsam.

Take of

Benzoin in powder, three ounces,
Peruvian balsam, two ounces,
Hepatic aloes in powder, half an ounce,
Alcohol, two pounds.

Digest with a gentle heat for seven days, and filtrate through paper.

This preparation may be considered as an elegant simplification of some very complicated compositions, which were celebrated under different names; such as Wade's balsam, Friar's balsam, Jesuit's drops, &c. These, in general consisted of a confused farrago of discordant substances. They, however, derived considerable activity from the benzoin and aloes; and every thing to be expected from them, may readily be obtained from the present formula.

The compound tincture of benzoin, has been highly recommended, externally, for cleansing and healing wounds and ulcers, for discussing cold tumors, allaying gouty, rheumatic, and other old pains and aches; and likewise internally for warming and strengthening the stomach and intestines, expelling flatulencies, and relieving colic complaints. Its dose is from thirty to sixty drops. In modern practice it is much less used than formerly.

TINCTURA CAMPHORÆ. *Tincture of Camphor.* Elixir of Camphor.

Take of

Camphor, one ounce,
Alcohol, one pound.

Mix them together, that the camphor may be dissolved.

It may also be made with a double or triple proportion of camphor.

This solution of camphor is only employed externally, against rheumatic pains, paralytic numbnesses, for discussing tumors, preventing gangrenes, or restraining their progress. Bruises and strains are also relieved by this application by way of friction to the part.

TINCTURA ELEUTHERIÆ. *Tincture of Cascarilla.*

Take of

Bark of cascarilla in powder, four ounces,
Diluted alcohol, two pounds.

Digest with a gentle heat for eight days and filtrate.

This tincture may be employed to answer most of those purposes for which the bark itself is recommended; but in the cure of intermittents, it in general requires to be exhibited in substance.

TINCTURA ANGUSTURÆ. *Tincture of Angustura.*

Take of

Bark of angustura in powder, four ounces,
Diluted alcohol, two pounds.

Digest with a gentle heat for eight days and filtrate.

In cases of dyspepsia this tincture has been found serviceable in doses of one or two drachms.

TINCTURA SENNÆ COMPOSITA. *Compound Tincture of Senna.*
Elixir of Health.

Take of

Leaves of senna, three ounces,
Root of jalap bruised, one ounce,
Coriander seeds,
Caraway seeds, each bruised, half an ounce,
Lesser cardamom seeds bruised, two drachms,
Diluted alcohol, three pounds and a half.

Digest for seven days, and to the liquor filtrated through paper add of

Double refined sugar, four ounces.

This tincture is in very common use as a carminative and cathartic, by those especially who have accustomed themselves to the use of spirituous liquors; it oftentimes relieves flatulent complaints and colics, where the common cordials have little effect. Dose from one to two ounces.

TINCTURA CASTOREI. *Tincture of Castor.*

Take of

Russian castor in powder, an ounce and a half,
Alcohol, one pound.

Digest for seven days, and filtrate through paper.

This is a feeble remedy, given sometimes as an antispasmodic, in a dose of from half a drachm to a drachm.

TINCTURA CINCHONÆ OFFICINALIS. *Tincture of Cinchona.*
Tincture of Bark.

Take of

Red bark of cinchona in powder, six ounces,
Diluted alcohol, two pounds and a half.

Digest for seven days, and filtrate through paper.

The active matter of bark is entirely extracted by diluted alcohol, but the powers of the menstruum itself do not allow of the use of bark under this form, where large doses of the remedy are necessary. It is used in dyspepsia, occasionally, in a dose of two drachms.

TINCTURA CINCHONÆ COMPOSITA. *Compound Tincture of Cinchona.* Huxham's Tincture.

Take of

Red bark of cinchona in powder, two ounces,
External rind of Seville oranges dried, one ounce
and a half,
Root of Virginian snakeroot bruised, three drachms,
Saffron, one drachm,
Cochineal in powder, two scruples,
Diluted alcohol, twenty ounces.

Digest for fourteen days and filtrate.

This has been for a considerable time celebrated under the title of *Huxham's Tincture of Bark*.

As a corroborant and stomachic, it is given in doses of two or three drachms; but when employed for the cure of intermittents, it must be taken to a greater extent. It is more grateful than the simple tincture, and in dyspeptic affections, it proves a pleasant and efficacious remedy.

TINCTURA COLOMBÆ. *Tincture of Colomba.*

Take of

Columba root in powder, two ounces and a half,
Diluted alcohol, two pounds and a half.

Digest for seven days and filtrate through paper.

This is used merely as a bitter tincture in dyspepsia, in a dose of three or four drachms. It may be advantageously employed against bilious vomitings, and those different stomach ailments, in which the colomba has been found useful; but where there does not occur some objection to its use in substance, that form is in general preferable to the tincture.

TINCTURA CONVULVULI JALAPÆ. *Tincture of Jalap.*

Take of

Root of jalap in powder, four ounces,
Diluted alcohol, fifteen ounces.

Digest for seven days and filtrate through paper.

The activity of jalap resides in its resin, which in this preparation is extracted along with a portion of mucilage. The tincture may be given as a cathartic, in a dose of four or six drachms.

TINCTURA CROCI SATIVA. *Tincture of Saffron.*

Take of

English saffron sliced, one ounce,
Diluted alcohol, fifteen ounces.

Digest for seven days and filtrate through paper.

This tincture is to be valued only for its colour.

TINCTURA DIGITALIS PURPUREÆ. *Tincture of Common Fox-
Glove.*

Take of

Dried leaves of common fox-glove, one ounce, *or 13*
Diluted alcohol, eight ounces. *7 1/2 pint*

Digest for seven days and filtrate through paper.

This is a very active preparation; it is the one in which the virtues of digitalis are longest preserved uninjured, and appears to be the best form under which that remedy can be exhibited, to obtain its narcotic effects. Its dose is ten drops, which, according to the general rules observed in the administration of digitalis, is to be gradually increased. It has been chiefly used to diminish the force of the circulation of the blood in hæmoptysis, and often with remarkable success. It has been also said to cure phthisis pulmonalis, but subsequent experience has not confirmed the first trials.

TINCTURA GENTIANÆ COMPOSITA. *Compound Tincture of
Gentian. Stomachic Elixir.*

Take of

Root of gentian sliced and bruised, two ounces,
Rind of Seville oranges dried and bruised, one ounce,
Bark of canella alba bruised, half an ounce,
Powder of cochineal, half a drachm,
Diluted alcohol, two pounds and a half.

Digest for seven days and filtrate through paper.

This is a very elegant spirituous bitter, formerly called *stomachic elixir*. The aromatics are here very commodious ingredients, as in this spirituous menstruum they are free from the inconvenience with which they are attended in other liquors, of diminishing their transparency.

This tincture is employed in dyspepsia, in a dose of two or three drachms given occasionally.

TINCTURA GUAJACI OFFICINALIS. *Tincture of Guaiacum.*

Take of

Gum resin of officinal guaiacum in powder, one
pound,
Alcohol, two pounds and a half.

Digest for seven days and filtrate through paper.

What is called gum guaiac is in fact a resin, and perfectly soluble in alcohol. This solution is a powerful stimulating su-

dorific, and may be given in doses of about half an ounce in rheumatic and arthritic cases.

TINCTURA HELLEBORI NIGRI. *Tincture of Black Hellebore.*

Take of

Root of black hellebore bruised, four ounces,
Cochineal in powder, half a drachm,
Diluted alcohol, two pounds and a half.

Digest seven days and filtrate through paper.

This is perhaps the best preparation of hellebore, when designed for an alterative, the menstruum here employed extracting the whole of its virtues. It has been found by experience particularly serviceable in uterine obstructions. In sanguine constitutions, where chalybeates are hurtful, it has been said that it seldom fails of exciting the menstrual evacuations, and removing the ill consequences of their suppression. A teaspoonful of the tincture may be taken twice a-day in warm water, or some other convenient vehicle.

TINCTURA HYOSCIAMI NIGRI. *Tincture of Black Henbane.*

Take of

Leaves of black henbane dried, one ounce,
Diluted alcohol, eight ounces.

Digest for seven days and filtrate through paper.

This tincture, although not yet come into general use, is a valuable anodyne, and in many cases may be substituted with advantage for the tincture of opium, especially where the latter produces obstinate constipation; or, instead of its usual soporific and sedative effects, it causes uneasiness, restlessness, and universal irritation. Its dose is from a scruple to a drachm.

TINCTURA KINO. *Tincture of Kino.*

Take of

Kino in powder, two ounces,
Diluted alcohol, a pound and a half.

Digest seven days and filtrate through paper.

This is certainly a very astringent tincture, and will be found an excellent medicine in obstinate diarrhœa and in lenteria. The dose is from half a drachm to a drachm.

TINCTURA LAURI CINNAMOMI. *Tincture of Cinnamon.*

Take of

Bark of cinnamon bruised, three ounces,
Diluted alcohol, two pounds and a half.

Digest for seven days and filtrate through paper.

This is used merely as an aromatic and cordial, in doses from one drachm to three.

TINCTURA CINNAMOMI COMPOSITA. *Compound Tincture of Cinnamon. Aromatic Tincture.*

Take of

Bark of cinnamon,
Lesser cardamom seeds, each bruised, one ounce,
Long pepper in powder, two drachms,
Diluted alcohol, two pounds and a half.

Digest for seven days and filtrate through paper.

In this formula, the Dublin and London Colleges diminish the quantity of cardamom seeds, and substitute ginger. This makes no alteration on the virtues of the preparation, which is a warm aromatic, too hot to be given without dilution. It was formerly called *aromatic tincture*. A teaspoonful or two may be taken in wine, or any other convenient vehicle, in languors, weakness of the stomach, flatulencies, and other similar complaints; and in these cases it is often employed with advantage.

TINCTURA LAVANDULÆ COMPOSITA. *Compound Tincture of Lavender. Compound Spirit of Lavender.*

Take of

Spirit of lavender, three pounds,
..... rosemary, one pound,
Bark of cinnamon bruised, one ounce,
Flower-buds of the clove tree bruised, two drachms,
Nutmeg bruised, half an ounce,
Wood of red saunders rasped, three drachms.

Macerate for seven days and filtrate.

This is a grateful cordial in common use, as relieving languor and faintness. From ten to an hundred drops may be conveniently taken dropped upon sugar. It does not appear very clearly whether it should be considered as a spirit or tincture; for although the spirit of lavender be the predominant ingredient, yet the mode of preparation is that of a tincture, and the spirit as a menstruum dissolves astringent colouring, and other substances, which would not rise with it in distillation.

TINCTURA MELOES VESICATORII. *Tincture of Cantharides.*

Take of

Cantharides bruised, one drachm,
Diluted alcohol, one pound.

Digest for seven days and filtrate through paper.

This tincture contains the active principle of the cantharides, whatever it may be. It is applied externally as a stimulant and rubefacient, and is sometimes given internally, in doses of from ten to twenty drops as a diuretic.

TINCTURA MELOES VESICATORII FORTIOR. *Strong Tincture of Cantharides.*

Take of

Cantharides bruised, ten drachms,
Diluted alcohol, one pound.

Digest for fourteen days and filtrate through paper. This is intended merely for external application.

TINCTURA MIMOSÆ CATECHU. *Tincture of Catechu. Japonic Tincture.*

Take of

Extract of catechu in powder, three ounces,
Bark of cinnamon bruised, two ounces,
Diluted alcohol, two pounds and a half.

Digest for eight days and filtrate through paper.

The cinnamon is a very useful addition to the catechu, not only as it warms the stomach, &c. but likewise as it improves the roughness and astringency of the other. This tincture is of service in all kinds of defluxions, catarrhs, loosenesses, uterine fluors, and other disorders, where mild astringent medicines are indicated. Two or three teaspoonfuls may be taken frequently in red wine, or any other proper vehicle.

TINCTURA MOSCHI. *Tincture of Musk.*

Take of

Musk, two drachms,
Alcohol, one pound.

Macerate for seven days and filtrate.

In this form it is almost impossible to give such a quantity of musk as is necessary for our purpose; and hence this article is more frequently employed under the form of julep or bolus.

TINCTURA MURIATIS AMMONIÆ ET FERRI. *Tincture of Muriate of Ammonia and Iron.* Ammoniac Tincture of Iron.

Take of

Muriate of ammonia and iron, four ounces,
Diluted alcohol, sixteen ounces.

Digest and filtrate.

This is seldom prepared, being much less elegant than the following.

TINCTURA MURIATIS FERRI. *Tincture of Muriate of Iron.*
Tincture of Iron.

Take of

Carbonate of iron, half a pound,
Muriatic acid, three pounds,
Alcohol, three pounds and four ounces.

Pour the muriatic acid on the carbonate of iron in a glass vessel; and shake the mixture now and then, during three days. Set it by, that the feces may subside; then pour off the liquor; evaporate this to sixteen ounces, and when cold, add to it the alcohol.

The black oxyd of iron combines with the muriatic acid, and, during the solution, acquires more oxygen, partly by absorption from the atmosphere, and partly by decomposition of the water, which is promoted by the heat applied. The muriate of iron, in which this more perfect oxyd is contained, is soluble in alcohol. The present preparation is such a tincture diluted with the water of the muriatic acid. When first prepared, it contains a portion of muriate of iron, in which the metal is imperfectly oxydated; but this soon attracts more oxygen; and hence, the colour of the tincture deepens on keeping. It is a very active and excellent chalybeate, and may be given in doses of ten or twenty drops, twice or thrice a-day, in any proper vehicle.

TINCTURA MYRRHÆ. *Tincture of Myrrh.*

Take of

Myrrh in powder, three ounces,
Alcohol, twenty ounces,
Water, ten ounces.

Digest for seven days and filtrate through paper.

Tincture of myrrh is recommended internally for warming the habit, attenuating viscid juices, strengthening the solids, opening obstructions, particularly those of the uterine vessels,

and resisting putrefaction. The dose is from fifteen to forty drops, or more. It may perhaps be given in these cases to advantage; though it is more commonly used externally as a stimulant and antiseptic application for cleansing foul ulcers, and promoting the exfoliation of carious bones.

TINCTURA OPII. *Tincture of Opium. Thebaic Tincture. Liquid Laudanum.*

Take of

Opium, two ounces,
Diluted alcohol, two pounds.

Digest seven days and filtrate through paper.

This tincture is the most usual form under which opium is administered, having long been known under the name of *liquid laudanum*.

The proportion of opium to the solvent is five grains to the drachm; but by evaporation it is found that one drachm of the tincture holds three grains and a half dissolved. The usual dose is twenty-five drops. It is to be regretted that this tincture is not so well adapted for keeping as could be wished; in long standing a part of the opium is gradually deposited, and consequently the tincture becomes weaker; the part which thus separates amounts sometimes as it is said, to near one fourth of the quantity of opium at first dissolved.

The occasions for the use of laudanum in families are so numerous, that the utmost certainty with regard to the uniformity of the strength, and the dose ought to prevail. According to the London college, ten drachms of opium go to one pint of proof spirit. Dr. Donald Monroe observes, one drachm (sixty drops,) of such tincture, contains, by experiment, three and two thirds grains of opium: so that three drachms of it contains eleven grains: hence if we mix eight drachms of proof spirit, with three drachms of the above tincture, we form a tincture, each drachm of which contains one grain of opium; if we want a still weaker preparation, we may add eleven drachms more of *spirit*, when we shall have a tincture, each drachm of which contains half a grain of opium. In most cases, however, it is adviseable to administer *laudanum* in small quantities, (say fifteen drops to a grown person,) at a time, until the desired effect be produced. A single full dose of twenty, thirty, or thirty-five drops, will frequently disappoint our wishes, by proving either too great, or too small a quantity for the necessities of the system. *Laudanum* should always be given in a perfectly pure state: that which has by long keeping deposited a portion of the opium previously held in solution and thereby become thick, and strong, should be marked, and reserved for external application.

TINCTURA OPII CAMPHORATA. *Camphorated Tincture of Opium.* Paregoric Elixir.

Take of

spt
30 grs // Opium,
Benzoic acid, of each one drachm,
Camphor, two scruples,
Volatile oil of aniseed, one drachm,
Diluted alcohol, two pounds.

1 1/2 pints
to 45 gr. opi

Digest for ten days and filtrate through paper.

In this formula the virtues of the opium and camphor are combined. It gets an agreeable flavour from the acid of benzoic, and the essential oil. The latter will also render it more stimulating; but whether it derives any salutary virtues from the former, we do not know. It was originally prescribed under the title of elixir asthmaticum, which it does not ill deserve. It tends to allay the tickling which provokes frequent coughing, and, at the same time, it is supposed to open the breast, and give greater liberty of breathing. It is given to children against the chin cough, &c. from five to twenty drops; to adults, from twenty to an hundred. Half an ounce, by measure, contains about a grain of opium.

TINCTURA RHEI PALMATI. *Tincture of Rhubarb.*

Take of

Root of rhubarb in coarse powder, three ounces,
Lesser cardamom seeds bruised, half an ounce,
Diluted alcohol, two pounds and a half.

Digest for seven days and filtrate through paper.

This tincture contains all the virtues of rhubarb. Its dose is from half an ounce to an ounce.

TINCTURA RHEI ET ALOES. *Tincture of Rhubarb and Aloes.*
Sacred Elixir.

Take of

Root of rhubarb in coarse powder, ten drachms,
Socotorine aloes in powder, six drachms,
Lesser cardamom seeds bruised, half an ounce,
Diluted alcohol, two pounds and a half.

Digest for seven days and filtrate through paper.

TINCTURA RHEI ET GENTIANÆ. *Tincture of Rhubarb and Gentian.* Bitter Tincture of Rhubarb.

Take of

Root of rhubarb in coarse powder, two ounces,
Root of gentian sliced and bruised, half an ounce,
Diluted alcohol, two pounds and a half.

Digest for seven days and filtrate through paper.

TINCTURA RHEI DULCIS. *Sweet Tincture of Rhubarb.*

Take of

Root of rhubarb in coarse powder, two ounces,
Root of liquorice bruised,
Anise seeds bruised, each one ounce,
Double refined sugar in powder, two ounces,
Diluted alcohol, two pounds and a half.

Digest for seven days and filtrate through paper.

All the foregoing tinctures of rhubarb, are designed as stomachics and corroborants, as well as purgatives; spirituous liquors excellently extract those parts of the rhubarb in which the two first qualities reside, and the additional ingredients considerably promote their efficacy. In weakness of the stomach, indigestion, laxity of the intestines, diarrhoeas, colic, and other similar complaints, these medicines are frequently of great service. The sacred elixir has been much employed as a warming cordial purge, and for the general purposes of aloetics, with which, however, it combines the medical properties of rhubarb.

A spoonful or two may be taken for a dose, and occasionally repeated.

TINCTURA SAPONIS. *Tincture of Soap.* Saponaceous Liniment.

Take of

Soap in shavings, four ounces,
Camphor, two ounces,
Volatile oil of rosemary, half an ounce,
Alcohol, two pounds.

Digest the soap in the alcohol for three days; then add to the filtrated liquor, the camphor and oil, agitating them diligently.

TINCTURA SAPONIS ET OPII. *Tincture of Soap and Opium.*
Anodyne Balsam.

This is prepared in the same way and from the same substances as the tincture of soap, but with the addition from the beginning of one ounce of opium.

These tinctures are used externally as powerful stimulant applications in strains and rheumatic pains. The latter long known under the title of *anodyne balsam*, possesses great efficacy in removing local pains, especially if a teaspoonful be at the same time taken internally.

TINCTURA SCILLÆ MARITIMÆ. *Tincture of Squill.*

Take of

Root of squills fresh dried and bruised, four ounces,
Diluted alcohol, two pounds.

Digest for eight days and pour off the liquor.

As vinegar best covers the nauseous taste of squill, it is generally used as its menstruum. This tincture contains, however, the active matter of this, and may be given in a dose of from twenty to sixty drops.

TINCTURA TOLUIFERÆ BALSAMI. *Tincture of Balsam of Tolu.*

Take of

Balsam of tolu, an ounce and a half,
Alcohol, one pound.

Digest until the balsam be dissolved, and then filtrate the tincture through paper.

This solution of balsam of tolu possesses all the virtues of the balsam itself. It may be taken internally, with the several intentions for which that valuable balsam is proper, to the quantity of a teaspoonful or two, in any convenient vehicle. Mixed with the plain syrup of sugar, it forms an elegant balsamic syrup.

TINCTURA VERATRI ALBI. *Tincture of White Hellebore.*

Take of

Root of white hellebore bruised, eight ounces,
Diluted alcohol, two pounds and a half.

Digest for seven days and filtrate through paper.

White hellebore is a medicine perhaps never prescribed internally, its operation is so violent. The dose of this tincture cannot exceed a few drops.

TINCTURES MADE WITH ETHERIAL SPIRITS.

We have classed these tinctures by themselves, because they are more strongly characterized by the nature of the menstruum, than of the substances dissolved in it. Indeed, the ethereal spirits are used in these instances, not to dissolve bodies which would resist the action of the alcohol and water, but for the sake of their own direct action on the body.

TINCTURA ALOES ÆTHEREA. *Ethereal Tincture of Aloes.* Vitriolic Elixir Proprietatis.

Take of

Gum resin of socotorine aloes,
Myrrh, of each in powder an ounce and a half,
English saffron sliced, one ounce,
Sulphuric ether with alcohol, one pound.

Digest the myrrh with the liquor for four days in a close vessel, then add the saffron and aloes.

Digest again for four days, and when the feces have subsided, pour off the tincture.

By first digesting the myrrh with the spirit, a sufficient quantity of it is dissolved, which would not be, were the aloes added to it; and, by the second digestion, a sufficient quantity of the latter is taken up. The formula is the improvement of one which has long kept its place in the different pharmacopœias. It agrees generally in its effects, with the other tinctures of aloes, the only difference arising from the more penetrating and stimulating nature of the menstruum itself. As a purgative, it is given in doses of one or two drachms.

ÆTHER SULPHURICUS CUM ALCOHOLE AROMATICUS. *Aromatic Sulphuric Ether with Alcohol.*

This is made of the same aromatics, and in the same manner as the compound tincture of cinnamon; except that in place of the alcohol, sulphuric ether with alcohol is employed.

The additions to the sulphuric ether in this formula, are of so little importance, that the preparation is scarcely ever used.

ACIDUM SULPHURICUM AROMATICUM. *Aromatic Sulphuric Acid.* Acid Elixir of Vitriol.

Take of

Alcohol, two pounds,
Sulphuric acid, six ounces.

Drop the acid gradually into the alcohol.

Digest the mixture with a very gentle heat in a close vessel for three days, and then add of

Bark of cinnamon bruised, an ounce and a half,

Root of ginger bruised, one ounce.

Digest again in a close vessel for six days, and then filtrate the tincture through paper placed in a glass funnel.

This is a valuable medicine in weakness and relaxation of the stomach, and decays of the constitution, particularly in those which proceed from irregularities, which are accompanied with slow febrile symptoms, or which follow the suppression of intermittents. It frequently succeeds, after bitters and aromatics, by themselves, had availed nothing; and, indeed, great part of its virtues depend on the sulphuric acid, which, barely diluted with water, has, in cases where the stomach could bear acidity, produced happy effects. It is very usefully conjoined with cinchona, and other tonic barks, both as covering their disagreeable taste, and as coinciding with them in virtue. It may be given in doses of from ten to thirty drops, or more, several times a day.

AMMONIATED OR VOLATILE TINCTURES.

ALCOHOL AMMONIATUM AROMATICUM. *Aromatic Ammoniated Alcohol.*

Take of

Ammoniated alcohol, eight ounces,

Volatile oil of rosemary, one drachm and a half,

Volatile oil of lemon peel, one drachm.

Mix them, that the oils may be dissolved.

By this combination of the ammonia with the alcohol, and the addition of the aromatic oils, it is rendered more grateful than the water of ammonia. This preparation is therefore sometimes used in preference to the other, as a stimulating perfume, and even for internal exhibition. Dose from fifteen to thirty drops.

TINCTURA CASTOREI COMPOSITA. *Compound Tincture of Castor.*

Take of

Russian castor in powder, one ounce,

Gum resin of assa foetida, half an ounce,

Ammoniated alcohol, one pound.

Digest for seven days in a close stopped phial, and filtrate through paper.

This composition is a medicine of real efficacy, particularly in hysterical disorders, and the several symptoms which accompany

them. The spirit here used is an excellent menstruum, both for the castor and the assa fœtida, and greatly adds to their virtues. The dose is from half a drachm, to one drachm.

TINCTURA GUAJACI AMMONIATA. *Ammoniated Tincture of Guaiacum.* Volatile Elixir of Guaiacum.

Take of

Gum resin of officinal guaiacum, four ounces,
Ammoniated alcohol, one pound and a half.

Digest for seven days and filtrate through paper.

This is a very elegant and efficacious tincture; the ammoniated spirit readily dissolving the resin, and at the same time promoting its medicinal virtue. In rheumatic cases, a tea or even table spoonful, taken every morning and evening, in any convenient vehicle, particularly in milk, has proved of singular service.

TINCTURA OPII AMMONIATA. *Ammoniated Tincture of Opium.*

Take of

Benzoic acid,
English saffron sliced, each three drachms,
Opium two drachms,
Volatile oil of anise seeds, half a drachm,
Ammoniated alcohol, sixteen ounces.

Digest for seven days in a close vessel, and filtrate through paper.

This is a preparation of considerable efficacy in many spasmodic diseases, as chincough, &c. the ammonia removing the spasm immediately, while the opium tends to prevent its return. Each drachm contains about a grain of opium under the name of *paragoric elixir*. This preparation has been highly esteemed in catarrhal affections, and other complaints of the breast. Its dose is from half a drachm to a drachm.

CHAPTER XIV.

MEDICATED WINES.

WINE, from its composition, and especially from the alcohol and water it contains, is capable of dissolving the active matter of many vegetables. Solutions of this kind are named *medicated wines*. They are more liable to decomposition from keeping than tinctures. To obviate this, it is usual to add to them, when prepared, a portion of alcohol.

VINUM ALOES SOCOTORINÆ. *Wine of Socotorine Aloes.* Sacred Tincture.

Take of

Gum resin of socotorine aloes in powder, one ounce,
Lesser cardamom seeds bruised,
Root of ginger bruised, each one drachm,
Spanish white wine, two pounds.

Digest for seven days, stirring now and then, and afterwards filtrate.

This medicine has long been in great esteem, not only as a cathartic, but likewise as a stimulus. It appears, from long experience, to be a medicine of great utility. The dose, as a purgative, is from one to two ounces. It may be introduced into the habit, so as to be productive of excellent effects as an alterant, by giving it in small doses, at proper intervals ; thus managed, it does not for a considerable time operate remarkably by stool ; but at length proves purgative, and occasions a lax habit of much longer continuance, than that produced by other cathartics.

VINUM FERRI. *Wine of Iron.* Chalybeate Wine.

Take of

Purified filings of iron, one ounce,
Spanish white wine, sixteen ounces.

Digest for a month, often shaking the vessel, and then filtrate.

This is merely a solution of tartarized iron in wine ; for the iron is only dissolved in the wine by means of the super-tartrite of potash it contains. But a solution of a known proportion of

tartarized iron in wine, will give a medicine of more equal powers, and may be made extemporaneously. The dose is from a drachm to half an ounce, twice or thrice a day in chlorotic cases.

VINUM GENTIANÆ COMPOSITUM. *Compound Wine of Gentian.*
Bitter Wine.

Take of

Root of gentian sliced and bruised, half an ounce,
Red bark of cinchona in powder, one ounce,
External rind of Seville oranges dried and bruised,
two drachms,
Bark of canella alba in powder, one drachm,
Diluted alcohol, four ounces,
Spanish white wine, two pounds and a half.

First pour on the diluted alcohol, and after twenty-four hours, add the wine ; then macerate for seven days and filtrate.

This wine is intended to supply the place of the *Vinum Amarum*, as it was formerly called.

Wine is fully capable of extracting the active powers of the different ingredients ; and it supplies us with a very useful and elegant stomachic medicine. Its dose is six drachms.

VINUM IPECACUANHÆ. *Wine of Ipecacuan.*

Take of

Root of ipecacuan in powder, one ounce,
Spanish white wine, fifteen ounces.

Macerate for seven days and filtrate through paper.

This medicated wine is preferable to a tincture of ipecacuan, as being less pungent, while it holds the active matter of the root fully dissolved. Its dose, as an emetic, is one ounce to an adult.

VINUM NICOTIANÆ TABACI. *Wine of Tobacco.*

Take of

Dried leaves of tobacco sliced, one ounce,
Spanish white wine, one pound.

Macerate for seven days and filtrate through paper.

We have already, under the article *Nicotiana* in the *Materia Medica*, offered some observations upon its introduction into practice by Dr. Fowler, as a very useful remedy in the cure of dropsies and dysurics. From his treatise on that subject, the present formula is taken ; and we may observe, that while in

practice, we have frequently experienced from this tobacco those good effects, for which Dr. Fowler recommends it, we are inclined to give the present formula the preference to every other which he has proposed.

Dose, thirty drops, gradually increased to sixty or eighty, twice a day.

VINUM OPII COMPOSITUM. *Compound Wine of Opium.* Thebaic Tincture.

Take of

Opium, two ounces,
Flower buds of the clove tree bruised,
Cinnamon bruised, each one drachm,
Spanish white wine, sixteen ounces.

Macerate for seven days and filtrate through paper.

This is the *liquid laudanum* of Sydenham, with the exchange of Canary wine for Mountain, and the omission of an ounce of saffron; and was the *tinctura thebaica*, or liquid laudanum, of the London pharmacopœia. The aromatics here directed are in so small quantity, that no considerable effect can be expected from them, the proportion of each that goes to a grain of opium amounting to no more than the sixteenth part of a grain. Even the minute proportions, however, are in a good measure sufficient to take off the ill odour of the opium, which seems to be all that is intended by them.

The principal advantages of exhibiting opium in this form are, that by being already dissolved, it exerts itself sooner in the body, and that by some persons, liquids are more commodiously taken, than a bolus or pill. The common doses of the tincture are from *ten drops to forty, fifty, or more*, according to the exigencies of the case. It is to be wished that the dose could be more exactly ascertained, by weight or measure; as the drops may, according to different circumstances, vary in quantity, though in number the same; and as an error therein may, in some cases, be of mischievous consequences. *Twenty drops contain, at a medium, about one grain of opium*, or rather so much as that quantity of wine will extract from one grain; for the liquor does not dissolve the whole substance of the opium, nor is the solution equivalent, in its effect, to the full quantity of opium employed in it.

A liquid opiate, free from the inconveniences here complained of, may be found under the head of tinctures, page 344.

VINUM RHEI PALMATI. *Wine of Rhubarb.*

Take of

Root of rhubarb sliced, two ounces,
 Bark of canella alba bruised, one drachm,
 Diluted alcohol, two ounces,
 Spanish white wine, fifteen ounces.

Macerate for seven days and filtrate through paper.

This is a warm, cordial, laxative medicine. It is used chiefly in weakness of the stomach and bowels, and some kinds of loosenesses, for evacuating the offending matter, and strengthening the tone of the viscera. Its dose as a purgative is from half an ounce to an ounce.

VINUM TARTITRIS ANTIMONII. *Wine of Tartrate of Antimony.*
Antimonial Wine.

Take of

Tartrate of antimony, twenty-four grains,
 Spanish white wine, one pound.

Mix them so that the tartrate of antimony may be dissolved.

Tartrate of antimony dissolved in wine, can be preserved longer without decomposition than when dissolved in water; but, even on long keeping, part of the antimonial oxyd is deposited. In its employment and effects, the vinous solution of tartar emetic does not differ from one made with water. It is given as an emetic in the dose of one ounce; as a diaphoretic, in a much smaller dose. It contains two grains of tartrate of antimony in the ounce, but it is not of sufficient strength. The formula directed by the London and Dublin Colleges, containing four grains in the ounce, will be found more convenient in practice.

In the old formula for the preparation of *antimonial wine*, vitrified (glass) of antimony was directed to be used; but as the tartarous acid contained in the wine acts on the oxyd of antimony and renders part of it soluble, the quantity must be uncertain, and the wine cannot be uniform in strength. The preparation, therefore, ought to be entirely rejected, since its strength cannot be known.

CHAPTER XV.

EXTRACTS.

EXTRACTS MADE WITH WATER.

WHEN vegetable matter is dissolved in water or alcohol, by evaporation of the solvent, a concrete tenacious mass is obtained, termed an extract. When prepared from an aqueous solution, it is named a watery, when from one in alcohol, pure or diluted, a spirituous extract. The former must consist chiefly of those proximate principles which water can easily dissolve; mucilage, tannin, extractive, and saline matter: the latter, of a portion of these with resin.

In either preparation, the volatile principles must necessarily be dissipated; and in many cases, especially in the preparation of the watery extracts, decomposition or oxygenation of the more fixed parts take place. Hence there are few vegetables whose virtues are obtained uninjured in their extracts. Water is the menstruum most economically employed in making extracts, as it is capable of dissolving all the active principles except resin, and can have its solvent powers assisted by a considerable degree of heat.

It is indifferent, with regard to the medicine, whether the subject be used fresh or dry, since nothing that can be preserved in this process, will be lost by drying.

The evaporation is most conveniently performed in large, shallow vessels; the larger the surface of the liquor, the sooner will the aqueous parts exhale. It is necessary to keep a constant stirring toward the end of the process, in order to prevent an empyreuma, and that the extracts may be of an uniform consistence, and free of clots.

EXTRACTUM GENTIANÆ LUTÆ. *Extract of Gentian.*

Take of

Root of gentian, any quantity.

Having cut and bruised it, pour upon it eight times its quantity of water. Boil to the consumption of one half of the liquor, and strain it by strong expression. Evaporate the decoction immediately to the consistence of thick honey, in a bath of water saturated with muriate of soda.

In the same manner are prepared

From the roots of

Liquorice, *Extractum glycyrrhizæ glabræ.*
Extract of liquorice.

Black hellebore, *Extractum hellebori nigri.*
Extract of black hellebore.

From the inner bark of

Butternut, *Extractum juglandis cineræ.*
Extract of butternut.

From the leaves of

Rue, *Extractum rutæ graveolentis.*
Extract of rue.

Senna, *Extractum cassiæ sennæ.*
Extract of senna.

From the flowers of

Chamomile, *Extractum anthemidis nobilis.*
Extract of chamomile.

From the capsules of

White poppy, *Extractum papaveris somniferi.*
Extract of white poppy.

From the wood of

Logwood, *Extractum hamatoxyli campechensis.*
Extract of logwood.

All these extracts are supposed to contain the virtues of the substances from which they are prepared, in a very pure and concentrated form. But this supposition is, we believe, in several instances erroneous. Extract of liquorice root consists chiefly of mucilage and saccharine matter, and is used as a demulcent in catarrh. It is sometimes purified by solution in water, straining and a new evaporation. This is named refined liquorice. When made with care, it is exceedingly sweet, not at all bitterish or nauseous, more agreeable in taste than the root itself, of a pleasant smell, and reddish brown colour. This preparation would be very convenient for many purposes in the shops, if kept in a somewhat softer consistence than that of an extract.

EXTRACTS MADE WITH ALCOHOL AND WATER.

EXTRACTUM CINCHONÆ OFFICINALIS. *Extract of Cinchona.*
Extract of the Bark.

Take of

Bark of cinchona in powder, one pound,
Alcohol, four pounds.

Digest for four days, and pour off the tincture.

Boil the residuum in five pounds of distilled water for fifteen minutes, and filtrate the decoction boiling hot through linen. Repeat this decoction and filtration with an equal quantity of distill-

ed water, and reduce the liquor by evaporation to the consistence of thin honey. Draw off the alcohol from the tincture by distillation, until it also become thick; then mix the liquors thus inspissated, and evaporate in a bath of boiling water, saturated with muriate of soda, to a proper consistency.

This preparation is undoubtedly preferable to the watery extract of bark. By the joint action of the alcohol and water, every principle adhering to the mere ligneous fibre of the bark, is dissolved; and in the subsequent evaporation, the dissolved matter suffers less injury, partly from less heat being required to bring it to the due consistence, and partly, perhaps, from the alcohol resisting the oxygenation of the extract. It is, however, much more expensive; and the extract of bark to be found in the shops, is generally that prepared by the preceding formula. The dose of this extract is ten grains.

EXTRACTUM CONVULVULI JALAPÆ. *Extract of Jalap.*

This is prepared in the same way.

This extract as a cathartic is capable of operating fully in a dose of ten or twelve grains.

CHAPTER XVI.

OF POWDERS.

THIS form is proper for such materials only, as are capable of being sufficiently dried for pulverizing, without the loss of their virtue. There are many substances, however, of this kind which cannot be conveniently taken in powder; bitter, acrid, and fetid drugs are too disagreeable; emollient and mucilaginous herbs and roots are too bulky; pure gums cohere, and become tenacious in the mouth; fixt alkaline salts deliquesce when exposed to the air; and volatile alkalies exhale. Many of the aromatics, too, suffer great loss of their odorous principle when kept in powder, as in that form they expose a much larger surface to the air.

The dose of powders, in extemporaneous prescription, is generally about half a drachm; it rarely exceeds a whole drachm, and is not often less than a scruple. Substances which produce powerful effects in smaller doses are not trusted to this form, unless their bulk be increased by additions of less efficacy; those which require to be given in larger ones are better fitted for other forms.

The usual vehicle for taking the lighter powders, is any agreeable thin liquid. The ponderous powders, particularly those prepared from metallic substances, require a more consistent vehicle, as syrups; for from thin ones, they soon subside.

PULVIS CINNAMOMI COMPOSITUS. *Compound Powder of Cinnamon. Aromatic Species.*

Take of

Bark of cinnamon,
Lesser cardamom seeds,
Root of ginger, each equal parts.

Reduce them to a very fine powder, which is to be kept in a glass vessel well closed.

This formula is a very eligible one, and may be administered in all cases where powerful aromatic medicines are required. Its dose is from ten to twenty grains. Under the title of *aromatic powder* it has been employed in cold phlegmatic habits, and decayed constitutions, for warming the stomach, promoting digestion, and strengthening the tone of the viscera.

PULVIS ASARI COMPOSITUS. *Compound Powder of Asarabacca.*
Sternutatory.

Take of

Leaves of asarabacca, three parts,
..... sweet marjorum,
Flowers of lavender, each one part.

Rub them together to a powder.

This is an efficacious errhine, and superior to herb snuff. It is often employed with great advantage in cases of obstinate headach, and of ophthalmias resisting other modes of cure. Five or six grains snuffed up the nostrils at bed time will operate the succeeding day as a powerful errhine, inducing frequent sneezing, and a copious discharge from the nose.

PULVIS CARBONATIS CALCIS COMPOSITUS. *Compound Powder of Carbonate of Lime. Chalk Powder.*

Take of

Prepared carbonate of lime, four ounces,
Nutmeg, half a drachm,
Bark of cinnamon, one drachm and a half.

Reduce them together to powder.

The addition of the aromatics in the above formula, coincides with the general intention of the remedy, which is indicated for weakness and acidity in the stomach, and in diarrhœa proceeding from acidity. Dose from a scruple to a drachm.

PULVIS IPECACUANHÆ ET OPII. *Powder of Ipecacuan and Opium. Dover's Powder.*

Take of

Root of ipecacuan in powder,
Opium, of each one part,
Sulphate of potash, eight parts.

Triturate them together into a fine powder.

The sulphate of potash, from the grittiness of its crystals, is perhaps better fitted for tearing and dividing the tenacious opium, than any other salt. The operator should be careful that the opium and ipecacuan be equally diffused through the whole mass of powder, otherwise different portions of the powder must be different in degree of strength.

In this composition we have an example of the power which one medicine has of modifying the action of another, the ipecacuan rendering the operation of the opium as a sudorific, much

1 3
1 3
1 5

more certain than it would otherwise be, and appearing also to diminish its narcotic effect. This powder is the most certain sudorific we possess, and as such was recommended by Dr. Dover as an effectual remedy in rheumatism. Modern practice confirms its reputation, not only in rheumatism, but also in dropsy, and several other diseases, where it is often difficult by other means to produce a copious sweat. The medium dose is fifteen grains; the operation of which is to be assisted by the sweating regimen; and frequently it is necessary to give additional smaller doses at intervals, to produce sweat.

PULVIS JALAPÆ COMPOSITUS. *Compound Powder of Jalap.*

Take of

Root of jalap, one part,
Super-tartrate of potash, two parts.

Grind them together to a very fine powder.

By this addition of super-tartrate of potash to jalap, the operation of the latter is supposed to be rendered less irritating, and more refrigerant. It is an excellent cathartic, operating freely in a dose of a drachm and an half.

PULVIS OPIATUS. *Opiate Powder.*

Take of

Opium, one part,
Prepared carbonate of lime, nine parts.

Rub them together to a very fine powder.

In this powder, the opium is the only active ingredient; it is merely divided by the substance mixed with it. Ten grains contain one grain of opium.

PULVIS SCAMMONII COMPOSITUS. *Compound Powder of Scammony.*

Take of

Gum resin of scammony,
Super-tartrate of potash, equal parts.

Rub them together to a very fine powder.

In this powder, the operation of the scammony is supposed to be rendered milder as a purgative, by the super-tartrate of potash. It is also preferred to the scammony alone, as a hydragogue cathartic. Its dose is from ten to twenty grains.

PULVIS SUPER-SULPHATIS ALUMINÆ ET POTASSÆ COMPOSITUS. *Compound Powder of Super-Sulphate of Alumina and Potash.* Styptic Powder.

Take of

Super-sulphate of alumina and potash, four parts,
Kino, one part.

Rub them together to a fine powder.

This powder is composed of two very powerful astringents, and is sometimes used internally in menorrhagia, in repeated doses of ten or fifteen grains, and externally as a styptic application to bleeding wounds.

PULVIS ALOES CUM CANELLA. *Powder of Aloes with Canella.*

Take of

Socotorine aloes, one pound,
White canella, three ounces.

Powder separately, and then mix them.

This composition has long been known in the shops under the title of *hiera ficra*. It is still retained in the London Pharmacopœia. It furnishes us with a useful aloetic purgative, the canella operating as a good corrigent for the aloes. It is generally made into a tincture, by infusing in spirits.

PULVIS ASTRAGALI TRAGACANTHÆ COMPOSITUS. *Compound Powder of Tragacanth.*

Take of

Gum tragacanth,
..... arabic,
Starch, of each one ounce and a half,
Double refined sugar, three ounces.

To be conjointly pulverized.

This preparation is one of the mildest emollient remedies in hectic cases, coughs, strangury, and similar disorders, occasioned by a thin, vitiated state of the fluids; the dose being two or three ounces.

CHAPTER XVII.

CONSERVES AND ELECTUARIES.

IN these preparations, vegetable matter bruised is mixed with about three times its weight of sugar, and beat into a uniform pulpy mass. It was supposed that the sugar, by its antiseptic quality, would prevent the decomposition of the vegetable matter. This, however, is not the case. This form of preparation therefore, is not applied to any active medicine. The shops were formerly encumbered with many conserves altogether insignificant; the few now retained, have, in general, either an agreeable flavour to recommend them, or are capable of answering some useful purposes as medicines. The sugar should be pounded by itself, and passed through a sieve, before it be mixed with the vegetable mass, for without this it cannot be properly incorporated. The common dose is the bulk of a nutmeg, or as much as can be taken at once or twice on the point of a knife.

Electuaries are compositions of the consistence, nearly of honey, and are generally made by adding to any powder, a sufficient proportion of syrup or mucilage. It is a form adapted to the exhibition of such medicines as are not ungrateful in taste or flavour. The ingredients are so proportioned, that the dose shall not be less than a teaspoonful, and not more than twice or thrice that quantity at a time.

Conserve of the outer rind of oranges, and conserve of red rose buds, require no particular remarks, except that their taste and virtues are compounded of those of sugar and the substance combined with it. The former is a pleasant stomachic, and the latter, a mild astringent.

ELECTUARIUM AROMATICUM. *Aromatic Electuary.* Cardiac Confection.

Take of

Compound powder of cinnamon, one part,
Syrup of orange peel, two parts.

Mix and beat them well together, so as to form an electuary.

This composition is sufficiently grateful, and moderately warm. It is given in the form of a bolus, in doses of from five grains to a scruple, or upwards, as a cordial, or as a vehicle for more active substances.

ELECTUARIUM CASSIÆ FISTULÆ. *Electuary of Cassia.*

Take of

Pulp of the fruit of the cassia tree, six ounces,
Pulp of tamarinds,
Manna, each an ounce and a half,
Syrup of damask roses, six ounces.

Having beat the manna in a mortar, dissolve it in a gentle heat in the syrup; then add the pulps and evaporate them with a regular continued heat to the consistence of an electuary.

This composition is a very convenient officinal, to serve as a basis to purgative electuaries and other similar purposes. It is likewise taken by itself to the quantity of two or three drachms occasionally, for gently loosening the belly in costive habits.

ELECTUARIUM CASSIÆ SENNÆ. *Electuary of Senna. Lenitive Electuary.*

Take of

Leaves of senna, eight ounces,
Coriander seeds, four ounces,
Root of liquorice, three ounces,
Figs,
Pulp of prunes, each one pound,
..... of tamarinds, half a pound,
Double refined sugar, two pounds and a half.

Powder the senna with the coriander seeds, and sift out ten ounces of the mixed powder. Boil the remainder with the figs and liquorice in four pounds of water, to one half; then press out and strain the liquor. Evaporate this strained liquor to the weight of about a pound and a half; then add the sugar, and make a syrup; add this syrup by degrees to the pulps, and, lastly, mix in the powder.

This electuary is a very convenient laxative, and has long been in common use among practitioners. Taken to the size of a nutmeg or more, as occasion may require, it is an excellent laxative for loosening the belly in costive habits.

ELECTUARIUM CATECHU. *Electuary of Catechu.* Japonic
Confection.

Take of

Extract of catechu, four ounces,
Kino, three ounces,
Bark of cinnamon,
Nutmeg, each one ounce,
Opium diffused in a sufficient quantity of Spanish
white wine, one drachm and a half,
Syrup of red roses boiled to the consistence of honey,
two pounds and a quarter.

Reduce the solids to powder ; and having mixed them with the opium and syrup, make them into an electuary.

This electuary affords a combination of the more powerful astringents, rendered grateful by aromatics, and having its efficacy, as a remedy in diarrhœa, increased by the opium. It is the basis of the common extemporaneous astringent mixture. One grain of opium is contained in rather more than three drachms.

ELECTUARIUM OPIATUM. *Opiate Electuary.* Thebaic Elec-
tuary.

Take of

Compound powder of cinnamon, six ounces,
Virginian snakeroot in fine powder, three ounces,
Opium diffused in a sufficient quantity of Spanish
white wine, half an ounce,
Syrup of ginger, one pound.

Mix them and form an electuary.

This has kept its place in the Pharmacopœias as a substitute for the mithridate and theriaca andromachi ; officinal preparations once highly celebrated, but now discarded. Each drachm prepared according to the above formula, contains a grain and a half of opium.

The action which this electuary will produce on the living system, is abundantly apparent from the nature of its ingredients.

CHAPTER XVIII.

TROCHES.

TROCHES or Lozenges, consist of powders brought to a solid form by the addition of mucilage. When moist, they form a soft paste, in which state they are cut into square or round pieces ; and these are hardened by drying. It is a form adapted principally to such medicines as are designed to dissolve slowly in the mouth, and hence, they are always rendered pleasant by the addition of a large proportion of sugar. They are seldom active remedies.

TROCHISCI CARBONATIS CALCIS. *Troches of Carbonate of Lime.* Troches of Chalk.

Take of

Prepared carbonate of lime, four ounces,
Gum arabic, one ounce,
Nutmeg, one drachm,
Double refined sugar, six ounces.

Powder them together and form them with water into a mass, which is to be made into troches.

This is a pleasant form under which carbonate of lime may be given as an antacid ; and it is useful in diarrhœa.

TROCHISCI GLYCYRRHIZÆ CUM OPIO. *Troches of Liquorice with Opium.*

Take of

Opium, two drachms,
Tincture of balsam of tolu, half an ounce,
Simple syrup, eight ounces,
Extract of liquorice, softened in warm water,
Gum arabic in powder, each five ounces.

Grind the opium well with the tincture, then add by degrees the syrup and extract ; afterwards gradually sprinkle upon the mixture the powdered gum arabic. Lastly, dry them so as to form a mass to be made into troches, each weighing ten grains.

These troches are very effectual in relieving the tickling cough frequently attending catarrh. The opium is the active ingredi-

ent ; the others cover its taste and flavour, and render the composition pleasant, adding at the same time a demulcent quality. One drachm or six grains contain one grain of opium, and from six to twelve may be taken in twenty-four hours.

TRUCHISCI MAGNESIÆ. *Troches of Magnesia.*

Take of

Magnesia, four ounces,
Double refined sugar, two ounces,
Root of ginger powdered, one scruple.

Triturate them together, and with the addition of the mucilage of gum arabic, make troches.

Magnesia may be conveniently administered, under this form, as an antacid, and at the same time it tends to keep the bowels open.

CHAPTER XIX.

PILLS.

TO this form, those drugs are particularly adapted, which in a small dose, and whose nauseous and offensive taste or smell, require them to be concealed from the palate. Pills dissolve the most difficultly in the stomach, and produce the most gradual and lasting effects, of all the internal forms. This is, in some cases, of great advantage ; in others, it is a quality not at all desirable ; and sometimes, may even be of dangerous consequence, particularly with regard to emetics, which, if they pass the stomach undissolved, and afterwards exert themselves in the intestines, operate there as violent cathartics. Hence emetics are scarce ever given in pills ; and hence, to the resinous and difficultly soluble substances, saponaceous ones ought to be added, in order to promote their solution.

Gummy resins, and inspissated juices, are sometimes soft enough to be made into pills, without addition. Where any moisture is requisite, spirit of wine is more proper than syrups and conserves, as it unites more readily with them, and does not sensibly increase their bulk. Light, dry powders require syrups or mucilages, and the more ponderous, as the mercurial and other metallic preparations, thick honey conserve or extracts. Light powders require about half their weight of syrup ; or of honey, about three fourths their weight, to reduce them into a due consistence for forming pills. Half a drachm of the mass will make five or six pills of a moderate size.

Gums and inspissated juices, are to be first softened with the liquid prescribed ; the powders are then to be added, and the whole beat thoroughly together, until they be perfectly mixed. The masses for pills are best kept in bladders, which should be moistened with some of the same kind of liquid that the mass was made up with, or with some proper aromatic oil.

PILULÆ ALOETICÆ. *Aloetic Pills.*

Take of

Gum resin of socotorine aloes in powder,
Soap, equal parts.

Beat them with simple syrup into a mass fit for making pills.

Under this simple form aloes is very commonly exhibited as a cathartic. Two pills are a medium dose.

PILULÆ ALOES ET ASSÆ FOETIDÆ. *Pills of Aloes and Assa
Fætida.*

Take of

Gum resin of socotorine aloes in powder,
Gum resin of assa fœtida,
Soap, equal parts.

Form them into a mass with mucilage of gum arabic.

These pills, in doses of about ten grains twice a day, produce the most salutary effects in cases of dyspepsia, attended with flatulence and costiveness.

PILULÆ ALOES ET COLOCYNTHIDIS. *Pills of Aloes and Colo-
quintida. Pilulæ Coccix.*

Take of

Gum resin of socotorine aloes,
..... scammony, each eight parts,
Fruit of colocynthida, four parts,
Volatile oil of cloves,
Sulphate of potash with sulphur, each one part.

Reduce the aloes and scammony into a powder with the salt; then let the fruit of colocynthida, beat into a very fine powder and the oil be added; lastly, make it into a proper mass with the mucilage of gum arabic.

In these pills we have a very useful and active purgative; and where the simple aloetic pill is not sufficient to obviate costiveness, this will often effectually answer the purpose. These pills often produce a copious discharge in cases of obstinate costiveness, when taken to the extent of only five or ten grains; but they may be employed in much larger doses. They are, however, seldom used with a view of producing proper cathartics. Half a drachm of the mass, contains about five grains of the colocynth, ten of aloes, and ten of scammony.

PILULÆ ALOES ET MYRRHÆ. *Pills of Aloes and Myrrh. Rufus's
Pills.*

Take of

Gum resin of socotorine aloes, two ounces,
Myrrh, one ounce,
Saffron, half an ounce.

Beat them into a mass with a proper quantity of simple syrup.

These pills have long continued in practice, as a stimulating aperient. Given to the quantity of half a drachm or two scru-

ples, they prove considerably cathartic, but they answer much better purposes in smaller doses as laxatives or alteratives. Two or three for a dose.

PILULÆ ASSÆ FOETIDÆ COMPOSITÆ. *Compound Pills of Assa Fœtida. Gum Pills.*

Take of

Gum resin of assa fœtida,
Galbanum,
Myrrh, each eight parts,
Purified oil of amber, one part.

Beat them into a mass with simple syrup.

These pills are designed for anti-hysterics, and emmenagogues, and are very well calculated for answering those intentions. Half a scruple, a scruple, or more, may be taken every night or oftener.

PILULÆ ACETITIS PLUMBI ET IPECACUANHÆ. *Pills of Acetite of Lead and Ipecacuan.*

Take of

Acetite of lead,
Root of Ipecacuan in powder, of each one drachm,
Opium, ten grains.

Beat them with simple syrup into a mass to be divided into forty equal pills.

In most cases of internal hæmorrhage, but more especially in uterine profluvia attended by debility, these pills, taken one every three or four hours, seldom fail to produce the desired astringent effect; and if their use be duly persisted in, will in general induce that salutary change in the system upon which a radical cure depends.

PILULÆ AMMONIARETI CUPRI. *Pills of Ammoniaret of Copper. Copper Pills.*

Take of

Ammoniaret of copper in fine powder, sixteen grains,
Bread crumb, four scruples,
Solution of carbonate of ammonia, as much as may be sufficient.

Beat them into a mass, to be divided into thirty-two equal pills.

It is under this form that ammoniaret of copper is given in epilepsy and the other spasmodic diseases in which it has been

employed. Half a grain of it is contained in each pill. One pill is given at first, night and morning, and the dose is gradually increased.

PILULÆ HYDRARGYRI. *Pills of Quicksilver.* Mercurial Pills.

Take of

Purified quicksilver,
Conserve of red roses, each one ounce,
Starch, two ounces.

Triturate the quicksilver with the conserve, in a glass mortar, till the globules completely disappear, adding occasionally a little mucilage of gum arabic; then add the starch, and beat the whole with water into a mass, which is immediately to be divided into four hundred and eighty equal pills.

The common mercurial pill is one of the best preparations of mercury, and may in general supersede most other forms of this medicine. In its preparation the mercury is minutely divided, and probably converted into the black oxyd. To effect its mechanical division, it must be triturated with some viscid substance. Soap, resin of guaiac, honey, extract of liquorice, manna, and conserve of roses, have all been at different times recommended, and either of them may be employed.

We learn when the mercury is completely extinguished, most easily, by rubbing a very little of the mass with the point of the finger on a piece of paper, if no globules appear. As soon as this is the case, it is necessary to mix with the mass a proportion of powder of liquorice or starch, to give it a proper degree of consistency. It is necessary to form the mass into pills immediately, as it soon becomes hard. While this preparation of mercury is much milder in its operation than some others, it is perhaps capable of answering every purpose which the remedy can serve. The common dose, given with the view of inducing the common mercurial action, is two pills at bed time, and one in the morning, which in particular cases and habits, require to be increased. Four, or six pills given at once, generally excite purging. Each pill contains one grain of quicksilver.

PILULÆ OPIATÆ. *Pills of Opium.* Thebaic Pills.

Take of

Opium, one part,
Extract of liquorice, seven parts,
Jamaica pepper, two parts.

Soften the opium and extract separately, with diluted alcohol, and having beat them into a pulp, mix them; then add the pep-

per reduced to powder ; and lastly, having beat them well together, form the whole into a mass.

This affords a form under which the exhibition of opium may be concealed from the patient. Two pills or ten grains of the mass contain one grain of opium. In the formula of the London College, the aromatic is omitted, and the proportion of opium increased ; so that each pill contains one grain.

Some complain that the extract of liquorice occasions the mass to become too hard and difficult to manage. The following formula, therefore, may be substituted, or a stronger preparation : viz.

Take of

Castile soap, eight parts,
Camphor, six parts,
Opium, four parts.

The several articles being separately powdered, mix and beat them into a mass.

PILULÆ RHEI COMPOSITÆ. *Compound pills of Rhubarb. Stomachic Pills.*

Take of

Root of rhubarb in powder, one ounce,
Gum resin of socotorine aloes, six drachms,
Myrrh, half an ounce,
Volatile oil of peppermint, half a drachm.

Make them into a mass with a sufficient quantity of syrup of orange peel.

This is a moderate laxative much employed, especially in dyspeptic affections, to obviate costiveness, and gently stimulate the stomach and intestines. Two pills are taken at bed time.

PILULÆ SCILLITICÆ. *Squill Pills.*

Take of

Dried root of squills in fine powder, one scruple,
Ammoniacum,
Lesser cardamom seeds in powder,
Extract of liquorice, each one drachm.

Mix and form them into a mass with simple syrup.

This is an elegant and commodious form for the exhibition of squills, whether for promoting expectoration, or with the other intentions to which that medicine is applied. As the virtues of the compound is derived chiefly from the squills, the other ingredients are often varied in extemporaneous prescriptions. If

however, the above form should be found to be too hard and difficult to manage, the following formula may be preferred : viz.

Take of

Dried root of squills in fine powder,
Gum ammoniacum, each one drachm,
Castile soap, one ounce.

Mix them into a mass with a sufficient quantity of balsam copaiva.

PILULÆ PLUMMERI. *Plummer's Pills.*

Take of

Precipitated sulphur of antimony,
Mild muriate of mercury, each three drachms,
Extract of gentian,
Hard Spanish soap, each one drachm.

Let the mercury be triturated with the sulphur ; then add the extract and form a mass with jelly of soap.

These pills were recommended to the attention of the public, about forty years since, by Dr. Plummer, whose name they long bore. He represented them in a paper, which he published in the Edinburgh Medical Essays, as a very useful alterative ; and on his authority they were at one time much employed. In some cutaneous and even venereal affections, they are yet in repute, as being an efficacious remedy in doses of from four to eight or ten grains, morning and night.

CHAPTER XX.

CATAPLASMS.

By cataplasms, are in general understood, those external applications, which are brought to a due consistence or form for being properly applied, not by means of oily and fatty matters, but by water or watery fluids. Of these, not a few are had recourse to in actual practice ; but they are seldom prepared in the shop of the apothecary, and, in some of the best modern Pharmacopœias, no formula of this kind are introduced. The London and Dublin Colleges, however, although they have abridged the number of cataplasms, still retain a few ; and it is not without some advantage that there are fixed forms for the preparation of them.

CATAPLASMA ALUMINIS. *Cataplasma of Alum.* Alum Curd.

Take the whites of two eggs ; agitate them with a piece of alum, until a coagulum be formed.

This preparation taken from Riverius, is a useful astringent epithem for sore moist eyes. Where the complaint is violent, this preparation, after the inflammation has subsided a little to bleeding, is one of the best external remedies. It is to be spread upon lint and applied at bed time.

CATAPLASMA SINAPEOS. *Mustard Cataplasma.*

Take of

Mustard, in powder,
Crumb of bread, of each half a pound,
Vinegar, as much as is sufficient.

Mix and make a cataplasma.

Cataplasms of this kind, are commonly known by the name of sinapisms. They were formerly, frequently prepared in a more complicated state, containing garlic, black soap, and other similar articles. But the above simple form will answer every purpose which they are capable of accomplishing. They are employed only as stimulants ; they often inflame the part, and raise blisters ; but not so perfectly as cantharides. Their chief advantage depends upon the suddenness of their action.

This preparation is the common sinapism which is applied with advantage, as a powerful stimulant, to the soles of the feet in typhus, where there is a determination to the head, and in comatose affections.

CHAPTER XXI.

LINIMENTS, OINTMENTS, CERATES, AND PLASTERS.

THESE are all combinations of fixed oil, or animal fat, with other substances, and differ from each other only in consistence. A liniment is of the consistence of thin honey; an ointment is firmer; and a cerate still harder. Oil or lard is their common basis; the due consistence is given by wax or spermaceti, and to the composition may be added any substance which is to be used under this form. *Plasters* are the most solid, and when cold, should be firm, and should not adhere to the fingers, but when gently heated, should become sufficiently soft to spread easily, and should then adhere to the skin. Plasters derive their firmness, either from a large proportion of wax, or from the presence of some metallic oxyd, such as that of lead. The following general directions are given in the Edinburgh Pharmacopœia for their preparation.

In making these compositions, the fatty and resinous substances are to be melted with a gentle heat, and then constantly stirred, adding at the same time the dry ingredients, if there be any, until the mixture on cooling become stiff.

LINIMENTUM SIMPLEX. *Simple Liniment.*

Take of

Olive oil, four parts,
White wax, one part.

UNGUENTUM SIMPLEX. *Simple Ointment.*

Take of

Olive oil, five parts,
White wax, two parts.

UNGUENTUM PHYSETERIS MACRO CEPHALI SEVI. *Ointment of Spermaceti.*

Take of

Spermaceti, two parts,
Olive oil,
White wax, each one part.

Melt them together over a slow fire, stirring them constantly and briskly until they be cold.

These several compositions differ merely in consistence. They are useful cooling ointments for excoriations and other frettings, and for softening the skin and healing chaps. They are also applied spread on linen as usual dressings to slight wounds and simple ulcers. Frequently they are employed as the basis of more compounded ointments.

UNGUENTUM OXIDI PLUMBI ALBI. *Ointment of White Oxyd of Lead.* White Ointment.

Take of

Simple ointment, five parts,
White oxyd of lead, one part.

Or, the oxyd may be added in the same proportion to the spermaceti ointment, its firmer consistence being better adapted to the purpose of keeping the oxyd uniformly suspended.

This is a cooling desiccative ointment of great use when applied to excoriated surfaces ; and has been a common application to burns and superficial inflammation.

UNGUENTUM ACETITIS PLUMBI. *Ointment of Acetite of Lead.* Saturnine Ointment.

Take of

Simple ointment, twenty parts,
Acetite of lead, one part.

This is an excellent cooling ointment, and of the greatest use in many cases. It is applied to the same purposes as the preceding, and is more frequently employed.

CERATUM LITHARGYRI ACETATI COMPOSITUM. *Compound Cerate of Acetated Litharge.* Goulard's Cerate.

Take of

Water of acetated litharge, two ounces and a half,
Yellow wax, four ounces,
Olive oil, nine ounces,
Camphor, half a drachm.

Rub the camphor with a little of the oil. Melt the wax with the remaining oil, and as soon as the mixture begins to thicken, pour in by degrees the water of acetated litharge, and stir constantly until it be cold ; then mix in the camphor previously rubbed with oil.

This ointment, usually named *Goulard's cerate*, has been rendered famous by the recommendations of Mr. Goulard, a French surgeon. It is unquestionably in many cases very useful ; it

cannot, however, be considered as varying essentially from the saturnine ointments already mentioned. It is employed with nearly the same intentions, and differs from them chiefly in consistence.

UNGUENTUM ROSARUM. *Ointment of Roses.*

Take of

Hog's lard,
Fresh damask roses with their calices, each equal
parts.

Let the roses be slightly bruised in a marble mortar with a pestle of wood, and put them in a vessel with the lard ; place this over a gentle fire, so as to evaporate a great part of the moisture ; then press it through linen and suffer it to cool. Separate the feces which are on the top, and melt it in order to depurate.

UNGUENTUM AQUÆ ROSÆ. *Ointment of Rose Water.*

Take of

Oil of sweet almonds, two ounces,
Spermaceti, half an ounce,
White wax, one drachm.

Melt the whole in a water bath, stirring it frequently ; when melted, add of

Damask rose water, two ounces,
and stir the mixture continually till it is cold.

These more elegant compositions being similar in their properties to the preceding, are used for the same purposes.

UNGUENTUM STRAMONII. *Ointment of Thorn Apple.*

Take of

Leaves of thorn apple recently gathered and sliced,
five pounds,
Hog's lard, fourteen pounds.

Let them simmer together over a gentle fire till the leaves become crisp and dry. Then press out the lard, return it into the vessel when cleansed, and add to every pound of the compound, of

Yellow wax, two ounces.

Set the whole on the fire ; when the wax has melted remove the vessel, and let it rest while the contents gradually cool, that the impurities may subside. These must then be separated from the ointment.

This ointment has been found to afford relief in external inflammations, and hæmorrhoids. It is also highly beneficial in burns, and to allay the swelling of a cow's udder.

UNGUENTUM RESINOSUM. *Resinous Ointment.* Basilicon
Ointment.

Take of

Hog's lard, eight parts,
Resin of pine, five parts,
Yellow wax, two parts :—Or

Take of

Yellow resin,
..... wax,
Hog's lard,
Oil of olives, equal weights.

This ointment, long known under the name of yellow basilicon, is commonly employed in dressing, for digesting, cleansing, and incarning wounds and ulcers.

UNGUENTUM PICIS. *Tar Ointment.*

Take of

Tar, five parts,
Yellow wax, two parts.

Equal parts of tar and mutton suet are preferred by some as forming an ointment of a more firm consistence. The two compositions, however, cannot be considered as differing essentially from each other. As far as they have any peculiar activity, this entirely depends on the tar. From the empyreumatic oil and saline matters which it contains, it is undoubtedly of some activity. Accordingly it has been successfully employed against foul ulcers, and some cutaneous affections, particularly tinea capitis.

UNGUENTUM INFUSI MELOES VESICATORII. *Ointment of
Infusion of Cantharides.* Mild Epispastic Ointment.

Take of

Cantharides,
Resin of pine,
Yellow wax, each one part,
Hog's lard,
Venice turpentine, each two parts,
Boiling water, four parts.

Infuse the cantharides in the water for a night ; then strongly press out and strain the liquor and boil it with the lard till the water be consumed ; then add the resin and wax, and when these are melted, take the ointment off the fire and add the turpentine.

This ointment, containing the soluble parts of the cantharides, uniformly blended with other ingredients, are more commodious, and in general occasion less pain, though little less effectual in their action, than the compositions with the fly in substance.

UNGUENTUM PULVERIS MELOES VESICATORII. *Ointment of the Powder of Cantharides.* Strong Epsispastic Ointment.

Take of

Resinous ointment, seven parts,
Powdered cantharides, one part.

This ointment is employed in the dressings for blisters, intended to be made perpetual, as they are called, or to be kept running for a considerable time ; which in many chronic, and acute diseases, is of great service. Particular care should be taken, that the cantharides employed in these compositions, be reduced into a very subtle powder, and that the mixtures be made as equal and uniform as possible.

UNGUENTUM SULPHURIS. *Sulphur Ointment.* Antisporic Ointment.

Take of

Hog's lard, two parts,
Sublimed sulphur, one part.

To each pound of this ointment, add of
Volatile oil of lemons, or
..... of lavender, half a drachm.

Sulphur is a certain remedy for the itch, more safe than mercury. A pound of this ointment serves for four unctions. The patient is to be rubbed every night, a fourth part of the body each time. Though the disease may be thus cured by a single application, it is in general adviseable to touch the parts most affected for a few nights longer, and to conjoin the internal use of sulphur.

UNGUENTUM ACIDI NITROSI. *Ointment of Nitrous Acid.*

Take of

Hog's lard, one pound,
Nitrous acid, six drachms.

Mix the acid gradually with the melted lard, and diligently beat the mixture as it cools.

The axunge in this ointment seems to be oxydized ; for, during the action of the acid upon it, there is a great deal of nitric oxyd gas disengaged. It acquires a yellowish colour, and a firmer consistency ; and forms an excellent and cheap substitute, in slight herpetic and other cutaneous affections, for the ointment of nitrate of mercury.

UNGUENTUM HYDRARGYRI. *Ointment of Quicksilver.* Strong Mercurial Ointment.

Take of

Quicksilver,
Hog's lard, each three parts,
Mutton suet, one part.

Rub the quicksilver carefully in a mortar with a little of the hog's lard, until the globules entirely disappear ; then add the remainder of the lard and the suet, rubbing them well together.

A few grains of sulphur may be added to facilitate the union of the ingredients.

UNGUENTUM HYDRARGYRI MITIUS. *Mild Ointment of Quicksilver.* Blue Ointment.

This is to be prepared as the preceding ointment, excepting that only one part of quicksilver is to be employed.

During the trituration of mercury with unctuous matter, it cannot be doubted that an oxydation of the metal is effected ; and the efficacy of the ointment depends, in a great measure, on this oxyd of mercury. It has been also supposed, with a sufficient probability, that the portion of sebatic acid formed in animal fat, when exposed to the air, may promote this oxydation, and combine with the oxyd ; and the improvement of the ointment on keeping, a fact long observed, is probably owing to the gradual formation of this sebate of mercury.

Mercurial ointment, is the form by which mercury is introduced into the system by external friction. It is a mode employed with advantage, in cases where the preparations administered internally, are liable to be too much determined to the intestines, so as to occasion griping and purging, and when it is necessary to introduce a large quantity of mercury speedily into the system ; likewise in some local affections, particularly bubo. One drachm of the strong ointment, (that containing equal parts of the mercury and lard,) is introduced by friction in the evening, and frequently in the morning, until the system be affected. The inside of the thighs and legs, are the parts most suitable for the

application of the frictions. But it is frequently necessary to change the place, as even the mildest ointment is sometimes apt to excite topical inflammation, and render further application very inconvenient. It is requisite that the ointment should be prepared with very great care ; for, upon the degree of triture which has been employed, the activity of the mercury very much depends.

UNGUENTUM OXIDI HYDRARGYRI CINEREI. *Ointment of
Gray Oxyd of Quicksilver.*

Take of

Gray oxyd of quicksilver, one part,
Hog's lard, three parts.

This is designed as a substitute for the mercurial ointment, and as the quicksilver is fully oxydized, it has been supposed that it will prove more active. If this were sufficiently established, the facility and certainty of its preparation would be attended with great advantages.

UNGUENTUM SUB-MURIATIS HYDRARGYRI ET AMMONIÆ.
Ointment of Sub-Muriate of Quicksilver and Ammonia.

Take of

Sub-muriate of quicksilver and ammonia, one drachm,
Ointment of roses, one ounce and a half.

Let them be mixed very intimately.

This is a very elegant mercurial ointment, and is frequently made use of in the cure of obstinate cutaneous affections.

UNGUENTUM OXIDI HYDRARGYRI RUBRI. *Ointment of Red
Oxyd of Quicksilver.*

Take of

Red oxyd of quicksilver by nitrous acid, one part,
Hog's lard, eight parts.

This is an excellent stimulating ointment, often of very great service in indolent, ill conditioned sores, when we wish to excite them to greater action. If it prove too stimulating, it may be weakened with axunge ; and in this state, it is often applied to the eye-lids, in chronic ophthalmia.

UNGUENTUM NITRATIS HYDRARGYRI. *Ointment of Nitrate of*
Quicksilver. Yellow Ointment.

Take of

Purified quicksilver, one part,
Nitrous acid, two parts,
Hog's lard, three parts,
Olive oil, nine parts.

Dissolve the quicksilver in the nitrous acid, by digestion in a sand heat, and, while the solution is hot, mix with it the lard and oil, previously melted together, and just beginning to grow stiff. Stir them briskly together in a glass or wedgwood mortar, so as to form the whole into an ointment.

In this ointment, the nitrate of the quicksilver combines with the lard; and as there is also an excess of nitric acid, it acts chemically on the fat, and gives to the composition a very firm consistence. It is a very active ointment, and as such, it is frequently employed with success in cutaneous and other topical affections, a small quantity being rubbed on the part.

UNGUENTUM NITRATIS HYDRARGYRI MITIUS. *Milder Oint-*
ment of Nitrate of Quicksilver.

This is prepared in the same manner as the preceding, with a triple quantity of hog's lard, and olive oil. It is, of course, a much milder application, and is designed to be also of a softer consistence; but, to obtain the latter convenience, it is better to reduce the strong ointment, with the requisite proportion of lard.

UNGUENTUM SUB-ACETITIS CUPRI. *Ointment of Sub-Acetite*
of Copper. Ointment of Verdigris.

Take of

Resinous ointment, fifteen parts,
Sub-acetite of copper, one part.

This ointment is used for cleansing sores, and keeping down fungous flesh. Where ulcers continue to run from a weakness of the vessels of the parts, the tonic powers of the copper promise considerable advantage. It is also frequently used with advantage in cases of ophthalmia, depending on scrofula, where the palpebræ are principally affected; but, when it is to be thus applied, it is in general requisite that it should be somewhat weakened, by the addition of a proportion of simple ointment of hog's lard.

UNGUENTUM OXIDI ZINCI IMPURI. *Ointment of Impure
Oxyd of Zinc. Ointment of Tutty.*

Take of

Simple liniment, five parts,
Prepared impure oxyd of zinc, one part.

This and the following ointment are chiefly used in affections of the eye, particularly in those cases where redness arises rather from relaxation than from active inflammation.

UNGUENTUM OXIDI ZINCI. *Ointment of Oxyd of Zinc.*

Take of

Simple liniment, six parts,
Oxyd of zinc, one part.

CERATUM SIMPLEX. *Simple Cerate.*

Take of

Olive oil, six parts,
White wax, three parts,
Spermaceti, one part.

This differs from the simple ointment, in containing a greater proportion of wax to the oil, and in the addition of the spermaceti. But by these means, it obtains only a more firm consistence, without any essential change of properties.

CERATUM CARBONATIS ZINCI IMPURI. *Cerate of Impure Carbonate of Zinc. Turner's Cerate.*

Take of

Simple cerate, five parts,
Prepared impure carbonate of zinc, one part:—Or,

Take of

Olive oil, two pounds,
Yellow wax,
Prepared impure carbonate of zinc, each two parts.

This composition is formed upon that which was formerly called *Turner's cerate*. The inventor strongly recommends it in cutaneous ulcerations and excoriations. It appears, from experience, to be an excellent epulotic, and as such, is frequently made use of in practice.

CERATUM SABINÆ. *Savine Cerate.*

Take of

Fresh leaves of cedar savine, bruised, two pounds,
Yellow wax, one pound,
Hog's lard, four pounds.

Bruise the fresh savine with half the quantity of lard, and submit them to the force of an iron press; add the whole to the remainder of the lard, and boil until the herb begins to crisp; strain off the mixture, and then add the wax previously melted, to the composition.

The ceratum sabinæ (see juniperus virginiana) is designed as an irritating application with the view of exciting a perpetual discharge from blisters as a remedy in chronic diseases of the joints, &c. and in other cases where such discharge is required. It is an admirable preparation of that shrub, and has been found by experience to answer every purpose for which it was originally suggested by Dr. Crawther. On the use of this cerate, immediately after the cuticle raised by the blister is removed, it should be remarked, that experience has proved the advantage of using the application lowered by half or two thirds of the unguentum ceræ: an attention to this direction will produce less irritation and more discharge, than if the savine cerate is used in its full strength. But as the discharge diminishes, the strength of the savine dressing should be proportionally increased.

CERATUM JUNIPERI VIRGINIANÆ. *Cerate of Red Cedar.*

Take of

Leaves of red cedar recently gathered and bruised,
two pounds,
Yellow wax, one pound,
Hog's lard, four pounds.

To the lard and wax previously melted, add the leaves, boil them till they become crisp, and strain while the mixture is hot, through a coarse cloth. Care being taken that the lard and wax be not too hot when the leaves are added.

EMPLASTRUM SIMPLEX. *Simple Plaster.*

Take of

Yellow wax, three parts,
Mutton suet,
Resin of pine, each two parts.

The principal use of this plaster is as a dressing, when spread thin on linen, to the part to which a blister has been applied.

EMPLASTRUM RESINOSUM COMPOSITUM. *Compound Resinous
Plaster.*

Take of

Burgundy pitch, two pounds,
Galbanum, one pound,
Resin of pine,
Yellow wax, each four ounces,
Fixed oil of mace, one ounce.

To the pitch, resin and wax melted together, add first the galbanum and then the oil of mace.

This plaster has been applied to the region of the stomach, as a stimulus, to relieve nausea and vomiting, and is considered as the most elegant formula of the kind.

EMPLASTRUM MELOES VESICATORII. *Plaster of Spanish Flies.
Blistering Plaster.*

Take of

Mutton suet,
Yellow wax,
Resin of pine,
Cantharides, each equal weights.

Beat the catharides into a fine powder, and add them to the other ingredients previously melted and removed from the fire.

This is the plaster usually employed to raise a blister. It is of a softer consistence than the other plasters, that it may admit of being spread without the assistance of heat, which would impair the acrid quality of the cantharides. It requires to be applied twelve hours to produce a perfect blister; it is then removed; the vesicle is cut, and the inflamed surface dressed with simple cerate or plaster.

EMPLASTRUM MELOES VESICATORII COMPOSITUM. *Compound
Plaster of Spanish Flies.*

Take of

Venice turpentine, eighteen parts,
Burgundy pitch,
Cantharides, each twelve parts,
Yellow wax, four parts,
Sub-acetite of copper, two parts,
Mustard seed,
Black pepper, each one part.

Having first melted the pitch and wax, add the turpentine, and to these in fusion, and still hot, add the other ingredients, reduced to a fine powder and mixed, and stir the whole carefully together, so as to form a plaster.

It occasionally happens, that the common plaster of cantharides is insufficient to excite a blister, even when its surface has been sprinkled over with powdered cantharides. In such cases, or even in others, where it is necessary that a blister should be quickly raised, this more powerful composition may be employed. It certainly contains a sufficient variety of stimulating ingredients, and its operation is accompanied with a pungent sensation of heat.

EMPLASTRUM OXIDI PLUMBI SEMIVITREI. *Plaster of the Semi-Vitrified Oxyd of Lead.* Common Plaster.

Take of

Semi-vitrified oxyd of lead, one part,
Olive oil, two parts.

Boil them, adding water, and constantly stirring the mixture till the oil and oxyd be formed into a plaster.

Oxyds of lead, boiled with oils, unite with them into a plaster of an excellent consistence, and which makes a proper basis for several other plasters.

In the boiling of these compositions, a quantity of water must be added to prevent the plaster from burning and growing black. Such water as it may be necessary to add during the boiling, must be previously made hot; for cold liquor would not only prolong the process, but likewise occasion the matter to explode, and be thrown about with violence, to the great danger of the operator. This accident will equally happen upon the addition of hot water, if the plaster be extremely hot. It is therefore better to remove it from the fire a little, before each addition of water. This plaster, which has long been known under the name of *diachylon*, is a common application in excoriations of the skin, slike fresh wounds, and the like. They keep the part soft, and somewhat warm, and defend it from the air, which is all that can be expected in these cases, from any plasters.

EMPLASTRUM RESINOSUM. *Resinous Plaster.* Adhesive Plaster.

Take of

Plaster of semi-vitrified oxyd of lead,
Resin of pine, equal weights.

This plaster rendered more adhesive, and somewhat stimulating, by this intermixture of resin, is used for keeping on other dressings, for retaining the edges of recent wounds together, when we are endeavouring to secure them by the first intention, and for giving mechanical support to new flesh, and contracting the size of ulcers in the manner recommended by Mr. Baynton, for the cure of ulcers of the legs.

EMPLASTRUM ASSÆ FOETIDÆ. *Plaster of Assa Fætida.* Anti-Hysteric Plaster.

Take of

Plaster of semi-vitrified oxyd of lead,
Gum resin of assa fætida, each two parts,
Galbanum,
Yellow wax, each one part.

As an application to the umbilical region, or over the whole abdomen, in hysteric cases, this plaster has sometimes produced good effects. But probably more from its giving an additional degree of heat to the part, than from any influence, derived from the fetid gums.

EMPLASTRUM GUMMOSUM. *Gum Plaster.*

Take of

Plaster of semi-vitrified oxyd of lead, eight parts,
Ammoniacum,
Galbanum,
Yellow wax, each one part:—Or,

The following form is preferred by some for the same purposes.

Take of

Plaster of semi-vitrified oxyd of lead, three pounds,
Strained galbanum, half a pound,
Common turpentine,
Frankincense, each three ounces.

Melt the three first articles together, and add the last in powder; stir them well together.

This plaster is used as a digestive and suppurative; particularly in abscesses, after a part of the matter has been matured and discharged, for suppurating or discussing the remaining hurt part; but it is very doubtful whether it derives any advantage from the gums entering its composition.

EMPLASTRUM SAPONACEUM. *Saponaceous Plaster.*

Take of

Plaster of semi-vitrified oxyd of lead, four parts,
Gum plaster, two parts,
Soap sliced, one part.

To the plasters melted together, add the soap; then boil for a little while so as to form a plaster.

This is likewise supposed to possess a discutient quality, but is much inferior to the mercurial plaster, and is scarcely ever used.

EMPLASTRUM HYDRARGYRI. *Plaster of Quicksilver. Blue Plaster.*

Take of

Olive oil,
Resin of pine, each one part,
Quicksilver, three parts,
Plaster of semi-vitrified oxyd of lead, six parts.

Melt the oil and resin together, and when this mixture is cold let the quicksilver be rubbed with it till the globules disappear; then add by degrees the plaster of semi-vitrified oxyd of lead melted, and let the whole be accurately mixed.

This mercurial plaster is considered as a powerful resolvent and discutient, acting with much greater certainty for these intentions than any composition of vegetables alone. Pains in the joints and limbs from a venereal cause, nodes, tophi, and beginning indurations are said sometimes to yield to its application.

EMPLASTRUM OXIDI FERRI RUBRI. *Plaster of Red Oxyd of Iron. Strengthening Plaster.*

Take of

Plaster of semi-vitrified oxyd of lead, twenty-four parts,
Resin of pine, six parts,
Yellow wax,
Olive oil, each three parts,
Red oxyd of iron, eight parts.

Grind the red oxyd of iron with the oil, and then add it to the other ingredients, previously melted.

This plaster spread on leather is used as the common strengthening plaster in weaknesses of the large muscles, as of the loins; and its effects seem to proceed from the artificial mechanical support given to the part, which may also be done by any other plaster that adheres with equal firmness.

APPENDIX.

N^o. I.

MEDICAL PRESCRIPTIONS.

THE principal objects designed to be attained by the composition of medicines, are, to communicate an agreeable taste or flavour; to give a convenient form; to correct the operation of the principal medicine, or obviate some unpleasant symptom it is liable to produce; to promote its action, by the additional article exerting one of a similar kind; to obtain the joint operation of two remedies, having different powers; or to alter their usual effects, by the power which one may have of modifying the action of another.

A prescription has been usually divided into four parts, which compose it,....the *basis*, or principal article; the *adjuvans*, or that designed to promote the action of the former; the *corrigens*, or that which is intended to correct its operation, or obviate any unpleasant symptom which it may be apt to produce; and the *constituens*, or that which gives to the other ingredients consistence or form. These are not necessarily present in every formula; nor is the division of much importance, except as perhaps affording the best principle for regulating the order in which the ingredients of a prescription should be enumerated.

The following are the principal circumstances to be attended to in forming a prescription.

1st, Simplicity should be attained, as far as is consistent with the objects of the prescription. Nothing ought to enter into the composition which does not add to its virtue, render it less ungrateful, give it a convenient form, or which is not necessary to conceal any particular ingredient; and, in general, the practice of accumulating a number of articles in one prescription is to be avoided.

2dly, Substances, it is evident, ought not to be mixed together, which are capable of entering into chemical combination, or of decomposing each other, unless it be with the view of obtaining the product of the combination, or decomposition, as a remedy.

3dly, Those mixtures are also to be avoided, in which one medicine, by its peculiar action on the stomach or general system, modifies and changes the action usually exerted by another,

unless where the object is to obtain the effects of that modified operation.

4thly, The error of contra-indication is to be guarded against, or those medicines ought not to be combined, the virtues of which are not merely different, but are, in some measure, opposed to each other.

5thly, The ingredients which are to be mixed, must be such as will mix properly together, so that the form in which the remedy is designed to be exhibited, may be easily obtained and preserved.

Lastly, The form under which a medicine is prescribed, must be adapted to certain circumstances; principally to the nature of the disease, the nature of the remedy itself, and, as far as may be possible, to the taste of the patient.

The doses of medicines are not reducible to any general rules, from their general similarity of operation, or any other circumstance. The principal circumstances by which they are influenced are, Age, Sex, Temperament, Idiosyncrasy, Habit, and Disease.

Age.....From infancy to manhood, a larger dose of any medicine is requisite to produce its effect, in proportion to the advance in life. From manhood to old age, there is a similar gradation with regard to diminution of dose, though in a much less proportion than that which regulates the increase. The following table has been supposed to shew these proportions.

TABLE.

Let the dose for a person of middle age be	1 or 1 drachm.
For one from xiv to xxi years, it will be	$\frac{2}{3}$ or 2 scruples.
..... vii to xiv,	$\frac{1}{2}$ or half a dr.
..... iv to vii,	$\frac{1}{3}$ or 1 scruple.
..... of iv years of age,	$\frac{1}{4}$ or 15 grains.
..... iii	$\frac{1}{6}$ or half a scr.
..... ii	$\frac{1}{8}$ or 8 grains.
..... i	$\frac{1}{12}$ or 5 grains.

Sex.....Women, in general, require smaller doses of any medicine than men, a difference probably owing to their greater sensibility from their habits of life.

Temperament.....Those of the sanguine temperament are supposed to be more affected by medicines, and therefore to require smaller doses than those of the phlegmatic or melancholic; but in what has been said on this subject, there is so much uncertainty, that little reliance can be placed on it.

Idiosyncrasy.....This denotes that disposition in individuals to be affected by certain causes, in a manner different from the generality of mankind. Such idiosyncrasies are observed with regard to medicines, as well as to other agents; and, where they are known, require to be attended to by the prescriber.

*Habit.....*This has an important influence on the operation of medicines. In general, they lose some of their power by having been long continued. This is particularly the case with all strong stimulants and narcotics, and is even observed, to a certain extent, in some of the other classes of the *Materia Medica*. In a few instances, the reverse has been supposed to hold true.

*Disease.....*This has an influence on the doses of medicines not less important; the susceptibility to external impressions, and to action, being much varied in morbid affections, and the operations of remedies of course being modified by such variations. The state of susceptibility being in general apparent, when it varies much from the healthy standard, the doses of the medicines administered are easily regulated. *Murray.*

ON THE NATURE AND MEDICINAL USES OF THE
GASES.

BY A FELLOW OF THE MASSACHUSETTS MEDICAL SOCIETY.

THE term gas, introduced into the nomenclature of chemistry, by Van Helmont, is synonymous with air, and applied to a class of bodies, invisible, highly attenuated, compressible, and permanently elastic at the common temperature of the atmosphere, and the lightest of substances, whose specific weight is susceptible of demonstration.

Every species of gas owes its form to the caloric with which it is combined. By the introduction of this agent, the particles which constitute the basis of the air, are made to recede to a greater distance from each other, cohesive attraction is destroyed, and a repulsive power is acquired, in consequence of which, they would fly off to an indefinite distance, were it not counteracted by a proportional external pressure. By the abstraction of caloric to a certain degree, the distance between the particles of the air or gas is diminished, they are still capable of moving freely over the surfaces of each other, although cohesive attraction be so far augmented as to constitute them liquids. Hence, as the airs obviously owe their specific forms merely to the quantity of caloric with which they are united, it has been inferred by chemists, that they are formed by the solution of certain unknown bases in heat. For example, the term *oxygen* is applied to a substance of peculiar properties, which, by its union with caloric, is rendered capable of assuming the form of an invisible, inodorous, insipid, permanently elastic, and compressible fluid, denominated *oxygen gas*. When this air or gas exerts an attraction for other substances, and enters into combination with their particles, the oxygen, or the base alone, is the subject of the change, and the other principle, the caloric, is evolved or becomes sensible. Hence the origin of the heat during the transition of oxygen from the aereform to the solid state. The same observations are equally applicable to the other species of gases. By the diminution of the capacity of an air for caloric, even without altering its form, by simple compression, a quantity of heat may be evolved, sufficient to produce, by a peculiar arrangement, the ordinary effects of combustion. Of the precise nature of the bases of the different

gases, we are still ignorant, for no attempts to obtain them independent of their combinations, have yet proved successful.

The difference between gas and vapour is the property, possessed by the former, of remaining permanently elastic (with the single exception of the oxygenized muriatic acid gas*) at the common temperatures of the atmosphere, while the latter, though it retain its elasticity for a time, is ultimately condensed and restored to the state of a liquid.

The gases are susceptible of their peculiar form at very low temperatures, for the abstraction of caloric to the greatest extent observed in nature, or produced by art, has never been sufficient to deprive them of their elasticity, and reduce them to the state of liquids, or of solids: on the contrary, in the formation of vapour, the temperature of the liquid is augmented above that of the surrounding air, it rises in the atmosphere, where its caloric, from its repellent power or tendency to equilibrium when accumulated in a body, is gradually abstracted, its particles again approximate toward each other, and it reassumes the form of liquid. Hence, says Mr. Murray, "the distinction between gas and vapour is merely relative, and arises from the difference of temperature, at which they were formed."†

In the enumeration of the different species of the extensive genus of gases, we shall confine ourselves to the description of the properties of those, which, in consequence of their peculiar action on the nervous system, and their well known influence in exciting or depressing the vital powers, have been lately introduced as a distinct class of remedies, into the *Materia Medica*. The observations of Lavoisier, confirmed by the more extensive and hazardous experiments of Mr. Davy, have sufficiently demonstrated, which indeed was thought probable a priori, that the different species of airs, when taken into the lungs, produce very powerful effects on animal life. The respiration of some of them is accompanied with all the effects of increased excitement. The pulsations of the heart and arteries are accelerated, respiration is hurried, the brain labours with intense thought, new ideas and images present themselves to the imagination, and produce new combinations and associations, a propensity to muscular motion, almost irresistible, is excited, and the whole frame glows with a sense of "pleasurable existence."‡ The breathing of others, on the contrary, is followed by vertigo and sick-

* Gazeous ammonia is another exception to the general observation, that the airs are incapable of undergoing a change of form by a reduction of temperature. This abstraction of heat, however, must be great, and is to be effected by art. According to the experiments of Guyton, ammonia retains its elastic form at any temperature above 56° , but below that point it is converted into a liquid, an effect ascribed by Mr. Murray, to the presence of water, with a portion of which, that gas is always found strongly combined. It reassumes the aerial form as the temperature rises.

† Murray's Chemistry, vol. ii. p. 10.

‡ Davy's Researches.

ness, the senses grow less acute, a painful sensation of stricture across the chest is produced, respiration becomes irregular and laborious, and the pulsations of the heart almost imperceptible, the wish and even the power of muscular motion is for a time extinguished, and the vital powers of the system slowly recover from the almost annihilating influence of these invisible agents. Hence it is obvious, that the airs are capable of acting as remedies in two ways, either by exalting or by depressing the vital powers of the constitution. Of the first class there exist but two species, oxygen gas and nitrous oxyd gas.

1. Oxygen Gas.

This gas, generally obtained from the black oxyd of manganese by the application of heat, is an invisible, inodorous, insipid, permanently elastic fluid, rather heavier than atmospheric air, and characterized by the property of eminently supporting the processes of respiration and combustion. As the capacity of atmospheric air to continue these actions has been sufficiently demonstrated to depend on the oxygen it contains, it was reasonable to suppose, that, when respired pure and undiluted, it would have no inconsiderable influence in increasing the activity of the vital powers. The experiments, however, of Mr. Davy prove that this stimulant effect is not so positive as might be inferred, for on breathing from and into a bag containing twenty quarts of oxygen gas, nearly six minutes, the only deviation from his usual standard of health, perceptible, was an increased hardness of the pulse and an oppression at the chest analogous to that arising from the want of fresh air.* It is probable that during the respiration of this air the system is excited, partly by a stimulating quality imparted to the blood, and partly by the more direct application of the stimulant to the nervous expansions on the membranes of the lungs. The diseases, in which oxygen gas has been administered medicinally, are those of a chronic nature, where the various functions of the system are languid and debilitated. In these it has been respired always more or less diluted with atmospheric air, in the quantity of from one to two quarts daily, according to the effects produced by its inhalation.†

2. Nitrous Oxyd Gas.

This interesting compound, the effects of which on the human system were first discovered by Mr. Davy, is formed by the union of thirty-seven parts of oxygen and sixty-three of nitrogen. It is a product of art, and is obtained in the greatest purity by the decomposition of the nitrate of ammonia by heat. The degree of temperature must be regulated by the texture of the salt. In order to obtain it with ease from the compact nitrate, the temperature should be preserved between the 340° and 480° Fahrenheit; the decomposition of the fibrous nitrate is effected between

* Researches. p. 474.

† Murray. Mat. Med. vol. ii. p. 286....7.

400° and 450°. The products of this distillation are water and nitrous oxyd gas. The theory of the formation of these substances is obvious. The hydrogen of the ammonia combines with a portion of the oxygen of the nitric acid, and forms water, while the remaining oxygen unites with the residual nitrogen both of the ammonia and acid, and produces the nitrous oxyd, which passes over into the receiver in the form of gas, carrying with it a portion of the salt which may have escaped decomposition, from which it may be freed by standing a short time in contact with water.

The effects on the system, resulting from the respiration of this gas, are very remarkable, and are amply detailed in the "Researches" of Mr. Davy. It operates like a very powerful and general stimulus on the vital powers. Objects appear to the subject under its influence magnified and of a dazzling lustre, the sense of hearing is often painfully acute, the whole frame glows with a consciousness of pleasurable sensation; if the inhalation be continued the patient nearly loses all connection with the objects which surround him, he gradually passes into a state of delirium, when the various faculties of the mind act with unknown and uncontrollable energy, respiration is hurried, the pulse is accelerated, and an irresistible propensity to muscular motion is evinced which exhausts itself in laughing, stamping, exclamations of joy, and walking. These effects continue for a few minutes, and at length gradually subside, though the impression on the system often gives a charm to existence for many hours. Unlike the operation of other stimuli, the respiration of the nitrous oxyd gas is unattended by any exhaustion or debility of the vital powers, and although the stimulation have perhaps amounted to a degree, beyond which the functions of the body might remain permanently impaired, it passes off almost insensibly, and leaves no unpleasant traces of its powers. "A substance capable of acting in such a manner, we might suppose, would prove one of our most valuable remedies. The transient nature of its operation must undoubtedly limit its medicinal efficacy, but still in diseases of extreme debility we seem justified in expecting from its exhibition the most beneficial effects. The dose which is necessary to produce its peculiar effects varies from four to nine quarts, which may be breathed pure or diluted with atmospheric air. It cannot be breathed for more than four minutes and a half, insensibility being induced."*

The gases inimical to animal existence constitute a much more extensive class than the preceding, and appear to be destructive of life, either by simply excluding oxygen from the lungs, or by some positive action on the nervous system. All the airs, with the exception of oxygen and nitrous oxyd, may be supposed to produce their effects in one of these modes.

* Murray's Mat. Med. vol. ii. p. 288...9.

The administration, however, of these has been confined to hydrogen, nitrogen, carbonic acid, and carburetted hydrogen gases, the two first of which are negative, and the two last positive, with regard to their action on the human system.

1. Hydrogen gas.

For the purposes of respiration this gas should always be procured by the decomposition of water transmitted in vapour over the surface of ignited iron. "In a pure state, if the lungs have been previously emptied as much as possible of atmospheric air, it cannot be breathed above three quarters of a minute. It quickly occasions a giddiness and sense of suffocation; the countenance becomes livid, and the pulse sinks rapidly;* but, when diluted with two thirds or an equal bulk of atmospheric air, it can be safely breathed; nor does it appear to produce any very important effect. It occasions some diminution of muscular power and sensibility, and of the force of circulation. It has been used in catarrh, hæmoptysis, and phthisis, but its powers seem merely those of a palliative."* Hence it may be inferred that hydrogen, like nitrogen gas, operates only by the exclusion of oxygen, and not by any positive influence on the nervous system.

3. Carbonic Acid Gas.

This ærial fluid has acquired some celebrity in medicine, and has often been administered by respiration; by the introduction of substances into the stomach from which it is easily disengaged; and as an antiseptic in cases of topical gangrene. It may be obtained with facility, and in a state of purity by the exposure of carbonate of lime to a strong red heat in an iron tube, and collecting the gas over water. By the experiments of Mr. Davy, it appears to produce an acid taste in the mouth and fauces, and a sense of burning at the top of the uvula. When arrived to the upper part of the trachea, it is instantly stimulated to such a degree as to excite a spasmodic constriction of the glottis, and render it incapable of transmitting a particle of the air into the lungs. The same effects are produced even when diluted with an equal bulk of atmospheric air. But when the proportion of the two gases is about three quarts of carbonic acid to nine of atmospheric air, the mixture may be breathed for a short time with impunity. The symptoms resulting from its respiration in this way, are those of a weak sedative, producing a slight degree of giddiness, and an inclination to sleep. The effects, however, are temporary, and rapidly disappear after ceasing to breath the air.

This gas has been highly recommended in the cure of diseases of increased excitement, particularly phthisis pulmonalis; and patients have even been persuaded to visit daily, and even to

* Murray's Mat. Med.

reside in those places, particularly brewhouses, in which there is a constant copious production of this depressing power.—There are few cases on record, in which it has done more than act like an anodyne to diminish sensibility, and thus smooth the path to the grave.

This substance has perhaps proved more permanently useful as a local application to phagedenic ulcers and incipient gangrene, conveyed to the part through the fermenting poultice, from which it is extricated, or by means of a flexible tube, in its pure uncombined state.

4. Carburetted Hydrogen gas.

This is undoubtedly the most deleterious of all the gases which have been employed to diminish the morbid actions of the animal system. It is usually prepared by passing the vapour of water over the surface of charcoal, heated to ignition in an iron tube. The fluid is decomposed; its oxygen enters into combination with a portion of the carbon, and produces carbonic acid, while the hydrogen thus liberated unites with the remaining carbon, forms carburetted hydrogen gas, which, mixed with the other ærial product, passes over into the receiver, and is freed from the latter by agitation over lime water. Respired in a diluted state, it produces very alarming effects on the vital powers, and when pure almost immediate death. The rashness of Mr. Davy, in attempting its respiration, had nearly cost him his life. When diluted with atmospheric air, in the proportion of three quarts of the former to two of the latter, its inhalation was followed by a slight giddiness, pain in the head, and momentary loss of muscular power, attended by a quick and feeble pulse. When pure, however, the effects were much more positive and alarming. “After a forced exhaustion of my lungs,” says Mr. Davy, “I made three inspirations and expirations of the hydro-carbonate. The first inspiration produced a sort of numbness and loss of feeling in the chest, and about the pectoral muscles. After the second inspiration, I lost all power of perceiving external things, and had no distinct sensation, except a terrible oppression on the chest. During the third expiration this feeling disappeared, I seemed sinking into annihilation, and had just power to drop the mouth piece from my unclosed lips.”—“Putting my finger on my wrist, I found my pulse thread-like, and beating with excessive quickness.” The system was a long time in recovering from the effects of this experiment. From the action of this gas on his nervous system, it was inferred by Mr. Davy, that its operation is directly sedative, or productive of a diminution of vital powers and debility, without previous excitement.

The medicinal effects of this air are most obvious in phthisis pulmonalis, and it is to this disease, that its administration has in general been directed. According to the experiments of

Dr. Beddoes, it has in many cases relieved the symptoms and suspended the disease. Its respiration, however, must be regulated with caution. The gas should at first be highly diluted, and its strength gradually increased, in proportion as the system becomes accustomed to its action. The quantity to be respired should vary from one to four quarts a day.

MEDICAL ELECTRICITY.

THE application of this subtle fluid to medicinal purposes, was thought of, soon after the discovery of the electric shock. At the first introduction of electricity as a remedy, it was very highly celebrated for its efficacy in a number of diseases ; and after various turns of reputation, its medical virtues seem now to be pretty well established.

The medicinal operation of electricity may be referred to its stimulant power. It produces forcible contractions in the irritable fibre ; excites therefore to action, if duly applied ; and, when in excess, immediately exhausts irritability. It possesses the important advantage of being easily brought to act locally, and of being confined to the part to which it is applied, while it can also be employed in every degree of force.

Electricity is applied to the body under the form of a stream or continued discharge of the fluid, under that of sparks, and under that of shock ; the first being more gentle, the second more active, and the last much more powerful than either of the others. The stream is applied by connecting a pointed piece of wood, or a metal wire, with the prime conductor of the electrical machine, and holding it by a glass handle, one or two inches from the part, to which it is to be directed. A very moderate stimulant operation is thus excited, which is better adapted to some particular cases, than the more powerful spark or shock. The spark is drawn by placing the patient on the insulated stool, connected with the prime conductor, and, while the machine is worked, bringing a metal knob within a short distance of the part, from which the spark is to be taken. A sensation somewhat pungent is excited, and slight muscular contractions may be produced ; these effects being greater or less, according to the distance at which the knob is held, if the machine be sufficiently powerful. The shock is given by discharging the Leyden phial, making the part of the body, through which it is intended to be transmitted, part of the circuit. The sensation it excites is unpleasant, and the muscular contractions considerable, if the shock be moderately strong.

The general rule for the medical employment of electricity, is to apply it at first under the milder forms, and gradually to raise it, if necessary, to the more powerful. Mr. Cavallo, who has published the latest and best treatise on medical electricity,

entirely disapproves of giving violent shocks, and finds it most efficacious to expose the patient to the electrical aura discharged from an iron or a wooden point ; or, if shocks be given, they should be very slight, and not exceed thirteen or fourteen at a time. In this way he recommends it as effectual in a great number of disorders. The patient may be electrified from three to ten minutes ; but, if sparks be drawn, they should not exceed the number of shocks above mentioned.

Rheumatic disorders, even of long standing, are relieved, and generally quite cured, by only drawing the electric fluid by a wooden point from the part, or by drawing sparks through flannel. The operation should be continued for about four or five minutes, repeating it once or twice, every day.

Deafness, except when it is occasioned by obliteration, or other improper configuration of the parts, is either entirely or partly cured by drawing the sparks from the ear with the glass tube director, or by drawing the fluid with a wooden point.

Toothach, occasioned by cold, rheumatism, or inflammation, is generally relieved by drawing the electric fluid with a point, immediately from the part, and also externally from the face. But when the body of the tooth is affected, electrization is of no use, for it seldom or never relieves the disorder, and sometimes increases the pain to a prodigious degree.

Swellings, in general, which do not contain *matter*, are frequently cured by drawing the electric fluid with a wooden point. The operation should be continued for three or four minutes every day, and in obstinate cases it is sometimes necessary to persevere in its use for several weeks.

In inflammations of the eyes, the throwing of the electric fluid, by means of a wooden point, is often attended with great benefit ; the pain being quickly abated, and the inflammation being generally dissipated in a few days. In these cases, the eye of the patient must be kept open ; and care should be taken not to bring the wooden point very near it, for fear of any spark. Sometimes it is sufficient to throw the fluid with a metal point ; for in these cases, too great an irritation should always be avoided. It is not necessary to continue this operation for three or four minutes without intermission, but after throwing the fluid for about half a minute, a short time may be allowed to the patient to rest and wipe his tears, which generally flow very copiously ; then the operation may be continued again for another half minute, and so on for four or five times every day.

Palsies are seldom perfectly cured by means of electricity, especially when they are of long standing ; but they are generally relieved to a certain degree ; the method of electrifying in those cases, is to draw the fluid with the wooden point, and to draw sparks through flannel, or through the usual covering of the parts, if they are not too thick. The operation may be continued for about five minutes per day.

Ulcers, or open sores of every kind, even of long standing, are generally disposed to heal by electrization. The general effects are a diminution of the inflammation, and first a promotion of the discharge of properly formed matter ; which discharge gradually lessens, according as the limits of the sore contract, till it be quite cured. In these cases, the gentlest electrization must be used, in order to avoid too great an irritation, which is generally hurtful. To draw or throw the fluid with a wooden, or even with a metal point, for three or four minutes per day, is fully sufficient.

Cutaneous eruptions have been successfully treated with electrization ; but in these cases it must be observed, that if the wooden point be kept too near the skin, so as to cause any considerable irritation, the eruption will be caused to spread more ; but if the point be kept at about six inches distance, or farther if the electrical machine be very powerful, the eruptions will be gradually diminished till they are quite cured. In this kind of disease, the immediate and general effect of the wooden point, is to occasion a warmth about the electrified part, which is always a sign that the electrization is rightly administered.

Scrophulous tumors, when they are just beginning, are generally cured by drawing the electric fluid with a wooden or metal point from the part. This is one of those kinds of diseases in which the action of electricity requires particularly the aid of other medicines in order to effect a cure more easily ; for scrophulous affections commonly accompany a great laxity of the habit, and a general cachexy, which must be obviated by proper remedies.

Locked-jaw has in some instances been speedily cured by small shocks passing through the jaws.

Nervous headaches, even of long standing, are generally cured by electrization. For in this disease, the electric fluid must be thrown with a wooden, and even sometimes with a metal point, all round the head successively. Sometimes exceedingly small shocks have been administered ; but these can seldom be used, because the nerves of persons subject to this disease are so very irritable, that the shocks, the sparks, and sometimes even the throwing the electric fluid with a wooden point kept very near the head, throw them into convulsions.

Amenorrhœa, a disease of the female sex, that often occasions the most disagreeable and alarming symptoms, is often successfully and speedily cured by means of electricity, even when the disease is of long standing, and after the most powerful medicines, used for it, have proved ineffectual. The cases of this sort, in which electrization has proved useless, are so few, and the successful ones so numerous, that the application of electricity for this disease, may be justly considered as an efficacious and certain remedy.

Small shocks, that is, of about one twentieth of an inch, may be sent through the pelvis ; sparks may be taken through the clothes

from the parts adjacent to the seat of the disease; and also the electric fluid may be transmitted, by applying the metallic or wooden extremities of two directors to the hip in contact with the clothes; part of which may be removed, in case they be too thick. Those various applications of electricity should be regulated according to the constitution of the patient. The number of shocks may be about twelve or fourteen. The other applications may be continued for two or three minutes; repeating the operation every day. But either strong shocks, or a stronger application of electricity than the patient can conveniently bear, should be carefully avoided; for by those means, sometimes disagreeable symptoms are produced.

The application of electricity has also been beneficial in other diseases besides the abovementioned; but as the facts are not sufficiently numerous to afford the deduction of any general rules, we have thought not proper to take any particular notice of them. We may lastly observe, that, in many cases, the help of other remedies to be prescribed by the medical practitioner, will be required to assist the action of electricity, which by itself would, perhaps, be useless; and, on the other hand, electrization may often be applied to assist the action of other remedies, as of sudorifics, strengthening medicines, &c. It not unfrequently happens that electricity is relinquished as an unsuccessful remedy, when by a more rigid perseverance a cure might have been effected.

N. B. The substance of the above article may be found in the Encyclopedia, American edition.

Nº. IV.

GALVANISM.

THE peculiar power, which is generated, when two metals moistened are in contact, at first named animal electricity, since galvanism, discovered by Professor Galvani, at Bologna, has been recently applied as a remedy in various morbid affections. Its effects on the animal system are such as warrant this application. Its activity is shewn, by its exciting strong sensations, in sensible parts, and powerful contractions in parts endowed with irritability. These singular phenomena take place in consequence of a mutual communication between any two points of contact, whether more or less distant, in a system of muscular and nervous organs. The extent of this communication may be considered as a complete circle divided into two parts, one of which, comprising the organs of the animal under the experiment, is called the *animal arc*; the other, which is formed by the metals or galvanic exciters, is denominated the *excitatory arc*; and consists of more than one piece of various kinds.

Beside the effect thus produced on the muscles, the impressions made on the organs of sense are equally remarkable. For instance, if a thin plate of zinc be placed on the upper surface of the tongue, and half a crown, shilling, or teaspoon, be laid on the lower surface of the tongue, and both metals after a short space of time be brought into contact, a peculiar sensation, similar to taste, will be perceived, at the moment when the mutual touch happens. A similar perception will result both at the moment of contact, and that of separation, if one of the metals be applied as high as possible between the gums and upper lip, or even under the tongue.

Signior *Volta's* apparatus consists of a number of copper or silver plates, (which last are preferable,) together with an equal number of plates composed of tin, or still better of zinc, and a similar number of pieces of card, leather, or woollen cloth, the last of which substances appears to be the most suitable. These last should be well soaked in water saturated with common salt, muriate of ammonia, or, more effectually, with nitre. The silver or copper may be pieces of money, and the plates of zinc may be cast of the same size. A pile is then to be formed, by placing a plate of silver on a corresponding one of zinc, and on them a piece of wet cloth or card; which is to be repeated alternately, till the number required be arranged in regular succession. But,

as the pieces are apt to tumble down, if their numbers be considerable, unless properly secured, it will be advisable to support them by means of three rods of glass, or baked wood, fixed into a flat wooden pedestal, and touching the pieces of metal at three equi-distant points. Upon these rods may be made to slide a small circular piece of wood, perforated with three holes, which will serve to keep the top of the pile firm, and the different layers in close contact. The moistened pieces should likewise be somewhat smaller than those of metal, and gently squeezed before they are applied, to prevent the superfluous moisture from insinuating itself between the pieces of metal.....Thus constructed, the apparatus will afford a perpetual current of animal electric fluid, or galvanic influence, through any conductor that communicates between the uppermost and lowest plate ; and, if one hand be applied to the latter, and the other to the highest metal, a shock will be perceived, which may be repeated as often as the contact is renewed. This shock greatly resembles that given by the torpedo, or *gymnotus electricus* : and, according to the larger size of the metallic plates, the shock will be proportionably stronger. The intensity of the charge, however, is so low, that it cannot penetrate the dry skin ; it will therefore be necessary to wet both hands, and to grasp a piece of metal in each, in order to produce the desired effect : its power may be considerably increased, both by an elevation of temperature, and by augmenting the number of pieces that compose the pile. Thus twenty pieces of each will emit a shock that is very perceptible in the arms ; if one hundred be employed, a very severe but tremulous sensation will extend even to the shoulders ; and, if the surface of the skin be broken, the action of the galvanic influence will be uncommonly painful.

The sensation of a flash, or shock with this apparatus, does not materially differ from that produced by two simple plates ; but it may be effected in various ways, especially if one or both hands be applied in a wet state to the lowest plate of the pile ; or any part of the face be brought in contact with a wire communicating with the top piece. Farther, if a wire be held between the teeth, so as to rest upon the tongue, that organ, as well as the lips, will become convulsed, the flash will appear before the eye, and a very pungent taste will be perceived in the mouth.

Between galvanism and electricity there are so many points of resemblance, that they have been considered as ultimately the same power, or, as the same subtle matter in different states. Whether this opinion be just or not, the effects of galvanism on living matter, are different from those of electricity. The sensation, which the former excites, though somewhat analogous to that produced by the latter, is still dissimilar ; the action of galvanism is more extended, both to the nervous and muscular systems, than that of electricity, which is more local in its action. The galvanic excitation produces sensations and contractions in the parts, which, from disease, are insensible to electrical

impressions ; and the stimulant power, which both exert, appears in galvanism, to be greater in proportion to its intensity, than in electricity ; or the sensations and muscular contractions, which the galvanic discharge excites, are more than proportioned to its power of producing electrical phenomena.

The diseases, in which galvanism has hitherto been employed, are principally those of the nervous kind. In paralysis, it has been affirmed to have restored the capability of muscular contraction, and consequently the power of motion. Cases of chorea, tetanus, and some other spasmodic affections, have been related, in which perfect cures were accomplished by its application. It appears, in several instances, to have relieved deafness, especially that species of it arising from torpor of the auditory nerve ; and it has been successful in discussing indolent tumors.

Galvanism is applied by connecting two metallic wires with the two extremities of a galvanic battery, and bringing them in contact with the part affected, so that it shall form part of the circuit of the galvanic discharge ; the one wire is kept in contact with the part it touches ; the other is alternately applied for a moment and removed. If the skin be moistened, the galvanic influence is communicated more readily and effectually ; and still more so if a small piece of metallic leaf be laid on the parts to which the wires are applied. Sometimes even the cuticle has been previously removed by a blister, but the galvanic application is then attended with pain.

AN ABRIDGMENT OF DR. CURRIE'S MEDICAL REPORTS ON THE USE OF WATER.

DR. CURRIE has published a work in medicine apparently of the utmost importance, and particularly so to the United States ; for whose now reigning disease, it flatters us with some appearance of relief, if not of cure. The veracity of the author in all situations, is as well established as his reputation for solid and ingenious talents.

Dr. William Wright, F. R. S. formerly of Jamaica, and well known for his writings in medicine and botany, seems to have furnished a case to our author, which, joined to his own previous opinions, led him to the train of practice and observation of which we are about to give the account.—Dr. Wright, while on a voyage from Jamaica, in 1777, being attacked with fever, on the third day of it, ordered three buckets of salt water to be thrown upon himself, which gave him instant relief ; and this, being repeated on the two following days, removed every symptom of disease. Another passenger, whose attack from fever had begun on August 9, copied the example, and was restored to health. A seaman, who originally communicated the fever to Dr. Wright, refusing proper assistance, died. Encouraged by these incidents, and finding that Dr. Brandreth of Liverpool, had employed cold water externally in cases of fever, with happy effects, Dr. Currie resolved upon a series of experiments.

In December 1787, Dr. Currie, in seven cases of contagious fever, threw cold water from a bucket upon the body of each patient ; and the whole recovered. An eighth patient died, with whom the practice was omitted. The cure was *chiefly intrusted to this remedy* in one hundred and fifty three cases, of which the author kept a register ; besides many *subsequent* cases, of which he kept no register, unless where the application failed of success.

The 30th regiment of British infantry, in particular, while quartered at Liverpool, in 1792, afforded him an opportunity of trying this application with some precision ; and the result of the experiment is instructive. A guard-room, prison-room, two sick-rooms, and a cellar, had, by their foulness, either caused or increased a fever, which soon affected a number in the regiment. Dr. Currie being called in, the primary causes of the disaster were removed, and the patients all cleansed. Those

whose strength was not greatly reduced, had cold salt water poured upon them; and the rest were sponged over with tepid vinegar. The remainder of the regiment was drawn up in its ranks, and seventeen others who had marks of the disease were separated, and subjected to the cold affusion;* which cut the disease short in all but two of these. Those who were yet well, were ordered to bathe in the sea; being regularly mustered for that purpose. The number infected in the whole was fifty-eight; of whom twenty-six had the disease, by these means, brought suddenly to a close; but in the remaining thirty-two it ran its course. It was fatal, however, only to two; who had been weakened by visiting the West Indies, and by being bled, and who besides had not received the cold aspersion, not having been visited by Dr. Currie till the twelfth or fourteenth day of the disease. The fever broke out about the beginning of June, but no new attack occurred after the thirteenth of that month. The water employed was taken from the river Mersey; having in it 1-32 or 1-33 part of sea salt; and being of the temperature of 58 or 60 degrees of Fahrenheit's, which is our common, thermometer.

When Dr. Currie speaks of fever simply, he means the low contagious fever; which frequently is called the nervous, and in certain cases the putrid, fever; being the common fever of England, and prevailing chiefly among the poor, who are most exposed to the causes producing it. Dr. Cullen gives it the name of *typhus*; terming it a *contagious fever; in which the heat is but little increased; the pulse small, weak, and mostly quick; the urine scarcely changed; the functions of the brain and senses much disturbed; and the strength greatly reduced.*

In fevers called *continued*, there is nevertheless (see Dr. Cullen and others) at least one increase and one abatement in each day. This increase of the fever is known by thirst, restlessness, and increased flushing; and also by the heat in the internal parts of the body, raising the thermometer one or two degrees beyond the average observed during other moments of the fever. As this increase (or paroxysm) usually occurs in the afternoon or evening, Dr. Currie prefers this period (other things being equal) for the cold affusion; thinking it most *safe*, as well as most *useful*, to apply the water at the height of the fit or immediately after it has begun to decline. But he says, that the remedy may be safely used, *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 perspiration*; which he observes, are particulars of the utmost importance.†

* By affusion or aspersion, the author means the pouring of water upon a patient, as for example, from a bucket.

† One important caution appears to have escaped both Dr. Currie and his able commentator. That when fevers are complicated, (as they often are in this climate) with pneumonic inflammation, or other dangerous affections of the lungs, cold ablution is inadmissible. [Compiler.]

During the cold stage of the fever, the cold water nearly suspends the respiration, greatly disturbs the pulse, increases the chill, and seems to bring on the struggles of death ; and really would do so, if repeated. The thermometer therefore is never to govern the practitioner, where the chilliness of the patient contradicts its indications. On the other hand, the absence of chilliness is no guide, unless the thermometer concurs to shew a heat more than natural. Lastly, profuse perspiration, in fever, must for the time, deter from the operation ; and especially in proportion to its continuance. Though perspiration is in itself a cooling process, yet the load of heated bed-cloaths may prevent an *internal* diminution of the heat from being immediately perceived. Under these restrictions, Dr. Currie thinks, that the cold affusion may be used at any period of fever ; but preferably in the beginning.

The author seems after each affusion to have rubbed the body *hastily* with towels.

The cold affusion generally reduces the heat from two to six degrees of Fahrenheit's thermometer ; and the pulse sinks by it from two to above twenty beats in the minute ; and in one case, somewhat dubious indeed as to its issue, it fell at least forty beats.

Where the heat is reduced and the debility great, some cordial should be given immediately after the affusion ; and the author thinks that warm wine is the best. In case the affusion produces effects unusually severe, then to the *cautious* use of warm cordials in small quantities, friction and especially of the extremities, is to be added, and a bladder of hot water applied to the pit of the stomach.

Several examples are given of the effect of the cold affusion in the first, second, third, fourth, and succeeding days of fever. On the first and second days, the disease often instantly vanishes with one aspersion ; and sometimes on the third day ; but on the fourth day this is rare. Each aspersion however instantly removes the symptoms ; and a few repetitions of it on the successive returns of the paroxysm, in two or three days happily terminate the disease, with none or trifling aid from medicine.

In advanced periods of the disease, the author commonly employs water only fifteen or twenty degrees below the natural heat of the human body. After the eighth or ninth day he often simply sponges the whole body with tepid vinegar, to which he sometimes adds water. But where the heat has remained considerable, and where the *sole object* has been its removal, he has still persisted in the tepid aspersion.

Hence another limitation occurs to the author's general doctrine ; for the cold affusion is to be changed after a certain number of days for the tepid, and the tepid affusion in various cases is to give way after a time to moistening and washing the body.

Since cold, cool, and even tepid water, employed externally, each reduce the patient's heat ; we see why this heat should not

be too low at the moment, lest too great a chilliness should follow. Hence also the same patient, whose disease has been removed by cold water judiciously applied, would often suffer from repeating the application in his convalescent state. But if we think we perceive why this rude remedy answers so happily at the delicate moment of the hot fit ; we are still to inquire, whence it often removes the *whole of the disease*, of which the heat seems to constitute only a part ?

Dr. Currie, as might be expected, has extended his trials with water to other species of fever. One species and one alone, he has found in every shape insensible to his great remedy, of aspersion with *cold* water ; but this species was generally insensible also to every other remedy, and was *not made worse by cold water*. This fever occurs, he says, chiefly in the winter season ; and in persons who are in the flower or vigour of life, and who are also possessed of considerable sensibility of mind, and are in habits of more than ordinary mental exertions. Other particulars of this complaint must be looked for in Dr. Currie ; who is the first perhaps who has noticed it, as a distinct species of fever ; to which indeed it seems to lay claim, not merely by its refusing to yield to his applications, but by its symptoms ; and particularly by the acuteness which prevails in all the senses of the patient, beyond perhaps the state of nature, and certainly beyond what occurs in common fever.

In *intermittents*, the cold affusion with vigorous patients, applied *before* the period of the *cold* fit, has prevented the whole of the fit ; but where weakness made the attempt hazardous, the cold fit was suffered to arrive and pass, and the affusion was applied to the hot fit when thoroughly formed. The disease was sometimes cured in the first case ; but in the second, there was only a solution of the pending fit ; though four or five repetitions of the practice finally removed the disease. In any event, opportunity was given for throwing in medicines.

Dr. Currie has found not only that eruptions on the surface of the skin, but that salivation, are no obstacles to the cold affusion, under the restrictions before mentioned.

A friend of his has tried it also in the first commencements of *scarlet fever* (*scarlatina*), and with complete success. The efflorescence on the skin and the affection of the throat were even prevented ; which has led Dr. Currie to consider the tendency to these symptoms as being the *effect*, and not the *cause*, of this fever. Dr. Currie having had no late opportunity of treating the scarlet fever in its early stages, has contented himself with prescribing for it in its later stages, immersion in the tepid bath, heated from ninety-two to ninety-six degrees of Fahrenheit.

In the eruptive fever of the *small pox*, Dr. Currie has found a new object for the successful use of the cold affusion ; regulating himself as usual by the actual state of the patient's heat, as appearing from the thermometer, provided the indications of the thermometer are confirmed by the patient's *sensation* of heat.

In the confluent small pox, after the eruption is completely formed, he is diffident of its benefit. But he is the more anxious to apply it in the eruptive fever, since he says that the assimilation of the quantity of contagious matter produced from the first contagion, is invariably found to bear an exact proportion to the eruptive fever. He declares that in the eruptive fever, he has instantly abated the symptoms however severe, and that the disease has assumed a benignant form. He tells us, that the Chinese are stated to have long followed this practice with success.

Dr. Currie treats of *cold water applied internally* in fevers. He says that in the cold stage, it is never to be employed, however urgent the thirst ; which ought only to be gratified in this stage of the fit, or paroxysm, with warm liquids. When the hot stage is fairly formed, and the surface of the body *dry and burning* ; cold water, he says, may be drank with the utmost freedom ; and if it succeeds in lowering the pulse and heat, as is usual, perspiration and sleep commonly follow. Its effect however is never so powerful, according to his experience, as to dissolve even the existing fit of the fever, and much less the fever itself. But he holds draughts of cold water as an useful auxiliary in these cases, and says that they may be used more freely in proportion as the heat is more advanced above the natural standard. He allows cold water to be drank, though more sparingly, even in the *beginning* of the sweating stage ; since it may promote the flow of perspiration ; which after it has commenced, seems to be checked, if a fresh *increase* of animal heat occur. But after the perspiration has become general and profuse, the use of cold drink is strictly forbidden ; the rule being, in all other respects, the same as laid down for cold water used externally.

In case of *injury from drinking cold water*, the author recommends hot water to be applied in a bladder to the pit of the stomach ; and small and frequent doses of tincture of opium to be administered, which Dr. Rush recommends in cases of injury from cold water drank in warm weather.

Though Dr. Currie is persuaded that injury has sometimes followed from cold water drunk in hot weather, and from cold bathing used after strong exercise ; yet he denies that any inconvenience is *necessarily* to follow. He affirms, that inconvenience arises only for the want of making proper distinctions. In situations where the body, after having been much heated and enfeebled by severe exertions, is losing its surplus heat by perspiration, and in general by a cessation of the exertions which caused the heat ; he allows that cold water, whether applied inwardly or outwardly, may often be injurious and sometimes even fatal. But while the surplus heat is kept up by a continuance of the exertion, he says that cold water may be drank safely in moderate quantities. The same he asserts respecting the cold bath ; and therefore he has for some years constantly directed infirm persons to use such a degree of exercise before plunging into the cold bath, as would produce some increased

action of the vascular system, with some increase of heat; and thus secure reaction under the shock. It will appear, however, that the patient here ought not to perspire; or if perspiring, ought not to stand still, either dressed or undressed, sufficiently long to become chilled from the effect of the act of perspiration, or from the evaporation following it.

Under the above persuasions our author contends against Dr. Rush; that where the party is warm, *no* attempt should be used to reduce the heat, previous to drinking cold water. It follows however from Dr. Currie's own premises, that no objection occurs either against removing the chill from the water, by means of the sun, of common fire, or of animal heat; or against continuing to exercise for a short time after the draught: and as either of these expedients is simple, it would be well to employ one or both of them; as the sole object in view is quenching the thirst, and not curing a disease upon speculative principles. We may here also observe the benefit of wearing cotton or even woollen next to the skin, where perspiration is probable from hot weather or violent exercise, especially where both are combined; since wet linen aided by evaporation, conducts away the heat of the body so rapidly, in certain situations, as often to occasion severe chills. Few however are the cases, in which it will not be safe and highly adviseable to throw off the wet linen, rub or wipe from the skin the matter perspired with something dry, and put on a fresh and dry covering next to the body; as those who have had experience in the case, will cheerfully testify.

As to using the cold bath when the body is warm, there are so many facts on both sides of the question that it requires an expedient to reconcile them; and this Dr. Currie certainly seems to offer. By his means, we perceive whence the Roman youth could plunge in the *course of their daily exercises* into the river Tiber, and yet Alexander suffer from throwing himself into the river Cydnus, after being fatigued and chilled with perspiration; as well as whence the Russians and others jump from a vapour or hot bath into the snow, or into a cold bath; while merely to sit in a cold stream of air, after violent exercise, is sufficient to bring others, nay the very same people, to the grave. A number of other seemingly contradictory, and yet authentic relations, receive here also a similar solution. Hence we may assure ourselves, that if the waters of the Mississippi never injure those who drink them in summer, whatever be their state as to perspiration or fatigue; it is not owing to the *quality* of these waters, but to their *warmth*, in consequence of their long exposure to the sun. In like manner, if the water issuing newly from the ground in Abyssinia, is harmless in all cases; it is because the spring-water of that country (which every where nearly corresponds with the average temperature of the weather of the place) is never very cold.

But we pass on to new cases of disease.

Before and since the year 1790, the author has witnessed thirteen cases of tetanus (that is, stiffness accompanied at intervals with convulsion, as instanced in the disease known by the name of the locked jaw.) This disease is distinguished into the proper or primary, called idiopathic; and the concomitant or secondary, called symptomatic, being an occasional attendant upon wounds, especially in hot countries. The author from his later experience, is disinclined to use the cold bath in any of its forms in the *symptomatic* tetanus; unless in the earlier stages of the disease, when the vigour is less impaired, and the disease less rooted. One reason is, that change of posture is required for the purpose, in a case where the mere action of the will on the muscles is often alone sufficient to bring on a general convulsion. He rather prefers wine given in large quantities, a remedy first introduced by Dr. Rush; but wishes it combined with very large doses of opium. Wine, it seems, has in this disorder been given with success also to horses; but it is queried, whether other strong or spirituous liquors would not answer as well. It is observed that the constitution under this disease, powerfully resists the intoxicating quality of the wine and opium. In tetanus also, Dr. Currie has applied pressure, with evident good effect; moistening at the same time the bandages with ether, but taking care lest inconvenience should arise from too great an evaporation, the natural consequence of ether being exposed to a current of air. In the *idiopathic* or simple tetanus, the author has applied water of an exceedingly cold temperature (exhibited in a bath where the effect was sudden, and the limbs could be stretched out,) with a very marked success, though all other applications had failed. Let us observe here, that since to rub in sweet oil has been found a powerful remedy with many, in cases of *cramp* of the external muscles; it might be well always to try it in tetanus, though medical persons often slight it. In any event, those subject to this painful affection of the cramp, especially pregnant women and swimmers, may do well to remember this use of oil. Oily substances may also be tried by the mouth or clyster, in cases of cramp or spasm in the stomach or intestines.

The author has applied a very cold bath to more than one case of insanity, with brilliant success; but it was when the fit was at the highest. The ordinary delirium of fever is acted upon by cold water in different shapes, in common with all the other symptoms of fever.

In children's convulsions, it is also serviceable; stopping the fit, and giving time for other remedies. When the author mentions that convulsions may sometimes arise from worms or other causes; perhaps he ought to have added, that teething is one of these causes, and that John Hunter has given instant relief, by cutting the gum over a young tooth with a lancet. On the whole, Dr. Currie recommends caution in the applications of water in early infancy; sometimes tempering his water, and

sometimes only pouring it on, in preference to bathing in it ; but making the operation sudden and transient, and providing means ready for securing the re-action, and even omitting it altogether when little vigour is left. But with these precautions he has seen great benefit resulting from the application of cold water.

In cases of St. Vitus's dance he has found no encouragement, for a reason hereafter to be mentioned ; but he recommends electricity in this complaint, as one of the few in which this operation seems advantageous.

He promises us little from his remedy in the case of epilepsy, where his experience does not seem indeed to have been extensive. Instead however of his own favourite remedy, he mentions benefit derived, in a case of periodical epilepsy, from a plaster formed chiefly of tobacco, applied near the pit of the stomach before the expected attack. He has used tobacco also in two desperate cases of convulsion, followed by continued coma, (that is, sleepiness and loss of sense ;) but it was in the form of a decoction applied, as a clyster, which he prefers to the fumes of tobacco ; the quantity for the decoction being half a drachm of tobacco in four ounces of water. In epilepsy also he applies oxyd of zinc (that is the calx of the semi-metal zinc ;) and still more efficaciously the *digitalis purpurea*, or purple fox-glove, concerning which Dr. Withering and others have lately written largely. The author might have added, that hartshorn or ether mixed with water and given during the epileptic fit, tend powerfully to shorten it.

But let us close the author's account of his treatment of convulsive diseases with the following general remarks, extracted from his work. The efficacy of the cold bath in convulsive disorders, is much promoted by its being employed *during the moment of convulsion* ; or (as he afterwards chooses to express himself,) its chief benefit depends on its being used in the paroxysm of convulsion ; its efficacy consisting in resolving or abating this paroxysm, by which means the return is greatly retarded, if not entirely prevented. This law or principle in the disease, the author tells us, bears analogy to the fact, that madness is best treated in the height of phrenzy. He also remarks, that the cold bath seems without effect in every spasmodic disorder, (as St. Vitus's dance,) which does not rise to the height of convulsion. Lastly, he observes, that in cases of madness and convulsion, there must be no considerable wound or other lesion of structure ; that the disease should not be too habitual, and especially so as to produce insensibility to impression ; that the fit should have a *general influence on the frame* ; and that the digestion should not be too much impaired nor the vigour of the circulation much debilitated, lest the action of the cold be too strong for the living powers.

“ Cold water (says our author) cannot be used as a *drink* during the paroxysm of *convulsions* ; and of course we cannot shew the analogy between its external and internal use in these, as in other diseases.

"That its effects (he adds) taken internally, are most salutary, in a numerous class of *chronic* diseases, is however well known; though perhaps not acknowledged to the full extent of the truth. A considerable part of the virtue of mineral waters is doubtless to be attributed either to the diluting quality of the pure element itself; or to the invigorating effect of cold on the stomach, and through it, on the system at large. * * * In hypochondriacal, hysterical and dyspeptic* affections, cold water taken internally has produced the most salutary effects. Hoffman praises it in head-ach, whether arising from indigestion or some primary affection of the nerves of the head. The following case will shew the use of cold drink in certain convulsive affections." Here the author cites from Hoffman the case of a Jew boy, cured of violent convulsions in a fortnight, by drinking cold water frequently every day.

Dr. Currie applies the term *tepid*, to water heated from 87 to 97 degrees of Fahrenheit, where it is used for affusion; though water will seem to be warm to the body at some degrees lower, if used as a bath, for in this case the evaporation is excluded. The cold from evaporation is so considerable, that water in the warmest climates will chill the person moistened with it, if standing in a current of air in the shade.

The author finds the coolness remaining from the *warm* affusion (strange as it may be thought) as great, as that from the cold affusion; and perhaps greater; but the cold is less sudden and stimulating. Without inquiring into the author's reasonings, let us observe that he applies the tepid affusion to certain other cases where there is fever; provided the chief view is to diminish the heat, and provided there is no contagion present, nor any foul matter in the bowels, as likewise no local inflammation; for we must never forget that affusion is only recommended where the heat is *general*. Under these impressions, the author employs the warm affusion frequently with children; and he has used it also where the lungs were affected; and especially in his *own* case, during the hectic fit, in hereditary consumption. But independent of the possibility of the respiration being affected, he remarks that in hectic cases, the body soon parts with its heat, which is then seldom great, even in the extremities. He recommends, however, in any event to moisten the inside of the hands and feet; since from the sensation of heat in the extremities, great irritation follows to the system.

Dr. Currie every where insists, that when the patient feels chilly, neither affusions nor wet sponges, of any kind, are to be applied: but he repeats, that the cold affusion (which he calls an *energetic* remedy) is not only the most effectual, but *safest* application, in many of the cases where it can be used; since the system often accommodates itself to a sudden cold which is general and stimulating, but shrinks from a cold which is slow and successive.

* Dyspepsia, in general includes the obvious diseases arising from indigestion.

Water tempered from 75 to 87 degrees, (which the author terms *cool*) is recommended for febrile diseases; but more frequently for palsy and other cases of debility. If the system is to be strengthened, or if diseased associations (or habits) are to be broken through, the application is to be quick and brief; but if it is merely to allay heat, and there is no danger of indirectly affecting the respiration, it may be used more slowly.

Such are the principal uses of water here to be mentioned from Dr. Currie.—We may be permitted to add one or two to his list. In cases of strains, dislocations, or fractures, *cold water* employed externally has had the happiest effects: operating in the first case like a charm; and in the others, allaying inflammation and preventing swelling, till the arrival of the surgeon, who then finds less impediment in examining the bones. With bruises and burns, similar advantages perhaps may be expected. But in all cases, it must be remembered, that the application must be *immediate* and long continued, and used merely to the part affected; and the water changed whenever the cold goes off.

That the facts respecting the use of *cold water* in certain diseases, as detailed in these sheets, may seem applicable to the case of the inhabitants of the United States; the author of this abridgment has judged it proper to cite the following evidence of some eminent physicians of America, on this subject.

In the "History of the *yellow fever*, as it appeared in the city of New York in 1795, by Dr. Alexander Hosack, jun. of that city," we are told that "the most certain and successful means [of cure] were, to wash the whole surface of the body with *cold vinegar* and water; and, immediately after, covering the patient with blankets, to administer such medicines as possess the effect of bringing on sweating. Of these, the *spiritus mindereri* and saline draughts of Riverius succeeded well; more especially if the warm drinks were continued; such as the infusion of snake-root, gruel, toast water, tamarind water, lemonade, &c. These were much aided by applying to the feet of the patient a warm brick, steeped in vinegar and covered in a flannel cloth wet with vinegar or spirits: the steam, thus emitted and diffused through the bed, had a wonderful effect in softening the skin and exciting sweat; especially where the *cold* washing had been previously employed.

"Some practitioners have preferred the practice of plunging the patient several times in a cold bath, and violently dashing the body with cold water. But simply washing the patient with cloths dipped in *cold vinegar* and water, was found much preferable to immersion;* both because it more effectually diminished the heat of the system and was less fatiguing to the patient. Experiments have proved, that repeatedly wiping and washing with water, in the ordinary way in which the operation is performed; dimi-

* Before deciding here, we must consult Dr. Currie.

nished the heat seven or eight degrees more than simple immersion, or dashing it over the body with pails.

"The practice of cold bathing in fevers of this type, is not a new one, but was very commonly employed at Breslaw in Silesia; and of late years has been very successfully applied in the West Indies,* as well as in different parts of Europe, where diseases of this type prevail.

"Professor Gregory, of Edinburgh, and Dr. Currie, an eminent physician at Liverpool, have also prescribed it with great advantage in the low typhus fevers of those cities. But its great success in the *New York hospital*, as employed by Dr. Samuel Bard, and in the private practice of my brother, have fully convinced me of its use.

"It is also proper to remark, that where the physician was not called to the patient in the first stage of the disease, and putrid symptoms had appeared, and the patient had become much debilitated, the cold bath was injurious: and from the abuse of cold bathing, by employing it in the *last* stage of the disease, it has fallen into disrepute with some practitioners. But as the abuse of a thing is no argument against its use, I repeat my observation, that in the *first or inflammatory* stage of the disease, it was one of the most useful remedies that was employed.

"When the cold bath had been thus made use of, and immediately after followed by the spiritus mindereri or saline mixture, with plentiful dilution, it rarely failed to produce sweating in the course of fifteen minutes; and when once induced, it was easily continued by the repetition of the sudorific medicines and drinks, until a solution of the fever was obtained. In some instances, where the patient refused his drink and medicines, or from the carelessness of the nurses they had not been supplied as frequently as was proper, and the perspiration had been suppressed, it became necessary to repeat the cold bathing; which seldom failed to procure a return of the *sweating*. By the continuance of this discharge, an abatement of all the symptoms took place. It appeared to operate as a specific in the disease; the pulse in a short time become moderate; the heat of the skin diminished; the pain in the head and back, before so distressing, was also relieved; the sickness of stomach and vomiting were removed; and in the course of two or three days from the attack, the patient had little else to contend with but mere debility."

Thus far Dr. A. Hosack, jun. who, as we perceive, cites the authority of his brother Dr. D. Hosack, and of Dr. G. Bard, both of New York, in addition to his own. We must observe, that neither of these gentlemen, at the time of the publication of Dr. A. Hosack's pamphlet, had seen the larger work of Dr. Currie; of which the first edition appeared at the close of 1797, and the second in 1798. This work therefore merits an examination by itself, even by the physicians of New York. One of them, whose name has not

* See Dr. Jackson on the Diseases of Jamaica.

yet been mentioned, but whose own productions are read even in the centre of Germany, mentions in a private letter, that Dr. Currie's work did not reach New York till the present year (1799.) He himself says of it, that "it appears to be a judicious and interesting practical work." But not to dwell upon an opinion given incidentally only, however weighty may be the judgment of the party; we proceed to other evidence.

An American physician, whose name is known in every part of the civilized world, states that "he can from the experience of five years, subscribe to all Dr. Currie's remarks upon the use of cold water in the disease which has lately afflicted *** Philadelphia." He adds, "its efficacy is now admitted by nearly all our physicians.—It is so far from interfering with, that it aids the operations of bleeding, and mercury. Where cold water has been too feeble to compose the inordinate actions of the blood vessels, I have used *ice* with great advantage. When the head is much afflicted, I confine the ice in a bladder and apply it to the forehead. In a few minutes I have seen it abate pain, remove a delirium, and sometimes induce the most salutary sleep. Its effects are equally obvious when applied to the seats of *violent* disease in other parts of the body; provided none of those circumstances forbid its application which are mentioned by Dr. Currie."

In various eastern countries, we find cold water used as an instrument in medicine; the custom probably being derived to them from ancient times. Dr. Currie not only cites the example of the Chinese, but of others; and he especially refers to the treatment of the sickness of Sir John Chardin in Persia; and Dampier says,* that he himself was cured of a flux, by bathing daily in a river in some of the eastern parts of Asia. But it is not from the rude practice of the orientals, nor even from Hippocrates or Galen, who each employed cold water medicinally, that we are to expect nice distinctions in these cases. Such do not in general offer themselves suddenly even in our own times.

Dr. Wright made his experiment in 1777, and (as every physician ought to do where he has the opportunity) he made it upon himself. He has great merit; but that merit does not consist in having given us *sufficient rules*. In 1788, a part of the practice in question was established in the Liverpool infirmary; whence it spread into the town of Liverpool and its surrounding country. In 1791, Dr. Currie's colleague published an account of these methods in Dr. Duncan's medical commentaries for that year. Dr. Currie himself published another partial account in 1792. Dr. Gregory (the younger) of Edinburgh, has spoken on the subject in his public lectures; and even in 1737 it was used in a vague manner in Silesia, though it is now probably neglected there. Various practitioners also have resorted to cold water in the West-Indies, and some likewise in the United States. But as the practice has not gained ground generally, and chiefly

* This fact is stated upon memory only.

for want of the rules necessary to prevent mistakes, especially in the case of fever ; we have sufficient proof of our obligations to Dr. Currie. What thanks would not be due to him, who should teach with certainty when to employ and when to avoid *blood-letting* ; and especially should he give so accurate a guide as a thermometer and the feelings of the patient as to heat, when confirming each other ?*

The thermometer indeed cannot always be used by the country practitioner, to whom we shall soon suggest a substitute ; but to others, who can more easily obtain this useful assistant, we address the following information.

Mr. John Hunter, in the London philosophical transactions for 1778 (see also those for 1779) describes a thermometer of his own invention and of Mr. Ramsden's workmanship ; which was short, slender, and with so small a bulb, that he could upon occasion put the whole into a peacock's quill ; even including the scale, which was moveable† and of transparent ivory, being in the form of a hollow tube, and no were touching the bulb. The results of this thermometer, differed from those of others before used by John Hunter, and even from his own expectations. It was this sort of thermometer which Dr. Currie employed with his patients ; taking care to make the stem bend backwards in order to admit of his standing behind the sick, to avoid infection from their breath. Dr. Currie recommends as a farther improvement to add a gauge like that used by Mr. Six, in his thermometers made upon the plan of those invented by lord C. Cavendish. (See London Phil : Trans : for 1782 and 1757.) But a thermometer with spirits of wine (which sufficiently corresponds with one of mercury in the high temperatures here in question) would probably be visible enough to answer every purpose, were the spirits as is usual, *coloured* ; and it does not appear, why excessive diminutiveness is so necessary a quality in mere medical thermometers.

We have hinted that country practitioners must often be content, and may do sufficiently well, without thermometers ; and

* This was written before seeing Dr. Rush's late brief and simple rules for blood-letting.

The members of the three learned professions in America, notwithstanding the worth and well known talents of many among them, have long been liable to the reproach, of having contributed little to the progress of their respective sciences, by means of their *publications*. The American practitioners in medicine have lately relieved themselves from this charge, by some valuable works. Among the earliest of these *authors* we must certainly place the amiable and respectable Dr. Rush, who has so eminently contributed to excite an emulation among the medical students in his own state. Professor Mitchell, and others have most happily introduced a like emulation into the state of New-York ; which it is hoped will soon spread itself.

† A moveable scale admits the application of the naked thermometer in certain cases ; and the observer by a mark on its tube, is easily enabled when the scale is afterwards restored to its place, to ascertain where the mercury has stood during his experiments.

especially in these parts of the United States, where thermometers are so seldom found corresponding with each other; and where, even if good, they are with difficulty replaced in case of accidents. The uses of the thermometer in Dr. Currie's system of practice are chiefly two; one to shew the heat of the patient, and the other the temperature of the water to be applied to him.

Let us begin with the latter subject. It is known to every practitioner, that boiling water is always of the same heat in the same state of the atmosphere. Next, it will soon be shewn, that water can always easily be found at hand at certain other known degrees of temperature. Lastly, rules may be given, for producing *any intermediate temperature* between that of boiling water and of water of any other known temperature, *merely by mixing them in certain proportions and with certain precautions.*

We shall now shew that water may generally be found of several temperatures, which are easily ascertained without the aid of thermometers. 1° In winter, water which has remained a certain time filled with ice or pounded snow, after it is poured off, will stand at the freezing point; or at thirty-two degrees of Fahrenheit's thermometer. Water will also stand at the freezing point; when taken from underneath a surface of thick ice, formed upon it in winter in a vessel of moderate size.* 2° The average temperature of the air throughout the year may be known for any place; and this temperature is one and the same with that of the springs of the place when first issuing from the ground, and also of the earth of the place at a few feet below the surface. 3° The average temperature of each month also may easily be known for any place; and when known, it will commonly nearly mark the temperature of the water accidentally found in any considerable vessel, placed under shelter from the wind and sun, but exposed to the open air; especially upon making certain obvious allowances.

Enough then has been said as to the fixed points of heat at which water may be found and the methods by which it may be tempered by being mixed in different proportions at different temperatures, for the purpose of bathing, aspersing, or moistening the bodies of different patients according to their respective cases. Happily very great nicety is not found to be requisite; and perhaps the guess of the practitioner will always abundantly suffice. In this case, what has been said on these subjects will not be lost, since it will find its place with those attentive to *meteorology* and other branches of natural philosophy.

As to calculating the patient's heat, without help from a thermometer, in general, we may depend on the patient's feelings, the rapidity of the pulse, the precedence of the cold stage of fever, the colour of the skin, its freedom from perspiration, the fulness of the face, and the marks of *universal* heat to the touch

* Mr. Nairne, instrument maker at London, first noted this fact, in itself so evident.

of the observer. That the practitioner may not be misled by the remains of heat which the bed clothes may have kept in the patient from a preceding hot fit ; let the bed clothes be thinned with judgment and for a short time ; and if the patient still remains hot, he will offer a new criterion as to his temperature. If other rules are wanting, the following are some which present themselves.

Take a short tube of glass, exceedingly thin and with a very small bore, having one end open and the other closed. Having first heated it gradually by placing its *outside* in heated water, plunge its open mouth into a small quantity of spirits coloured with cochineal, or of aqua-fortis made blue by vitriol or copper ; or if quicksilver is at hand, put it into a little quicksilver. As the air cools in the tube, fluid will rise into it ; and when a very short column (amounting only to a drop or two) has been taken up, we have an instrument suited to our purpose.—A cork may be placed in the open end, when this instrument is not in use, to prevent dirt entering, or the evaporation of the spirit or water ; but the cork must be carefully withdrawn, to preserve the connection with the atmosphere, when the instrument is employed.* Let the practitioner place it during some time under his arm-pit, when at the sick bed ; and, marking the spot then occupied by the column or fluid, let him wipe the instrument, and place it under the arm-pit of his patient. If the patient's heat be *greater* than his own, the air behind the column of fluid confined by the closed end of the tube, will now be most rarified, and drive the fluid farther out than with himself ; if the contrary, the reverse will happen. This instrument must at some one time be compared with a thermometer, merely to shew how its scale of variation agrees with that of the thermometer, unless this can be guessed at by other methods. But the degree in which an instrument of this sort will be affected by the changes in the weight of the atmosphere, (for it is a species of barometer) render it necessary that the comparison of it with the heat of a healthy person, should always take place. An object to be farther attended to is, that the patient's heat be not only greater than natural, but at a high pitch even for *fever* heat.

Perhaps chemists may invent some compositions, which by their melting or effervescence may indicate fixed degrees of heat, which may be contrived to serve as standards for the heat of fever.

With respect to the standard heat of the human subject taken *internally* in a *state of health* ; it varies with age, constitution, exercise, fulness from meals, and other circumstances, independent of disease. The usual average temperature is perhaps at 97 ; but eating for example, increases it one or more degrees. In disease, according to Dr. Currie's observations, it sometimes

* Whenever the fluid employed is carried off by evaporation or other accident, it is easy to put in a fresh quantity, in the manner used for putting in the first.

in extraordinary cases, sinks as low as 92 ; and sometimes in cases equally extraordinary, it rises to 105. Repeated doses of the *purple fox-glove* have reduced the heat to 89, and the pulse to 32 in the minute. Dr. Currie constantly treats the heat under the tongue when the mouth is shut, and the heat under the arm-pit when the body is properly covered, as one and the same ; and takes them for his standard of the internal heat. The experiments of John Hunter, Dr. Crawford, and others, upon animals whose bodies have been opened during life, prove that the heat within, near the heart and lungs, is greater than in the other parts of the body. But it is needless to repeat these cruel experiments, which can offer no guide with patients ; the stations assigned by Dr. Currie for receiving the instruments to measure the internal heat, answering every purpose in the cases here in view.

Dr. Currie says, in a note ; “ I intended to have introduced one or two registers of the heat and pulse, taken every half hour, during the paroxysm of intermittent ; but this is delayed, till I am enabled to speak from more numerous observations.” Dr. Currie, it is to be hoped, will feel himself bound to fulfil this task. If these lines should chance to meet his notice he is requested by one who respects his benevolent zeal, as well as his abilities, to extend his views ; and to favour us with a more accurate account of the internal heat of the human subject in all cases referred to in the preceding paragraph, short of *living* dissections.

To encourage him or others to labours of this kind (which are best pursued in large towns, particularly if possessed, as they are generally, of infirmaries,) we may be allowed to state something concerning the standard rate of the *pulse* in the human subject. The pulse offers an important criterion in fever ; and the pulse of persons under given circumstances, when in health, furnishes a necessary point of comparison for the pulse of the *same* class of persons during *disease*. We shall follow in this, the good Dr. William Heberden ; observing that he speaks of the pulse as it is found in England.*

Rates of the beats of the pulse in the human subject, during the course of one minute.

During sleep.	{ On the day of birth,	130 to 140 ;
	{ Through the first month,	108 to 140 ;
	{ Thence, during the first year,	108 to 120 ;
	{ Through the second year,	90 to 100 ;
Thence to the sixth year, decreasing,		80 to 108 ;
During the seventh year,		72 and upwards ;
Thence to the twelfth year,		70 and upwards.

N. B. The pulse up to this age is more easily quickened by illness than afterwards.

* See Medical Transactions published by the College of Physicians in London, vol. 2.

Afterwards the pulse is from sixty to eighty ; but in men, it sometimes goes to ninety, and in women even beyond ninety. Sometimes the pulse is below forty. It frequently likewise intermits.

After a full meal the pulse increases ten or twelve beats. But if it has ten pulsations beyond the natural rate of the patient's pulse, viewed as varying according to accidental circumstances, it indicates disorder.

In *disorder* during the first year, the rate may pass from one hundred and forty to one hundred and sixty ; but want of sleep and appetite, with thirst and the state of the infant's breathing, are here better indications.

Sometimes one hundred and forty four is a rate fatal at two years ; but with others, one hundred and fifty six and one hundred and fifty two, are not fatal rates, at the age of four and nine respectively.

With children a reduction of fifteen or twenty beats of the pulse, accompanied with signs of considerable illness, mark an affection of the brain. With adults, a sudden abatement of pulse in fever, and an aggravation of other symptoms, equally indicate disease in this organ.

With adults, one hundred beats denote commonly no evident danger ; but danger begins at one hundred and twenty, and unless there be delirium, all beyond is commonly fatal. The author excepts cases of acute rheumatism and cases previous to a deposit of matter ; when there have been recoveries even at one hundred and fifty and one hundred and twenty respectively. He excepts also cases of *low fever* at ninety or one hundred ; for here may still be danger.

It is hard to count one hundred and forty beats, unless distinct ; but where distinct we may count one hundred and eighty in a minute.

Schirrous and ulcerous cases, with a hectic, are often for a long time from ninety to one hundred and twenty.

Great pain in certain cases, does not quicken the pulse ; as is instanced with gall-stones.

It must not be forgotten in disease, as well as in health, that women sometimes have quicker pulses than men, other things being equal.

Thus far we collect from Dr. Heberden.

A practitioner wishing to pursue observations of this kind, may not always be provided with a watch beating seconds ; and, in these parts of the United States, he cannot always be certain of access even to a pendulum clock. It may therefore be convenient to know, that in these latitudes, a pendulum beating seconds, may be made of a *very fine* thread and a *small* leaden ball ; extending in the *whole* about thirty-nine inches and two tenths, from the point of suspension ; which point we will suppose formed by a very strong dressing pin. Theoretically, a pen-

dulum should be somewhat shorter in these latitudes ; but the above total length will answer for practice with a pendulum of the above description. The habits of astronomers shew, that it is easy to learn to *count seconds* by memory. The practitioner who is able to do this, may, in certain cases, station one upon whom he can depend, to note the pulsations which have occurred in a patient, while he has been counting apart a certain number of seconds. It can be of no disservice also for a patient to learn the ordinary rates of his own pulse, to tell to his physician in case of disease.

With respect to other indications of the pulse, in which not only certain individuals, but certain nations pretend to a peculiar nicety, we refer to the various authors who have written more or less expressly on the subject.

We do not follow Dr. Currie in his *history* of the theory of fever. We rather give his *own* account of the leading *symptoms of this affection*, when viewed independent of circumstances and under general characters, in order to accompany it with his remarks.

Fever begins with a languor of a *peculiar* kind seen even in the countenance, and is followed by paleness, cold, and trembling, and (he should have added here) by a shrinking of the surface of the body ; the action of the mind and of the whole system being enfeebled. The heart and lungs, being roused by the fluids now crowding inwards, soon press them outwards. A tightness or spasm, however, in the vessels at the surface opposing, the internal re-action becomes increased. If in the struggle, the stomach becomes affected by sympathy, a tendency to sickness ensues. At last, the powers of life prevailing, heat appears, first in one part of the surface and then in another, but with some fluctuation ; till the hot stage becomes universal, when the vessels on the surface finally yield a passage to perspiration, though not always without a check. Such is the course of a single fever fit, when it obtains a regular termination. But in cases of *continued* fever, both the spasm and heat remain longer ; till at length as the patient weakens, the spasm decreases so as to admit of perspiration, and the heat is sometimes brought almost to its natural state ; the quickness of the pulse alone persisting, as the *effect of a habit* produced in the course of the disease. Thus he says, when a hot room or bath raises the heat in the human subject four or five degrees, and most of the other symptoms of fever appear ; yet after the external heat is removed, and the internal heat becomes natural, the increased pulse still continues ; which he attributes to the principle of association, peculiar to life and pervading the vital phenomena, intellectual and corporeal. The author from the same case of artificial heat proves the existence of *spasm* ; since perspiration follows this heat so plentifully, as to make it difficult to increase

the internal heat beyond one hundred or one hundred and one ; whereas at the same temperature in fever, perspiration is often refused. He observes also, that both in hot fever and in the sudden increase of heat in health, the tightness of the vessels at the surface often exists : but when the heat abates, it disappears so as to admit of perspiration ; the spasm in the case of health being the result of a resistance to a violent stimulus. This resistance he calls another law of the living system, belonging to every species of vital action, whether of mind or of body.

In these circumstances, he conceives that the general and powerful spur or stimulus of cold water dissolves the spasm or tightness ; perspiration and evaporation now succeeding, which naturally tend to reduce the heat and pulse. Whether the cold as a new stimulus *aids* the stimulus already existing in the blood vessels ; or whether the cold acts by dispelling or by *counter-balancing* the spasm on the surface ; or whether these causes stand more or less combined, will not here be disputed. Certain it is, that the *cold* of the water operates more than its *moisture* ; because warm water in general less easily effects a cure, even when producing a greater coolness through its longer application ; though it is possessed of those additional chemical powers for dissolving or penetrating substances which are derived from heat. On the other hand, even sudden cold reduces the animal heat, chiefly by affecting the body as consisting of organized living matter. Hence a variation in the effects, both temporary and permanent, of the cold and other affusions, &c. whether we compare these effects with themselves or with each other, in cases similar in a mere mechanical view.

As to the diminution of *thirst* following the cold affusion on the surface, Dr. Currie by no means admits that much water is ever absorbed by the skin ; and therefore attributes this diminution of thirst to the removal of a spasm in the mouth, jaws, and stomach. Whether it be the removal of spasm or something else which is effected within, will not be discussed : it suffices, that *a sympathy obtains between all these parts*. It is no less true, that thirst is allayed by a draught of fluid before it can have entered the circulation ; as likewise, that perspiration often as immediately follows.

The author (as has been hinted) attributes the reduction of heat by the tepid affusion, to cold arising from evaporation ; but as this stimulus is always slight and necessarily transient, the heat ultimately returns and the effect becomes merely palliative. Even the cold affusion cures at once, only in the early stages of disease ; and though uniformly advantageous while the morbid *heat* continues, its effects are less decisive when morbid associations have once been produced.

What then, says Dr. Currie, ought to be the *indications in the cure of fever* ? To diminish the cold in the cold stage ; to moderate the heat in the hot stage ; to resolve the tightness or spasm

on the extreme vessels ; and, where the inordinate action of the vascular system still continues, to support the powers of life, till the diseased associations die away from the ceasing of their causes. It is also essential, to secure the proper action of the bowels ; and, in every case, to unload them of their morbid contents, whether these are the effect or the cause of the disease.

It is a serious error, according to Dr. Currie, to suppose that febrile poison received into the system, is the principal cause of the *symptoms* of fever ; and that these symptoms consist in a struggle of nature to expel the poison. It is safer to consider the poison, as an agent that *excites the system into fever* ; the fever being afterwards carried on, not by the agency of this poison, but of the principles which regulate the actions of life. We are not therefore to wait for a restorative process, by which nature is conceived to throw off the poison ; but to oppose the fever in every stage with all our skill, and bring it to as speedy a termination as is possible. By the powerful means of the cold affusion applied in time, the whole of the feverish symptoms vanish. Hence the safety and wisdom of decisive measures before the strength is materially impaired or diseased habits established.

Those who practice within the *tropics*, where fever runs its dreadful course with such rapidity, ought especially, he says, to be aware of this truth. They ought also to combat the disease not merely by cold affusions, (which whether supplied by springs or by the sea, can seldom there be below the temperature of 77 or 78 ;) but by actual immersion of the patient in a bath, or in the sea, supposing this at hand. The duration of the immersion he thinks must be governed by the pulse, by the sensations of the patient, and by the thermometer. He refers for the success of this practice to the case of Sir John Chardin ; and to that of persons, who in the delirium of fever, and chiefly in warm climates, have plunged into the sea, and who in every instance within his knowledge (where they have been saved from drowning) have recovered.* To increase the cold of water in hot climates, he refers to the well known artificial modes of cooling water. He also hints at the practice of alternately plunging the patient in water and then raising him into the air, where the wind blows over his naked body, farther to cool it ; but he says that the utmost care is necessary to guard against fatigue ; and we venture to add, that it will be prudent to have means at hand to remove both chilliness and faintness, should either occur. In the northern and middle latitudes of the United States, the effects of cold winters upon springs, furnishes cold water at all times ; and ice-houses admit of rendering it still colder.

In hot climates, to cold water for the surface, the author would add cold *drink* in large quantities, where the patient's heat will bear it, especially the heat within at the stomach ; and he consi-

* See a remarkable case of this kind in the London Phil. Trans. for 1786, p. 190.

ders a tendency to vomit as no objection. He confirms his opinion by the practice of the ancients, by the treatment used in the Hungarian fever (which he holds as resembling the yellow fever,) and by the recommendations of Hoffman in bilious vomitings and dysentery.

We now proceed to glean a few other *detached particulars* from the author's work, which are either theoretical or conjectural; or have no immediate relation to the use of water; or have not before been sufficiently noticed.

The author wishes both cold water and cold drink to be tried in the case of the *plague*, should the heat in that disease be considerable; but if it is no greater than in the confluent small pox, which is little, if at all above the natural standard, he has little hope.

The best explanation which he can give of the success of his favourite remedy, in *convulsive diseases and in insanity*, if applied at the moment of their *height*, is taken from John Hunter and Dr. Darwin; namely, that no *two* great actions seem to take place in the human constitution at the same time; and that if the balance of vital energy can be turned in favour of a shock from cold, it will supersede the disposition to the diseases in question at their critical moments, and thus break through their associations. Tobacco used in the *crisis* of epilepsy, is another instance with him of the benefit of employing, in these cases, the balance of power in one stimulus over that in another. From both these remedies thus respectively applied; the good effect he says, has repeatedly been *permanent*.

In *cooling the surrounding air*, or in any other application of cold, in fever; care must be taken to watch the limits within which it is grateful to the sensations; in which case the author's experience has *uniformly* shewn it to be advantageous.

It is believed that the author somewhere speaks of a wet blanket having been used with success. Dr. Crawford certainly gave temporary relief even from delirium, to a patient in fever, by this means; and nothing but its being used too late, seemed to have made it a palliative rather than an effectual remedy.

The author says, that the action of cold may be conveyed over the whole system by its application to a single part; as when cold substances are applied to some single part, *to stop bleedings*. Hence, for bleeding from the lungs, he has dipped the feet in cold water; though he thinks that it might perhaps have been better to have applied cold permanently to the scrotum, &c.; and he has often here found it safe and efficacious to plunge the patient into cold water up to the hips. In all these instances, the application of cold must be both powerful and permanent.

The same rule as to permanency and degree, is necessary for cold applied *locally* to parts which are *inflamed*. Thus even ice, snow, and the clay-cap, are successfully employed, not only for reducing, but *preventing* inflammation; the sensation of cold in the parts acted upon, speedily subsiding.

He does not apply cold to local inflammation, *if attended with fever*; chiefly, because in such cases there is too great a sensibility to cold and indeed to other stimulants; but this is a subject which he avoids treating at length.

He extends this objection however to *measles, catarrhs*, (or colds,) &c. and he is not persuaded that cold can be useful in *pluerisy or peripneumony*. Yet in inflammations of the *brain, stomach, intestines*, &c. and especially if desperate, he thinks the cold bath should be hazarded. But *in all inflammatory cases*, he inclines to judge it proper to moderate the cold, if employed. Besides sinking for example, gradually, into the cold bath; the state of the pulse and of the heat is to be examined; though the author remarks from his own case, while in health, that the heat within the trunk of the body is wonderfully sustained in the cold bath, notwithstanding it is speedily and permanently lessened at the extremities.

The *House of Recovery*, instituted in May, 1796, at Manchester, in England, affords a singular instance of success in preventing infection throughout a large town; and merits a short abstract from our author. Into this asylum on the first notice of fever, the patient is removed; and proper methods (being in part chemical) are taken to purify his habitation. The prevalence of fever has hence diminished to a degree beyond all rational expectation; and the fears that the institution might spread contagion in its particular neighbourhood, are found groundless; since not one case of fever appears there for ten or fifteen cases which prevailed there before. About one in nine only of those admitted, die; and as the result has made considerable impression, it will still farther greatly reduce both the deaths and the danger of contagion, should the poor apply in the *early* stages of the disease. The importance of such an institution, in great towns, may be known from two other facts related by Dr. Currie: First, the apartments for fever-cases, in the Liverpool work-house, are in the very centre of the building, and cannot be entered except through the common stair-case; and yet not a single instance is known of contagion spreading thence, to the other patients in the house. Secondly, the number of fever-cases annually presented to the medical attendants at the Dispensary at Liverpool (a town with a population resembling that of Philadelphia) is above *three thousand*; and the average duration of the fever is about fourteen days, besides fourteen days consumed in the recovery, where the recovery happens. The fever-cases, in short, make nearly one fourth of the whole number of maladies; the loss to the public occasioned by which may easily be conceived. In Liverpool (and this is another remarkable fact) eighteen hundred cellars are inhabited by about seven thousand persons, besides nine thousand who live in close and confined houses; and many of these persons taste no animal food; tea being generally drank, once, if not twice in the day; from which causes principally, and the use of spirits, above five hundred patients, who are chiefly females, are

annually found among those applying to the dispensary on account of *diseased digestion*.

When our author, however, in speaking of the above institutions, affirms with Dr. William Heberden, that cold winters are unhealthy in England; and states that the most unhealthy moment is that when they are exchanged for warmer weather; an inhabitant of these northern parts of the United States cannot but indulge a smile. Perhaps in no part of the civilized western world, is the entire severity of a cold winter *actually* more fully braved, than in these parts; nor can a more sudden transition from heat to cold easily offer; and yet *in no one country in the known world*, is there less disease, or fewer deaths, upon a given number of inhabitants. This fact, and especially in a comparative view, merits a particular attention, which will perhaps be given to it on a future occasion.

The common treatment of fever by the gentlemen belonging to the Liverpool dispensary (which is distinct from the infirmary) consists in giving first, antimonial emetics; and then, bark, opium, and wine; nourishing food being occasionally administered; but seldom washing with cold water (which would indeed be difficult in the cellars where this disease is usually found.)

Dr. Currie will now offer some more particular and interesting information on the use of opium and strong liquors in fever.

Dr. Currie, treats of *opium*, pursuant to the engagement in the title to his work; viewing it as administered in health and in fever.

In a state of *health*, if the mind is vacant and external objects excluded, and provided also that the stomach is empty; opium usually procures sleep. This sleep is preceded by agreeable sensations, happy slumbers, and gentle perspiration; the surface and extremities of the body acquiring the same heat with the internal parts. As the full sleep approaches, the pulse quickens, and the breath becomes slightly irregular; but when profound sleep has actually arrived, the pulse abates to its slowest rate; while the breathing, besides growing slow, becomes regular also, and deep.

In *fever*, if the heat reaches or exceeds one hundred degrees of the thermometer, with a dry skin; opium *commonly* seems to add to the heat and restlessness. When the skin has softened, and the heat, though still great, is yet subsiding, opium often accelerates the perspiration; and by this means, diminishes the heat; in which case tranquillity and sleep generally follow.

Hence, in the case of *continued fever*, which is commonly greatest in the evening, and is then accompanied with two or more additional degrees of heat, an opiate (or anodyne) may injure at night, and yet do service at two or three o'clock in the morning. Hence also in continued fever, it may be proper to lower the temperature of the surface and prepare for perspiration, by cold or tepid affusion or drink, (applied according to

rules) before giving, or even after giving, the opium. In *intermittents*, on the other hand, where the disposition to perspire is more easily excited, opium may be given with fewer precautions; though if administered in the hot stage, its salutary effects may be much promoted by moderate draughts of liquids; which should be cold, if the heat is great.

The author conceives water to be a better assistant to opium in procuring perspiration, than ipecacuan or antimonials; except in inflammatory diseases and in dysentery. His dose of opium is two or three grains of the extract, or from ten to sixty drops of the tincture; for he finds that a very small quantity judiciously applied, will produce considerable effects; and he thinks that whatever is beyond necessity, it would be unwise to employ.

Alcohol is another of the topics standing in the title to Dr. Currie's work; by which term, he does not mean, with common chemists, spirits of wine; but vinous and spirituous drinks. Alcohol (or strong drink) he says, is more heating than opium, and has less tendency to produce perspiration and sleep; but yet has a striking resemblance to opium in its effects.

In *health*, like opium, if the mind is vacant, and external objects excluded, and the stomach empty; strong drink inclines to sleep. But as sleep approaches, the heat of the body rising throughout and the pulse quickening, an agitation follows, which is often opposed to sleep. If the dose however has for the moment stupified all sense, still on the first return of sense, the drunkard is roused from his apoplectic slumbers by intolerable heat; amounting in one case (that of Dr. Alexander, who tried the experiment on himself) to one hundred and seven degrees; and this is accompanied with thirst, agitation, and consequent weakness, as also with obstructed perspiration. The author here, as perhaps in all other cases, where there is heat and a dry skin *without* local inflammation, would prescribe large draughts of water, or the affusion; which is likely to prove more effectual, if cold, than if warm. Opium, where the skin softens, favours perspiration in the drunkard; and sometimes, and perhaps by this very means, affords remarkable relief.

In *fever*, strong drinks must be given with the same precautions, as opium; that is, be avoided in cases of great heat and a dry skin; and reserved for those cases, where the heat is only a little above the natural standard; unless perspiration is certain, when they may be used in a heat somewhat beyond the natural.

Such are the author's remarks on opium and strong drinks. They are offered only with a view to fever; and he so little considers them as complete, that he proposes to resume the subject.

In the author's title page stands another topic yet unnoticed by us; namely *inanition*, or abstinence; and along with it, he

handles another important, as well as long disputed point ; namely, whether fluids, and consequently nourishment if wanted, can *pass through the skin*.

A part of his conclusions on the subject of inanition or starving, are drawn from a case where a scirrhus tumor took away the power of swallowing. The heat and in general the pulse were natural to the last ; the spirits even ; the intellect good ; the strength sufficient for walking about the house ; neither hunger nor thirst on the whole troublesome ; but after a certain number of weeks, a distortion of vision was followed by delirium and other symptoms, which closed the scene. Nourishing clysters gradually increased, in which liquid laudanum was largely mixed, especially in the evening, together with a warm bath of water and of milk, were the only applications. Another patient whose power of swallowing was destroyed by a different disease, used the clysters, but omitted the bath ; and never complained of hunger, nor always, nor very much of thirst ; his pulse being good, unless previous to death, which in him was easy and accompanied with the perfect use of all the faculties.

Hence the author remarks as follows ; 1° A regular pulse is no certain indication of the system being in order. 2° Vital heat is not principally owing to digestion ; the increase of heat after food appearing to arise from the influence of the stomach on *other parts*. 3° As the first patient did not easily recruit his heat, when heat was taken from him, the power of doing this is to be held in proportion to the force of the living principle ; (and this is a fact which might before have been inferred from the experiments of John Hunter in the papers already cited, in the case both of vegetables and animals ; which Dr. Currie at the moment seems to have forgotten.)

We come now to some particularities respecting the *passage through the skin*, to which the first case leads us. The patient in a balance sensible to the amount of a drachm, was found to have had *no difference produced in his weight by using the warm bath*, in three instances where the trial was made. According to the rate at which his body wasted from day to day, during many days, he ought to have lost five sixths of an ounce during the time he spent in the bath : but he appeared neither to have lost nor gained. He seemed indeed to perspire ; but the author conceives the appearance to have been owing to the vapour of the bath resting on his forehead. At the heat of eighty-two in the public baths at Buxton, in England, the author (with various others) has found no change of weight : in other experiments he has found no change in himself in baths variously heated between the temperatures of eighty-seven and ninety-five ; and in several cases of the diabetes, (where indeed a disease in the skin according to him usually occurs) the warm bath has produced no change of weight.

These experiments do not countenance the common supposition, that in case of a deficiency of liquids at sea, thirst may be prevented by wet penetrating *inwards* through the skin. The author is indeed aware of several conjectures to be urged in favour of this supposition; as for example that what is taken inwards may not shew itself in the weighing machine, from being counter-balanced by what escapes outwards; and that fluid may be taken inwards at lower temperatures than those of the warm bath. But he inclines to overlook these conjectures; and he likewise dissents from the experiments of Dr. Falconer and Mr. Abernethy, as made only on a part of the human body at once.

He is strongly inclined to think, that though certain vessels* in the skin afford a passage *outwards*; yet that the absorbent vessels lie below the skin, and never take up any thing from *without*; unless in consequence of mechanical pressure, or of a wound or a disease in the skin, or of the destructive nature of the matter applied to it. He explains therefore the benefit derived in certain cases from wetness at sea, either to the coolness produced; or to its preventing the wasting effects which would attend evaporation, could the air have access. The removal of the thirst, he attributes to a relaxation of those vessels in the skin which pass outwards, having effect on the vessels of the stomach by sympathy; just as perspiration in fever abates the thirst, without the aid of drinking.

But some experiments made in France by M. Seguin, the co-adjutor of the celebrated Lavoisier, which are related by M. Fourcroy, prove the necessity of a new examination of the whole subject. In low temperatures, as from about 54° to 59° of Fahrenheit, the loss of weight in the human body, says M. Seguin, is much greater when the body is exposed in air, than when it is exposed in water; because, according to him the *air* in the latter case, cannot pursuant to its office, dissolve the perspirable matter on the skin; so that a loss of weight can now only arise from what escapes through the lungs. At about 70° , the disproportion of loss somewhat increases; as the air entering the lungs, from having been previously loaded with the moisture of the bath, does not so rapidly dissolve the perspirable matter in the lungs. At 90° and upwards, by the increased action of the heart and arteries, sweat flows from the skin, and lessens the above disproportion; which from being about three to one in favour of the air, becomes now only as about two to one. But in no circumstances, does M. Seguin find any absolute increase of weight in the bath.

* He conceives with Dr. G. Fordyce and Mr. Cruikshanks, of London, that the matter of the perspiration is separated from the blood by the capillary arteries, and then thrown out by organic pores existing in the cuticle (however difficult to be discovered) which are connected with the extremities of these arteries; and he supposes that in this process, there is not a separation merely, but a new combination; during which a loss of heat may take place, accounting for a part of the coolness attending sweating.

To decide however more precisely whether absorption through the skin occurred in water, M. Seguin dissolved in water a preparation of mercury, in which different venereal patients bathed their feet, and apparently without taking any of the mercury into circulation; unless where the skin was broken, as in the itch, &c. At last he directed his experiments upon himself, as a person in health; bathing a part of his arm in water containing a preparation of mercury; and covering the glass which held it, as also his whole body, his *mouth* excepted, with gummed or with waxed silk according to the case. In low temperatures, he found no effect. At about 72° of Fahrenheit, mercury was taken into the body, but no water; whence he concludes, that the lymphatic vessels did not perform this absorption, since they would more readily have imbibed the water. When the heat of the bath was pushed on nearly to blood heat, even mercury was no longer taken up. Hence the author supposes that the mercury when the water was at 72°, penetrated into the drops of sweat slowly moving outwards and thence into the body; which could not happen, when the drops of sweat rolled out faster, in greater heats.

When other substances act through the skin, M. Seguin in effect explains the case nearly as Dr. Currie. He decides also from these experiments, that contagion acts through the air and lungs, and not through the skin by contact; that the diabetes arises from water left in the lungs; and that dropsies occur from the absorbing being stronger than the exhaling vessels, (the absorbing being supposed to operate only on what is *within* the body, including what is found in the lungs.) Some of his other conclusions do not seem to regard our purposes.

Upon a *comparison*, it will appear, that in Dr. Currie's experiments, no weight was lost in the warm bath, at least that was discoverable by his weighing machine; but that in those by M. Seguin, weight was actually lost in the bath, though less than was lost under the same circumstances in the air. Surely these matters require elucidation, and happily they may be pursued by any person in any country. Indeed our inquiries demand to be extended to many other objects still more familiar. So simple a fact as the state of heat in starving persons, (supposing the cause of the ambiguity not to be in the nourishing clysters) is still the subject of dispute; and the same as to the heat in the diabetes. And Dr. Currie has perpetually to complain, that the heat is little observed in any disease whatever.

Whoever inquires experimentally into the comparative weights of the body and of the powers of the skin, will of course seek to consult Sanctorius and other celebrated authors; but let him not overlook the English Dr. Stark, of whose experiments Dr. Franklin was so fond. Dr. Stark, like many others in Europe, exposed his life in medical researches, and would himself have been more celebrated, had not his zeal brought upon him a pre-

mature death. Lieutenant, (now Admiral) Bligh has given a relation of a famine at sea suffered by himself and his companions, which deserves particular consultation; for he was left adrift in a boat in the Pacific Ocean, during six weeks; in consequence of a mutiny on board his vessel, which was conveying the bread-fruit, spice and other plants, to the British West Indies. Nor will Dr. Franklin's remark be useless, as to the *loose texture of the skin*, after having long remained immersed in water.

The practice of *anointing* the skin among some of the ancients who were *fully* clothed, and among many nations ancient and modern using *little* clothing; also calls for attention. Unction with them seems a custom alike prevailing in warm and cold weather. If new principles are called for to explain these usages, modern lights and modern accuracy will probably lead to them.

Dr. Currie connects the *warm bath* with the subject of *unguents*. He says, that the warm bath is used in the French, and is beginning to be used in the English West Indies; and he supposes it salutary after exercise; and that it restrains profuse sweating, keeps up the heat of the surface and extremities so as to prevent re-action in the arterial system, and soothes the sensations; but he adds, that on leaving the bath, friction should follow, with the anointing of the surface to prevent evaporation. To this system, however, he would join flannel clothing next to the skin, after the Greek and Roman manner. Perhaps these things should accompany each other; but without going so far, it is clear that cotton would be useful next to the skin both in hot and in cold countries; pursuant to the boast of the English cotton manufacturer, who says that whoever uses cotton *once*, never quits it. The use of oil is also proper for swimmers; and among other reasons (as Dr. Currie remarks) that the body may glide more easily through the water, as well as to guard them (as we have added) against the cramp.

Dr. Currie thinks that the perspirable matter of Europeans is not well fitted for the torrid zone, as being too liquid; adding that the sweat of the negro is unctuous or oily. Has he or others made the comparison in a scientific view; and taken the case of the Hindoo and other Asiatics, with that of the original Americans, into the account? The question demands to be treated with caution.

Dr. Currie, in a paper in the *Appendix* to his work, speaks of a *ship-wreck of some Americans near Liverpool*; adding remarks on the influence of fresh and salt water, hot and cold, on the powers of the living body immersed in it: the article being extracted from the London Phil: Trans: for 1792.

It appears as to the Americans, that two who died early during the accident, suffered from an alternate exposure to air and to water (both salt and fresh;) that others survived, who were more plunged in the sea, one excepted, who was desponding,

but who died later; and that he who suffered least, was a black, who was covered to the shoulders in the sea. The sea was about thirty-five degrees in its temperature, according to the author's present conjecture. The air was probably still lower, and attended during part of the time with sleet and snow and a piercing wind. The stay on the wreck on the whole was twenty-three hours. The two who died first, were delirious; none were ever drowsy; but all were thirsty and hungry. Mr. Amyat who related the story, had his hands and feet swelled and numb, but not senseless; his mouth parched; a tightness at the pit of the stomach; and distressing cramps in his sides and hips. Hence we may perceive the advantage of having been continually covered with the salt water.

This accident led the author into a train of experiments on what he esteemed the most fundamental power attending life; namely, the capacity of the body *to preserve the same heat under different circumstances.*

In his first experiment a young man who was plunged into a bath at 44° of Fahrenheit, had the thermometer under his tongue reduced from 98° to 87°; then raised gradually in twelve minutes to above 93°; but upon being exposed to the wind at 44°, though attendants were rubbing him, it fell again in two minutes to 87°; nor did he, though every resource was employed, entirely recover his heat under three hours. A second experiment on the next day, gave nearly the same result; as did a third on the following day; but in the third, the man was afterwards plunged into a *warm* bath on being taken out of the cold air, when the thermometer *sunk* two degrees. But the thermometer rose again more quickly than in the cold bath, and the heat was general over the body, and not confined (as in the cold bath) to the trunk alone. In a fourth experiment on another day, a longer stay in the bath produced inconveniences somewhat resembling those felt by Mr. Amyat; and great pain followed afterwards from a warm bath at 104°,* into which the party was too suddenly transferred. Three other experiments offer little essential variation, though two of them were tried on a new subject.

The cold water had always salt mixed in it, in the proportion of one to twenty-four; and the cold was always lessened one or more degrees by the stay made in it.

The parties immersed were generally agitated, so that the pulse was quickened; but the cold bath sunk it twenty beats in the minute from its last rate; and at the wrist, it was scarcely

* In cases of this sort, "Heat (says John Hunter) must be gradually applied, and proportioned to the living principle; but as the life increases, we may increase the degree of heat." See his *Proposals for recovering persons apparently drowned*, in the *London Phil. Trans.* for 1776. Mortification arising from heat too suddenly applied to a frost-bitten limb, is one of the facts, on which he founds his opinion.

to be felt. A sense of cold at the stomach was generally followed by a rapid fall of the thermometer; and heat applied there so generally restored the heat in other parts that the author is persuaded that the stomach or diaphragm, or both, have some concern in the process of animal heat.

The following facts also appeared. 1°. The parties best resisted situations tending to produce cold, when they possessed most of their natural heat, as by wearing a flannel dress. 2°. Cold wind operated more severely than colder calm weather. 3°. Though the human body rapidly accommodates itself to change, yet the change may be made too quick, especially when the strength is diminished. 4°. The action of cold water is more or less considerable, according to the vigour of the constitution. 5°. The condition of the mind operates also; fear increasing the influence of cold; and attention pointed to other objects, as in madness, diminishing it. 6°. These experiments require great caution, and the presence of every means necessary for counteracting their effects when carried too far.

The author, in an experiment upon himself, passed alternately but gradually out of a cold into a hot bath, twice; staying a short time only in each bath, and being covered with a flannel dress; but his internal heat never varied from 96.

By another experiment, it was found, that the cold of *fresh* water is more difficult to support, than that of salt water.

In another paper of the Appendix, we find *Dr. Wright* again coming into notice, through *Dr. Duncan's Medical Annals* for 1797. He was still, among other things, using, in the West Indies, external applications of cold in various shapes in the early stages of the ship fever and of the yellow fever, and with continued success; and in the latter stages, he employed calomel in small doses, to procure purging and *sweating*. Where the stomach was too irritable for calomel, recourse was had to Capsicum (or Cayenne, commonly called Kian, pepper) made into pills; and it has cured even after the black vomit. This pepper has been given in the putrid sore throat, in the West Indies, with the most signal benefit.

In the course of this paper concerning *Dr. Wright*, *Dr. Currie* observes that perspiration seems useful in *every fever in every country*, not excepting the famous English sweating sickness; but that for this purpose it must be *profuse*, and also *early*, since in the latter stages of fever it is often injurious. The mode of exciting it, he says, may however be mechanical. *Mr. Thomas Graham* for example, covers the whole surface of the body for this purpose with warm vapour, in the early stages. In the plague, *Count Berchtold* relates, that perspiration may be produced by a pint of olive oil, rubbed during four minutes, upon the patient in a close room over hot coals, with a clean sponge; or if the first trial fails, then after wiping the body with a warm dry cloth, it may be repeated, and be aided by sudorific

drinks. But in every case, the sweating must not only be early, but may be employed during the cold fit ; when it will still leave room for the use of cold water in the hot fit, should the hot fit still occur.

Before quitting Dr. Currie, we shall give him pleasure, by affording him an opportunity to rectify two or three oversights.

First, Dr. Cullen does not, as he intimates, neglect *cold* as a cause of fever.

Next, Dr. Currie attributes the discovery concerning the near agreement of the heat of springs with the average heat of the place where they are found, to Dr. John Hunter ; a British physician of eminence, (but not related to the celebrated surgeon and anatomist of that name.) Dr. Hunter's reputation does not need the aid of borrowed fame. The first observer of the fact appears to have been Dr. John Roebuck, F. R. S. at least Dr. William Heberden's comment upon the subject implies it.... (See London Phil. Trans. for 1775.)

Lastly, Dr. Currie seems also to have omitted to notice Dr. Crawford's paper in the London Phil. Trans. for 1781 ; where that amiable philosopher stated, that the *difference* between the colour of the venous and arterial blood increases with *cold* and lessens with *heat* ; and that from the event connected with this difference, nature finds the means of proportioning the generation of heat to the call for it.* Dr. Currie knows that this difference of colour had its proper cause† assigned to it, by Dr. Priestley ; which paved the way for Dr. Crawford's application of the fact, to explain the origin of animal heat as coming from the action of the air on the blood in the lungs. The above additional fact noticed by Dr. Crawford, if confirmed by a few more experiments, will probably go far to remove Dr. Currie's difficulties concerning this beautiful discovery respecting animal heat, which he extended also to combustion. Mr. Cavendish and the French chemists have by their new system led to some modification of this discovery, (for it is no longer to be called theory ;) but however this shall be decided by time, the essence of the whole is Dr. Crawford's, and will render his name immortal. Dr. Rutherford, of Edinburgh, under their modification, explains the supply of water in diabetes to arise from "a portion of the oxygen, (which in the ordinary course of things is exhaled in the form of an elastic vapour,) being absorbed in the

* Is there any decisive difference in the colour of the venous and arterial blood in insane persons indicative of their known power to resist cold ; which the practitioner can pursue through all its mazes, so as to arrive at the means of assisting their malady ? Their power of resisting cold has indeed its limits, since their limbs may be frost-bitten ; and perhaps it seems greater than it is, from their attention (where they can command any) being directed to other objects ; in which they agree also with children.

† Mr. Hewson and others had been aware that the air operated here, but they knew not *how* it operated. See London Phil. Trans. for 1776.

form of water." But Dr. Crawford's discovery requiring to be treated at length, we for the present drop any further discussion of it; especially as this hypothesis regarding diabetes, leaves its *symptoms* still unexplained.

In taking leave of Dr. Currie, let us do justice to his ingenuity, industry and candour. If his work stands the test of time, immortality also will be *his* lot. He is well known to many Americans frequenting Liverpool; but it is not perhaps known to all Americans, that besides Middlesex, no county in England can boast of so many able and spirited medical men, as that of Lancaster; especially if we include Dr. Haygarth in the number, as united with them by intercourse, though residing in Chester. Among the foremost of these, we may certainly place the excellent Dr. Percival, of Manchester; to whose zeal for philosophy and for humanity, we may attribute in no small degree the honourable pre-eminence here mentioned.

As to our analysis, though it includes the chief substance of Dr. Currie's book containing 347 octavo pages, the reader will not fail to peruse that work, with pleasure; nor, having read that work, will the reader perhaps regret his having seen this analysis. Dr. Currie is not in every respect methodical; but he is more; he is original on some of the most important of medical subjects.



The foregoing abridgment was published in a pamphlet, during the melancholy devastation of our cities by the prevailing epidemic fever. The respected and benevolent author will not, it is presumed, require an apology for the republication of a work so honorary to himself, and so extensively useful to the community.

A BRIEF ANALYSIS

OF THE SECOND VOLUME OF CURRIE'S MEDICAL REPORTS.

THIS volume is composed chiefly of additional evidence in favour of the opinions and practice proposed in the volume preceding. This evidence is furnished not only from Dr. Currie's own experience, but is communicated to him from practitioners in various situations, and from various climates.

The following is a comprehensive statement by Dr. Currie of his experience at the time of publishing this volume.

"In the six years, which have elapsed since the publication of the second edition of the first volume, I have invariably employed the affusion of water, cold and tepid, in the diseases pointed out in the original publication, and I have extended it to some others, of which I shall afterwards speak. Its success has equalled my expectations; I have nothing to detract from the accounts I have formerly given of its efficacy. I repeat, that used in the three first days of fever the cold affusion very generally stops the disease—that the same happy effects sometimes follow its use on the fourth or even fifth day, but seldom later; that even in the subsequent stages, where the heat continues preternaturally great, and the skin dry, it is of great and manifest advantage, almost immediately relieving the most distressing symptoms, particularly restlessness and delirium, and conducting the disease to a safe and speedier issue.

"The tepid affusion is, as I formerly observed, applicable, and possesses very considerable, though inferior efficacy. I find it, however, very safe, easy of application, and in a high degree grateful, and I have extended it to almost the whole class of febrile diseases. In my practice the cold and tepid affusions are very often combined in the same disease. While the heat is great, the skin dry, and the vascular action strong, I use water perfectly cold; when these symptoms diminish, I use it cool; and as they subside still farther, I make it tepid." The precise meaning of these terms is given in chapter X. volume I.

The limits of this analysis will permit us to state only such remarks as are most essential, and those in very general terms.

Dr. Currie describes an epidemic dysentery, which prevailed in Liverpool in 1801. In this disease, which was attended with fever, he did not try the application of cold in any form; for he had learnt by experience that that remedy was not successful in

fever, attended with affections of the bowels. The tepid affusion he did try, but without any permanent benefit, although it abated the heat.

In Scarlatina of the same year he employed very extensively "the affusion, both cold and tepid, with the happiest effects." In this disease he followed the same rules, as in fever, without any regard to the eruption. Both Dr. Currie, and Dr. Gregory, professor of the practice of medicine in the university of Edinburgh, evinced their confidence in the cold affusion by applying it to their own children, when affected with Scarlatina.

In this disease it is commonly necessary to repeat the affusion very often, and at very short intervals; in some instances ten or twelve times in twenty-four hours. Dr. Currie assisted this remedy by giving cold drinks, and by opening the bowels, if necessary, with sub-muriate of quicksilver; and in a few cases he also employed tartrate of antimony as a diaphoretic. He suggests doubts respecting cinchona in this disease; and strongly reprobates the use of wine, while there is any considerable heat on the surface.

In typhus, which also prevailed in Liverpool in 1801, our author did not find his favourite remedy so useful as on former occasions. The affusion, seldom lower than cool, generally tepid, was employed in most cases of the fever of that season. It was beneficial, but did not cut short the disease, even when employed at an early stage. But there was an unusual deficiency of heat, and therefore no opportunity was afforded of employing the cold affusion, which is much more efficacious than the tepid water. Dr. Currie suggests, in contradiction however to his own principles and cautions, that "a practice somewhat bolder might have been more successful."

Dr. Currie avers, that he has not seen nor heard of any instance, in which the practice of cold affusion has been injurious. He doubts the utility of this practice in cases, where there is an unusual sensibility of the surface of the body to cold. Yet he gives a case, in which Mr. Dalrymple, of Norwich, disregarded this doubt not only with impunity, but with advantage.

In some cases of *cynanche tonsillaris*, or inflammatory sore throat, and likewise of measles, the cold affusion was employed in the early stages under a mistake respecting the nature of the cases. In these instances, there was no injury produced; and they were noticed as proving singularly mild.

Dr. C. did not employ the affusion of water on any person affected with influenza, except himself. While he had that disease he submitted to the shower bath at 85° every three or four hours. The effects seem to have been beneficial. But Dr. Wright informed him that he employed the cold affusion in this disease to "keep down heat and flushings," at the same time he allowed wine and a liberal diet; "a mode of treatment, which he found invariably successful."

The following statement is quoted, as it relates to cases of yellow fever, originating in our own country.

"Mr. Wilson, surgeon of his Majesty's ship the Hussar, employed the cold affusion with extraordinary success in 1795. The Hussar had taken a French ship from Gaudaloupe, off the Capes of Virginia, which had brought the yellow fever out of port with her, of which many had died. The disease spread rapidly among the crew of the Hussar, and the ship, running northwards, landed eighty-three persons ill of the fever, at Halifax, in Nova Scotia, in the month of June. There not being accommodation for them in the hospital, tents were fitted up for them on the shore, in which Mr. Wilson attended them. His practice was to bleed early generally in an hour after the accession of the hot stage. He then gave a solution of emetic tartar. The cold affusion was always administered in cases of delirium, which it immediately removed, inducing tranquillity and sleep. *Of these eighty three cases, Mr. Wilson did not lose one.*"

Among many very important communications and testimonials in favour of the practice of cold affusion is the following highly interesting letter from Mr. Nagle, surgeon to his Majesty's ship Ganges, to Dr. Currie.

*"His Majesty's ship, Royal Sovereign.
Portsmouth, May 9th, 1803.*

"Sir,

"I took the first moment after my return from the West Indies, to acquaint you with the extraordinary success which has attended your new remedy in fever, the affusion of cold water, in my practice on board his majesty's ship Ganges, of 74 guns, on the Jamaica station ; and I very readily comply with your desire to give the particulars a little more in detail.

"The Ganges was commissioned at Portsmouth in August, 1800, at which time I joined her as surgeon. She was then, and for some time afterwards, remarkably healthy, from her high state of discipline ; but an infectious fever was brought on board of her by some marines, from the Malta, at Spithead, in August, 1801. Forty marines, and four seamen, ill of it, were sent on shore to the royal hospital, at Haslar, and this cleared the ship of the disease. We then sailed for the coast of France, and were on a cruise off Brest, from the 14th of September, to the 23d of October, at which time we were ordered to Jamaica, where we arrived on the 24th of November. During these ten weeks not a man died, and we reached the harbour of Port Royal in remarkable health. We found a malignant fever prevailing among the shipping there. The mortality was particularly great on board the merchant ships at Kingston, many of them being almost unmanned by it. Soon after our arrival it broke out on board the Ganges, and spread rapidly, especially among the marines and landsmen, who had never before been in a warm climate. The

symptoms were—severe headach ;—hot and dry skin ;—the face flushed ;—eyes red ;—nausea ;—thirst ;—the pulse strong, and full at first, and as frequent as one hundred and twenty in the minute ;—pains in the back and limbs ;—great anxiety, and restlessness. The patients were in general under much depression of spirits from the accounts we had received of the great mortality from the fever. There was little chilliness in any stage of the disease, and remissions were scarcely perceptible. Heat of the skin was the most striking symptom. To what degree it actually rose, I had no means of ascertaining, having unfortunately, broken my thermometer. I was therefore obliged to trust to my sensations, and those of the patient. But from the impression on my hand, I have no doubt that the heat in this fever, was many degrees greater than the temperature of health, and considerably more than in the common fever of England.

“ The violent, and rapid nature of the disease, convinced me, that early and decisive measures were required, and I determined to have recourse to the affusion of cold water, under the directions which you have given for its use. As soon therefore as the morbid heat fairly indicated the accession of fever, I poured a quantity of sea-water on the patient, from the head downwards ; generally two or three bucketfulls ; and commonly directed the body to be afterwards wiped with a towel dipped in vinegar, but more with the view of preventing the sailors from thinking that I trusted entirely to the cold water, than from any supposition of the vinegar being required. I then put the patient into bed ; gave him in general from eight to ten grains of calomel, with four or five grains of the pulvis antimonialis, and supplying him with plenty of diluent drinks, left him to his repose.

“ The affusion, when used in the first, or even second day of fever, operated like a charm. The morbid heat and dryness of the skin were converted into an agreeable coolness, with some degree of moisture ; the pulse sunk very often from 120 to 90 ; the headach, flushings, restlessness, and agitation disappeared ; sensations of comfort were diffused over the whole body, and the patient fell into a natural and refreshing sleep. On awaking, two or three passages downwards from the calomel, seemed to carry off every remaining irritation. Most commonly the fever did not return ; but if it did, the bathing was repeated once, or perhaps twice, as might be required. Where I had not an opportunity of seeing the men for the first day or two of fever, which sometimes happened from their being taken ill on shore, and remaining there, the effects of the affusion, though strikingly beneficial, were not so immediately decisive, and it was requisite to repeat it several times. I had seldom occasion to use opium in this fever, for the cold affusion produced sleep, and in three or four cases in which I gave opiates at bed time, irritation and restlessness ensued ; the symptoms being increased which the cold affusion had obviated. We had one hundred and twenty cases of fever in all, during the time I served on board the Ganges on

the Jamaica station, (that is, from November, 1801, to the end of July, 1802) in all of which the cold affusion was used, and of which we lost two only. One of these had been ill of a violent inflammation in the knee, for which I was obliged to use bleeding largely, and in this reduced state he was attacked with fever. The other was a marine, of a weakly habit, and a consumptive tendency. I did not use the affusion in this case, in the early stage of the fever, and when I did use it, I fear I persisted in it too long. These were indeed the only deaths which occurred on board the *Ganges* from the time we left Portsmouth, to the end of last July, a period of eleven months, as may be ascertained by my journal at the board of sick and hurt, and during this time, two men only were sent to the hospital at Port Royal, one from an accident, the other from general debility.*

"The fever broke out first at Port Royal, as I have already mentioned, and we carried several cases to sea with us, on a cruise to the island of St. Domingo, on which we were out six or seven weeks; when we repaired to Port Royal to refit and refresh for a few days, and again returned to our cruising ground. In these successive cruises, our whole time was employed. We had a great deal of calms, with heavy rains, at intervals, off St. Domingo, and at this time the mortality was understood to be very great among the French troops on shore. While at sea, we were often for several weeks together, not only without fresh vegetables, but without fresh animal food, and without even a single glass of lime juice, to correct the scorbutic tendency in the men. Many of my patients in fever had ulcers in their legs and feet, which had assumed a scorbutic appearance, from the want of those articles. In patients under these circumstances, the cold affusion was an incalculable blessing. It acted like magic. It was generally used in the evening, and scarcely ever failed to produce a gentle perspiration, and refreshing sleep, removing the symptoms of fever, and relieving the depression of spirits and anxiety of mind. A saline cathartic, such as I have already mentioned, completed the cure. By these means, we generally got clear of fever while at sea; but it broke out again on our return to Port Royal, because there the men were often on shore, exposed to the heat of the sun, on watering and dock-yard duty; and besides in harbour, discipline could not be so easily preserved, or drunkenness prevented.

* "I had a great objection to sending patients to the hospital at Port Royal, from the air at sea being far preferable in the West Indies for fever patients. The mortality at the hospital is often very great, and many other causes prevent men from returning to their ships again. Captain Freeman-tle was so sensible of this, that he would not allow a man to be sent on shore, except in cases of the most urgent necessity, knowing the great loss to the service that good men are during the season of war. If proper diet is allowed by government, their recovery is more rapid at sea, and taking care of them when ill on ship-board, makes them more attached to the service. Dr. Trotter has very justly remarked the great loss the service sustained, when the hospital ship was discontinued in the channel fleet."

"I was soon so much convinced of the great advantage of using the cold affusion early, that I made a point of seeing immediately any man that complained; and I gave positive directions to my mates, whenever I was out of the ship, to use the same vigilance, and to apply the affusion without delay. And I always kept one of the mates in the sick birth, during the night, to watch the exacerbations of heat, and where they appeared, to take the patient out of bed directly, and pour the salt water over him.

"At first, my patients were startled with the proposal of this novel remedy; but after a little experience of its effects, they submitted to it cheerfully, and were even anxious to use it. As soon as the fever went off, I gave the bark infusion or decoction, with a light nutritive diet, and in some cases, a little good wine and porter from the ward-room mess.

"I leave you to judge what direful effects the lancet must have had, employed on such patients as I have described. In those ships where venesection was used, the mortality was great. But the more general practice, both in ship and on shore, was to trust chiefly to calomel, and to bring on salivation as speedily as possible. Of this medicine, as an auxiliary, I have the highest opinion. I generally used it as a cathartic, as I have already mentioned, and in some cases brought on salivation. But even in these instances, I never hesitated to use the cold affusion on the febrile heat recurring, and I never saw any injury from this practice.

"I never had recourse to blood-letting in this fever, although I was incited to use it, both by precept and example. I am a decided enemy to this practice in the fevers of the West Indies, and of other warm climates, both from reasoning and observation. It may perhaps be sometimes used with officers just arrived, of full habits, and who live freely. But it will not do with sailors, and especially with those who are impaired by service, or by the climate.*

"Neither did I encourage the use of emetics, which must ever, I think, be attended with dangerous consequences in this

* "I served in the East Indies five years, (from 1793 to 1798) on board his majesty's ship *Heroine*, commanded by the hon. captain Gardner, and the hon. captain Murray, and did not use the lancet twelve times in that period of years, except in cases of accident.

"When the lancet was used, it was chiefly in the incipient state of inflammation of the liver, in new comers. Lord Hobart came home passenger in the *Heroine*—in our passage from Madras to Spithead, we did not lose a single man, and there was only one man sent to the hospital on our arrival, in the last stage of a liver affection. I contracted a disease of the liver in the East Indies, which appeared again in the West Indies, and obliged me to leave the Ganges, and come home a passenger. Dr. Blane, late commissioner of sick and hurt, is no stranger to my practice in the East Indies; nor is the ingenious Dr. Clarke of Newcastle, who has made the best practical remarks on the diseases of that climate; remarks which may be depended on."

fever, notwithstanding, that in one of the medical journals, a practitioner of Jamaica mentions his giving a solution of the tartarum antimoniale to stop vomiting! In a case on board the Ganges, in which one of my mates gave this medicine, it brought on such violent retchings, cold sweats, and languid pulse, as alarmed me greatly. A large dose of tincture of opium, in Madeira wine, stopped these symptoms.

"The fever which prevailed on board the Ganges, was not confined to the sailors; it extended to the officers. Mr. George Allcot and Mr. William Carter had it. This last had three different attacks of the fever, and every time he used the cold affusion. I have not the least doubt that he was saved by it, and that nothing else would have saved him. In the absence of the surgeon of the St. George, I was sent for on board that ship, to attend Mr. Yule. As usual, I prescribed the cold affusion, and with the usual happy effects. Captain Lobb, who now commands the Isis, a man of superior talents in his profession, then commanded the St. George. He was much pleased with the practice, and mentioned that he had known one surgeon of the navy before, who had adopted it, and with the greatest success.

"If you ask whether this was the yellow fever of the West Indies, I would answer that it was, though under the practice I have described, the yellow tinge of the skin seldom appeared. By whatever name it may go, it was no doubt the same fever that spread such destruction through our naval and military service in the West Indies last war. I did not consider it as contagious. There was little chilliness perceptible in this fever—the remissions, if any, were very indistinct. The patients complained of a burning heat, almost from the first.

"While we lay at Port Royal, a merchantman came down from Kingston, and our purser, Mr. John Allcot, went on board of her to buy some coals. When he returned, he informed me that almost all her men were down in fever, and entreated me to go to their assistance. I found that she had already lost in this fever ten of her seamen and two mates; four men were then dangerously ill of it. They were in a very dirty state; the symptoms were, a hot burning skin, flushed face, red suffusion of the eyes, rapid pulse, anxiety, restlessness, and delirium. I immediately put in practice the cold affusion with them all, and with immediate and striking benefit; I directed it to be repeated from time to time, as the heat might require it. I also sent each of them a dose of calomel and antimonial powder, to be taken next morning. The master of the ship, who had been himself ill of this fever, and with difficulty recovered, was wonderfully struck with this bold practice, and with its obvious good effects. The next day his steward being taken ill of the fever, he himself put him under the cold affusion, and sent to me for the medicine the others had taken. I visited the ship in the evening, and found the steward quite cool and comfortable, and so far recovered from his alarm, which had been great, that he said

he would attend his duty next day. All the others were doing well.

"From the extraordinary success of my practice, I considered it as a duty incumbent on me to publish an account of it, and I accordingly sent one to the Kingston Diary, of July the 25th, 1802, referring to your book, as the authority from which it was derived. Of this I have already sent you a copy. I hope, but am not sure, that it was published, as I sailed immediately after sending it. I also made my success known to all my medical friends. I imagine the practice is scarcely known at Kingston, as a medical man of considerable reputation there, wondered at my temerity, and was astonished at my success. The second battalion of the 60th regiment, stationed at Upper Park camp, lost a number of men from fever; they were treated by mercury. On mentioning the success of my practice with the cold affusion to the surgeon, he regretted the want of a liberal supply of water, to put it in practice, the regiment being supplied by contract from Rock-port, some miles off. On my passage home in his Majesty's ship the Decade, the cold affusion was tried in all the fever cases that occurred, and with similar success to what I have already mentioned.

"In a short time, it will, I think, have as many advocates as the cow-pox.

"I am, Sir,

"Your very obedient and faithful servant,

(Signed)

"L. F. NAGLE."

The preceding letter is given entire, on account of the great advantage derived from the use of cold affusions in the fever which occurred on board the Ganges; the observations, however, relative to venesection, should, perhaps, be received with caution by the practitioner, not only as they appear to be merely theoretical, but as the remedy has been found by experience remarkably efficacious in diseases of a similar type, by physicians of the first respectability in America.

Although not precisely connected with the subject, we cannot omit to notice one very interesting case, in which an ounce of tincture of opium was swallowed by mistake. After vomiting, the other usual effects were following, but these were almost completely counteracted by the repeated affusion of water, heated to 106° and 108°, over the naked body.

It does not belong to this place to decide either on the merit, or on the precise extent of the utility of the practice recommended by Dr. Currie. We must, however, exhort every man, who practises physic, to study the work, of which this is a very short analysis,* and in adopting its principles to regard all the rules and cautions it inculcates.

* A cheap edition of this work was published in Philadelphia, in 1808.

COLD AND WARM BATHING.

THE observations here subjoined relative to the important subject of cold and warm bathing, selected from various respectable sources, will not be deemed superfluous.

Cold baths are those of a temperature varying from the thirty-third to fifty-sixth degree of Fahrenheit's thermometer. The general effects, produced in a healthy person by immersion into an ordinary cold bath (that is, water of the temperature of forty-eight or fifty degrees) are, according to the accurate statement of Dr. Saunders, as follow: "First, there is a general sensation of cold, forming that sudden shock to the whole system, which is one of the most important effects of the cold bath. This is almost immediately succeeded by an equal universal sense of warmth, which increases rapidly to a certain point, so as to cause the surrounding water, though actually cold, to feel of a comfortable warmth; and this feeling is sooner produced, and continues longer, in proportion as the person is in full health, and naturally possesses a vigorous circulation. By degrees, however, if the body continues immersed, it becomes chilled; violent shivering comes on; the extremities grow numb and pale; sometimes sickness takes place; and, at last, the animal powers are exhausted by cold and fatigue. In this process, the most remarkable effects are those which occur first, and are directly consequent to the shock of immersion; and these require particular attention in a medical view, as it is only to the production of these that the cold bathing should be suffered to proceed.

"The sensations of returning warmth which take place directly after the cold of the first immersion, constitute what has been called the *re-action of the system*; and this is certainly a proper and characteristic term, as it imports an action produced in the body itself, to resist an external impression. Re-action in this place seems to be a peculiar effort of the living power, and to be excited in a degree proportionate to the force of that power, and to the intensity of the cause which called it into action. It implies not merely an increase of the production of animal heat, but, superadded to this, a sudden effort within the body, and the whole arterial system, to overcome an impression on the extremities as sudden and powerful. Hence it is, that a mere abstraction of heat, by a cold medium, will not produce that which is precisely meant by re-action, except the external cold be applied suddenly, and to a large surface. These two conditions are fulfilled by sudden immersion into cold water. The superior power of conducting heat, which water possesses over air,

is also a circumstance that is always to be kept in mind in applying cold externally. This is particularly shewn where a person continues long in this cold medium beyond the first effects of re-action. On account of the high conducting power of water, the body must be constantly employed in producing an unusual quantity of heat; and this appears to be a great effort in the constitution, which, if carried too far, goes directly to destroy the animal powers." Thus three effects are produced by immersion in cold water; viz. an instantaneous and powerful shock, a sudden abstraction of heat from the surface of the body, and that exertion of the vital energies to counteract the shock and restore the lost quantity of animal heat, which is termed re-action. It is easy to perceive, that when the body is placed under such circumstances for a few seconds, a considerable impression must be made, first upon the sentient system, that is, the brain, and its ramifications, the nerves; and, secondly, upon the sanguiferous and absorbent systems: and that such impression may be rendered subservient to the prevention and cure of various diseases. It contributes in various ways to brace the human body. The relaxed fibres of the skin and the muscles acquire more solidity and compactness from contraction. Their elasticity is increased, and thus a considerable defect removed. The nerves are stimulated and excited to those powerful exertions, on which the vigour of the body so much depends. Hence the superior advantages of cold bathing over all internal *corroborants*, its immediate salutary action being on the solids, without the intervention of the organs of digestion and nutrition. It is peculiarly adapted to those constitutions which, though robust and apparently healthy, are liable to nervous, hysteric, hypochondriacal, and paralytic affections, as well as to frequent attacks of flatulency, and consequent indigestion. As cold bathing is a remedy, which is successfully employed for the cure of various disorders, so is it a preservative against others, and particularly against febrile infection. When used by persons in health, it increases the tone of the muscular fibre, strengthens the digestive organs, and by diminishing the sensibility of the whole system, and particularly of the skin, renders the body less susceptible of atmospheric impressions from cold, wet, and sudden changes of temperature; thus contributing to the production of what is termed a robust or athletic constitution. The duration of every cold bath applied to the whole body ought to be short; for its efficacy depends upon the sudden impression of the cold upon the skin and nerves. Much mischief is frequently done by staying in too long. It is a vulgar error, that it is safer to enter the water when the body is cool, and that persons heated by exercise and beginning to perspire, should wait till they are perfectly cooled. Thus plunging into it in this state they experience a sudden chillness that is alarming and dangerous. In such cases, the injury is generally imputed to going into the water too warm, whereas in truth it arises from going in too

cool. To use the cold bath without danger, and, on the contrary, with great advantage, is to dip into the water when the heat of the body has been a little increased by exercise. In this way only is the plunge productive of a shock, without which not the smallest benefit arises from cold bathing. Healthy persons may continue in it much longer than valetudinarians; and both will be influenced by the temperature of the air, so that in summer they can enjoy it for an hour, when in spring or autumn, one or two minutes may be sufficient. The head should first come in contact with the water, either by immersion, pouring water upon it, or by the application of a wet cloth, and then diving head foremost into the water. The immersion ought to be sudden, that the first impression may be uniform all over the body; a contrary method would be dangerous; as it might propel the blood from the lower to the upper parts of the body, and thus occasion a fit of apoplexy. The best place for cold bathing is in the invigorating water of the sea, or a clear river. The morning or forenoon is the most proper time, either when the stomach is empty, or two hours after a light breakfast. While in water the person ought to move about, in order to promote the circulation of the blood from the inner parts of the body to the extremities. After immersion the whole body ought to be rubbed dry as quick as possible, with a dry and somewhat rough cloth. Moderate exercise out of doors if convenient is adviseable, and indeed necessary after bathing. If after going into the cold bath a glowing warmth pervade the whole body, we are assured of its salutary effects, but if the patient feel dull or chilly, or complain of headach or tightness across the chest, it is a proof that it disagrees, and it should accordingly be discontinued. A temperate bath (i. e. from 70° to 85° or more) is applicable to the same cases as the cold bath, and may be used in the same manner. It is preferable in many cases where the shock of the ordinary cold bath is too great. It should be remarked, that this powerful remedy is not suited to those, who have a tendency to consumption, nor to such as are constitutionally liable to bowel complaints. It should also be prohibited in cases of general plethora, or full habit of body; in hæmorrhagies, and in every kind of inflammation; in constipations, in diseases of the breast, difficult breathing, short and dry coughs, &c.; in an acrimonious or sharp state of the fluids, bad colour of the face, difficult healing of the flesh, and the scurvy, properly so called; in fits of the gout; in cutaneous diseases, and in a state of pregnancy.

Where persons cannot resort to the sea or a river the most eligible method is by the *shower bath*, a proper apparatus for which is to be had at the tin shops; or water may be poured from a common water pot over the head and shoulders, while the person sits upon a stool, placed in a large tub; by this method considerable benefit is derived from the gravity as well as the tonic power of the water. The head and breast are secured from danger by receiving the first shock, and the water is quickly transmitted

over the whole body. The temperature of the water too may be more easily modified and adapted to the circumstances of the patient. For these and other reasons the *shower bath* possesses advantages superior to all others.

The cold bath is highly useful to preserve children from the bowel complaints, which prevail in the summer throughout the United States, and in cases of rickets it is eminently beneficial. The *warm* or *tepid bath* is about the same temperature with the blood, between ninety-six and ninety-eight degrees of Fahrenheit's thermometer. *Warm bathing* is a remedy not less efficacious than the former in diseases of an opposite nature; but concerning the operation of which, wrong notions have till very lately been entertained by the generality of medical writers and medical practitioners. It has been imagined that the warm bath relaxes and weakens, whereas it produces a contrary effect; unless indeed the temperature be so high, or the time of immersion continued so long, as to bring on that degree of debility, which is accompanied with deliquium. But this arises only from an abuse of hot bathing, and is even then the consequence of an excess of stimulation. So far is immersion of the body in water, heated to ninety-six, from having a lowering or weakening operation, that when duly regulated, it is found to raise the spirits, to mend the pulse and appetite, and to refresh and invigorate the whole frame. Hence the benefit derived from it after great fatigue; in old age; in atonic gout, accompanied with stiffness and pallid swellings of the joints; in paralysis; in chlorosis; in diseases arising from a certain torpor of the lymphatic and glandular system; such as scrofula, leprous and other chronic eruptions, &c. In cases of predisposition to phthisis, it abates the frequency of the pulse, and tends to retard at least, if it does not wholly prevent, the pulmonary affection. In consequence of its soothing and agreeable impression upon the surface of the body, it produces very beneficial effects in certain disordered states of the alimentary canal, originating in diminished action; and it affords the best and speediest relief in a great variety of painful disorders, whether connected with local inflammation or not; such as chronic rheumatism, certain forms of lues venerea, nephritis, calculus vesicae, colic, enteritis, &c. Dr. Charleton, of Bath in England, asserts that, of nine hundred and ninety-six paralytics, most of whom had resisted the powers of medicine, eight hundred and thirteen were benefited by the proper application of the warm bath. The time of immersion should be varied according to the temperature of the water, and the feelings of the patient. In a bath of ninety-six, a person may remain fifteen, twenty, or thirty minutes, or even longer; but in one of ninety-eight or one hundred, it will seldom be proper, and indeed there are few persons that can bear to remain beyond ten minutes, and in the generality of cases not so long. Patients labouring under chronic rheumatism and palsy, bear the high degree of temperature best. When sweating is desired the warm bath should be used

in an evening, and the patient should immediately afterwards be put into a warm bed, and remain there until late the next morning : but in all other cases, the best time for using the warm bath will be in the forenoon, about two hours after breakfast. In these cases the bathers should not retire to bed, nor confine themselves within doors, but go about as usual ; unless the weather should be particularly damp or inclement. Hot bathing, like cold bathing, is applied topically by pumping on the diseased part. Sometimes steam is applied to the body instead of warm water. The warm bath is of very great utility to such individuals as are troubled with a parched and rough skin ; in this and in most other cases a free use of friction with a flannel cloth, while in the water, will prove extremely beneficial.

The celebrated count Rumford has paid particular attention to the subject of warm bathing ; he has examined it by the test of experiments long and frequently repeated, and bears testimony to its excellent effects. “ It is not merely on account of the advantages,” says the count, “ which I happened to receive from warm bathing, which renders me so much an advocate for the practice. Exclusive of the wholesomeness of the warm bath, the luxury of bathing is so great, and the tranquil state of mind and body, which follows, is so exquisitely delightful, that I think it quite impossible to recommend it too strongly, if we consider it merely as a rational and elegant refinement.” “ The manner, in which the warm bath operates,” continues the count, “ in producing its salutary consequences, seems very evident. The genial warmth, which is applied to the skin, in the place of the cold air of the atmosphere, by which we are commonly surrounded, expands all those very small vessels, where the extremities of the arteries and veins unite, and by gently stimulating the whole frame, produces a free and full circulation, which, if continued for a certain time, removes all obstructions in the vascular system, and puts all the organs into that state of regular, free, and full motion, which is essential to health, and also to that delightful repose, accompanied by a consciousness of the power of exertion, which constitutes the highest animal enjoyment of which we are capable. If this statement be correct, it cannot be difficult to explain, in a manner perfectly satisfactory, why a warm bath is often found to produce effects when first used, and especially by those, who stay in the bath for too short a time, which are very different from those which it ought to produce, and which it cannot fail to produce when properly managed. We shall likewise be enabled to account for the feverish symptoms, which sometimes result from going out of a warm bath into a warm bed. The beginning of that strong circulation, which is occasioned on first going into a warm bath, is an effort of nature to remove obstructions ; and, if time be not given her to complete her work, if she be checked in the midst of it, the consequences must necessarily be very different from those which would result from a more scientific and prudent

management. Hence we see how necessary it is to remain in a warm bath a sufficient time, and above all how essential it is that the bath should be *really warm*, and *tepid*, or what has been called temperate." *Ree's Cyclopi.*

"Dr. Marchard, resident physician of Pymont, has, in our opinion," says Dr. Willich, (Dom. Ency.) "satisfactorily demonstrated, that the warm bath, in many cases of debility, from spasms, pain, anxiety, and other causes, as well as to hectic and emaciated persons, is, *generally*, of eminent service, and almost the only means of restoring their health, and prolonging their lives. Instead of *heating* the human body, as has erroneously been asserted, the warm bath has a cooling effect, in as much as it obviously abates the quickness of the pulse, and reduces the pulsations in a remarkable degree, according to the length of time the patient continues in the water. After the body has been overheated by fatigue from travelling, violent exercise, or from whatever cause, and likewise after great exertion or perturbation of mind, a tepid bath is excellently calculated to invigorate the whole system, while it allays those tempestuous and irregular motions, which otherwise prey upon, and at length reduce, the constitution to a sick-bed." Upon the whole, it were much to be wished that the use of the warm baths were more general among all classes of people. "Considered as a species of universal domestic remedy, as one which forms the basis of cleanliness, bathing in its different forms may be pronounced one of the most extensive, and beneficial restorers of health and vigour."

N. B. Those who are desirous of improving a fund of instruction and amusement, relative to this interesting subject, are referred to Dr. Saunders's "Treatise on Mineral Waters," "A view of the Russian Empire, &c." by the Rev. Mr. Tooke. But more especially, a truly animated and brilliant account of the use of the warm bath, to be found in M. Savery's "Letters on Egypt."

ON THE CULTIVATION
OF THE
PAPAYER SOMNIFERUM, OR POPPY-PLANT,
AND THE METHOD OF PREPARING OPIUM.

SUCH is the intrinsic value of opium, and such the high price which it commands, that every method, promising to increase the quantity in the market, should be encouraged as of great importance to the community.

The citizens of the United States have not in general been apprized, that this exotic may be cultivated on our own soil to an extent adequate to every exigency, and with a profit exceeding that of many other productions of husbandry.

Opium is the inspissated juice of the *papaver somniferum*, or white poppy, and also of the common garden poppies of every description. From the testimony of travellers, we learn that in the several provinces of Asia, the white poppy plant attains in one season the height of from thirty to forty feet, bearing capsules weighing ten or twelve ounces, from which opium is obtained in immense quantity, by tapping them at the proper season. In England the climate and soil are not favourable to such luxuriant production, but according to the experiments of Mr. John Ball, fields cannot be sown with any thing more lucrative to the farmer, especially if those fields have a south exposure. The society for the encouragement of the arts, &c. for the year 1796, granted a premium of fifty guineas to Mr. Ball, and also a similar reward to Mr. Jones, for their exertions, and a discovery of their method of preparing opium from poppies reared in England, which proved in all respects equal in effect and superior in purity to the best foreign opium. By a calculation, says he, which I have made, suppose one poppy to grow in one square foot of earth, and to produce only one grain of opium, more than fifty pounds will be collected from one statute acre of land. But he asserts that one poppy having twenty-eight heads, produced above thirty grains of opium. The particular species which Mr. Ball prefers as most productive, is the *double* or *semi-double*, each root of which produces from four to ten heads or pods, containing large dark coloured or variegated flowers.* The seeds of the

* See Annals of Medicine, 1796.

poppy in their unripe state are very nourishing, are divested of the narcotic property of the juice, and yield on expression a mild sweet oil little inferior to that of almonds : hence they are often employed as an article of diet, and it is customary in the east to carry a plate of them to the table after dinner with other fruit.

The attempts to cultivate this valuable plant in the United States, have been abundantly successful, and established the important facts, that every species and variety of the plant is equally capable of producing good opium ; and that the collection of it might not only become a useful, but also a lucrative employment. Dr. Shadrach Ricketson, of Dutchess county, New York, and Dr. Reynolds, of Montgomery county, Maryland, have favoured the public with their mode of cultivation, and the result of their experiments.

The poppy seeds in this country, should be sown or planted about the middle of May, or as early in that month as the warmth of the season will admit : the soil should be moist, good, and well manured. The seeds should be planted at about ten or twelve inches distance in transverse rows, which should also be about the same distance from each other. They may be planted much thicker than is intended to allow the plants to grow, one plant in every square foot being as much as will grow advantageously. The residue should be pulled out at the first or second hoeing. The hoe must be frequently and carefully employed to keep the plants from being shaded by weeds ; and when grown about four inches high, if the land be dry and not fertile, they may be frequently watered and manured. About the middle of July, the plants, in their flowering state, arrive at maturity, and yield the most juice ; when commences the tapping or harvest.

The tapping ought to be commenced directly after the flower-leaves begin to wither or fall from the capsules, and during a sun-shining day. If this be neglected many days, the stalk becomes dry, and no juice can be obtained. The Asiatic method of performing this operation, and which Mr. Ball adopted, is, to make several longitudinal incisions, without penetrating their cavities, first on one, and afterwards on the opposite side of the capsules, leaving the exuding juice to dry till the succeeding day, when it is to be scraped off. But it is well ascertained, that the more eligible method is, first to cut off with a sharp knife the stalk about half an inch below the capsule ; then holding the capsule in one hand, take the milky juice that issues from it with a knife, and put it upon an earthen plate ; by this time the top of the incised stalk will hold another large drop, which should be removed as before ; this done, the stalk should be cut about an inch lower, when a similar drop of juice will issue : the cutting must be repeated as often as the milk rises upon the top. This juice must be exposed to the sun in earthen vessels, frequently stirring it, when in a few hours the aqueous part will evaporate, and the genuine opium be formed, much stronger and more pure than any imported.

Dr. Ricketson has found by experience, that although every species of variety of the plant affords the same opium, yet a single species, and of the variety of large red or purple flowers, is deserving the preference, as growing more luxuriantly than any other, and producing from two to four stalks or heads from one seed. The capsules or heads grow particularly large, as do also the stalks; and it is obvious, that in these particulars, the superiority of this variety of the plant consists. The quantity of opium that may be procured, says Dr. Ricketson, depends very much upon the largeness of the plant, and the care used in collecting it. From one poppy plant he produced seven grains of the inspissated juice.

Two species of the poppy plant were exposed to the experimental observation of the compiler of this volume the last season: the single species bearing a variegated reddish or purple flower, consisting of four leaves only, and the double or many-leaved poppy producing smaller capsules, and a flower of a pale reddish colour. The former of which proved to be incomparably the most succulent and productive. It attains to the height of from four to five feet, branching out numerous side-stalks; and more than fifty heads were counted upon one plant proceeding from a single seed. It continues to send forth capsules and flowers in succession from about the middle of July to the middle of September. Attention therefore must be paid to collecting the juice during several weeks. The method of cutting the stalk half an inch below the capsule, and repeating it as often as the juice rises upon the top, is decidedly the most eligible that can be adopted.* From twenty plants the spontaneous and promiscuous growth from seeds lodged in the garden during several preceding years, one hundred and ten grains of pure and strong opium were obtained. Calculating from this experiment, though not attended by advantageous circumstances, it appears, that even in our northern climate, an average number of ninety-eight plants will yield one ounce, and that one acre of rich, well cultivated land will produce from fifteen to twenty pounds of opium. It is acknowledged, however, that the trouble and inconvenience in collecting the juice is, by no means inconsiderable, but when it is considered that this operation, by far the greatest part of the whole labour of the season, may be performed by women and children, and that the crop would be ready for the market and exchanged for cash in the short space of four or five months, it will readily be conceded, that while the price of opium continues to exceed ten dollars per pound, the cultivator of the poppy may anticipate a profit greatly exceeding that of the ordinary crops of Indian corn or other grain. Computing the whole expense at eighty dollars, the neat profit may be estimated at about seventy dollars per acre.

* Some of the largest heads should be reserved to mature seed for the ensuing season. We are assured that Linnaeus counted in one poppy-head thirty-two thousand seeds.

It is a subject of grateful reflection that in every exigency we may resort to that all bountiful source of national and individual wealth, our native soil, which with the labour of our hands, may administer to our necessities, and supersede the importation of expensive and frequently adulterated foreign productions. To the cultivators of rice in our southern states enjoying a climate and soil, supposed to be peculiarly adapted to the growth of the poppy, it must be a very interesting inquiry, whether the culture of this plant might not be an excellent substitute for that of rice. A rich and moist soil is most congenial to the poppy, and even if the planter should not in the first instance realize an equivalent remuneration, yet the draining off stagnant water from noxious rice swamps, will annihilate one of the most fertile sources of pestilence and disease, and thereby essentially meliorate their own local condition. From experiments on a small scale, the probable issue of more extensive attempts might be predicted. Every effort, therefore, to effect an object so truly interesting and important ought to be duly encouraged and rewarded.

TABLE
OF
ANCIENT NAMES WITH THEIR SYNONIMES,
IN THE
NOMENCLATURE OF THE MASSACHUSETTS PHARMACOPOEIA.

ANCIENT NAMES.	SYSTEMATIC NAMES.
Abrotanum.	Artemisia abrotanum.
Absinthium.	absinthium.
Acetosella.	Oxalis acetosella.
Acetum vini.	Acidum acetosum.
distillatum.	Acidum acetosum destillatum.
scilliticum.	Acetum scillæ maritimæ.
Acidum vitriolicum.	Acidum sulphuricum.
Aconitum.	Aconitum neomontanum.
Ærugo.	Sub-acetis cupri.
Æther vitrioli.	Æther sulphuricus.
Æthiops martialis.	Carbonas ferri.
mineralis.	Sulphuretum hydrargyri nigrum.
Alkali causticum.	Potassa.
fixum fossile.	Carbonas sodæ impurus.
vegetabile.	potassæ impurus.
volatile.	ammoniæ.
Aloe.	Aloe perfoliata.
Althæa.	Althæa officinalis.
Alumen.	Super-sulphas aluminæ et potassæ.
ustum.	Super-sulphas aluminæ et potassæ exsiccatus.
Ammonia.	Carbonas ammoniæ.
Aconitum.	Aconitum neomontanum.
Amygdala dulcis.	Amygdalus communis.
Anethum.	Anethum graveolens.
Angelica.	Angelica archangelica.
Anisum.	Pimpinella anisum.

ANCIENT NAMES.	SYSTEMATIC NAMES.
Antimonium.	Sulphuretum antimonii.
præparatum.	præpa- ratum.
tartarizatum.	Tartris antimonii.
Aqua aeris fixi.	Aqua acidi carbonici.
ammoniaë.	carbonatis ammoniaë.
causticæ.	ammoniaë.
cassiaë lignæ.	lauri cassiaë.
cinnamomi simplex.	cinnamomi.
spirituosa.	Spiritus lauri cinnamomi.
ferri aerati.	Aqua super-carbonatis ferri.
fortis.	Acidum nitrosum.
kali præparati.	Aqua carbonatis potassæ.
puri.	potassæ.
lixivia caustica. }	myrti pimentæ.
pimentæ.	menthæ pulegii.
pulegii.	rosæ damascenæ.
rosarum.	Solutio sulphatis cupri compo- sita.
styptica.	Hydrargyrus.
Argentum vivum.	purificatus.
purificatum.	Arnica montana.
Arnica.	Oxidum arsenici.
Arsenicum.	Gummi-resina ferulæ assæ fœ- tidæ.
album. }	Citrus aurantium.
Assa fœtida.	Avena sativa.
Aurantium hispalense.	Adeps suis scrofæ.
Avena.	Tinctura saponis et opii.
Axungia porcina.	Resina liquida pini balsameæ.
Balsamum anodynum.	Resina liquida copaiferæ offi- cinalis.
canadense.	Resina liquida amyridis gilea- densis.
copaibæ.	Balsamum myroxyli peruiferi.
gileadense.	Tinctura saponis.
peruvianum.	Oleum sulphuratum.
saponaceum.	Balsamum toluiferæ balsami.
sulphuris.	Tinctura benzoin composita.
tolutanum.	Arctium lappa.
traumaticum.	Carbonas sodæ impurus.
Bardana.	barytæ.
Barilla.	Murias barytæ.
Barytes.	Atropa belladonna.
muriatus.	Balsamum styracis benzoin.
Belladonna.	
Benzoinum.	

ANCIENT NAMES.

SYSTEMATIC NAMES.

Bistorta.	Polygonum bistorta.
Borax.	Sub-boras sodæ.
Butyrum antimonii.	Murias antimonii.
Cajeputa.	Melaleuca leucadendron.
Calamus aromaticus.	Acorus calamus.
Calomelanos. }	Sub-murias hydrargyri.
Calomelas. }	Sub-murias hydrargyri et am-
Calx hydrargyri alba.	moniaæ.
viva.	Calx.
Camphora.	Laurus camphora.
Cancrorum oculi. }	Carbonas calcis durior.
lapilli. }	Meloe vesicatorius.
Cantharis.	Amomum repens.
Cardamomum minus.	Centaurea benedicta.
Carduus benedictus.	Fructus ficus caricæ.
Carica.	Eugenia caryophyllata.
Caryophyllus aromaticus.	Carum carui.
Carvi.	Croton eleutheria.
Cascarilla.	Laurus cassia.
Cassia.	Extractum mimosæ catechu.
Catechu.	Potassa.
Causticum commune acerri-	Potassa cum calce.
mum.	Nitras argenti.
mitius.	Chironia centaurium.
lunare.	Ceratum carbonatis zinci im-
Centaurium minus.	puri.
Ceratum epuloticum.	Oxidum plumbi album.
lapidis calaminaris. }	Anthemis nobilis.
turneri. }	Conium maculatum.
Cerussa.	Carbonas potassæ impurus.
Chamæmelum.	Sulphuretum hydrargyri ru-
Cicuta.	brum.
Cineres clavellati.	Laurus cinnamomum.
Cinnabaris factitia.	Coccus cacti.
Cinnamomum.	Cochlearia officinalis.
Coccinella.	Colchicum autumnale.
Cochlearia.	Oxidum ferri rubrum.
Colchicum.	Cucumis colocynthis.
Colcothar vitrioli.	Electuarium aromaticum.
Colocynthis.	catechu.
Confectio cardiaca.	Conserva citri aurantii.
Confectio japonica.	rosæ damascenæ.
Conserva corticis aurantii.	Dorstenia contrajerva.
rosarum.	
Contrayerva.	

ANCIENT NAMES.	SYSTEMATIC NAMES.
Cornu cervi.	Cornu cervi elaphi.
ustum.	Phosphas calcis impurus.
Coriandrum.	Coriandrum sativum.
Cortex peruvianus.	Cortex cinchonæ officinalis.
Cremor tartari.	Super-tartris potassæ.
Creta alba.	Carbonas calcis mollior.
præparata.	præparatus.
Crocus antimonii.	Oxidum antimonii cum sul-
	phure per nitratem potassæ.
anglicus.	Crocus sativus.
martis.	Oxidum ferri rubrum.
metallorum.	antimonii cum sul-
	phure per nitratem potassæ.
Crystalli tartari.	Super-tartris potassæ.
Cuminum.	Cuminum cyminum.
Cuprum ammoniacum.	Ammoniaretum cupri.
vitriolatum.	Sulphas cupri.
Curcuma.	Curcuma longa.
Cynosbatus.	Rosa canina.
Daucus sylvestris.	Daucus carota.
Decoctum lignorum.	Decoctum guajaci composi-
	tum.
Dens leonis.	Leontodon taraxacum.
Digitalis.	Digitalis purpurea.
Dolichos.	Dolichos pruriens.
Dulcamara.	Solanum dulcamara.
Elaterium.	Succus spissatus momordicæ
	elaterii.
Electuarium lenitivum.	Electuarium cassiæ sennæ.
thebaicum.	opiatum.
Eleutheria.	Croton eleutheria.
Elixir asthmaticum.	Tinctura opii camphorata.
camphoræ.	camphoræ.
paregoricum.	opii camphorata.
proprietas.	aloes et myrrhæ.
sacrum.	rhei et aloes.
salutis.	sennæ composita.
stomachicum.	gentianæ composita.
vitrioli.	Acidum sulphuricum aromati-
	cum.
Emplastrum adhesivum.	Emplastrum resinosum.
antihystericum.	assæ fœtidæ.
cantharidum.	meloës vesicato-
	rii.
cereum.	simplex.
cerussæ.	oxidi plumbi albi.
cœruleum.	hydrargyri.

ANCIENT NAMES.	SYSTEMATIC NAMES.
Helleborus albus.	Veratrum album.
Hepar sulphuris.	Sulphuretum potassæ.
Hippocastanum.	Æsculus hippocastanum.
Hordeum.	Hordeum distichon.
Hydrargyrus muriatus corrosivus.	Murias hydrargyri.
	mitis.
Hyoscyamus.	Sub-murias hydrargyri.
Hyssopus.	Hyoscyamus niger.
	Hyssopus officinalis.
Infusum amarum.	Infusum gentianæ compositum.
japonicum.	mimosæ catechu.
Iris.	Iris pseudacorus.
Jalapa.	Convolvulus jalapa.
Kali purum.	Potassa.
præparatum.	Carbonas potassæ.
Lac ammoniaci.	Emulsio ammoniaci.
Lactuca.	Lactuca sativa.
Lapis calaminaris.	Carbonas zinci impurus.
infernalis. }	Potassa.
septicus. }	Tinctura opii.
Laudanum liquidum.	Lavandula spica.
Lavandula.	Hæmatoxylum campechianum.
Lignum campechense	Citrus medica.
Limon.	Tinctura saponis.
Linimentum saponaceum.	Oleum ammoniatum.
volatile.	Aqua super-carbonatis potassæ.
Liquor alkali vegetabilis mitissimi.	Linum usitatissimum.
Linum.	Oxidum plumbi semivitreum.
Lithargyrus. }	Aqua potassæ.
auri. }	Humulus lupulus.
Lixivium causticum.	Carbonas magnesiæ.
Lupulus.	Magnesia.
Magnesia. }	Sulphas magnesiæ.
alba. }	Origanum majorana.
calcinata. }	Malva sylvestris.
usta. }	Succus concretus fraxini orpi.
vitriolata.	Carbonas calcis durior.
Majorana.	Ferrum.
Malva.	
Manna.	
Marmor album.	
Mars.	

ANCIENT NAMES.

SYSTEMATIC NAMES.

Marrubium.	Marrubium vulgare.
Mastiche.	Pistacia lentiscus.
Melampodium.	Helleborus niger.
Melissa.	Melissa officinalis.
Mentha piperitis.	Mentha piperita.
sativa.	viridis.
Mercurius.	Hydrargyrum.
calcinatus.	Oxidum hydrargyri cinereum.
corrosivus sublima-	Murias hydrargyri.
dulcis. [tus.	Sub-murias hydrargyri.
emeticus flavus.	Sub-sulphas hydrargyri flavus.
præcipitatus albus.	Sub-murias hydrargyri et am-
	monia.
	Oxidum hydrargyri rubrum
	per acidum nitricum.
Mezereum.	Daphne mezereum.
Minium.	Oxidum plumbi rubrum.
Mucilago arabici gummi.	Mucilago mimosæ niloticæ.
Muria.	Murias sodæ.
Natron præparatum.	Carbonas sodæ.
Nicotiana.	Nicotiana tabacum.
Nitrum.	Nitras potassæ.
Nux moschata.	Nucleus fructus myristicæ
	moschatæ.
Oculi cancrorum.	Carbonas calcis durior.
Olea essentialia.	Olea volatilia.
Olibanum.	Gummi resina juniperi lyciæ.
Oliva.	Olea europæa.
Oleum essentielle juniperi.	Oleum volatile juniperi com-
	munis.
succini rectificatum.	succini purissimum.
tartari per deliquium.	Aqua carbonatis potassæ.
terebinthinæ.	Oleum volatile pini laricis.
rectificatum.	purissimum.
vitrioli.	Acidum sulphuricum.
Petroleum barbadense.	Bitumen petroleum.
Petroselinum.	Apium petroselinum.
Pilulæ coccia.	Pilulæ aloes et colocynthidis.
cupri.	ammoniaretæ cupri.
fœtidæ.	assæ fœtidæ compositæ.
mercuriales.	hydrargyri.
rufi.	aloes et myrrhæ.
saponaceæ.	aloeticæ.
stomachicæ.	rhei compositæ.

ANCIENT NAMES.	SYSTEMATIC NAMES.
Pilulæ thebaicæ.	Pilulæ opiatæ.
Pimento.	Myrtus pimenta.
Piper indicum.	Capsicum annuum.
jamaicense.	Myrtus pimenta.
Pix burgundica.	Resina sponte concreta pini- abietis.
Pix liquida.	Resina empyreumatica pini sylvestris.
Prunus gallica.	Prunus domestica.
Potio cretacea.	Mistura carbonatis calcis.
Pulegium.	Mentha pulegium.
Pulvis antimonialis.	Oxidum antimonii cum phos- phate calcis.
aromaticus.	Pulvis cinnamomi compositus.
asarabaccæ.	asari compositus.
cretaceus.	carbonatis calcis compo- situs.
doveri.	ippecacuanhæ et opii.
stypticus helvetii.	super-sulphatis aluminæ et potassæ compositus.
Pyrethrum.	Anthemis pyrethrum.
Quassia.	Quassia excelsa.
Quercus.	Quercus robur.
Raphanus rusticanus.	Cochlearia armoracia.
Resina alba.	Resina pini.
Rhabarbarum. }	Rheum palmatum.
Rheum. }	Rhododendron crysanthum.
Rhododendron.	Ricinus communis.
Ricinus.	Succus pissatus sambuci nigræ.
Rob sambuci.	Rosa damascena.
Rosa centifolia. }	gallica.
pallida. }	Rosmarinus officinalis.
rubra.	Rubia tinctorum.
Rosmarinus.	Carbonas ferri.
Rubia.	Ruta graveolens.
Rubigo ferri.	Juniperus sabina.
Ruta.	Acetis plumbi.
Sabina.	Carbonas potassæ purissimus.
Saccharum saturni.	sodæ.
Sal absynthii.	Carbonas potassæ.
alkalinus fixus fossilis puri- ficatus.	Murias ammoniæ.
alkalinus fixus vegetabilis purificatus.	
ammoniacus.	

ANCIENT NAMES.

SYSTEMATIC NAMES.

Sal catharticus amarus.	Sulphas magnesiæ.]
cornu cervi.	Carbonas ammoniæ.
diureticus.	Acetis potassæ.
epsomiensis.	Sulphas magnesiæ.
marinus.	Murias sodæ.
martis.	Sulphas ferri.
glauberi.	sodæ.
nitri.	Nitras potassæ.
polychrestus.	Sulphas potassæ cum sulphure.
rupellensis.	Tartris potassæ et sodæ.
succini.	Acidum succinicum.
tartari.	Carbonas potassæ purissimus.
vitrioli.	Sulphas zinci.
volatile salis ammoniaci.	Carbonas ammoniæ.
Salvia.	Salvia officinalis.
Sambucus.	Sambucus nigra.
Sanguis draconis.	Resina pterocarpi dracontis.
Santalum rubrum.	Lignum pterocarpi santalini.
Santonicum.	Artemisia santonica.
Sapo albus hispanus.	Sapo.
Sarsaparilla.	Smilax sarsaparilla.
Sassafras.	Laurus sassafras.
Saturnus.	Plumbum.
Scammonium.	Gummi-resina convolvuli scam-
	moniæ.
Scilla.	Scilla maritima.
Sel de seignette.	Tartris potassæ et sodæ.
Seneka.	Polygala senega.
Senna.	Cassia senna.
Serpentaria virginiana.	Aristolochia serpentaria.
Sevum ovillum.	Adeps ovis arietis.
Simarouba.	Quassia simaruba.
Sinapi album.	Sinapis alba.
Soda.	Carbonas sodæ.
muriata.	Murias sodæ.
Solanum lethale.	Atropa belladonna.
Solutio terræ ponderosæ salitæ.	Solutio muriatis barytæ.
Species aromaticæ.	Pulvis cinnamomi compositus.
Spermaceti.	Sevum physeteris macroce-
	phali.
Spigelia.	Spigelia marilandica.
Spina cervina.	Rhamnus catharticus.
Spiritus ammoniæ.	Alcohol ammoniatum.
ammoniæ aromaticus.	ammoniatum aromati-
	cum.
foetidus.	foetidum.
carvi.	Spiritus cari carui.
cinnamomi.	lauri cinnamomi.

ANCIENT NAMES.

SYSTEMATIC NAMES.

Spiritus cornu cervi.
 mindereri.
 nucis moschatae.
 nitri dulcis.
 fortis.
 pimentae.
 salis marini.
 salis ammoniaci.
 vinosus.
 vinosus camphoratus.
 vinosus rectificatus.
 tenuior.
 vitrioli dulcis.

 vitrioli fortis.
 tenuis.

Spongia.
 Staphisagria.
 Stibium.
 Stramonium.
 Styra.
 Succu ad scorbuticos.

Sulphur antimonii præcipita-
 tum vel auratum.
 Sulphuris flores.
 Syrupus balsami tolutani.
 corticis aurantii.
 ex althæa.
 limonum.
 papaveris albi.
 rosæ solutivus.
 spinæ cervinæ.
 zingiberis.

Tamarindus.
 Tanacetum.
 Tartarum regeneratum.
 solubile.
 vitriolatum.
 Tartarus emeticus.
 crudus.
 purificatus.
 Terebinthina veneta.
 Terra japonica.
 ponderosa.
 vitriolata.

Aqua carbonatis ammoniæ.
 Aqua acetitis ammoniæ.
 Spiritus myristicæ moschatae.
 ætheris nitrosi.
 Acidum nitricum.
 Spiritus myrti pimentæ.
 Acidum muriaticum.
 Aqua carbonatis ammoniæ.
 Alcohol ammoniatum.
 Tinctura camphoræ.
 Alcohol.
 dilutum.
 Æther sulphuricus cum alco-
 hole.
 Acidum sulphuricum.
 dilutum.

Spongia officinalis.
 Delphinium staphisagria.
 Sulphuretum antimonii.
 Datura stramonium.
 Styra officinalis.
 Succus cochleariæ officinalis
 compositus.
 Sulphuretum antimonii præci-
 pitatum.
 Sulphur sublimatum.
 Syrupus toluiferæ balsami.
 citri aurantii.
 althææ officinalis.
 citri medicæ.
 papaveris somniferi.
 rosæ damascenæ.
 rhamni cathartici.
 amomi zingiberis.

Tamarindus indica.
 Tanacetum vulgare.
 Acetis potassæ.
 Tartris potassæ.
 Sulphas potassæ.
 Tartris antimonii.
 Super-tartris potassæ impurus.
 Super-tartris potassæ.
 Resina liquida pini laricis.
 Extractum mimosæ catechu.
 Carbonas barytæ.
 Sulphas barytæ.

ANCIENT NAMES.

SYSTEMATIC NAMES.

Tinctura alexipharmica.

amara.

aromatica.

balsami tolutani.

cantharidum.

cardamomi.

cascarillæ.

cinnamomi.

corticis peruviani.

com-

posita.

ferri.

fœtida.

guaiaci volatilis.

hellebori albi.

ipecacuanhæ.

jalapæ.

japonica.

martis.

salita.

rhei.

amara.

sacra.

serpentariæ.

thebaica.

Tormentilla.

Toxicodendron.

Tragacantha.

Trifolium palustre.

Triticum.

Trochisci cretæ.

glycirrhizæ compo-

siti.

Turpethum minerale.

Tussilago.

Tutia.

præparata.

Unguentum æruginis.

album.

e cerussa.

cœruleum.

basilici flavi.

Tinctura cinchonæ composita.

gentianæ composita.

lauri cinnamomi com-

posita.

toluiferæ balsami.

meloës vesicatorii.

amomi repentis.

eleutheriæ.

lauri cinnamomi.

cinchonæ officinalis.

composita.

muriatis ferri.

ferulæ assæ fœtidæ.

guajaci ammoniata.

veratri albi.

Vinum ipecacuanhæ.

Tinctura convolvuli jalapæ.

mimosæ catechu.

muriatis ammoniæ et

ferri.

muriatis ferri.

rhei palmati.

et gentianæ.

Vinum aloës socotorinæ.

Tinctura aristolochiæ serpen-

tariæ.

opii.

Tormentilla erecta.

Rhus toxicodendron.

Gummi astragali tragacanthæ.

Menyanthes trifoliata.

Triticum æstivum.

Trochisci carbonatis calcis.

glycirrhizæ cum

opio.

Sub-sulphas hydrargyri flavus.

Tussilago farfara.

Oxidum zinci impurum.

præ-

paratum.

Unguentum sub-acetitis cupri.

oxidi plumbi albi.

hydrargyri.

resinosum.

ANCIENT NAMES.	SYSTEMATIC NAMES.
Unguentum calcis hydrargyri albi.	Unguentum sub-muriatis hy- drargyri et ammoniæ.
citrinum.	nitratis hydrar- gyri.
epispasticum for- tius.	pulveris meloes vesicatorii.
mitius.	infusi meloes ve- sicatorii.
e mercurio præci- pitato.	sub-muriatis hy- drargyri et ammoniæ.
mercuriale fortius.	hydrargyri.
mitius.	mitius.
oxygenatum.	acidi nitrosi.
saturninum.	acetitis plumbi.
tutiæ.	oxidi zinci im- puri.
Unguentum zinci.	Unguentum oxidi zinci.
Uva passa.	Fructus siccatus vitis viniferi.
ursi.	Arbutus uva ursi.
Valeriana sylvestris.	Valeriana officinalis.
Vinum amarum.	Vinum gentianæ compositum.
antimoniale.	tartritis antimonii.
chalybeatum.	ferri.
Viola.	Viola odorata.
Vitriolum album.	Sulphas zinci.
cæruleum. }	cupri.
romanum. }	ferri.
viride.	Oxidum antimonii cum sul- phure vitrificatum.
Vitrum antimonii.	Oxidum antimonii vitrificatum cum cera.
ceratum.	
Zedoaria.	Amomum zedoaria.
Zincum vitriolatum.	Sulphas zinci.
Zingiber.	Amomum zingiber.

NOTE. This table is designed to present the names, in use among us only. We have not inserted those, adopted some years ago by the London and Edinburgh colleges, because the greater part of them have never been employed by our physicians.

TABLE

OF SYTEMATIC NAMES USED IN THE MASSACHUSETTS PHARMACOPOEIA
WITH THEIR SYNONIMES IN THE ANCIENT NOMENCLATURE.

SYSTEMATIC NAMES.	ANCIENT NAMES.
Acetis plumbi.	Saccharum saturni.
potassæ.	{ Tartarum regeneratum.
Acetum scillæ maritimæ.	{ Sal diureticus.
Acidum acetosum.	Acetum scilliticum.
destillatum.	vini.
benzoicum.	distillatum.
muriaticum.	Flores benzoini.
nitricum.	Spiritus salis marini.
nitrosum.	nitri fortis.
succinicum.	Aqua fortis.
sulphuricum.	Sal succini.
sulphuricum aromati-	{ Acidum vitriolicum.
cum.	{ Oleum vitrioli.
dilutum.	{ Spiritus vitrioli fortis.
Aconitum neomontanum.	Elixir vitrioli.
Acorus calamus.	Spiritus vitrioli tenuis.
Æsculus hippocastanum.	Aconitum.
Æther sulphuricus.	Calamus aromaticus.
hole.	Hippocastanum.
Alcohol.	Æther vitrioli.
ammoniatus.	{ Spiritus ætheris vitriolici.
aromati-	{ vitrioli dulcis.
cum.	{ vinosus rectificatus.
fœtidum.	{ ammoniæ.
dilutum.	{ salis ammoniaci vino-
Aloe perfoliata.	sus.
Althæa officinalis.	aromati-
Ammoniaretum cupri.	cus.
Amomum repens.	fœtidus.
zedoaria.	vinosus tenuior.
zingiber.	Aloe.
Amygdalus communis.	Althæa.
	Cuprum ammoniacum.
	Cardamomum minus.
	Zedoaria.
	Zingiber.
	Amygdala dulcis.

SYSTEMATIC NAMES.	ANCIENT NAMES.
Amyridis gileadensis resina liquida.	Balsamum gileadense.
Anethum fœniculum.	Fœniculum dulce.
Anethum graveolens.	Anethum.
Angelica archangelica.	Angelica.
Anthemis nobilis.	Chamæmelum.
pyrethrum.	Pyrethrum.
Apium petroselinum.	Petroselinum.
Aqua acetitis ammoniæ.	Spiritus mindereri.
acidi carbonici.	Aqua aeris fixi.
ammoniæ.	ammoniæ causticæ.
carbonatis ammoniæ.	ammoniæ.
carbonatis potassæ.	{ Spiritus cornu cervi.
super-carbonatis ferri.	salis ammoniaci.
lauri cassiæ.	{ Aqua kali præparati.
cinnamomi.	{ Oleum tartari per deliquium.
menthæ pulegii.	Aqua ferri aerati.
myrti pimentæ.	cassiæ ligneæ.
potassæ.	cinnamomi simplex.
rosæ damascenæ.	pulegii.
super-carbonatis potassæ.	pimentæ.
Arbutus uva ursi.	{ Lixivium causticum.
Arctium lappa.	{ Aqua lixivii caustica.
Aristolochia serpentaria.	kali puri.
Arnica montana.	rosarum.
Artemisia abrotanum.	Liquor alkali vegetabilis mitis-
absinthium.	simi.
santonica.	Uva ursi.
Astragali tragacanthæ gummi.	Bardana.
Atropa belladonna.	Serpentaria virginiana.
Avena sativa.	Arnica.
Bitumen petroleum.	Abrotanum.
Bubon galbanum.	Absinthium.
Calx.	Santonicum.
Capsicum annuum.	Tragacantha.
Carbonas ammoniæ.	{ Belladonna.
	{ Solanum lethale.
	Avena.
	Petroleum barbadense.
	Galbanum.
	Calx viva.
	Piper indicum.
	{ Ammonia.
	{ Sal cornu cervi.
	volatile salis ammoniaci.
	{ Alkali volatile.

SYSTEMATIC NAMES.

ANCIENT NAMES.

Carbonas barytæ.	{ Barytes.
calcis mollior.	{ Terra ponderosa.
	Creta alba.
durior.	{ Marmor album.
præparatus.	{ Cancrorum oculi vel lapilli.
	Creta præparata.
ferri.	{ Rubigo ferri.
	{ Æthiops martialis.
magnesæ.	{ Magnesias.
	alba.
potassæ.	{ Sal alkalinus fixus vegetabilis
	purificatus.
	Kali præparatum.
impurus.	{ Alkali fixum vegetabile.
	Cineres clavellati.
purissimus.	{ Sal tartari.
	absynthii.
	Natron præparatum.
sodæ.	{ Soda.
	Sal alkalinus fixus fossilis puri-
	ficatus.
impurus.	{ Barilla.
zinci impurus.	{ Alkali fixum fossile.
	Lapis calaminaris.
præpa-	præparatus.
ratus.	
Carum carui.	Carvi.
Cassia senna.	Senna.
Centaurea benedicta.	Carduus benedictus.
Ceratum carbonatis zinci im-	{ Ceratum epuloticum.
puri.	lapidis calaminaris.
	turneri.
Cervi elaphi cornu.	Cornu cervi.
Chironia centaurium.	Centaurium minus.
Cinchonæ officinalis cortex.	Cortex peruvianus.
Citrus aurantium.	Aurantium hispalense.
Citrus medica.	Limon.
Coccus cacti.	Coccinella.
Cochlearia armoracia.	Raphanus rusticanus.
officinalis.	Cochlearia.
Colchicum autumnale.	Colchicum.
Conium maculatum.	Cicuta.
Conserva citri aurantii.	Conserva corticis aurantii.
rosæ gallicæ.	rosarum.
Convolvuli scammoniae gummi-	Scammonium.
resina.	
Convolvulus jalapa.	Jalapa.
Copaiferæ officinalis resina li-	Balsamum copaibæ.
quida.	

SYSTEMATIC NAMES.	ANCIENT NAMES.
Coriandrum sativum	Coriandrum.
Crocus sativus.	Crocus anglicus.
Croton eleutheria.	{ Cascarilla.
	{ Eleutheria.
Cucumis colocynthis.	Colocynthis.
Cuminum cyminum.	Cuminum.
Curcuma longa.	Curcuma.
Daphne mezereum.	Mezereum.
Datura stramonium.	Stramonium.
Daucus carota.	Daucus sylvestris.
Decoctum guajaci compositum.	Decoctum lignorum.
Delphinium staphisagria.	Staphisagria.
Digitalis purpurea.	Digitalis.
Dolichos pruriens.	Dolichos.
Dorstenia contrajerva.	Contrayerva.
Electuarium aromaticum.	Confectio cardiaca.
cassiae sennæ.	Electuarium lenitivum.
catechu.	Confectio japonica.
opiatum.	Electuarium thebaicum.
Emplastrum assæ foetidæ.	Emplastrum antihystericum.
hydrargyri.	{ mercuriale.
resinosum.	{ cœruleum.
resinosum compo-	adhesivum.
situm.	picis burgundicæ.
gummosum.	commune cum
	gummis.
meloes vesicatorii.	{ epispasticum.
oxidi ferri rubri.	{ cantharidum.
oxidi plumbi albi.	{ vesicatorium.
semi-	{ roborans.
vitrei.	{ cerussæ.
simplex.	{ commune.
	{ diachyli.
	{ cereum.
Emulsio ammoniaci.	Lac ammoniaci.
amygdali communis.	Emulsio communis.
Eugenia caryophyllata.	Caryophyllus aromaticus.
Extractum anthemidis nobilis.	Extractum chamæmeli.
cassiae sennæ.	sennæ.
convolvuli jalapæ.	jalapæ.
hæmatoxyli campe-	ligni campechensis.
chensis.	
juglandis cineræ.	nucis butyracæ.
papaveris somni-	capitum papaveris
feri.	albi.

SYSTEMATIC NAMES.	ANCIENT NAMES.
Ferri oxidum nigrum purificatum.	Ferri squamæ purificatæ.
Ferrum.	Mars.
Ferulæ assæ foetidæ gummi-resina.	Assa foetida.
Ficus caricæ fructus.	Carica.
Fraxini ornî succus concretus.	Manna.
Gentiana lutea.	Gentiana.
Geoffræa inermis.	Geoffræa.
Glycirrhiza glabra.	Glycirrhiza.
Gratiola officinalis.	Gratiola.
Guajacum officinale.	Guaiacum.
Hæmatoxylum campechianum.	Lignum campechense.
Helleborus foetidus.	Helleboraster.
niger.	Melampodium.
Hordeum distichon.	Hordeum.
Humulus lupulus.	Lupulus.
Hydrargyrus.	{ Argentum vivum.
purificatus.	{ Mercurius.
Hyoscyamus niger.	Argentum vivum purificatum.
Hyssopus officinalis.	Hyoscyamus.
	Hyssopus.
Infusum gentianæ compositum.	Infusum amarum.
mimosæ catechu.	japonicum.
Inula helenium.	Enula campana.
Iris pseudacorus.	Iris.
Juniperi lyciæ gummi-resina.	Olibanum.
Juniperus sabina.	Sabina.
Lactuca sativa.	Lactuca.
Laurus camphora.	Camphora.
cassia.	Cassia.
cinnamomum.	Cinnamomum.
sassafras.	Sassafras.
Lavandula spica.	Lavandula.
Leontodon taraxacum.	Dens leonis.
Linum usitatissimum.	Linum.
Magnesia.	{ Magnesia calcinata.
Malva sylvestris.	usta.
Marrubium vulgare.	Malva.
Melaleuca leucadendron.	Marrubium.
Melissa officinalis.	Cajeputa.
	Melissa.

SYSTEMATIC NAMES.	ANCIENT NAMES.
Meloe vesicatorius.	Cantharis.
Mentha piperita.	Mentha piperitis.
pulegium.	Pulegium.
viridis.	Mentha sativa.
Menyanthes trifoliata.	Trifolium palustre.
Mimosæ catechu extractum.	{ Catechu.
niloticæ gummi.	{ Terra japonica.
niloticæ mucilago.	Gummi arabicum.
Mistura carbonatis calcis.	Mucilago arabici gummi.
Momordicæ elaterii succus	Potio cretacea.
spissatus.	Elaterium.
Murias ammoniæ.	{ Sal ammoniacus.
	{ Ammonia muriata.
ammoniæ et ferri.	{ Ferrum ammoniacale.
	{ Flores martiales.
antimonii.	{ Ens veneris.
barytæ.	Butyrum antimonii.
	Barytes muriatus.
hydrargyri.	{ Hydrargyrus muriatus corro-
	sivus.
	{ Mercurius corrosivus sublima-
sodæ.	tus.
	{ Muria.
	{ Sal marinus.
Myristicæ moschatae nucleus	Nux moschata.
fructus.	
Myroxyli peruiferi balsamum.	Balsamum peruvianum.
Myrtus pimenta.	{ Pimento.
	{ Piper jamaicense.
Nicotiana tabacum.	Nicotiana.
Nitras argenti.	Causticum lunare.
potassæ.	{ Nitrum.
	{ Sal nitri.
Olca europæa.	Oliva.
volatilia.	Olea essentialia.
Oleum ammoniatum.	Linimentum volatile.
succini purissimum.	Oleum succini rectificatum.
sulphuratum.	Balsamum sulphuris.
volatile pini laricis.	Oleum terebinthinæ.
purissi-	rectifica-
mum.	tu m.
juniperi com-	essentiale juniperi.
munis.	
Origanum majorana.	Majorana.
Ovis arietis adeps.	Sevum ovillum.

SYSTEMATIC NAMES.

ANCIENT NAMES.

Oxalis acetosella.	Acetosella.
Oxidum antimonii cum phosphate calcis.	Pulvis antimonialis.
antimonii cum sulphure per nitratem potassæ.	{ Crocus antimonii. metallorum.
Oxidum antimonii cum sulphure vitrificatum.	
antimonii vitrificatum cum cera.	Vitrum antimonii. ceratum.
arsenici.	{ Arsenicum. album.
ferri nigrum.	
rubrum.	{ Colcothar vitrioli. Crocus martis.
hydrargyri cinereum.	
rubrum	Mercurius calcinatus. præcipitatus ruber.
per acidum nitricum.	
plumbi album.	Cerussa.
rubrum.	Minium.
semivitreum.	{ Lithargyrus auri.
zinci.	
impurum.	Flores zinci.
præ-	Tutia.
paratum.	præparata.
Phosphas calcis impurus.	Cornu cervi ustum.
Physeteris macrocephali seminum.	Spermaceti.
Pilulæ aloes et colocynthidis.	Pilulæ coccia.
aloes et myrrhæ.	rufi.
aloetica.	saponacea.
ammoniareti cupri.	cupri.
assæ foetidæ compositæ.	foetida.
hydrargyri.	mercuriales.
opiatæ.	thebaica.
rhei compositæ.	stomachica.
Pimpinella anisum.	Anisum.
Pini abietis resina sponte concreta.	Pix burgundica.
balsamæ resina liquida.	Balsamum canadense.
laricis resina liquida.	Terebinthina veneta.
laricis oleum volatile.	Oleum terebinthinæ.
sylvestris resina empyreumatica.	Pix liquida.
Pistacia lentiscus.	Mastiche.
Plumbum.	Saturnus.
Polygala senega.	Seneka.

SYSTEMATIC NAMES.	ANCIENT NAMES.
Polygonum bistorta.	Bistorta.
Polypodium filix mas.	Filix mas.
	{ Alkali causticum.
	{ Causticum commune acerri-
	{ mum.
Potassa.	{ Kali purum.
	{ Lapis infernalis.
	{ septicus.
cum calce.	Causticum commune mitius.
Prunus domestica.	Prunus gallica.
Pterocarpi santalini lignum.	Santalum rubrum.
dracontis resina.	Sanguis draconis.
Pulvis asari compositus.	Pulvis asarabaccæ.
carbonatis calcis com-	cretaceus.
positus.	
cinnamomi compositus.	{ aromaticus.
	{ Species aromaticæ.
ipecacuanhæ et opii.	Pulvis doveri.
super-sulphatis alumi-	stypticus helvetii.
næ et potassæ compositus.	
Quassia simaruba.	Simarouba.
excelsa.	Quassia.
Quercus robur.	Quercus.
Resina pini.	Resina alba.
Rhamnus catharticus.	Spina cervina.
Rheum palmatum.	{ Rhabarbarum.
	{ Rheum.
Rhododendron crysanthum.	Rhododendron.
Rhus toxicodendron.	Toxicodendron.
Ricinus communis.	Ricinus.
Rosa canina.	Cynosbatus.
Rosa damascena.	{ Rosa centifolia.
	{ pallida.
gallica.	rubra.
Rosmarinus officinalis.	Rosmarinus.
Rubia tinctorum.	Rubia.
Ruta graveolens.	Ruta.
Salix fragilis.	Salix.
Salvia officinalis.	Salvia.
Sambucus nigra.	Sambucus.
Sapo.	Sapo albus hispanus.
Scilla maritima.	Scilla.
Sinapis alba.	Sinapi album.
Smilax sarsaparilla.	Sarsaparilla.
Solanum dulcamara.	Dulcamara.
Solutio muriatis barytæ.	Solutio terræ ponderosæ salitæ.

SYSTEMATIC NAMES.	ANCIENT NAMES.
Solutio sulphatis cupri composita.	Aqua styptica.
Spigelia marilandica.	Spigelia.
Spiritus ætheris nitrosi.	Spiritus nitri dulcis.
cari carui.	carvi.
lauri cinnamomi.	{ Aqua cinnamomi spirituos.
myristicæ moschata.	{ Spiritus cinnamomi.
myrti pimentæ.	nucis moschata.
Spongia officinalis.	pimentæ.
Styracis benzoin balsamum.	Spongia.
Styrax officinalis.	Benzoinum.
Sub-acetis cupri.	Styrax.
Sub-boras sodæ.	Ærugo.
	Borax.
Sub-murias hydrargyri.	{ Calomelanos.
	{ Calomelas.
	{ Hydrargyrus muriatus mitis.
	{ Mercurius dulcis.
et ammoniæ.	præcipitatus albus.
Sub-sulphas hydrargyri flavus.	{ Calx hydrargyri alba.
	{ Mercurius emeticus flavus.
Succus cochleariæ officinalis compositus.	{ Turpethum minerale.
spissatus conii maculati.	Succi ad scorbuticos.
momordicæ	Extractum cicutæ.
elaterii.	Elaterium.
sambuci nigra.	Rob sambuci.
Sulphas aluminæ exsiccatus barytæ.	Alumen ustum.
	Terra ponderosa vitriolata.
cupri.	{ Cuprum vitriolatum.
	{ Vitriolum cœruleum.
	romanum.
ferri.	{ Sal martis.
	{ Vitriolum viride.
magnesiæ.	{ Magnesia vitriolata.
	{ Sal catharticus amarus.
potassæ.	epsomiensis.
potassæ cum sulphure.	Tartarum vitriolatum.
sodæ.	Sal polychrestus.
	glauberi.
Sulphas zinci.	{ Sal vitrioli.
	{ Vitriolum album.
	{ Zincum vitriolatum.
Sulphur sublimatum.	Sulphuris flores.

SYSTEMATIC NAMES.	ANCIENT NAMES.
Sulphuretum antimonii.	{ Antimonium.
	{ Stibium.
præparatum.	Antimonium præparatum.
præcipitatum.	Sulphur antimonii præcipitatum vel auratum.
hydrargyri nigrum.	Æthiops mineralis.
hydrargyri rubrum.	Cinnabaris factitia.
potassæ.	Hepar sulphuris.
Super-sulphas aluminæ et potassæ.	Alumen.
Super-sulphas aluminæ et potassæ exsiccatus.	ustum.
Super-tartris potassæ.	{ Cremor tartari.
	{ Crystalli tartari.
	{ Tartarus purificatus.
Super-tartris potassæ impurus.	crudus.
Suis scrofæ adeps.	Axungia porcina.
Syrupus althææ officinalis.	Syrupus ex althæa.
amomi zingiberis.	zingiberis.
citri aurantii.	corticis aurantii.
citri medicæ.	limonum.
papaveris somniferi.	papaveris albi.
ramni cathartici.	spinæ cervinæ.
rosæ damascenæ.	rosæ solutivus.
toluiferæ balsami.	balsami tolutani.
Tamarindus indica.	Tamarindus.
Tanacetum vulgare.	Tanacetum.
Tartris antimonii.	{ Tartarus emeticus.
potassæ.	{ Antimonium tartarizatum.
	Tartarum solubile.
et sodæ.	{ Sal rupellensis.
	{ Sel de seignette.
Tinctura aloes et myrrhæ.	Elixir proprietatis.
amomi repentis.	Tinctura cardamomi.
aristolochiæ serpentariæ.	serpentariæ.
ferulæ assæ fœtidæ.	fœtida.
benzoin composita.	Balsamum traumaticum.
camphoræ.	{ Elixir camphoræ.
cinchonæ officinalis.	{ Spiritus vinosus camphoratus.
	Tinctura corticis peruviani.
camposita.	{ composita.
convolvuli jalapæ.	alexipharmica.
	jalapæ.

SYSTEMATIC NAMES.

ANCIENT NAMES.

Tinctura eleutheriæ.	Tinctura cascarillæ.
gentianæ composita.	amara.
veratri albi.	Elixir stomachicum.
guajaci ammoniata.	Tinctura hellebori albi.
lauri cinnamomi.	guaiaci volatilis.
lauri cinnamomi composita.	cinnamomi.
meloës vesicatorii.	aromatica.
mimosæ catechu.	cantharidum.
muriatis ammoniæ et ferri.	japonica.
muriatis ferri.	martis.
opii.	salita.
opii camphorata.	thebaica.
rhei et aloës.	Laudanum liquidum.
et gentianæ.	Elixir paregoricum.
palmati.	asthmaticum.
saponis.	sacrum.
saponis et opii.	Tinctura rhei amara.
sennæ composita.	rhei.
toluiferæ balsami.	Balsamum saponaceum.
veratri albi.	Linimentum saponaceum.
Toluiferæ balsami balsamum.	Balsamum anodynum.
Tormentilla erecta.	Elixir salutis.
Triticum æstivum.	Tinctura balsami tolutani.
Trochisci carbonatis calcis.	hellebori albi.
glycirrhiæ cum opio.	Balsamum tolutanum.
Tussilago farfara.	Tormentilla.
Unguentum acetitis plumbi.	Triticum.
acidi nitrosi.	Trochisci cretæ.
hydrargyri.	glycirrhiæ compositi.
mitius.	Tussilago.
infusi meloës vesicatorii.	Unguentum saturninum.
nitratis hydrargyri.	oxygenatum.
oxidi plumbi albi.	mercuriale fortius.
zinci.	cœruleum.
impuri.	mercuriale mitius.
pulveris meloës vesicatorii.	epispasticum mitius.
resinosum.	citrinum.
	album.
	e cerussa.
	zinci.
	tutiæ.
	epispasticum fortius.
	basilici flavi.

SYSTEMATIC NAMES.

ANCIENT NAMES.

Unguentum sub-acetitis cupri.	Unguentum æruginis.
sub-muriatis	calcis hydrargyri
drargyri et ammoniæ.	albi.
hy-	e mercurio præci-
	pitato.
Valeriana officinalis.	Valeriana sylvestris.
Veratrum album.	Helleborus albus.
Vinum aloes socotorinæ.	Tinctura sacra.
ferri.	Vinum chalybeatum.
gentianæ compositum.	amarum.
ippecacuanhæ.	Tinctura ippecacuanhæ.
tartritis antimonii.	{ Vinum antimoniale.
	{ Essentia antimonialis.
Viola odorata.	Viola.
Vitis viniferi fructus siccatus.	Uva passa.

TABLE

SHEWING THE PROPORTION OF ANTIMONY, OPIUM, AND QUICK-SILVER, CONTAINED IN SOME COMPOUND MEDICINES.

TARTRITE OF ANTIMONY.

WINE OF TARTRITE OF ANTIMONY contains two grains of tartrate of antimony in the ounce.

OPIUM.

OPIATE ELECTUARY contains in each drachm about a grain and a half of opium.

ELECTUARY OF CATECHU contains in each ounce about two grains and a half of opium; for one grain of opium is contained in one hundred and ninety-three grains.

POWDER OF IPECACUAN AND OPIUM contains six grains of opium in each drachm, or one grain in ten.

OPIATE POWDER contains one grain of opium in ten.

OPIATE PILLS contain six grains of opium in each drachm, or five grains contain half a grain of opium.

TINCTURE OF OPIUM is made with two scruples of opium in each ounce of the liquid, or with five grains in each drachm. But a drachm of the tincture appears, by evaporation, to contain about three grains and a half of opium.

AMMONIATED TINCTURE OF OPIUM is made with about eight grains of opium in each ounce of the liquid, or with about one grain in the drachm.

TINCTURE OF SOAP WITH OPIUM is made with about fifteen grains of opium in each ounce of the liquid.

TROCHES OF LIQUORICE WITH OPIUM contain about one grain of opium in each drachm.

CAMPHORATED TINCTURE OF OPIUM contains nearly one grain of opium in three drachms.

QUICKSILVER.

QUICKSILVER PILLS contain fifteen grains of quicksilver in each drachm. Each pill contains one grain of quicksilver.

QUICKSILVER OINTMENT contains about twenty-five grains of quicksilver in each drachm.

MILD QUICKSILVER OINTMENT contains twelve grains of quicksilver in each drachm.

QUICKSILVER PLASTER contains about sixteen grains of quicksilver in each drachm.

OINTMENT OF NITRATE OF QUICKSILVER contains in each drachm four grains of quicksilver and eight of nitrous acid.

MILDER OINTMENT OF NITRATE OF QUICKSILVER contains in each scruple half a grain of quicksilver, and one grain of nitrous acid.

OINTMENT OF THE SUB-MURIATE OF QUICKSILVER AND AMMONIA contains in each drachm about four and a half grains of the oxyd.

- Ammōniācum gummi-resīna, gr. x ad ʒ ss.
 Ammōniāci emulsio, ʒ iij ad ʒ i.
 Amōmi zingibēris rādix, gr. v ad ʒ i.
 syrūpus, ʒ i ad iij.
 repentis semīna, gr. v ad ʒ i.
 tinctūra, ʒ i ad iij.
 zedoārīæ rādix, ʒ i ad ʒ i.
 Amygdāli commūnis oleum, ʒ iij ad ʒ i.
 emulsio, ℥ ij.
 Am̃yridis gileadensis resīna liquida, ʒ i ad ʒ i.
 Anēthi grāvēolentis semīna, ʒ i ad ʒ i.
 fœnicūli semīna, ʒ i ad ʒ i.
 oleum volatīle, gt. ij ad v.
 Angēlicæ archangēlicæ rādix, herba, semen, ʒ ss ad iss.
 Angustūræ cortex, gr. x ad ʒ i.
 Anthemīdis nobīlis flores, ʒ i ad ʒ i.
 extractum, gr. x ad ʒ i.
 pyrēthri rādix, gr. iij. ad ʒ i.
 Antimōniī oxīdum cum phosphāte calcis, gr. iij ad xv.
 cum sulphūre per nitrātem potassæ, gr.
 i ad iv.
 cum sulphūre vitrificātum, gr. $\frac{1}{4}$ ad iss.
 vitrificātum cum cēra, gr. iij ad ʒ i.
 sulphurētum præcipitātum, gr. i ad iv.
 præparātum, gr. x ad ʒ ij.
 tartris, gr. i ad viij.
 tartritis vinum, gt. xx ad ʒ i.
 Ap̃ii petrōselīni semīna, ʒ i ad ij.
 Arbūti uvæ ursi folia, gr. x ad ʒ ij.
 Argenti nitras, gr. $\frac{1}{8}$ ad $\frac{1}{2}$.
 Aristolōchiæ serpentariæ rādix, ʒ i ad ʒ i.
 tinctūra, ʒ i ad iij.
 Arnīcæ montānæ herba, gr. v ad x.
 Arsenīci oxīdum, gr. $\frac{1}{16}$ ad $\frac{1}{4}$.
 Artēmisīæ abrōtāni folia, ʒ i ad ʒ i.
 santonīcæ cacūmīna, ʒ ss ad i.
 absinthīi herba, ʒ i ad ij.
 Asāri europææ folia, gr. ij ad iv.
 pulvis composītus, gr. v ad ʒ i.
 Atrōpæ belladonnæ folia, gr. ss ad v.
 succus spissātus, gr. $\frac{1}{4}$ ad iij.
 Barytæ muriātis solūtio, gr. v ad x.
 Bubōnis galbāni gummi-resīna, gr. x ad ʒ i.
 Calcis aqua, ʒ iv ad ℥ i.
 muriātis solūtio, gt. xl ad ʒ i.
 carbōnas præparātus, ʒ i ad ʒ i.
 carbōnātis mistūra, ʒ i ad ij.
 pulvis composītus, ʒ i ad ij.
 trochisci, ʒ i ad ij.
 Canellæ albæ cortex, gr. xv ad ʒ ij.

- Capsici annui fructus, gr. v ad x.
 Cari carui semina, gr. x ad 3 i.
 spiritus, 3 ij ad 3 i.
 Cassiæ fistulæ pulpa, 3 ss ad i.
 electuarium, 3 ij ad 3 i.
 sennæ folia, 3 i ad 3 i.
 tinctura composita, 3 ss ad i.
 electuarium, 3 i ad 3 ss.
 extractum, gr. x ad 3 ss.
 Castoreum, gr. x ad 3 i.
 Castorei tinctura, 3 i ad ij.
 composita, 3 ss ad i.
 Centauræ benedictæ herba, gr. xv ad 3 i.
 Chironiæ centauri summitates, 3 i ad 3 i.
 Chinchonæ officinalis cortex, 3 i ad 3 ij.
 decoctum, 3 i ad iv.
 infusum, 3 i ad iv.
 tinctura, 3 i ad ij.
 tinctura composita, 3 i ad iij.
 extractum, gr. x ad 3 i.
 Citri aurantii folia, flores, gr. x ad 3 i.
 fructus cortex exterior, 3 ss ad 3 ij.
 aqua destillata, 3 i ad iij.
 syrupus corticis, 3 i ad ij.
 conserva corticis, 3 ij ad v.
 medicæ succus spissatus, 3 i ad 3 ij.
 syrupus succi, 3 i ad iij.
 aqua destillata, 3 i ad iij.
 Cochleariæ officinalis succus compositus, 3 i ad iv.
 armoraciæ radix, 3 i ad 3 i.
 Colchici autumnalis radix, gr. ss ad iij.
 Colombæ radix, gr. x ad 3 i.
 tinctura, 3 i ad iij.
 Conii maculati folia, gr. iij.
 succus spissatus, gr. $\frac{1}{2}$ ad gr. iij.
 Convolvuli scammoniæ gummi-resina, gr. v ad xv.
 pulvis compositus, gr. x ad xv.
 electuarium, 3 ss ad i.
 jalapæ radix, gr. x ad 3 ss.
 pulvis compositus, 3 ss ad i.
 tinctura, 3 i ad iij.
 extractum, 3 ss ad i.
 Copaifera officinalis resina, gr. xv ad 3 ss.
 Coriandri sativi semina, 3 i ad 3 i.
 Croci sativi floris stigmata, gr. v ad 3 ss.
 Crotonis eleutheriæ cortex, 3 i ad 3 ss.
 tinctura, 3 i ad 3 ss.
 Cucumis colocyntidis fructus medulla, gr. iij ad viij.
 Cumini cymini semina, 3 i ad 3 i.
 Cupri sub-acetis, gr. $\frac{1}{8}$ ad $\frac{1}{2}$.

- Cupri ammoniarētum gr. $\frac{1}{2}$ ad v.
 ammoniarēti pilulæ, No. i.
 sulphas, gr. ij ad x.
- Curcūmæ longæ rādx, Θ i ad $\mathfrak{z}$ i.
- Daphnes mezerēi rādīcis cortex, gr. i ad x.
 decoctum, $\mathfrak{z}$ iv ad $\mathfrak{ss}$.
- Datūræ stramonīi folia, semina, gr. i ad v.
 succus spissātus, gr. i ad x.
- Dauci carotæ semina, Θ i ad $\mathfrak{z}$ i.
- Delphinīi staphisāgrīæ semina, gr. iij ad x.
- Digitālis purpureæ folia, gr. ss ad iij.
 infūsum, $\mathfrak{z}$ iij ad $\mathfrak{z}$ i.
 tinctūra, gt. x ad xl.
- Dōlīchi prurientis pubes leguminis rigida, gr. v ad x.
- Dorstēniæ contrajērvæ rādx, Θ i ad $\mathfrak{z}$ ss.
- Electuarium opiātum, Θ i ad ij.
- Eugenīæ caryophyllātæ floris germen, gr. v ad Θ j.
 oleum volatīle, gt. ii ad v.
- Ferri limatūra purificāta, gr. iii ad x.
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NOTE. These are in general the doses for adults from twenty to sixty ; but they may be diminished for children and people past the prime of life, nearly in the following proportions :

	Ages.	Proportionate doses.
Months	2	$\frac{1}{15}$
	7	$\frac{1}{12}$
	14	$\frac{1}{8}$
	28	$\frac{1}{5}$
Years	3	$\frac{1}{4}$
	5	$\frac{1}{3}$
	7	$\frac{1}{2}$
	14	$\frac{2}{3}$
	63	$\frac{1}{1}$
	77	$\frac{5}{6}$
	100	$\frac{4}{6}$

It may also be observed, that sixty drops of water, one hundred of diluted alcohol, or an hundred and twenty of alcohol, are equal to a drachm by measure.

ENGLISH INDEX.

THE following index is greatly amplified by the insertion of the different trivial or common names of each substance or compound, the systematic names being contained in the Latin index. By such arrangement the reader may with facility detect the article searched for, under the term most familiar to himself, and having turned to the page, its synonymy will be presented to his view.

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Compound Powder of
Mandrake. Take pulverized
Root of Mandrake. Pulv. Spearmint
& Cream of tartar, e.g. Mix
Dose a teaspoonful in tea
or Syrup. Useful in diseases
of the Liver, dyspepsia, ob-
structed menses, dropsy, in
venereal diseases & in every
taint of the system. -
or 20 or 30 grs of the powder

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Diuretic Drops
Succ Spis Nitro - Dr Beach
Oil Almonds aa ℥i
Oil Coharine
Spis Turpentine aa ℥i
Mix together & add an amount of
Camphor - Dose a small teaspoon
full 3 or 4 times a day in mixture
gum arabic

Mistura Ferri Composita.
Compound Mixture of Iron.
(Lond. Phar.)
or Dr Griffiths Mixture.

Rx Myrrh powdered; a drachm
Sub-carbonate of potash - grs xxv .
Rose water vi oz.

Sulphate of Iron powdered ij

Spt. of Lavender. ss

Refined Sugar 3j

Rub together the myrrh, the sub
carbonate of potash & sugar & add
gradually, first, the Rose water & spt
of lavender - and last the sulphate
of iron. For nervous headache
to 6 parts of this mixture, add
one part of Sinct. Asafetida
For Burns & Chilblains, Scalds.

An Indian meal poultice covered
over with Young Hyson tea, soft
ened with hot water, laid over
burns & frozen limbs, as hot as
it can be borne.

Simple Cure for Rheumatism
Boil potatoes - butter the parts
affected with the water in which
the potatoes are boiled, as hot
as can be applied, immediately
before getting into bed. The pain
will be removed or at least miti-
gated before morning.

Lincture of Ergot of Rye.

From Lane
for 1827-28

Rx. Ergot of Rye, bruised, one ounce.
Boiling water, two ounces.
Infuse for twenty-four hours, and
add rectified Spirit, one ounce &
a half. Digest for ten days.
Half a drachm of this tincture
is said to be equivalent to ten
grains of the powder.

— Balm of Honey
Take of Gum. Benzoin 3oz.

Balsam Tolu 3oz.

Honey 4 3oz.

Alcohol 3 pints.

Digest for 10 days & filter.

— Common Poultice

Take of slippery elm bark

a sufficient quantity

pulverized; stir it in hot

or warm milk & water

for a poultice. This exceeds

every other in point of efficacy

— compared with every

other poultice commonly

into. insignificant

Dr Beech

"Death is a great evil, which no man can
dread more, & beyond which all is darkness."

Beach

Yellow water. Take one bushel of the water
of the water or in the wood, boil till the water is
is out - then strain, boil, & strain - add ten lb.
of fresh butter - 3rd of lbs. wax & 1² of water
tallow, then boil the water out, & strain till
clear. - This is used for all kinds of
ulcers. - It is also used, & also used, & also
with &c. ~~The water of the water of the water~~

The most satisfactory for use is
 more than 100 or 200 lbs. of
 in a few months. The most
 in fact is 100 lbs. of 100 lbs. of
 in fact is 100 lbs. of 100 lbs. of
 in fact is 100 lbs. of 100 lbs. of

