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LEEDS & WEST-RIDING
MEDICO-CHIRURGICAL SOCIETY

A MANUAL

OF

PRACTICAL THERAPEUTICS

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OF

PRACTICAL THERAPEUTICS

CONSIDERED CHIEFLY WITH REFERENCE TO

ARTICLES OF THE MATERIA MEDICA

BY

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TO

THE MEDICAL OFFICERS

OF

HER MAJESTY'S FORCES

SERVING IN THE EAST INDIES,

This Volume is dedicated,

WITH THE SINCERE HOPE THAT,

AMIDST THE EVER-VARYING CIRCUMSTANCES OF THEIR INDIAN CAREER,

IT MAY AFFORD SOME HINTS AND SUGGESTIONS,

TENDING TO THE ALLEVIATION AND BENEFIT OF THOSE

WHO MAY BE PLACED UNDER THEIR

CHARGE.

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PREFACE TO THE THIRD EDITION.

In common with all other branches of knowledge, Therapeutics has, within the last few years, made rapid strides, and the facts brought to light have been of a very diversified and important character. A notice of these in the following pages was manifestly indispensable, but to have engrafted them *en masse* on the matter contained in the previous editions was considered unadvisable, as by so doing the size of the volume would have been greatly increased without any commensurate benefit. Such a course, indeed, would have been attended with positive disadvantage, as the results of modern inquiry have tended in many instances to modify or overthrow views previously entertained; so that, in addition to increased bulk, itself objectionable, the volume would have presented in juxtaposition statements and counter-statements which could not well have failed to have been a source of considerable embarrassment to the student and young practitioner.

Under these circumstances it appeared expedient to re-write the work, which has accordingly been done to a great extent, and several modifications have been introduced; some of the articles, *e.g.*, Antimony, Calomel, and Blood-letting, have been considerably abridged, several unofficinal articles of minor importance have been omitted altogether, the formulæ have been arranged in a more

condensed form, the foot-note references have been diminished in number or incorporated with the text, and by the introduction of more numerous synonyms in the body of the work the necessity for the Index of Medicines, extending over fourteen pages, has been obviated. By these means space has been rendered available for new matter, and advantage has been taken of it to introduce notices of Chloral, Bromide of Mercury, Iodide of Methyl, Bichloride of Methylene, Protoxide of Nitrogen, Sandalwood Oil, Apomorphia, and other new remedies, together with extended notices of other medicines, which, though not strictly new, have acquired increased importance from their claims as therapeutic agents, having only of late years been fully recognised; such, for example, as Bromide of Potassium, Calabar Bean, Carbolic and Sulphurous Acids, Permanganate of Potash, and the Alkaline Hypophosphites and Hyposulphites. In Part II. space has been found for articles on the Hypodermic and Endermic methods of treatment, and to the article Antidotes has been appended a brief sketch of the most approved methods of treatment in cases of poisoning.

Notwithstanding these and other additions, this Edition, as compared with the last, shows a decrease in the number of pages, but it is confidently believed that though reduced in bulk it will not be found to have lost any portion of its practical utility, the object invariably aimed at throughout the compilation of the following pages.

I gladly avail myself of this opportunity of again expressing my grateful thanks to my professional brethren, especially to those in India, for the kind and practical approval which they have accorded to this little work.

London, *May* 26*th*, 1871.

LEEDS & WEST RIDING
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INTRODUCTION.

THERAPEUTICS, Therapeia, Therapeutica, from θεραπεύω, "*I cure.*" Under this term is included the application of remedies for the cure, alleviation, or prevention of disease. Taken in its widest sense, it includes not only medicinal agents, but many surgical operations, as lithotomy, amputations, &c. In connection with Materia Medica, the meaning of this term is limited to the application of medicinal substances for the purposes above indicated. If taken in its fullest sense, it embraces so wide a range of subjects, that it would be impossible, in a small volume like the present, to bestow a due consideration on the whole; and it is very evident that a treatise on the science in its more limited sense, namely, that of including the articles of the materia medica alone, would be very defective. In the following pages, therefore, some of the most ordinary remedial agents, which properly belong to the surgical department, as blood-letting, issues, setons, and acupuncture, have received notice, as being inseparably connected with the former class of therapeutic agents. Electricity and galvanism, which cannot properly be ranged in either of the above classes, have also been considered, with reference to their effects on morbid conditions of the body.

Therapeutics and pathology are so intimately connected with each other, that unless the latter be well understood, theoretically as well as practically, it is almost impossible to be a successful therapeutist. It is true that occasionally empirical practice may succeed in effecting cures, but he alone who is well grounded in pathology can administer remedies with a hope of anything like uniform or permanent success. By the

term pathology is meant a thorough knowledge of disease, its causes, pathognomonic signs and symptoms, the morbid changes which take place in the several organs of the body, and an intimate acquaintance with morbid anatomy. But this does not comprise all that is required to form a sound therapeutist. He should be thoroughly acquainted with the medicines which he employs, their natural history, their chemical composition, their physiological effects on the healthy frame, their *modus operandi* in morbid conditions, their effects in over-doses, and their manner of producing death. To this should be added a knowledge of their indications and contra-indications, as well as of those combinations which increase or diminish the medicinal activity of the various drugs. Such an amount of knowledge is only to be attained by many years of study, experience, and close observation; but every step which is made towards acquiring this information will render the practitioner so much the more efficient in the discharge of the duties of his profession.

Notwithstanding the rapid strides which pathology has made of late years, there yet remain many points involved in deep obscurity. Of this, hydrophobia, and diseases of an intermittent or periodic type, may be taken as prominent examples. When we have ascertained more precisely the seat and nature of now obscure diseases, which can only be done by more extended anatomical researches, and when the *modus operandi* of medicines on the human frame is more clearly understood, we shall, doubtless, be enabled, by attacking the cause of the disease with appropriate remedies, to eradicate it at once from the system; but, in the obscurity which at present hangs over our knowledge of the history of various diseases, we must, in many instances, content ourselves with playing, if I may so express it, a secondary part, by attacking the symptoms which present themselves in the course of a disease; and he will be the most successful in his practice who does not allow the smallest of these symptoms to pass unheeded, but directs his efforts to their removal or alleviation. It is not only on the bold, prominent symptoms which powerfully arrest our notice that attention should be bestowed, but it is upon the small, and in the patient's estimation, perhaps, insignificant symptoms, that the experienced physician will seize, and from which he will draw deductions, to serve as a guide in regulating his subsequent treatment of the case. These symptoms must be sought for, or they will never be discovered; indeed, it should be laid down as a rule in practice, that there is no such thing as a trivial symptom; even the smallest, in the estimation of the patient, may be fraught with deep importance to the experienced eye of the intelligent practitioner. Paradoxical as it may sound, it is undoubtedly true, that in some diseases the

very absence of an ordinary symptom is, of itself, sufficient to constitute one. These observations are not intended, in any degree, to detract from the vast importance of endeavouring to ascertain, by close and vigilant examination, the source and origin of a disease which we are called upon to treat. Without an accurate knowledge of these points we should fail to effect a radical cure, however successful our efforts may prove in alleviating, for a time, the severity of the symptoms.

A consideration of the diversified causes in which certain diseases have their origin, should teach us the necessity of minutely examining into each individual case, and of adapting our remedies to the cause, as far as that can be ascertained. It should, further, teach us to receive with great circumspection remedies which, from time to time, are paraded in the periodicals of the day as specifics, "or almost specifics," for obscure and hitherto incurable diseases. Take epilepsy, for example: we know that it may proceed from several causes; thus, it may arise—1, from organic disease of the nervous centres; 2, from the pressure of a portion of bone upon the brain; 3, from a vitiated state of the digestive organs; 4, from derangement of the uterine system; 5, from anæmia; 6, from plethora; 7, from moral causes, as fright, &c.; and 8, from the presence of intestinal worms. The enumeration of these various origins of a single disease shows the folly of relying on any single remedy as a means of cure. No article of the materia medica that we are acquainted with at present could possibly fulfil all the indications here presented. The salts of iron have been found useful in those forms of epilepsy connected with anæmia; but what possible benefit can we expect from them when the disease has its origin in organic lesion of the nervous centres; and what but mischief when it proceeds from a plethoric condition of the brain, or of the system?

The practice of treating a disease according to its name, without minutely examining into each particular case, and adapting the appropriate remedies to the several indications which present themselves, cannot be too strongly reprobated. One instance may be quoted, by way of example; namely, electricity in paralysis. As a general rule, we may say that electricity is a remedy for paralysis; but is it consequently applicable to every form and variety of that disease? Far from it. Its use is limited to those cases in which a muscle, or a set of muscles, is affected, or in which there exists a torpid or benumbed condition of the nerves themselves; and it is further limited to these states when they are of a purely chronic character. If it be applied under other circumstances, when organic changes have taken place in the nervous centres, or whilst inflammation exists, or when sanguineous effusion within the cerebral or spinal meninges is present, we may do

actual and permanent mischief. I am more particular in insisting on the paramount importance of this subject, as, in the body of this work, it will be seen that many remedies are recommended, on the authority of practitioners of high standing, which, if applied indiscriminately, without considering their applicability to the particular case under treatment, may prove, if not perfectly inert, perhaps injurious.

In prescribing medicines for the removal of disease, it should ever be borne in mind that nature tends, in the majority of cases, to repair injuries inflicted upon the body, and to remove morbid or deranged conditions of the system. This instinctive healing power—the Vis Medicatrix Naturæ—is undoubtedly capable, when aided by a judicious system of hygiene, of effecting the cure of disease, particularly when it is of a mild character, without the assistance of any medicine whatever. When, consequently, a disease presents itself for treatment, in which hygienic means alone offer a fair prospect of success, they should always be employed in preference to medicines, it being the duty of the physician to restore health by the most simple means in his power.

The credit which is really due to this natural healing tendency is too often ascribed to some drug which the patient may happen to be taking at the period of improvement or recovery; and thus many medicinal substances become endowed with reputed powers, which they really do not possess. It does not necessarily follow, because a patient recovers under a certain remedy, that recovery is due to that agent. In illustration of the fallacy of any such deductions, I may mention a case which occurred in my own practice. Having seen it mentioned that Dr. Tyler Smith had successfully treated amenorrhœa by the external application of castor oil leaves, I resolved to give the treatment a trial on the first opportunity. Shortly afterwards, a woman applied at the hospital, stating that, for a period of five months, she had been suffering in consequence of a suppression of the catamenia. Thinking this a fair case for a trial of the remedy, I directed my assistant to see that the proper measures were carried out, and desired the woman to attend at the hospital on the following morning. She came, accordingly, and with a smiling face informed me that on the preceding evening the discharge had returned, and that she felt much better. I was on the point of making a note in my case-book of the successful termination of the case, and of the means employed, when my assistant informed me that the woman had quitted the hospital immediately after my departure on the preceding morning, and that, as she had not returned, the remedy had never been employed. Now, observe, had the leaves been applied, and the menstrual discharge

appeared a few hours afterwards, which in this case it had done spontaneously, what would have been more natural than to have ascribed the benefit to the remedy employed? whilst, in fact, it was entirely due to the unassisted powers of nature It is necessary that a medicine should uniformly, in a large number of cases, produce a certain amount of benefit, before we are warranted in attributing to it the power of curing or alleviating a disease; or, in other words, in endowing it with the character of a valuable remedy.

All medicines act on the system either *directly* or *indirectly*. Of the first class, or those which act directly, we have examples in the ergot of rye, on the uterine muscular fibre; in cantharides, on the neck of the bladder; in belladonna, on the iris; and in caustics applied to ulcerations. The second class comprises by far the larger portion of medicinal substances; one example may suffice. In neuralgia depending upon acidity of the primæ viæ, carbonated alkalies are given to correct the acidity; the cause being removed, the effect ceases, and the alkali thus indirectly cures the neuralgic affection.

The means of discovering the medicinal properties of various substances, previous to their administration to the human subject, have in all ages attracted the serious attention of medical men. Many plans have been proposed of late years, but they are all more or less defective, and we are at last obliged to confess that the only sure way of ascertaining the true properties of all substances is by carefully observing their several effects upon the human economy, when, either from accident or design, they have been introduced into the system. A brief review of some of the means proposed may prove instructive.

1. *Affinity of botanical characters.*—It is undoubtedly true, that in some natural orders of plants, a strong similarity in action and properties pervades each individual of the class; but at the same time, there are so many exceptions to be found, that it is impossible to place any confidence in it as a means of discriminating beforehand, whether or no, a certain individual, hitherto untried, possesses the same properties as others of the family to which it belongs. A few examples will suffice. The order Solanaceæ comprises belladonna, stramonium, and tobacco, three powerful sedatives, and capsicum, an acrid stimulant; the order Liliaceæ contains the aloe, a drastic purgative; the squill, an expectorant and emetic; and the common asparagus, an innocuous vegetable; and in the Cucurbitaceæ we meet with Ecbalium officinarum, which yields elaterium, a powerful hydragogue, and the common cucumber and the melon, both innocent articles of diet. It should be further observed, that many articles possessing very similar medical properties, belong to widely different orders. It is only necessary to mention digitalis and tobacco, both powerful depressants, and

in some points closely resembling each other in therapeutic action; the former belongs to the order Scrophulariaceæ, the latter to the Solanaceæ.

2. Similarity in chemical composition has been suggested, as indicating a similarity in therapeutic action, but there is less reliance to be placed on this test than even on that of the botanical characters; although in some instances, as for example, the strong mineral acids, and the fixed alkalies, where there is a close chemical relation, very analogous effects on the system are produced. But these should be regarded rather as the exceptions to than as the supporters of the rule. The following is one out of many examples of chemical affinity and dissimilar therapeutic action:—

Citric Acid, a mild refrigerant, $H_3 C_6 H_5 O_7 . H_2 O$.
Gallic Acid, a powerful astringent, $H_3 C_7 H_3 O_5 . H_2 O$.

3. *The sensible properties of medical substances* have been suggested as a test of their therapeutic action; but no confidence whatever is to be placed on this test, as may be shown by one example. Sulphate of magnesia, sulphate of zinc, and the crystals of oxalic acid, so closely resemble one another in external characters, that they have often been substituted by mistake, the one for the other; yet how different are their effects—the first is a purgative, the second an emetic, and the third a virulent poison.

4. *Experiments upon animals.*—Much stress has been laid on this method of ascertaining the effects of medicines, and applying the results so obtained, by analogy, to the human frame. This mode of procedure is, however, open to many objections, and is rendered fallacious in many instances, in consequence not only of differences of the digestive organs, but of the organization of the nervous system. Take the horse, for example: as much as six ounces of tartar emetic have been given to horses, without producing any remarkable or permanent derangement of the principal functions; they will take very large quantities of arsenic with simply the effect of rendering them sleeker and fatter; and they have been known to eat as much as eight pounds of belladonna leaves, without any ill consequence. The peculiar construction of the stomach or stomachs of the cow, and other animals of the order Ruminantia, renders any deductions drawn from medicines exhibited by mouth to them very little to be relied upon; besides which, it is well known that some animals will eat with perfect impunity substances which prove poisonous to man.

Introducing substances directly into the circulation, by injecting them into the blood vessels, has been another means proposed for ascertaining their medicinal effects. Although many useful and valuable physiological facts may be obtained in this manner, the

procedure is far from being free from objections; indeed, deductions thus drawn should be received with extreme caution. The very fact of cutting down on a large or deep-seated vessel and the consequent loss of blood, must influence the result in a therapeutic point of view, setting aside the mechanical effect produced on the circulation and on the nervous system, by the liquid employed as a vehicle for the medicine. The force with which it is injected, and the quantity of fluid used, would also materially influence the result.

Other methods of attaining a knowledge of the therapeutic action of remedies have been proposed; but it would answer no useful or practical end to enter into their consideration.

On the Art of Prescribing Medicines.—Every medical man should pay strict attention to the proper and most efficient manner of prescribing medicines. It is a point intimately connected with his success as a practitioner, and some observations on this subject, so deserving our best attention, cannot be considered otherwise than useful and necessary in a work like the present, having, for its primary object, practical utility.

A prescription is, according to ancient usage, generally described as composed of four constituents, or rather as divided into four parts:—1, *the basis*, the principal or most active ingredient; 2, *the adjuvans*, intended to promote the action of the former; 3, *the corrigens*, or that designed to correct or modify the operation of the basis; and 4, *the excipient or vehicle*, which is the substance giving to the former ingredients consistence and form. The following formulæ may serve as examples:—

℞ Extracti Colocynthidis Co.	gr. xxx.	Basis.
Pil. Hydrargyri	gr. x.	Adjuvans.
Extracti Hyoscyami	gr. v.	Corrigens.
Syrupi q. s. M.		Vehicle.

Ft. Pil. xij.

℞ Vini Colchici, fl. drs. ij.		Basis.
Sp. Etheris Nitrosi, fl. drm. jss.		Adjuvans.
Tinct. Hyoscyami, fl. drm. j.		Corrigens.
Aquæ, fl. oz. vss., M.		Vehicle.

Ft. Mist.

It is not, however, necessary that every prescription should be formed on this model; indeed, the fewer the ingredients in a formula the better; it cannot well be too simple. Complexity of prescription should always be avoided. It is necessary that a prescription should always be written in a legible hand; the symbols denoting the quantities distinctly given: the exact quantity for each dose, the periods for its repetition,

and any other directions, should be given at full length, and in the plainest possible language. To this should be added a piece of advice from one of the most practical men of his day, the late Dr. A. T. Thomson, that no prescription should pass from the hand of the prescriber without being deliberately read over, and its correctness ascertained.

The circumstances which modify the action of medicines are very numerous. This modification or alteration depends, in some instances, on a peculiarity on the part of the patient; in others, on the character, form, or period of the disease, in which the medicine is administered, on the period of the day at which it is given, on the combination of medicines employed, on the proper regulation of the dose, &c. These, and other points connected with the efficient operation of medicines, merit the attention of every practical man.

Modifying circumstances on the part of the patient :—

1. *Idiosyncrasy.*—Many persons are peculiarly susceptible to the action of certain medicines; no reason can be assigned for this extreme susceptibility, but of the fact of its existence in some individuals there can be entertained no reasonable doubt. A few grains of a mercurial salt, only sufficient to act, in ordinary cases, as a very slight stimulant of the biliary secretion, will, when an idiosyncrasy exists with respect to this medicine, produce the most violent salivation, and other untoward effects. Under such circumstances, three five-grain doses of blue pill, one being administered every night, have proved fatal: two grains of calomel have caused ulceration, exfoliation of the jaw, and death; and the external application of three drachms of mercurial ointment has destroyed life in eight days. (Christison.) Other medicines act in a similar manner on certain constitutions. Opium, even in the smallest dose, will produce delirium and great disturbance of the cerebral and nervous functions; the very smell of ipecacuanha will, in some constitutions, cause the most distressing sense of suffocation; copaiba, inflammation of the kidneys; and squills and oil of turpentine, eruptions on the skin. It should always be ascertained, if possible, previous to the exhibition of these remedies, particularly in the cases of mercury and opium, if any idiosyncrasy with respect to them exists; and if so, the obnoxious medicine should in every form be carefully avoided.

2. *Sex.*—Women, from their more delicate organization and greater nervous susceptibility, seldom bear the same doses as men. Those which will produce only a mild and beneficial effect upon the adult male, will, in the majority of cases, produce a prejudicially violent one upon an adult female. There are, of course, many exceptions to this, but as a general rule it holds good. Great care is necessary in the administration of irritating purgatives, particularly of aloes, during the periods

of pregnancy and menstruation; of sulphuric acid during lactation, as it renders the milk disagreeable and griping to the infant; and of mercury in anæmic chlorosis.

3. *Age.*—In old age and in childhood, the same doses are not generally so well borne as in youth and manhood; and much nicety is sometimes necessary in regulating the dose. Several exceptions, however, present themselves; thus, in childhood and in old age, much larger quantities of mercury are necessary to induce salivation than in manhood; indeed, Dr. Clarke states that, in a practice of twenty years, he never saw a child truly salivated: an observation corroborated by the experience of others. Prof. Graves ascribes the difficulty of inducing salivation in children and in old persons to the undeveloped state of the salivary glands in the former, and to their atrophied state in the latter. On the other hand, in infancy and childhood, opium in every form is a remedy that requires the utmost caution in its administration. Two and a half drops of laudanum have destroyed an infant three days old; three drops a strong child of fourteen months; and four drops a child of a few weeks old. (Christison.) In infancy and childhood, blisters allowed to remain long in contact with the skin are apt to induce ulceration and gangrene; and leeches, on account of the thinness of the skin, and the vascularity of the subjacent tissues, draw more blood, and, consequently, make a more decided impression on the system in an infant, than a proportionate number would produce in an adult.

4. *Temperament and diathesis* influence the operation of medicinal agents. The sanguine and sanguineo-nervous temperaments bear the loss of blood and other antiphlogistic treatment much better than the nervous and phlegmatic; but, on the other hand, stimulants which would induce only a pleasing degree of excitement or stimulus in the latter, would probably act with extreme violence in the former. Opium is better borne, and produces far more benefit in persons of the melancholic than in those of the sanguine temperaments. Again, in the phlegmatic, where there often exists a great torpor of the bowels and of the system generally, the more stimulant and irritating cathartics, as aloes, scammony, gamboge, &c., are indicated, and often require to be repeated in such doses as would, if administered to a person of the sanguine temperament, produce an alarming degree of hypercatharsis and debility. Antispasmodics are more strikingly beneficial in the nervous than in the sanguine temperament.

5. *Habits and mode of life* likewise exercise a powerful influence. The inhabitants of large, over-crowded cities, those who work in close, ill-ventilated manufactories, and at the same time have barely a sufficiency of food, and even that of

an inferior description; those who habituate themselves to the use of large quantities of spirituous liquors, equally with those who, having ample means at their command, indulge in all kinds of luxury and sensuality, cannot bear the same active treatment as the robust resident in the rural districts, whose avocations are chiefly outdoor, who does not addict himself to the vice of drunkenness, nor indulge in vicious or luxurious habits. The same active treatment necessary to effect the cure of an acute disease in the latter instance, would probably only tend to cause a fatal termination in the persons forming the first class.

It is extraordinary the degree of tolerance which habit establishes, even with respect to the most poisonous substances: thus, Mustapha Shatoor, an opium-eater in Smyrna, took three drachms of crude opium daily.[1] Suleyman Yeyen, of Constantinople, is said (if it may be credited) to have taken corrosive sublimate daily, for thirty years. His usual daily dose was about a drachm;[2] and Mr. Baker[3] mentions that in Northern India, some of the inhabitants, beginning with one-eighth of a grain of nux vomica, gradually increase the dose until twenty grains, or an entire nut, is taken daily. Of course, in these instances, the peculiar article given in ordinary therapeutic doses would be of no avail to individuals habituated to its use. To produce an ordinary effect, under such circumstances, these articles must be given in extraordinary doses; and it should be remarked that, whenever a person accustomed for a long period to a certain amount of stimulus, is suddenly deprived of the article in which he indulges, he is apt to become alarmingly depressed; and, in order to sustain the powers of life, it is necessary to resume the accustomed stimulus.

6. *Race*, also, doubtless exercises an influence. A striking illustration of this may be found in the natives of India. Their power of bearing the action of evacuants, particularly of blood-letting, is very limited; and the same vigorous antiphlogistic treatment which might save the life of an Englishman, in any acute disease, would, if followed out in a native, most probably so greatly exhaust the nervous energy, that a fatal result would follow. There are very few medical officers in India, who have employed blood-letting to any extent on the natives, who have not had cause, subsequently, to regret having had recourse to it.

7. *Passions and affections of the mind* have a great influence in modifying the action of medicines, particularly that of narcotics. A dose of opium, which, under ordinary circumstances,

[1] Philosophical Transactions, vol. xix. p. 289.
[2] Thornton's Present State of Turkey, Lond., 1807, p. 295.
[3] Bengal Dispensatory, p. 439.

would produce profound narcotism, would exercise no such influence if administered to a person labouring under any great mental excitement, especially anger or grief. Hope and confidence exercise a most powerfully beneficial action; and faith, either in a particular medicine, or in a certain practitioner, in some instances, really appears to remove mountains of apparent difficulties. How else can we account for the miraculous cures (?) effected by the bread pills and coloured water, sold under some fine-sounding *soubriquet?*

Other circumstances which modify the action of medicines:

1. *Combination.*—A judicious combination of drugs is often more effectual in its operation than a single medicine, however well selected. This is particularly the case with diuretics and anthelmintics; and it is an object of considerable importance, that the practitioner should make himself well acquainted with those several combinations which either increase or diminish the action of certain remedies. Most of these combinations will be mentioned in the following pages, under their respective headings; in this place, therefore, a few examples will suffice to show the influence which this circumstance exercises. Digitalis frequently fails to act as a diuretic, until combined with the carbonate of ammonia, or with squill. Jalap, colocynth, and scammony are rendered more efficiently purgative by the addition of calomel; and diaphoresis is more certainly induced by a combination of ipecacuanha and opium than by either medicine singly. On the other hand, the purgative action of aloes is rendered milder by the addition of ipecacuanha; less griping by henbane; whilst it is modified by soap, the aromatic oils, and by alkalies. In some spasmodic affections, the operation of a cathartic is promoted by a combination with opium; and, lastly, this drug is stated to render almost inert the action of the iodide of potassium. In forming a combination of medicines, great care should be taken to avoid combining drugs whose action is directly opposed to each other; a diuretic and a diaphoretic, for example, in one mixture are, as a rule, no less incompatible therapeutically than the nitrate of silver and a solution of the chlorides are chemically. Do not attempt to fulfil too many indications at one time, or it is not improbable that the remedies may antagonize each other, and render your treatment perfectly inert.

2. *Combination of medicines chemically incompatible.*—As a general rule, it is inadvisable to prescribe in the same formula ingredients which are chemically incompatible, unless the resulting compound be the one which the practitioner wishes to administer; thus, if the citrate of potash is to be given, it may effectually be done by giving, in one draught, citric acid and the carbonate of potash in solution; these mutually

decompose each other; the carbonic acid is evolved, and the citrate of potash is obtained. It does not necessarily follow that, because the ingredients are chemically incompatible, the resulting compound is rendered inert; on the contrary, it may happen that it is much more violent in its operation than either of the ingredients used in its formation. Here we have to call chemistry to our aid, in order thoroughly to understand the changes which take place, and to ascertain what the compound resulting from the mixture is. Having ascertained this point, the next thing is to find out with what medicinal properties it is endowed. Many unchemical combinations are highly useful and valuable, *e.g.*, *yellow wash*, a compound resulting from a mixture of corrosive sublimate and lime water; *black wash*, that of calomel and lime water; and the *Mistura Ferri Co.*, or *Griffith's Mixture*, in which the carbonate of potash and the sulphate of iron are mutually decomposed, a simple carbonate of the protoxide of iron and the sulphate of potash resulting. But of all unchemical combinations, perhaps the most signally useful is that of opium and the acetate of lead. These agents react chemically on each other, and produce the acetate of morphia and meconate of lead; yet experience proves the combination to be one of the highest value in hæmorrhages and other diseases.

3. *The regulation of the dose.*—Almost every drug operates differently when given in a small and in a large dose. Tartar emetic, for example, in doses of from $\frac{1}{12}$ to $\frac{1}{6}$ of a grain, acts as a diaphoretic and expectorant; in doses of from $\frac{1}{4}$ to $\frac{1}{2}$ of a grain, as a nauseant; and if carried to the extent of two or three grains, it proves powerfully emetic. A very similar series of effects is produced by graduated doses of ipecacuanha; recent observations, indeed, tend to show that this drug in very small doses acts as a powerful anti-emetic. The neutral salts are aperient in large doses, and diuretic in small ones; opium as a stimulant in small, and a narcotic in large doses; and the oil of turpentine, in doses of fl. drm. j.—fl. drs. ij. acts as an acrid irritant of the kidneys and genito-urinary organs, whilst in doses of fl. oz. j., especially if combined with castor oil, it operates freely on the bowels, without producing any renal or vesical irritation. These are but a few examples out of many which might be quoted; but it may be observed, generally, that most of the medicinal substances whose operation is mild and beneficial in small doses, may be converted into powerful poisons by being administered in large quantities.

There is a source of error in regulating the doses of fluid medicines, which requires a passing notice, namely, the difference between the minim and the gutta or drop. They are often regarded as identical, both being regarded as the $\frac{1}{60}$th part of a fluid drachm. This is an error: from a table, furnished

by Dr. Dunglison, it appears that drops of certain fluids vary greatly in size. Thus, whilst 45 of water are equivalent to a fluid drachm, it requires 120 drops of most of the volatile oils, 132 of the tincture of the perchloride of iron, and 150 drops of sulphuric ether to fill that measure. Under these circumstances, the minim, as affording a certain standard of measurement, should always be employed in preference to the drop.

It is always advisable, when practicable, to regulate the doses of a medicine by the recognised pharmaceutical standard, *e.g.*, a fluid ounce, and so forth, or, which comes to much the same thing, only in a simpler form, to order it, in the case of a fluid medicine, in graduated bottles, so that a certain quantity may be taken at stated periods with little chance of mistake. A domestic standard, however, is in very common use, and it is, therefore, important to bear in mind what are the quantities these measures generally represent. *A tea-spoonful*, = fl. drm. j.; *a dessert-spoonful*, fl. drm. ij.; *a table-spoonful*, fl. drm. iv.; *a wine-glassful*, fl. oz. j$\frac{1}{2}$–ij.; *a tea-cupful*, fl. oz. v.; *a breakfast-cupful*, fl. oz. viij.; *a tumblerful*, fl. oz. x.–xij.

The dose of any given medicine, particularly of narcotics and purgatives, should be regulated rather in accordance with the effect it produces in each individual case, than from published or written directions on the subject; not that these are to be disregarded, but they should be looked upon rather as guides to the dose generally required than as applicable to every instance. It is impossible, in many instances, to lay down positive rules as to the quantity of a certain medicine to be exhibited. Take cancer of the uterus, for example; here opium is the sheet-anchor as a palliative; but the dose which at first will afford relief and induce sleep, soon fails to produce these effects, and the quantity requires to be increased almost daily, until enormous doses are required to give the same amount of ease and sleep which were originally produced by comparatively small ones. Iodine, in scrofulous cases, is another example. The tolerance of this medicine varies much in certain individuals, without any peculiar idiosyncrasy existing with respect to it; and a dose which will act beneficially in one case will be productive of great gastric irritation, &c., in another.

The following is another circumstance, by no means an uncommon one, with several medicines, which requires the notice of the practitioner, in the regulation of the dose. A scrofulous patient, for example, comes under treatment, and iodine is administered; for a time, the patient improves rapidly, ulcers heal, glandular enlargements diminish in size, the appetite increases, and the constitution gains tone and vigour. Suddenly, however, from no apparent cause, the reparative

process ceases, and the patient, perhaps, retrogrades. Under such circumstances, the dose requires either to be greatly decreased, or, what is still better, the medicine should be discontinued for a few days or weeks, when it may be resumed with the original benefit.

4. *The character, period, and form of disease*, influence the operation of medicines to a very great degree, and the medical man who treats a disease according to its name, without considering the individual circumstances of each case which comes under his treatment, will find his measures either prejudicially violent, or perfectly inoperative. If this be true in individuals, no less so is it in epidemics. In the inflammatory fevers which visited Great Britain previous to the year 1820, blood-letting appears to have exercised a most beneficial influence; but, observes Dr. Christison,[1] in the fevers which have prevailed for some years past, the salutary effects of blood-letting have ceased to be presented. It has been repeatedly remarked, he adds, that for the last fifteen years continued fever has been assuming more and more of the typhoid type, over the whole country, but especially in Edinburgh; a corresponding change has taken place in the effects of remedies, and of blood-letting more than any other. It is also worthy of remark, that in the principal epidemics which have prevailed of late years, a remedy which is highly beneficial at one period, appears to possess no efficacy at another. From the history of these epidemics, it appears evident that those persons who are attacked by the disease when it is beginning to decline, recover more rapidly, and in greater proportion, than those who were attacked when the disease first made its appearance, or whilst it was most prevalent. It almost appears that the violence of the disease exhausts itself by the virulence of its action; however this may be, it seems certain that many remedies will prove successful at the wane of an epidemic, which have proved utterly incapable of controlling the disease at its outset or its acme. If this be so, and the history of epidemics appears to warrant the correctness of the statement, it is evident that the period of an epidemic exercises a powerful influence on the action of medicines, the point which it is my object here to illustrate. In individual diseases, this influence is often very marked; numerous examples are met with in daily practice; blisters, for example, are most beneficial in inflammation after the violence of the symptoms has been subdued by other remedial means. Opium, in the same disease, is especially useful, generally, after depletion. Stimulant diuretics, which are hurtful in albuminuria whilst acute symptoms are present, may be given with advantage when the disease is assuming a chronic form. Stimulant diaphoretics are inadmissible in acute febrile

[1] Library of Medicine, vol. i. p. 174.

attacks, but beneficial in the advanced stages; and, lastly, injections into the urethra, which will prove of the highest service in the first and third stages of gonorrhœa, would cause stricture, orchitis, inflammation of the bladder, &c., if employed in the second stage, or whilst the inflammatory symptoms run high.

5. *Certain morbid conditions of the body, or the intensity of the disease*, must, of necessity, greatly modify the action of the remedy. Illustrations of this are constantly met with in practice. It is well known, for instance, that in severe spasmodic affections, large and repeated doses of opium are borne without a single ill consequence; doses which, if administered under ordinary circumstances, or in milder cases, would almost prove fatal. Again, if we look at mercury in suppurative inflammation of the liver, or in yellow fever, we find a quantity of mercury that is sufficient, in ordinary cases, to salivate a dozen men, produces no perceptible effect whatever. Perhaps the disease which exhibits the greatest tolerance of medicines is tetanus. In a case quoted by Dr. Bennett,[1] a patient, labouring under this disease, took, in the course of ten days, no less than four pounds, seven ounces, and six drachms of laudanum, besides six ounces, four drachms, and 45 grains of solid opium. In another case treated by Dr. Eben. Watson,[2] the patient took in forty-three days no less than 1,026 grains of the alcoholic extract of Calabar bean, and recovered. Stimulants have also been given to an almost incredible extent, without producing any ill consequences, or even a marked effect on the system; thus Dr. Currie[3] mentions a case of tetanus, in which the patient took 140 bottles of Madeira in less than a month; the daily quantity being four or five bottles of wine, besides brandy, ale, two gallons of strong broth, and two drachms and a half of laudanum. The patient recovered. Purgatives appear to make even less impression. In a case recorded by Dr. Briggs,[4] the patient took, in 48 hours, 210 grains of scammony, 89 grains of gamboge, an ounce and four scruples of jalap, two pints and a half of infusion of senna, and eight grains of calomel! Decided benefit is stated to have followed this treatment.

6. *A deranged condition of any of the principal functions of the body* modifies and interferes with the operation of medicines. This is peculiarly observable in the digestive organs; when these are the seat of functional derangement or organic lesion, medicines whose operation on the animal economy is mild and beneficial otherwise, may be rendered either prejudicially irritant or perfectly inert. Under these circumstances, quinine

[1] Library of Medicine, vol. v. p. 243.
[2] Practitioner, April, 1870.
[3] Medical Reports, vol. i. p. 148.
[4] Edin. Med. Surg. Journal, vol. v. p. 141.

ceases to act as an antiperiodic, digitalis as a diuretic, and tonics, instead of imparting tone and vigour, are converted into distressing irritants.

7. *The influence of diet* on the action of medicines is very considerable. The medical man who contents himself with merely ordering certain medicines, and who does not at the same time regulate the patient's diet, neglects to avail himself of a most valuable auxiliary, and may be allowing the presence of an antagonist, which, in all probability, will counteract all the benefit that might otherwise be reasonably expected to result from his prescriptions. Who, for instance, can expect benefit from antiphlogistic medicines, so long as a full animal diet, with wine and stimulants, is simultaneously pursued? and can we be surprised at the failure of a course of tonics, if only weak slops and an antiphlogistic diet be followed? The diet should, in every case, be regulated so as to promote, as far as possible, the operation of the medicines which are being employed at the time. This is a point which cannot be too strongly insisted upon.

The importance of dietetics is now happily more fully recognised than it was in former times by the profession; and their further study, in practice as well as in theory, as accessories to the exhibition of drugs, will, it is confidently believed, lead to better results in the treatment of disease. Many instances are on record in which well-directed medical treatment has been frustrated by the patient indulging in articles of food or drink, without the sanction, and sometimes in direct opposition to the directions of the medical attendant; hence, we should not be content with simply giving directions on the subject of diet, but whenever practicable, we should see the instructions followed out in the letter as well as in the spirit.

8. *The period of the day at which medicines are administered* modifies their operation. Narcotics operate most favourably if given an hour or two before the time at which the patient usually retires to rest, sufficient time being allowed for the stage of excitement to pass over. Emetics are best given towards night, so that the sleep which usually supervenes on their use may be the more readily indulged. Diaphoretics are, likewise, administered with the greatest advantage at the same period, the circumstances of warm bed-clothes, a horizontal position, and an equable temperature, favouring their operation. On the other hand, diuretics are best given during the day, when the surface of the body can be kept moderately cool. Aloes and the resinous cathartics, which remain a long time in the intestines previous to their action, are best given at bed-time; their solution will then be completed, and their operation will commence on the following morning: but the other cathartics, as the neutral salts, senna and castor oil, whose

operation is speedy, should be given early in the morning, on an empty stomach. As a general rule, cathartics should not be given so as to interfere with the patient's regular rest. The administration of medicines with reference to the periods of taking food, also requires the attention of the practitioner—thus, quinine acts most powerfully if given on an empty stomach; arsenic, most beneficially if given directly after a full meal; antacids, if taken four or five hours after a full meal, when we may suppose the digestive process to be nearly completed; iodine should not be given immediately after meals of arrowroot, sago, or of substances abounding with starchy matters; and the operation of an aperient is materially interfered with by being taken on a full stomach. If copious draughts of diluents be taken soon after a dose of Dover's powder, or of any of the preparations of ipecacuanha, or after fractional doses of an antimonial, vomiting is likely to be produced, and the medicine to be ejected without performing its proper office, unless, indeed, it has been given with a view of acting as an emetic.

9. *Light, Air, and Exercise* influence the action of medicines more than is generally allowed. They very sensibly promote the action of tonics, particularly that of iron and of iodine; indeed, taken alone, they tend in no inconsiderable degree to invigorate the constitution, to give tone to the digestive organs, and energy to the nervous system. Confinement in close, dark, ill-ventilated apartments, effectually counteracts any beneficial influence which might otherwise be derived from tonics, and renders the patient languid, sallow, unhealthy, scorbutic, or dropsical. On this point, Dr. Ranking[1] observes that scrofulous patients, who are not able to walk, should sit in the open air; anything is better than to pass the chief part of the day in the confined air of a sick room or hospital ward. "This is a point," he adds, "which I would strongly urge upon the attention of all who have the care of scrofulous cases, as I feel convinced that, in many instances, the failure of iodine is due to the neglect of insisting, at the same time, upon the patient taking exercise in the open air." This opinion few medical men will be inclined to dispute. Exercise, without doubt, retards the operation of narcotics, even when taken in poisonous doses. An illustrative case is related in Lockhart's "Life of Sir Walter Scott."[2] A young farmer swallowed a quantity of laudanum in mistake for some other medicine. While all around him were stupid with fear, he rose, saddled his horse, and rode to the doctor's residence, six or seven miles, and did not feel the operation of the drug until he had alighted, when it instantly began to operate. He perfectly recovered. Expo-

[1] Translation of Lugol on Scrofula, p. 242. [2] Vol. v. p. 186.

sure to the sun is said to hasten the production of that peculiar blueness of the skin, which occasionally appears during a prolonged course of the nitrate of silver. The action of diuretics is retarded by exercise in the open air, whilst that of digitalis is frequently not observed under the same circumstances.

10. *Season* is also a modifying agent. Some diseases, independent of all remedial measures, improve at certain seasons, and retrograde at others. We have a good example of this in scrofulous affections: in the spring this disease in every form is aggravated; during the latter part of summer and in autumn, improvements take place rapidly and uniformly; whilst during the winter it either remains stationary or retrogrades. Now, it is evident that any remedial measures in this disease must be greatly influenced by the season at which they are employed; or, in other words, by the tendency which the disease exhibits to improve or retrograde at particular periods. Much of the efficacy which has been ascribed to sea-bathing in this disease is probably due to the fact that it is usually employed at those seasons, summer and autumn, when the disease spontaneously improves. Season also influences the operation of medicines in another way; thus Dr. T. Smith observes that the oil of turpentine ought never to be given alone, in large doses, during the winter or in cold damp weather; because it then, like other hydrocarbons, tends to supply fuel for the evolution of animal heat, rather than to exert any therapeutic properties. Moreover, in winter, cerebral congestion may supervene, in summer intractable diarrhœa, if it be given in very large doses. Another example will suffice. Dr. Copland states that in the treatment of bronchocele with iodine, he has observed that drug, if continued during cold weather, produce pains in the limbs and joints resembling rheumatism, but that these disappeared when the weather became warm.

11. *The form in which a medicine is administered* influences, in many instances, its operation. When it is desired to produce a speedy effect, the liquid form is generally preferable: thus, the action of quinine is rendered not only more speedy, but more effectual, if administered in solution than if given in substance. The same remark applies to morphia, and to most of the alkaloids. Tannin, when intended to influence the stomach or bowels, is suitably exhibited in the form of pill; but if it be designed to enter into the circulation, or to act quickly at a distance from the stomach on some internal part, the form of solution should be employed. Digitalis, when given in the form of tincture, acts as a direct sedative on the heart and circulatory system; if given in infusion, it acts as a diuretic. Decoction is inadmissible as a form for exhibiting ipecacuanha, senna, and some other medicines, their active pro-

perties being dissipated by boiling. There are, however, several medicines which, from their insolubility, cannot be given in the liquid form; calomel, and the peroxide of iron, for example: these are necessarily given either in the form of pill or powder. In using the pillular form, we may, in the majority of cases, advantageously add soap to the mass, as it tends materially to hasten its solution in the intestines, and thereby to quicken its operation. It also renders the action of purgatives milder and less irritating. Powders are best given in syrup, honey, or treacle. When they are of an insoluble character, and are continued daily for any length of time, an aperient should occasionally be given, to obviate their accumulation in the intestines. The introduction of medicines into the system by subcutaneous injection forms an important epoch in the history of medicine.

12. *The purity of the medicine* employed should engage the earnest attention of the practitioner; otherwise his best efforts may prove not only unavailing, but perhaps injurious. This it is which forms the strongest bond of union between Materia Medica and Therapeutics, and the reason why they are so generally studied together. Every one who aims at being a successful therapeutist should make himself master of those peculiar characteristics by which he may know with some degree of certainty, whether the agents he employs in his researches are of such a quality as to justify any conclusions he may draw with regard to their operation. Here the British Pharmacopœia (Ed. 1867) is an invaluable guide.

13. *Disguising the taste of nauseous medicines* is often a matter for consideration, particularly in the case of children and delicate women. Castor oil, one of the most useful aperients in the materia medica, is often rendered inadmissible on account of its taste; and it is, consequently, important to discover some means by which it may be disguised, without impairing its medicinal activity. This remark applies even more strongly to cod-liver oil. Strong coffee, hot milk, or lemon syrup, will answer in a degree; or the medicine may be made into an emulsion with yolk of egg, sweetened with syrup, and coloured with Tinct. Cardam. Co.; but all these plans are inferior to the simple one of chewing a piece of lemon or orange peel, or a few cloves, or any aromatic substance, immediately previous to swallowing the medicine. The taste of senna may be concealed by sweetening the infusion, adding milk, and drinking as ordinary tea, which, when thus prepared, it much resembles. The taste of quinine is concealed by tannin; aloes, and hydrochlorate of ammonia, by liquorice; and the sulphate of magnesia, by the compound infusion of roses. Syrups are generally agreeable to children, and may be used for disguising unpleasant taste. In order to obviate the taste, some medicines

may be given in the form of effervescing draughts, the carbonic acid which is set free tending not a little to enable the stomach to retain the medicine. Nauseous liquid medicines, as copaiba, are sometimes advantageously given in the pillular form, or in gelatinous capsules, or enveloped in wafer-paper.

With the view of economizing space, and preventing useless repetitions in the body of the work, the following list of some of the principal authorities quoted from is appended, and it is to be understood that whenever a page or volume is inserted after an author's name, it is to one of the subjoined works or papers reference is intended, unless otherwise specially mentioned. In other cases, references are inserted in a foot-note.

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WEST INDIA
MEDICO-CHIRURGICAL SOCIETY

MANUAL

OF

PRACTICAL THERAPEUTICS.

PART FIRST.

ARTICLES OF THE MATERIA MEDICA.

1. Acaciæ Gummi, Gum Acacia, Gum Arabic. A gummy exudation from the stems of Acacia vera, *Willd.* and other undetermined species of Acacia. *Nat. Ord.* Leguminosæ. *Source*, Arabia and Africa, from Senegal to Egypt.

Med. Prop. and Action. Demulcent and emollient. It has been thought to be nutritive, and has been suggested as an article of diet for diabetic patients, but the evidence of its utility on both points is inconclusive. It is an excellent adjunct to other remedies of the same class, in pulmonary and genito-urinary affections, and forms an ingredient in Mist. Cretæ, Mist. Guaici, Pulv. Amygdalæ Co., Pulv. Tragacanthæ Co., and all the officinal lozenges.

Dose:—Of the Gum, drm. j., *ad libitum*. *Of the Mucilage* (oz. iv.; Aq. fl. oz. vj.) oz. ij.–oz. vj. daily or *ad libitum*.

2. *Therapeutic Uses. Coughs and Hoarseness* dependent upon dryness and irritation of the throat are often relieved by allowing a piece of gum to dissolve slowly in the mouth. The mucilage forms an excellent vehicle for cough mixtures.

3. *In Gastro-intestinal Irritation, Diarrhœa, in Ardor Urinæ and Calculous Affections*, the free use of the mucilage, combined with other demulcents or sedatives, often proves of service.

4. *In Infantile Diarrhœa*, gum acacia is very favourably spoken of by Dr. R. W. Foss.[1] In the simple forms he found the mucilage, 1 part to 3 of water, generally sufficient; but when

[1] Brit. Med. Journ., Sept. 3, 1870.

the stools are green and accompanied with vomiting, or when there is almost constant involuntary diarrhœa, the addition of a little grey powder has a rapidly beneficial effect.

5. *In superficial Hæmorrhage, as from Leech-bites*, finely-powdered gum has been used as a mechanical styptic. A case of severe *Epistaxis* is recorded,[1] successfully treated by finely-powdered gum blown into the nostril. The practice is not new; it was adopted by Heister in 1713.

6. *To Sore Nipples*, Mr. E. Wilson (p. 178) speaks of the mucilage of acacia as a useful application. He directs it to be pencilled on the tender part immediately after suckling, and the nipple to be protected with a leaden shield. He also speaks favourably of the application of a powder composed of equal parts of gum acacia and borax.

7. Acetum. Vinegar. An acid liquid prepared from malt and unmalted grain by the acetous fermentation. Sp. Gr. 1·017 to 1·019.

Med. Prop. and Action. Vinegar in its undiluted state is a stimulant and astringent, and when taken internally in large or continued doses, even when diluted, it acts injuriously on the stomach and its functions, inducing gastric pain and irritability, colic, anorexia, and eventual emaciation and cachexia. Taken, however, in moderate quantities, as an adjunct to food, its action seems salutary in many instances. As a medicinal agent it is of considerable value. Taken largely diluted with water, and moderately sweetened, it displays decided soothing and refrigerant properties, and is employed with advantage *in febrile and inflammatory affections*, quenching the thirst, calming the vascular excitement, re-establishing the functions of the skin, and restoring the action of the kidneys. The refrigerant influence of diluted vinegar applied externally is undoubted: it not only diminishes heat, but allays pain. *In Hæmorrhagic affections*, the cold feeling which it produces on the skin is extended to the whole system; hence the benefit derived from it in internal hæmorrhages, and inflammation of the cavities; as, for instance, in *uterine hæmorrhage*, when applied to the thighs and abdomen; and in *acute meningitis*, applied as a lotion, to the shaved scalp. *In general fever*, sponging the body with vinegar and water is applicable to every case in which the skin is preternaturally hot, when no idiosyncrasy stands in the way. The vapour of hot vinegar acts as a stimulant, and as such proves useful in many throat affections. Sprinkled about a sick room it acts in a degree as a deodorant, and is generally extremely refreshing to the patient. In combination with ammonia (Liq. Ammoniæ Acetatis) it acts on the skin; combined with soda and potash, on the kidneys. In *Narcotic Poisoning* it has been recommended to be administered after the stomach has been evacuated by an emetic. The fact, however, of its forming a soluble salt with morphia would negative its use in *poisoning by opium*. It is a direct antidote *in poisoning by the alkalies*. In these cases it is a safe and efficient remedy.

Dose:—fl. drm. j.-iv., in any bland vehicle.

8. *Therapeutic Uses. In Exanthemata, and other febrile affections*, sponging the body with vinegar diluted with water (1 part of vinegar to 6 or 8 of water) is a most soothing and

[1] Med. Repository, vol. xxvii.

refreshing application. The whole surface of the body may be gently bathed with it, two or three times daily. It may be used warm or cold, according to the feelings of the patient. A somewhat similar mixture, sweetened to the taste, forms a refrigerant drink in the same class of cases.

9. *In Scarlatina*, dilute acetic acid, internally, is strongly recommended by Mr. Isaac B. Brown. He considers that it is more efficacious than any other treatment, and that it tends to prevent the occurrence of dropsy. Experience has not confirmed its alleged virtues, although it is doubtless useful as a refrigerant. Dr. Webster[1] relates four cases, in which it appeared to him conclusive that sponging the body of the patient prevented the spread of the disease beyond the original patient. Further facts are required to confirm this statement. *The Sore Throat* which accompanies this disease, much improves under the inhalation of the steam of hot vinegar.

10. *In most varieties of Laryngeal Inflammation, Hoarseness, Relaxed Sore Throat, and Ulceration of the Fauces*, especially if aphthous in its character, decided benefit is often derived from the inhalation of the vapour of hot vinegar (*Dr.* Christison).

11. *In Phthisis*, the value of the external application of diluted vinegar to the chest and upper part of the body, in allaying the *profuse perspirations*, is well known ; it is a measure attended with salutary effects, and is of great comfort to the patient. Dr. Walshe[2] speaks very favourably of the practice. The mixture employed by Sir C. Scudamore,[3] for this purpose, is composed of 1 part of vinegar, 1 of Eau de Cologne, and 2 of water. *As a preventive of Phthisis*, Dr. Graves speaks favourably of the plan of washing the chest with vinegar and water, beginning with it tepid, and reducing the temperature gradually, until it can be used completely cold.

12. To persons subject to *repeated Catarrhs, Asthma, and Angina Pectoris*, the practice, during the intervals, of bathing the chest every morning with vinegar and water, as advised above, seems often to diminish the liability and to act as a preventive. *In Hæmoptysis*, used both externally and internally, its use is indicated, but it is a remedy of minor importance.

13. *In Uterine Hæmorrhage*, the application of cold vinegar and water to the pubes is not only agreeable to the patient, but tends considerably to arrest the discharge of blood. It may also be advantageously given internally. *Epistaxis* is sometimes effectually arrested by introducing into the nostril a piece of lint saturated with vinegar.

[1] Edin. Monthly Journ., Dec., 1849.
[2] On Dis. of the Lungs, p. 404.
[3] On Inhalation, &c., in Consumption, p. 39.

14. *In Scurvy*, vinegar has been recommended; but little reliance should be placed upon it, although in some instances it appears to be useful. It is greatly inferior to lemon or lime juice, or to fresh vegetable.

15. *In Purpura*, whether attended by fever, or of a passive character, Mr. Erasmus Wilson (p. 348) advises sponging the body with tepid vinegar and water.

16. *In Hospital Gangrene*, when of a mild character, Delpech speaks highly of the topical application of vinegar. The ulcerations, having been previously cleansed, are to be washed with strong vinegar, and then covered with charpie wet with the same liquid. If this fails to arrest the disease, caustics become necessary.

17. *To Bruises, Sprains, Contusions, and limited Inflammations*, diluted vinegar, a popular application, forms a useful refrigerant lotion. It should be kept continuously applied. A little alcohol may be advantageously added to it. Vinegar as a local application to *Burns*, was advocated by Mr. Cleghorn, but it is less efficacious than Liniment. Calcis (*q. v.*)

18. *To Milk or Mammary Abscesses*, warm vinegar is stated by Dr. Dewees (p. 502) to be so successful in the early stage of the disease, that we need not, in general, look for any other remedy. "It is," he states, "particularly useful when the breasts are greatly and painfully distended with milk; and it should be perseveringly employed for twenty-four hours." His testimony in its favour is very strong. Should it fail, leeches, poultices, &c., must be had recourse to.

19. *Particles of Lime in the Eye* are effectually dissolved, and the pain eased, by bathing the eye with diluted vinegar.

20. Acidum Aceticum Glaciale. Glacial Acetic Acid. Concentrated acetic acid, corresponding to at least 84 per cent. of anhydrous acid $C_4H_6O_3$. A colourless liquid, with a pungent acetous odour, converted, when cooled to 34°, into colourless prismatic crystals. Sp. Gr. 1·065, which is increased by adding to the acid 10 per cent. of water.

Acidum Aceticum. Acetic Acid. Purified Pyroligneous Acid. Prepared from wood by destructive distillation, and containing 28 per cent. of anhydrous acetic acid. Sp. Gr. 1·044.

Acidum Aceticum Dilutum. Dilute Acetic Acid. Prepared by mixing one pint of acetic acid with seven pints of distilled water. Sp. Gr. 1·006.

Med. Prop. and Action. Glacial acetic acid is only employed as an external agent; it is a very powerful caustic. Applied to the skin, it produces intense redness and pain, followed by rapid vesication. It must be used with caution, as its action extends to a considerable depth, and a

severe sore is produced. It may be used as a vesicant where the absorption of cantharadine would be prejudicial, as in some affections of the kidneys. (Garrod.) Glacial acetic acid dissolves cantharidine freely, and the solution so prepared may be used for rapid blistering. Acetic acid may be applied externally as a rubefacient, vesicant, escharotic, and antiseptic. Administered internally to man or animals, the concentrated forms of acetic acid act as powerful corrosive and irritant poisons. Dilute acetic acid may be used internally in the same manner as vinegar as a refrigerant and astringent.

Dose:—Of Acetic Acid, ℥iij.-℥xv. *Of Dilute Acetic Acid*, fl. drm. j.-ij.

21. *Therapeutic Uses. In Tinea Capitis*, the local application of the strong acid is recommended by Mr. Wigan.[1] The first application is with the acid, diluted with three times its weight of water. On being applied, a number of spots previously looking healthy become red patches; then, with a piece of sponge tied to the end of a stick, each spot is to be imbued thoroughly with the strong acid for three or four minutes. A single application is sufficient, in the majority of cases. A crust grows up with the hair, which may be removed as soon as a pair of fine scissors can be introduced beneath it. Mr. Erasmus Wilson (p. 448) speaks favourably of a similar mode of treatment repeated once in the week, and in the intermediate days using some mildly stimulating ointment.

22. *In Psoriasis*, Dr. Cummin[2] states that his trials with strong acetic acid have been highly satisfactory; the diseased cuticle separating in flakes, and a new surface being exposed, of a much more healthy character. The application of the acid is hot and painful, especially when there are excoriations and fissures; but these should be protected by some mild cerate. The acid requires, in most cases, to be repeated twice or thrice. *In obstinate cases of Lepra*, much benefit has been derived from the use of baths acidulated with acetic acid.

23. *Cancer*. The fact that acetic acid exercises a solvent power on cancer cells removed from the body, taken in connection with another fact that it does not coagulate albumen, and therefore being thus diffusible through the tissues, might, it was thought, come in contact with the cancer cells *in situ*, induced Dr. Broadbent in 1866 to resort to subcutaneous injections of diluted acetic acid (1 of acid to 3 of water) into the cancerous tumours, with the view of obtaining their disintegration and absorption. Cases treated on this principle are recorded by Dr. Broadbent,[3] Mr. Weedon Cooke,[4] Dr. M'Gregor,[5] Mr. C. W. Moore,[6] and others, with results, however, which are neither conclusive nor satisfactory: in some, benefit resulted; in others, the effects were *nil;* and in others, it seemed to hasten the development of the disease. The treatment must

[1] Med. Gaz., Sept. 15, 1843.
[2] Cyc. Pract. Med., vol. iii. p. 548.
[3] Med. Times and Gaz., 1866, 1867.
[4] Brit. Med. Journ., June 1, 1867.
[5] Glasgow Med. Jour., June, 1867.
[6] Brit. Med. Journ., Feb. 9, 1867.

be regarded as still *sub judice :* should its adoption be resolved upon, it should only be acted upon after a careful study of the recorded experience of others. It is evidently not a practice devoid of danger if the acid be too strong, or the quantity injected too large (ɱxxx. is about the average quantity), or if the injection be too frequently repeated, or if improper cases be selected. According to Dr. J. Barclay,[1] the local application of vinegar or diluted acetic acid exercises a decidedly sedative influence on *cancerous ulcerations.* Under its use, not only was the pain subdued, but the ulceration assumed a healthier condition. So simple a remedy deserves a trial. Injection of acetic acid into *ovarian cysts* has been advised, but the practice seems fraught with danger (Dr. Junker).[2]

24. *Nævus Maternus.* Dr. Behrend, of Berlin, advises, in the case of small flat nævi, the application of strong acetic acid, followed by compresses soaked in vinegar. Under this treatment, the blood coagulates in its vessels, the nævus becomes hard and yellow, and is thrown off in the form of a parchment-like layer, by a process of exfoliation. (Mr. E. Wilson, p. 336).

25. *Corns and Warts* may be effectually removed by the application of the strong acid. The wart should be first carefully pared down, the acid should then be applied with a camel's-hair brush, and subsequently compresses, soaked in vinegar, should be kept in contact with the part. *To Venereal Vegetations*, Mr. Acton[3] advises the application of the strong acid. Mixed with the white of egg, acetic acid has been advised by Bursharat as an application to *Sore Nipples.*

26. Aconitia. Aconitia. An alkaloid, obtained from the root of Aconitum Napellus.

Med. Prop. and Action. Sedative poison, too powerful for internal use. In man and animals its action seems directed to the nervous system, and through it to the heart. Sensation is lost; there is staggering gait and inability to walk; the heart's action becomes gradually slower, and death takes place by æsthenia. 1-50th of a grain is sufficient to poison a large dog, and the same quantity has proved nearly fatal in man. Very minute doses produce heat and tingling of the surface, and sometimes diuresis. Externally it may be applied in the form of ointment or solution. The Unguentum Aconitiæ of the B. Ph. contains Aconitia grs. viij., Rect. Sp. fl. drm. ½., Prepared Lard, oz. j. Dr. Fleming's ointment consists of Aconitia grs. xvj., Rect. Sp. ɱxvj., Lard ʒj. An alcoholic solution consisting of grs. viij. to fl. oz. ij. of Rect. Sp. has also been used as an external application. When rubbed on the skin, in the form of ointment or solution, it produces a sensation of heat and pricking, succeeded by a feeling of numbness and constriction of the part, as if a heavy weight were laid upon it, or as if the skin were drawn together by the powerful and involuntary contraction of the muscles beneath. This sensation lasts from ten to twelve hours, according to the quantity rubbed in. It produces very

[1] Brit. Med. Journ., April 21, 1866. [2] Med. Times and Gaz., Nov. 17, 1866.
[3] Lond. Journ. of Med., July, 1851.

slight, if any, vascular excitement, not more than may very easily be accounted for by the friction itself. (Turnbull.[1]) Dr. Fleming states, that when his Aconite ointment is applied to the conjunctiva, it produces *contraction* of the pupil; but that when applied to the temples and forehead, it produced, in two instances, dilatation of the pupil, attended with partial blindness. In consequence of its high price, it has been frequently adulterated, and found almost inert. Care should be taken not to apply the ointment or solution of aconitia where the skin is abraded.

27. *Therapeutic Uses. In Tic Douloureux, Sciatica, Lumbago, and other neuralgic affections, and also in some forms of Rheumatism and Gout*, aconitia, locally applied over the seat of pain, is one of the most certain and powerful palliatives of the materia medica. Dr. Fuller (p. 436) restricts its use to purely chronic cases, having repeatedly observed that it fails so long as signs of active disease remain. He speaks highly of its value, especially in intercostal rheumatism, and pronounces it undoubtedly the most valuable external remedy we possess. When, from the situation of the pain, or other circumstances, it is difficult to apply the ointment, he directs a solution of aconitia (grs. iij.–iv.) in rectified spirit (℥vj.) and glycerine (℥ij), to be applied by means of a camel-hair brush. It is chiefly useful in muscular rheumatism. The arrest of pain is only temporary in most cases; but even this, when the pain is intense, is an advantage of no inconsiderable importance. It may be applied in the form of ointment or solution (*ante*), and it should be rubbed in over the affected part until the pain is relieved. Dr. Turnbull advises the proportion of aconitia to be increased at every second or third friction. Sir T. Watson (i. p. 716) quotes a case, which resisted the use of aconitia, until it was combined with a saturated solution of iodine, when a complete cure was effected.

28. Aconiti Radix et Folia. Aconite Leaves and Root. The dried root and fresh leaves and flowering tops of Aconitum Napellus, *Linn. Nat. Ord.* Ranunculaceæ. *Hab.* Mountains of Europe and Asia.

The comparative activity of the different parts of the plant has been examined by Drs. Fleming and Turnbull. They agree that the *root* is the part which is the most active, certain, and eligible for medicinal use. The *seeds* rank second, the *leaves* third, the *flowers* fourth, and the *fruit* and *stem* last in the order of medicinal activity. The season of collection influences materially the power of the drug, the proportion of aconitia on which its activity depends being more than double, even treble, in the root collected after flowering than in that collected before flowering. To insure uniformity of strength, which is of great importance in so powerful a remedy, strict attention should be paid to the direction given in B. Ph. that the root shall be collected in the winter or early spring, before the leaves have appeared, and that the leaves and flowering tops be gathered when about one-third of the flowers are expanded.

[1] On the Med. Prop. of the Ranunculaceæ, p. 120.

Remarks on its Use. The physiological and therapeutic effects of Aconite have been carefully investigated by Dr. Fleming.[1] The formulæ, however, employed by him are considerably stronger than the officinal. The Tincture he used (Aconite Root ℥xvj., Spirit fl. ℥xxiv.) is six times as strong as that ordered in the B. Ph., and is far too powerful for ordinary use. The dose of Fleming's Tincture as prescribed by him is ♏v. gradually increased, and of the Alcoholic Extract gr. ⅛ thrice daily. It is to the former of these preparations most of the following observations refer.

29. *Physiological Effects.* When a small piece of the root is chewed, it causes an increased flow of saliva, a peculiar numbness of the lips and tongue, with a tingling sensation, and partial loss of the use of the former. Its topical application is unaccompanied either by pain, redness, or swelling, even when the physiological effects are developed to the fullest extent. Given internally, Dr. Fleming divides its operation into four degrees.

First Degree. Half an hour after a dose of ♏v. of his tincture, warmth is felt in the stomach, accompanied with slight nausea, and oppression of breathing, followed in about ten minutes by general warmth of the body, numbness, tingling, and a sense of distension of the lips and tongue. There is also a tingling at the tips of the fingers, and a peculiar sensation is felt at the roots of the teeth. These sensations continue more or less from one to three hours. Slight muscular weakness is generally experienced, with indisposition for exertion either mentally or bodily. In about half an hour more, the pulse is found diminished in strength, and in another hour, both the pulse and the respiration have become less frequent. Thus, a pulse which, in the normal state, beats 72 in the minute, will by that time have fallen to 64, and the respirations from 18 to 15 or 16.

Second Degree. Should a dose of ♏x. be given at first, or the first dose of ♏v. be succeeded in two hours by another of equal amount, these symptoms supervene more rapidly and with greater severity. The tingling extends along the arms, and the sensibility of the surface is more or less impaired. In an hour and a half, the pulse will probably have fallen to about 56 beats in the minute, and become smaller and weaker, still maintaining, however, perfect regularity. Respirations about 13, and labouring; great muscular debility, giddiness, and confusion of sight come on when in an erect posture. A lethargic state ensues, with great disinclination to be disturbed, coldness of the surface, and particularly of the extremities, which are cold to the touch.

This is the utmost extent to which Aconite can be administered with safety and success.

Third Degree. On the administration of ♏v. more, two hours subsequent to the last dose, the sense of warmth and the numbness and tingling again spread rapidly over the body; diminished sensibility of the surface; pains in the joints are complained of; and the vertigo and dimness of vision are increased; the countenance becomes pale and anxious; the voice becomes weak, and there is often a dread of approaching death. The pulse occasionally falls to 40, or even 36, but, more generally, rises to 70 or 80, small, weak, and irregular. Respiration short, hurried, and irregular, accompanied with deep sighing; surface moist and cold; and vomiting sometimes occurs. These symptoms do not subside for one or two days.

Fourth Degree. If the medicine be continued, the countenance becomes pale and sunken, froth issues from the mouth, and the prostration increases; sensations as if sinking from loss of blood; the pulse becomes smaller, weaker, and more irregular; with a cold clammy sweat. Consciousness usually remains. If the action be carried to a fatal extent, the patient becomes entirely blind, deaf, and speechless; the pupils are dilated; slight convulsions ensue, and after a few hurried gasps, death by syncope takes place.

[1] On the Med. Prop, &c., of Aconitum. 8vo. 1845.

Aconite proves fatal, 1, by a powerfully sedative impression on the nervous system; 2, by suspension of the respiratory function; 3, by syncope.

Treatment of Poisoning by Aconite consists in the administration of powerful stimulants—*e.g.*, brandy, ammonia. Cold affusion has been found serviceable.

Contra-Indications. 1. Great depression or constitutional feebleness of the vital powers. 2. Headache and other affections, arising from anæmia, or chlorosis; or whenever there is a torpid or paralytic condition of the muscular system. 3. All cases in which there is obvious mechanical impediment to the passage of the blood, particularly through the heart and lungs. 4. Irritability of the circulation, with great diminution of power, such as occurs after serious hæmorrhage.

Dose:—Of the Tincture. (Aconite Root in coarse powder oz. iiss. Rect. Spirit Oj.) ℥v.-xv. This is the dose laid down in B. Ph., but in order to obtain the full effect of the remedy, doses of one-third of these quantities suffice; hence, at the commencement at any rate, much smaller doses (℥j.-ij.-iij.) every four hours had better be employed. (*See* s. 30.) This tincture is the best form for internal use. *Of the Extract of the Fresh Leaves and Flowering Tops*, gr. j.-ij. (B. Ph.), a very uncertain preparation; if used, had better be commenced in smaller doses and gradually increased. For external use only *Aconite Liniment* (Aconite Root oz. xx., Camphor oz. j., Rect. Spirit q.s. ad Oj.)

An important practical hint on the administration of aconite is supplied by Dr. Fuller (p. 426)—viz., that if the tincture be given with alkalies, the aconitia is precipitated, and that unless great acidity exist in the stomach, the remedy is rendered almost inert; whereas, given in conjunction with a few drops of dilute sulphuric acid, its solubility is ensured and its full power is exerted. Hence, it must not be inferred because ℥x. or xij. are readily borne when taken in an alkaline mixture, that the same dose may be administered with impunity if the alkalies are omitted, and the mixture is made either acid or neutral. In every instance it is better to administer aconite in an acid mixture, in order that the full strength of the dose may be felt at once.

30. *Therapeutic Uses. Acute Inflammatory and Febrile Affections.* The recent researches of Dr. Prosser James,[1] Dr. Reith,[2] Dr. Wilks,[3] Dr. Ringer (p. 313), and others, tend to show that in this class of cases, when characterized by increased action of the heart and circulatory system and abnormally high temperature, aconite possesses considerable power as an antiphlogistic; but in order to render its administration safe and effectual, two conditions are requisite—1. That it should be given at the outset, or during the first stage of the affection; and 2. That no complications co-exist. The doses employed by the above writers exhibit a wide range, Dr. Wilks prescribing ℥iij.-v. every four hours, and Dr. James ℥ij.-iij. every three hours; whilst Dr. Reith places the dose between a quarter of a drop and one drop. Dr. Ringer directs half a drop to one drop of the tincture to be given in a teaspoonful of water every ten or fifteen minutes for two hours, and afterwards to be continued every hour. If there be much prostration, and the pulse be feeble and weak, the dose should, he advises, be still smaller.

[1] Med. Press, Aug., 1866. [2] Edin. Med. Journ., April, 1868.
[3] Practitioner, Dec., 1868.

The occurrence of the sensation of "pins and needles" is a sure indication that the remedy has been carried to its full extent, and that it should be discontinued. It seems to have proved especially valuable in *Febrile Catarrh*, a single dose at the outset often diminishing or removing the symptoms. *In the Tonsilitis or Acute Sore Throat of Children, and in Cartarrhal Croup*, Dr. Ringer speaks highly of its efficacy.

31. *In Acute Rheumatism*, the value of aconite is attested by Fleming, Neligan, Lombard, and others, but it has failed to maintain the high character awarded to it by these authorities. This is explainable, according to Dr. Reith, by the fact that it was given in too large and increasing doses; with small and often repeated doses (♏ ¼ of the tincture every two hours) he states that he has obtained good results in mild cases by its agency alone; but that in severe cases it is necessary to combine it with the full alkaline or blister treatment. Though not reliable as a *cure* in this disease, it proves in some cases a valuable adjunct to other remedies. *In Chronic Rheumatism*, it proves far more serviceable than in the acute form of the disease, and, according to the experience of Dr. Fuller (p. 425), its remedial effects are often strongly marked in cases unattended by redness and swelling. If in some instances, he adds, it has not exercised any control over the violence or duration of the pain, it has acted almost magically in others, and relief has followed as speedily after its exhibition as it not unfrequently does after its external application. When the secretions are out of order, and the general health impaired, it rarely proves efficacious until other medicines have been administered; but in many cases unconnected with a venereal taint, where the symptoms are those of aching pain and stiffness, without any redness or swelling of the parts, or any notable derangement of the secretions, it is valuable beyond all other remedies we possess. From ♏ v.–vj. of the Tincture (L. Ph.) may be given at first, and the dose may be gradually increased to ♏ x.- xij., combined with a few drops of Acid. Sulph. Dil. If relief be not speedily obtained, it is of little service to persevere in its use; whereas, if it prove sedative, it should be persisted in, and the dose gradually increased. These remarks apply equally to *Lumbago*. *In Rheumatic Gout* it is highly spoken of by Professor Graves (ii. p. 547). In all these cases Liniment of Aconite (B. Ph.) is a valuable local application, and its use should be conjoined with the internal administration of this remedy. *Rheumatic Headaches* are sometimes benefited by small doses, either alone or conjoined with other appropriate remedies.

32. *In Neuralgia*, aconite is a remedy of great value, but its use appears to be restricted mainly to those cases in which all signs of active disease are absent or have been subdued by

other means. In chronic cases its operation is often speedy and permanent, but even in these it fails so long as the secretions are out of order and the general health much impaired. These conditions being rectified by the due use of purgatives, &c., aconite will often evidence its action when previously it had failed. In all cases it is advisable to commence with its use externally; should this fail, it may subsequently be given internally. *In Sciatica*, Dr. Fuller (p. 464) observes:—"We are justified in concluding, not only that it proves a valuable and efficient remedy in many obstinate forms of the disease, but that, if properly administered and carefully watched, it is as safe and manageable as any other medicine." *Tic Douloureux* often yields to its local application, attention being paid at the same time to the state of the bowels and general health. *Toothache* is sometimes speedily cured by rubbing the gums with a few drops of the tincture, or introducing it on a bit of cotton into a carious tooth. With reference to its use in this class of cases, Dr. Ringer justly observes:—"If aconite succeeds at all, it will succeed at once; hence, if no relief is speedily obtained, it is useless to continue its employment." According to Dr. H. M. Jones,[1] the efficacy of aconite in neuralgia is greatly increased by combining it with quinia, which seems to add permanency to the relief afforded by the former, and is especially indicated in neuralgia occurring in anæmic or debilitated patients without any apparent nerve-lesion or exciting cause.

33. *In Tetanus*, the use of aconite in large and repeated doses was first proposed by Mr. De Morgan,[2] who relates several cases illustrative of its efficacy. Other cases successfully treated by it are related by Dr. G. Smith,[3] Dr. Sedgwick,[4] Dr. Woakes,[5] and Prof. Winderlich.[6] It acts by diminishing the irritability of that portion of the nervous centre which controls reflex muscular action, and the success which has attended its use warrants further trials with it. There appears to be a great tolerance of the drug in this disease.

34. *In Diseases of the Heart*, in which the chief indication is to diminish vascular excitement or irritability of that organ, aconite proves in the highest degree serviceable. *Nervous Palpitations* often yield to small doses. Even in *Pericarditis*, when the heart throbs violently, and thus produces extreme pain, aconite, according to Dr. Ringer, will quiet the heart and speedily ease the pain. From its powerfully depressing action on this organ, it is evident that it should be used with

[1] Med. Press, July 1, 1868.
[2] Brit. For. Med. Chir. Rev., April, 1859.
[3] Mad. Quar. Med. Jour., Jan. 1861.
[4] British Medical Journal, Jan. 20, 1860.
[5] Ibid. Oct. 26, 1861.
[6] Med. Press, June 2, 1869.

the greatest caution, or be held as contra-indicated in organic diseases, where the power or force of the heart is impaired. It is more a remedy for functional derangement than for organic disease.

35. *In Erysipelas*, aconite was a favourite remedy of the late Mr. Liston;[1] and doubtless in sthenic cases attended with much febrile action it may prove useful, but its use has been superseded by T. Ferri. Perchlor. and Belladonna (*q.v.*) *To Painful Sprains and Bruises and Chronic Arthritic Swellings*, Lin. Aconiti, locally applied, often affords speedy relief. The topical application of a mixture of T. Aconiti and T. Opii, succeeded in the hands of Mr. E. Wilson (p. 146) in three instances in relieving *the severe intercostal pain accompanying Herpes Zoster;* in others it failed.

36. *In Amenorrhœa*, Dr. Copland (ii. p. 538) prescribed the extract with decided benefit; and Dr. Ringer (p. 317) states that *in sudden suspension of the menses*, as from cold, it may be employed with advantage; he likewise states that the acute stages of *Gonorrhœa* may be well treated with gutt. j. of the tincture every hour, and that the same treatment will often remove *Chordee*. *For preventing rigors after the passage of a catheter* into the urethra, Mr. Long[2] found ℥ij. of Fleming's tincture in Aq. fl. oz. j. very effectual. For the relief of severe *Uterine Pains*, Lin. Aconiti externally applied occasionally affords relief when other remedies fail; or lint soaked in a mixture of equal parts of the tincture and of water may be placed over the seat of pain and covered with oil-silk (Dr. Tilt).

37. ACTÆA RACEMOSA, *Linn.* Cimicifuga racemosa, *Elliot.* Black Snake-root. *Nat. Ord.* Ranunculaceæ. *Hab.* North America.

Med. Prop. and Action. The root from its bitterness has been deemed tonic, and from its popular use in chest affections expectorant, but recent researches have pointed out that its proper place is amongst the arterial and nervous sedatives. It has a marked effect in diminishing the force and frequency of the pulse, which effect lasts for a considerable time. In large doses it produces vertigo, impaired vision, nausea and vomiting with marked reduction of the pulse. By some it has been regarded as presenting a striking analogy to aconite; by others to colchicum. It appears to exercise a special action on the uterus and its functions. Its powers in this character, first pointed out in 1839, by Dr. Wheeler,[3] have since been confirmed by Dr. Ringer (p. 310). Its action on the uterus, he remarks, is very similar to that of ergot. Thus the contractions of the parturient uterus are made more powerful by it, and hence it hastens the expulsion of the child. Ergot differs, however, from actæa in producing a constant and continuous contraction of the uterus, while the natural movements of this organ are merely strengthened, but not prolonged by actæa. This latter remedy,

[1] Elem. of Surgery, p. 61. [2] Liverpool Med. Chir. Rev., Jan. 1858.
[3] Boston Med. Journal, Sept., 1839.

therefore, endangers much less the life of the child and the soft structures of the mother. For preventing after pains, and for assisting the expulsion of the placenta, ergot, however, is preferable on account of its more persistent action. *In Protracted Labours*, it seems worthy of a trial, as advised by Dr. Wheeler. Its activity is probably due to a resinous principle which has been designated *Cimicifugine*. It may be given in the form of powder, or in Decoction (oz. j. ad Aq. Oj.) in doses of fl. oz. j.–fl. oz. iij. till from Oss. to Oj. is taken daily; in Tincture (oz. iv. ad Sp. Rect. Oj.) in doses of fl. drm. j.–fl. drs. ij., in Fluid Extract in doses of fl. drm. j.–fl. drs. ij., or in Extract in doses of gr. v.–gr. viij.

Dose of Powdered Root, gr. xx.–gr. lx.

38. *Therapeutic Uses. In Diseases of the Lungs*, it has long enjoyed a high repute in America, and cases of *Phthisis* have been recorded which were thought to have yielded to its action; but Stillé (ii. p. 500) justly points out that these were probably chronic bronchitic affections, in which it is doubtless a useful remedy. *In the Chronic Bronchitis and Coughs of old age*, it appears to be specially useful. Prof. G. B. Wood (ii. p. 167) considers that it probably acts in these cases by allaying irritation through its sedative properties. *In Pleurodynia connected with uterine derangement*, it is stated to be very useful.

39. *In Acute Rheumatism*, it was brought forward as a valuable remedy by Dr. F. N. Johnson, of New York,[1] but the evidence of its utility is less conclusive than in *Chronic Rheumatism*, in which its powers have been more extensively tried. Sir J. Y. Simpson[2] bears testimony to its value in *Lumbago;* and evidence in its favour has been adduced by Dr. McDonald[3] and others. Dr. Ringer (p. 309) found it most useful in *Rheumatoid Arthritis*, where the joints are enlarged and much stiffened; but he remarks that it does not suit all cases alike, but best those in which the pains are worse at night. He found it also serviceable where the *Rheumatism can be traced to some previous derangement of the uterus or its functions.*

40. *In Chorea*, its powers have been extolled by many American physicians of high standing; and it has been successfully employed in this country by Sir J. Y. Simpson (op. cit.) and others. Stillé, who regards it as one of the most valuable remedies in this disease, considers it peculiarly adapted for purely uncomplicated cases, and in these he advises that it should be used in doses of sufficient strength to develop its specific effects. Dr. Ringer, however, found it successful only in those cases which were of rheumatic origin, and even in these it was not always effectual. He regards it as greatly inferior to arsenic.

[1] Trans. Amer. Med. Assoc., 1840.
[2] Medical Times and Gazette, Dec. 8, 1860.
[3] Edinburgh Medical Journal, Aug., 1861.

41. *In Uterine Affections*, it holds out the promise of being a valuable remedy. Dr. Morse[1] found it effectual in *Amenorrhœa;* and Dr. Ringer says it will certainly arrest *Menorrhagia*, though he regards it as inferior in this affection to bromide of potassium. *In Dysmenorrhœa, in Suppression of the Menstrual or Lochial discharges*, and in the *Hysterical* and other *Headaches*, and other distressing symptoms attendant on uterine derangement, it seems well deserving of a trial. Sir J. Y. Simpson (op. cit.) mentions a case of *Puerperal Hypochondriasis and Depression* which yielded rapidly to its use.

42. *Other Diseases. In Spermatorrhœa and Nocturnal Emissions*, Dr. Morse (op. cit.) advises its use, as giving tone to the nervous system, removing irritation, and procuring sound and refreshing sleep. *In Hysteria*, it seems occasionally of value. *In Ophthalmia*, Dr. Brandige[2] regards a saturated tincture as superior to all other local applications. *In Cynanche Maligna*, a decoction of the root is recommended by Dr. Barton as an excellent gargle. A strong decoction is said to be an effectual remedy in *Scabies*.

43. Adeps Præparatus. Prepared Lard. Axungia. The purified fat of the hog, Sus Scrofa, *Linn.*

Med. Prop. and Action. Emollient; not administered internally, except occasionally as an ingredient in laxative enemas. It enters into many ointments and cerates. From the rapidity with which it becomes rancid, it is inferior to Benzoated Lard (Adeps Benzoatus, B. Ph.); prepared by melting together by the heat of a water-bath, Benzoin gr. 160 and Lard lb. j.

44. *Therapeutic Uses. In Scarlatina*, inunction of the surface with lard was first proposed, in 1849, by Dr. Schneemann, of Hanover, and has since been adopted successfully by Dr. Mauthner,[3] of Vienna, Mr. Taylor,[4] of London, and others. The treatment has been further tested by Prof. Ebers,[5] of Berlin, who draws the following conclusions:—

1. The inunction with lard did not in any way interfere with the development of the disease, as might, *à priori*, have been expected. The eruption came out on the third day, and declined on the fourth or fifth.

2. The treatment was not contra-indicated by the presence of complications; on the contrary, these disappeared more favourably than under the ordinary treatment.

3. The chief thing to be noticed was the absence of desquamation. In no case was anasarca known to follow.

[1] New York Med. Journ., v. p. 70.
[2] Philadelph. Med. Exam., Dec., 1851.
[3] Révue Medico-Chir., Jan., 1849.
[4] New Treatment of Febrile and other Diseases. 8vo. London, 1850.
[5] Révue Medico-Chir., Aug., 1851.

4. This treatment appears to destroy the contagious principle.

The lard requires to be diligently rubbed in, over the whole surface of the body, every morning and evening, and, if the weather be cold, it should be done before a fire, to ensure the fat being absorbed.

45. *In Inflammatory and Typhus Fevers, in Measles and the Exanthemata generally*, inunction with lard is strongly advised by Mr. Taylor (op. cit.) He relates numerous instances in which inunction of an ointment, composed of equal parts of lard and suet, was attended with the best effects. No internal remedies were employed. He states that it reduces the force and frequency of the pulse, and that when employed at an early period of the disease, it wards off a typhoid condition. The dry and brown tongue becomes clean, the patient falls into a sound sleep, and delirium subsides; in fact, all the symptoms improve with a steadiness and rapidity not seen in other methods of treating fever. Inunction should be performed twice or thrice daily. The treatment, as an adjunct to other measures, is worthy of a further trial.

46. *In Erysipelas*, Mr. Erasmus Wilson (p. 147) considers that inunction with lard is in every way superior to all fluid applications. He first, at the suggestion of Mr. Grantham, relaxes the skin with hot water or steam, and then saturates the surface with hot lard, which is afterwards covered with wool. He also speaks highly of the value of lard inunctions in the treatment of *Violent Sprains*.

47. *In Skin Diseases accompanied with excessive dryness of the skin*, e.g., *Prurigo, Lichen, Psoriasis, Lepra, Pityriasis and Favus*, inunction with oil or grease is, according to Prof. Bennett,[1] essential to the cure. The various powders, as sulphur, oxide of zinc, calamine, &c., which enter into the ointments usually employed in these cases, he regards as possessing no therapeutic value, beyond giving increased consistence to greasy base, and thus preventing its rapidly melting or being too readily lost or absorbed. The lard or grease he regards as acting mechanically by excluding the access of air, which, he points out, is essential to the vitality of parasitic growth. "Sulphur ointment," he remarks, "is an excellent application in *Scabies*, because lard thickened with sulphur is more tenacious, more readily blocks up the follicles and grooves inhabited by the itch insect, and thus induces their more perfect asphyxiation." Dr. Bennett's views have not met with general acceptance by the profession; and he himself admits that the cure is slower when lard alone is employed than when it is incorporated with other ingredients.

[1] Practitioner, Oct., 1868.

48. ÆGLE MARMELOS, *D.C.* Bael. Bela. Bengal Quince. *Nat. Ord.* Aurantiaceæ. *Hab.* East Indies and Ceylon.

Med. Prop. and Action. Although all parts of this tree are employed medicinally by the natives of India, the fruit alone calls for notice in this place, and it merits particular attention from the valuable property it apparently possesses of establishing a healthy tone in the intestinal canal, arresting diarrhœa when present, and acting as a mild aperient when constipation exists. According to the analysis of Mr. Pollock[1] and Prof. Macnamara,[2] it contains tannin, a bitter principle, a vegetable acid, a peculiar balsamic principle, and gummy and fibrous matter. The tannin and balsamic principle exist in the largest proportion in the ripe fruit. The astringent action of bael is doubtless due in a measure to the tannin; but Dr. Macnamara suggests that to the balsam is due the tone which the fruit gives to the intestines, rendering the secretions of the mucous membranes more healthy. It may be advantageously given in the form of sherbet, thus—Take of the soft gummy substance from the interior of the fruit oz. ij., mix this with fl. oz. iij.–fl. oz. iv. of water, sweeten to the taste, and add, if procurable, a lump of ice. This agreeable drink possesses the aroma of the fruit, and may be repeated twice or thrice daily. When prepared from the ripe fruit, it is not only astringent, but possesses the singular property of being aperient if the bowels are irregular or costive. When the patient is debilitated and the stomach weak, it sometimes disagrees; it ought then to be given in small repeated doses, and if these also are rejected, the dry Extract (*Ind. Ph.*) in doses of gr. xxx.–gr. lx. twice or thrice daily, may be tried. Another good form of administration is that of *marmalade* prepared in the same manner as orange marmalade; it is usually taken like it, spread on bread, and it possesses the great advantage of keeping well for a long period.

The Dose of the Liquid Extract (*off.*) is fl. drm. j.–ij., but it may be carried to a larger extent with impunity.

49. *Therapeutic Uses.* In various forms of *Intestinal Derangement*, bael exercises a marked and valuable influence. Though noticed by Rheede, Burman, and other old writers, it attracted little notice till 1853, when Sir Ranald Martin[3] called attention to its use. In 1854, Dr. A. Grant[4] published a paper on it, bringing together all that had hitherto been known on the subject, and recording his own experience as to its employment. He states that he has been in the habit of recommending the sherbet (*ante*) as an aperient to persons subject to *Habitual Constipation*, a small tumblerful, taken early in the morning, producing generally one evacuation daily. *In cases of Dyspepsia with obscure symptoms of Land Scurvy*, it seemed also to act very beneficially, and to possess alterative as well as anti-scorbutic qualities. Many persons in Bengal, observes Dr. Grant, suffer, especially during the rainy season, from attacks of *Irregularity of the Bowels, periods of looseness, alternating with others of constipation;* in such states of the system, the sherbet acts admirably, in the first instance as an astringent, and in the second as an aperient. It serves in both these opposite conditions to stimulate the mucous membrane to a

[1] Lancet, July, 1853.
[2] Indian Ann. of Med. Sci., ii. p. 233.
[3] Lancet, 1853, vol. ii. p. 53.
[4] Ind. Ann. of Med. Sci., ii. p. 225.

more natural action, combining with the ingesta and aiding healthy assimilation. It is in *Scorbutic Dysentery* that its powers are best marked; indeed, Dr. Maclean (i. p. 123) expresses his conviction that where there is no scorbutic taint, it is without efficacy, and he considers that it has fallen into disrepute as an ante-dysenteric, simply from its indiscriminate use. *In Chronic Diarrhœa*, it has also been strongly recommended. Dr. Goodeve (i. p. 101), however, speaks of it in very qualified terms; he states that he has sometimes seen benefit from its use, but has been frequently disappointed in its effects. He adds that bael disagrees when the digestion is feeble, producing flatulence, acidity, and loss of appetite; in such cases he recommends its being taken at bed-time instead of the morning, as is usual. Some interesting remarks on the use of this remedy have been published by Dr. Cleghorn.[1]

ÆTHER. See ETHER.

50. ALCOHOL. ABSOLUTE ALCOHOL. C_2H_6O. Sp. Gr. 0·795.

SPIRITUS RECTIFICATUS. RECTIFIED SPIRIT. Alcohol, with 16 per cent. of water obtained by the distillation of fermented saccharine fluids. Sp. Gr. 0·838.

SPIRITUS TENUIOR. PROOF SPIRIT. A mixture of Rectified Spirit (Ov.) and Distilled Water (Oiij.) Sp. Gr. 0·920.

SPIRITUS VINI GALLICI. SPIRIT OF FRENCH WINE, BRANDY. Spirit distilled from French Wine.

MISTURÆ SPIRITUS VINI GALLICI. MIXTURE OF SPIRIT OF FRENCH WINE. Take of Spirit of French Wine *alias* Brandy and of Cinnamon Water āā fl. oz. iv., Yolk of two Eggs, Refined Sugar oz. ss.; rub the yolks and sugar together, then add the cinnamon water and spirit. *Dose*, fl. oz. j.–ij.

Med. Prop. and Action. All these articles are powerful diffusible stimulants, increasing the action of the heart and arteries, occasioning a rapid flow of ideas and images, usually of a pleasant description, exciting the nervous and vascular systems, and producing a general exhilaration. This is succeeded by a state of depression varying in intensity in proportion to the previous amount of excitement. Such is the effect of a single moderate dose. If the quantity taken be very large, the excitement is followed by a peculiar comatose state, which has not unfrequently been mistaken for apoplexy. Some persons can only take a limited quantity without its inducing vomiting. When taken internally, it is rapidly absorbed into the blood, and is eliminated from the system by the kidneys, skin, and lungs. Under its use, urea is diminished, and also the exhalation of carbonic acid by the lungs. The habitual use of alcoholic drinks in large quantities produces a series of the most evil consequences on the system, commencing probably on the mucous coats of the stomach, its functions and even structure being deranged and destroyed; dyspepsia is one of the earliest ill consequences, and this is followed by cirrhosis of the

[1] Ind. Ann. of Med. Sci., ii. p. 223.

liver and kidneys, loss of mental and physical vigour, and derangement of the nervous system, terminating in that peculiar form of mania well known under the name of delirium tremens. These remarks have reference to the abuse of alcoholic liquors in health; in disease, employed as a medicine in appropriate cases, they prove agents of the greatest value. (See Stimulants, Part ii.) Absolute alcohol is employed solely in chemical processes. For the most complete account of the effects of alcohol on the system, consult Dr. Anstie's "Stimulants and Narcotics" (Lond. 1864), a valuable contribution to medical literature.

51. *Therapeutic Uses. To superficial Inflammations, Bruises, Sprains, &c., attended with heat and pain, but without abrasion*, diluted spirit (1 to 6 or 8 of water) applied on a thin piece of lint forms an excellent evaporating lotion. *In Gout*, Sir C. Scudamore speaks favourably of a tepid lotion of 1 part of alcohol, and 3 of camphor mixture. *In Cerebral Affections*, ice is generally preferable to diluted spirit, but in its absence the latter may be used advantageously. In all these cases it is of the greatest importance to renew the lotion repeatedly, so as to keep the part constantly moist.

52. *In Ptyalism*, Sir T. Watson (i. p. 236) states that he has found nothing more generally useful than a gargle composed of 1 part of brandy and 4 or 6 of water.

53. *To Bed-sores* in the early stage of excoriation, an excellent application is a mixture of equal parts of rectified spirit and white of egg, applied frequently with a feather, and renewed as it dries till an albuminous coating is formed over the part (Christison). *To prevent the occurrence of Bed-sores*, it is a good plan to bathe the parts subjected to pressure daily with undiluted brandy; it serves to harden the parts.

54. *To prevent Sore or Fissured Nipples*, the daily application, for some days before delivery, of brandy or of a mixture of brandy and olive oil is said to be effectual: it acts by hardening the tissues. Stillé (i. p. 651) states that it is rendered more effectual by the addition of a small proportion of alum or tannin. Ringer (p. 234) says that with the same view it is a useful practice to bathe the nipple of a suckling woman with brandy each time it is used, and then carefully to wash the part and wipe it dry.

For the uses of Alcohol as an internal remedy, see Stimulants, Part ii.

55. ALOE BARBADENSIS. Barbadoes Aloes. The inspissated juice of the leaf of Aloe vulgaris, *Lam. Nat. Ord.* Liliacæ. Imported from Barbadoes.

ALOE SOCOTRINA. Socotrine Aloes. The inspissated juice of the leaf of one or more undetermined species of Aloe. Usually procured from Socotra *viâ* Bombay.

Med. Prop. and Action. Aloes, in doses of gr. ij.–vj., is a stimulating purgative, its activity depending upon a peculiar extractive matter,

Aloesin, readily soluble in water, but nearly insoluble in alcohol and ether. Its operation is particularly directed to the rectum and lower intestines, and it is administered with a view of stimulating, not only these viscera, but also the neighbouring organs, particularly the uterus. In this manner, it occasionally proves emmenagogue. It has been asserted that aloes does not act specifically upon the lower intestines, but that its operation on these parts is owing to its slow solubility, its action not being evident until it has passed into and become dissolved in this portion of the intestine; but this cannot be entirely the case, as, if aloes be applied to an ulcer or excoriated surface, it acts as a brisk purgative, producing stools of the same character as if administered internally. As a purgative, it is particularly adapted for use in chlorosis, amenorrhœa, and atonic states of the uterine system, in accumulations of fæces in the rectum and lower intestines, and in persons of a leucophlegmatic temperament. Aloes appears to exercise a marked influence over the venous system of the abdominal and pelvic organs. To this are due the increased flow of bile, the disposition to hæmorrhoids and irritation of the rectum, and the vascular excitement of the sexual organs which have been observed to follow its administration. Socotrine aloes is said to be less likely to occasion hæmorrhoids than Barbadoes, but experiments have not demonstrated much difference in the effects of the different kinds of aloes on man. They both contain the same crystalline principle (aloine), but the Barbadoes contains a much larger amount of matter insoluble in water. It has been asserted that the insoluble or so-called resinous matter in aloes is the more irritating constituent, and that the watery extracts are, therefore, safer and milder in their operation than aloes itself. From Dr. Garrod's experiments, however, on the watery extract of Socotrine aloes it appears that the so-called resin is a feeble agent, and that the watery extract whilst it is a more powerful purgative, causes much more griping than the resinous insoluble matter.[1] In small doses, aloes acts as a tonic to the alimentary canal, assisting digestion, promoting secretion, and stimulating the muscular coat.

56. *Observations on the Use of Aloes.* Dr. Greenhow,[2] to whom we are indebted for the following judicious remarks, states, that for several years he has employed aloes in every variety of dose, and that he has uniformly found that very small doses have answered all the purposes to be obtained from it—viz., substantial fæculent evacuations, attended with little or no irritation; and for this purpose from ij. to v. grains will be found sufficient. When administered in larger doses, it is apt to occasion griping, heat about the anus, and, if long continued, hæmorrhoids; it also loses its effect of properly emptying the large intestines, producing frequent small evacuations, consisting principally of mucus, and attended with tenesmus, the abdomen being at the same time distended and tender, and the patient complaining that "the bowels feel as if scraped;" the pulse is sensibly quickened, and a sense of constriction is felt about the head.

The long-continued use of aloes has a tendency to produce emaciation. Its action on the bowels becomes uncertain; mucus and bands of lymph, and sometimes, matter resembling fat, being passed with much tenesmus; and Dr. Greenhow thinks that he has seen enteritis and stricture of the rectum follow its prolonged exhibition. He considers that aloes exerts a decided influence on the kidneys, and states that he has repeatedly found that when squills, with other diuretics, failed to act, the addition of a small portion of aloes has speedily produced a copious diuresis.

When aloes is given simply as an aperient, the best vehicle is extract of gentian. According to Dr. Christison (p. 91), sulphate of iron materially increases the purgative powers of aloes, gr. j. of aloes with gr. ij.–iij. of the sulphate producing as much effect as gr. ij.–iij. of aloes alone; at the same time there is less tendency to irritation of the rectum: hence the Pill Aloes and Iron (*infra*) has special claims to notice. Soap, aromatic oils

[1] Med. Times and Gaz., Feb. 6, 1864. [2] Medical Gazette, Nov. 19, 1836.

and alkalies are said to diminish its purgative powers. One or two grains of ipecacuanha, combined with each dose of aloes, have the effect of diminishing, and often of altogether removing, its irritating effect upon the anus; and many persons labouring under piles are not only able to take it in this way with impunity, but with advantage. If it produce griping, a few grains of Ext. Hyoscyami may be added. Care should be taken, in every case, that the aloes be well pulverized. Camphor is said to render the action of aloes more certain and less irritating.

Aloes should be given with caution—1, to pregnant females; 2, to women suffering from dysmenorrhœa, menorrhagia, or organic disease of the uterus; 3, to hæmorrhoidal subjects, excepting in combination with ipecacuanha or henbane; 4, during the presence of the catamenia.

Dose:—Of Aloes, Barbadoes or Socotrine, grs. ij.–vj. *Of the Watery Extract*, grs. ij.–vi. *Of the Compound Pill* (Aloes, oz. ij.; Hard Soap, oz. j.; Oil of Caraway, fl. dr. j.; Conf. of Roses, oz. j.), gr. v.–x. *Of Pill Aloes and Assafœtida* (Socotrine Aloes, oz. j.; Assafœtida, oz. j.; Hard Soap, oz. j.; Conf. of Roses, oz. j.), gr. v.–x. *Of Pill Aloes and Iron* (Barbadoes Aloes, oz. ij.; Sulphate of Iron, oz. 1½; Compound Powder of Cinnamon, oz. iij.; Conf. of Roses, oz. iv.), gr. v.–x. *Of Pill Aloes and Myrrh* (Socotrine Aloes, oz. ij.; Myrrh, oz. j.; Saffron, oz. ½; Conf. of Roses, oz. iiss.), gr. v.–x. *Of the Compound Decoction* (Ext. of Socotrine Aloes, gr. cxx.; Myrrh, Saffron, āā gr. xc.; Carb. of Potash, gr. lx.; Ext. Liquorice, oz. j.; Comp. Tinct. of Cardamoms, fl. oz. viij.; Water, q. s. and fl. oz. xxx.), fl. oz. ½–ij. *Of the Wine* (Socotrine Aloes, oz. iss.; Cardamom Seeds, Ginger, āā gr. lxxx.; Sherry, Oij.), fl. dr. j.–ij. *Of the Tincture* (Socotrine Aloes, oz. ½; Ext. of Liquorice, oz. 1½; Proof Spirit, Oj.) fl. dr. j–ij. *Enema of Aloes* (Aloes, gr. xl.; Carb. of Potash, gr. xv.; Mucilage of Starch, fl. oz. x.)

57. *Therapeutic Uses. In Habitual Constipation*, aloes ranks high in the list of purgatives, especially when this state depends upon atony of the colon, whether this be the result of fever and debilitating diseases, old age, or sedentary habits or occupations. It may be variously combined, as indicated, with quinia, nux vomica, ipecacuanha, or aromatics. Dr. Spender[1] strongly advises the following pill:—℞ Ext. Aloes Aq. gr. ss.–j., Ferri Sulph. gr. iss.–ij., to be taken thrice daily, immediately after the principal meals. These are to be taken regularly for a few days till the occurrence of the first loose motion, after which, one only is to be taken night and morning. Nothing approaching purgation ought ever to be permitted. At the end of a week or two another pill may be omitted; and within a month a single pill once or twice a week suffices. *In the Constipation of Hysteria*, the officinal pill of aloes and assafœtida is most serviceable; and *in the Constipation of Anæmia and Chlorosis*, the pill of aloes and iron, or aloes and myrrh, or the decoction of aloes with the simultaneous use of pills of iodide of iron, often produce excellent effects. *In the Constipation of Chronic Mania*, aloes is highly spoken of by Prof. Van der Kolk (p. 111). He considers that he has seen injury from it in large single ordinary doses, in place of which he directs gr. xv. of the aqueous extract to be combined with gr. v. of tartar emetic and some bitter extract, and to be

[1] Med. Times and Gazette, Feb. 19, 1870.

divided into 60 pills; of these from 2 to 4 to be taken four or five times a day. In time even these doses cease to be well borne, and the quantity must be gradually diminished, until at last the remedy is no longer needed. When constipation alternates with watery stools, he substitutes sulphate of copper for tartar emetic, and the combination may be continued for months together with advantage. If spasm co-exist, he adds belladonna, which increases the activity of the aloes, so that the dose of the latter may be decreased. When a thickly coated tongue indicates a special irritation of the mucous intestinal canal, he directs aloes to be conjoined with hydrochlorate of ammonia; by the use of which, he states, this appearance usually vanishes within a few days. In this combination tartar emetic is to be omitted.

58. *In Dyspepsia*, occurring in persons of a relaxed habit, or in those who have been debilitated by long illness, particularly if there is reason to believe the duodenum to be implicated, a combination of aloes (gr. ij.–iv.) and ipecacuanha (gr. j.–ij.) twice or thrice a week is often attended with benefit. It has been found serviceable also in *Jaundice*. *For the removal of Thread-worm* from the rectum, an enema of decoction of aloes is often effectual.

59. *In Amenorrhœa*, a small enema containing aloes (gr. x.) employed at the proper menstrual period, is spoken of by Schönbein as more certain in its operation than any other emmenagogue. Dr. Ashwell tried this practice in two or three cases with decided advantage. Aloes may also be advantageously given internally in the form of Pil. Aloes et Myrrh, together with Mist. Ferri Co. Dr. Tilt (p. 218) advises a combination of aloes and podophyllin.

60. *In Apoplexy, Congestive Headaches, and other cerebral affections arising from suppression of hæmorrhoidal discharge*, or in persons of a phlegmatic habit, aloetic purgatives are indicated and often prove beneficial. Conjoined with nux vomica, they may also prove useful in *Paralysis*.

61. *In Chronic Urticaria*, Mr. E. Wilson (page 158) states that he has derived the greatest benefit from aloetic purgatives combined with citrate of iron, or nitro-hydrochloric acid in a bitter infusion. *In Fissures and Excoriations of the Skin caused by Lichen Agrius, Eczema, &c.*, M. Chausit[1] speaks highly of the healing powers of the glycerine of aloes formed by evaporating from 4 to 8 parts of the tincture of aloes, and incorporating the residuum with 30 parts of glycerine. In some cases in my own practice it acted beneficially. *To Bed-sores and Indolent Ulcerations*, M. Delioux[2] found a solution of aloes (1 part) in alcohol (2 parts) a very efficient application.

[1] Gaz. des Hôpitaux, 1857. [2] Bul. de Thérap., vol. lxvi., p. 24.

62. ALUMEN. ALUM. A sulphate of ammonia and alumina crystallized from solution in water. $NH_4Al(SO_4)_2$. 12 H_2O.

ALUMEN EXSICCATUM. DRIED ALUM. Alum subjected to heat, not exceeding 400° F., till aqueous vapour ceases to be disengaged, and the salt has lost 47 per cent. of its weight.

Med. Prop. and Action. Alum is astringent and styptic, whether employed internally or externally. Its local effects depend upon a chemical action on the albuminous and gelatinous constituents of the tissue. When administered internally, it is absorbed into the system, and has been detected in the liver, spleen, and urine. "After its absorption," says Pereira, "alum appears to act as an astringent on the system generally, and to produce, more or less, general astriction of the tissues and fibres, and a diminution of secretion." Its astringent influence is chiefly directed to mucous surfaces; applied locally to relaxed or bleeding surfaces, it corrugates the surrounding tissues, and causes contractions of the capillaries. In this manner, it arrests the discharge, and acts as an astringent. Administered internally in large doses it has an emetic action.

63. *Modes of Administration.* The usual mode of administering alum is in solution in water or in some simple infusion; but Sir J. Murray[1] considers that, employed in this way, many of its most useful effects are in a great measure neutralized. He advises its being reduced to an impalpable powder; and then mixed with a little honey or molasses, so as to form an electuary. In order to prevent its producing constipation, he advises the addition of the acid tartrate of potash. Given in this manner, the full effects of the medicine will soon evidence themselves. This electuary, without the potash, diluted with a little water, forms an excellent gargle, which acts, in the opinion of Sir J. Murray, not only as a constringing lotion, diminishing the diameter of enlarged vessels, but as a means of reducing the size of enlarged and turgid glands and tissues. Another mode of administering alum is in the form of whey, which is made by boiling gr. cxx. of powdered alum for a few minutes in Oj. of milk. A teacupful of this, thrice daily, is a popular astringent and tonic in many parts of England. The Liq. Aluminis Co. (Ph. L.) (Alum., Zinci Sulph. āā ʒj. Aq. Ferv. Oiij.) is an excellent form for injections, collyriums, &c.

Dose of Alum, gr. x.–xx. Dried Alum is only used externally as an astringent and mild escharotic.

64. *Therapeutic Uses. Diseases of the Abdominal Viscera. In Colica Pictonum*, alum has long been held in high repute, and since its introduction from Holland by Dr. Percival, in 1774, it has been extensively employed. The theory of its action is, that it converts the poisonous salt of lead in the system into a comparative innocuous sulphate. Dr. Brachet[2] employed it in 150 cases with complete success, giving ʒiss.–ʒij. daily, with gutt. xl.–l. T. Opii, and with an occasional dose of castor or croton oil to procure one or two motions daily. It may be advantageously combined with sulphuric acid, as advised by Briquet.[3] ℞ Alum ʒj., Acid Sulph. ʒj., Aq. lb. iv. M. This,

[1] Dublin Med. Press, March 14, 1849.

[2] Brit. For. Med. Rev., Jan., 1851.

[3] Bul. de Thérap., liii. p. 97.

sweetened to the taste, should be drunk during the day. To this he added gr. j. of opium at bed-time, and sulphurous baths.

65. *In Chronic Dysentery*, it was more highly thought of and more employed formerly than it is at the present day. Adair found it useful combined with opium and aromatics in an epidemic dysentery occurring amongst negroes (Copland); and I have often seen benefit from it in doses of gr. xxx. daily, in conjunction with Dover's Powder, in the asthenic dysentery of Asiatics.

66. *In Diarrhœa dependent upon a relaxed condition of the mucous intestinal membrane*, alum, gr. xxx.–xl. daily, often proves beneficial. It may be given as follows:—℞ Alum gr. x., Pulv. Kino Co. gr. v., Conf. Rosæ q. s., ft. pil. sextis horis sumend. Benefit has also been found from alum (gr. x.–cxx. according to age) administered in the form of enema. *In the Diarrhœa of Typhoid Fever*, alum proved very effectual in the hands of Fonquier, of Paris.[1] Dr. Dürr[2] found that in doses of ʒss.–ʒj. daily, it powerfully controlled *Infantile Cholera*. It may be advantageously combined with aromatics and sedatives.

67. *In Catarrhal Affections of the Stomach*, Sir J. Murray (op. cit.) speaks in the highest terms of alum. In one aggravated case, attended with *Pyrosis*, a complete cure was effected by alum in electuary (*ante*), in doses of gr. xxij. thrice daily. He considers that it renders the mucous coats more firm, and restores their tone and strength.

68. *In Prolapsus of the Rectum*, the injection of a solution of alum (gr. lx.–gr. cxx. ad Aq. fl. oz. viij.) proves serviceable. It may also be used with advantage in *bleeding and painful Piles*, when unattended by inflammation.

69. *Affections of the Mouth, Throat, and Fauces. In Stomatitis and Catarrhal Affections of the Throat*, the local application of alum is very serviceable. In chronic cases, when the mucous membrane is much congested, and covered with mucus, which gives rise to a troublesome cough, alum gargles (gr. lx.—Aq. fl. oz. vj.) afford great relief and benefit. *In acute cases*, alum, reduced to an impalpable powder, and blown through a quill on the affected part, is stated by M. Perrin[3] and others to be signally successful. See Art. Insufflation, part ii.

70. *In Croup*, alum is commended by Prof. Meigs[4] as an emetic, in preference to antimony or ipecacuanha. He states that it acts more speedily and certainly than these medicines, and produces less prostration of the vital powers. The dose, gr. xxx.–gr. lx., is to be mixed with a teaspoonful or two of

[1] Bul. de Thérap., ix. p. 301.
[2] Hufeland's Journal, July, 1835.
[3] Bull. Gén. de Thérap., Mar. 1842.
[4] Medical Times, vol. xvi. p. 416.

water, and repeated every ten or fifteen minutes, until it produces a full emetic effect. It is rarely necessary to repeat it.

71. *In Ulceration and Relaxation of the Throat*, a solution of alum in water or decoction of cinchona (gr. lx. ad Aq. fl. oz. xij., sweetened with honey), proves a very useful gargle for ordinary cases.

72. *In Ptyalism and in Ulceration and Sponginess of the Gums, whether Mercurial or Scorbutic*, the lotion advised in the last section, with the addition of T. Myrrhæ fl. oz. ss., will prove useful. It should be used several times daily. *As a means of preventing the occurrence of salivation under prolonged courses of mercury*, Dr. T. J. Walker[1] advises that the patient should suck a small piece of alum every hour or two for two or three minutes at a time. By this measure and by attending carefully to cleanliness of the mouth, an essential point, he has, in obstinate syphilis, continued mercurial inunction daily for months, until every symptom of the disease has disappeared, without the occurrence of salivation or even of tenderness of the gums.

73. *Diseases of the Genito-urinary Organs. In Gonorrhœa and Gleet*, the injection of a solution of alum (gr. ij.–iv. ad Aq. fl. oz. j.) is often productive of benefit. The diluted Liq. Alum Co. (one part to six or eight of water) is also a good formula. In obstinate cases, it may be advantageously administered internally, combined with cubebs. *In Gonorrhœa Præputialis*, a solution of alum (gr. lx.—Aq. fl. oz. j.) applied on lint to the part is generally effectual.

74. *In Leucorrhœa*, alum combined with Pil. Aloes Co. proves highly serviceable. It may be given in doses of gr. viij. thrice daily. It also forms, with sulphate of zinc (Liq. Aluminis Co.), an excellent vaginal injection. The decoction of oak bark also forms a good vehicle (Alum gr. lx. ad Decoct. Oj.) Dr. Dewees (p. 81) states that, in some obstinate cases, he has effected a cure by alum (gr. v.) and nitre (gr. x.) thrice daily. The injection found most serviceable by Dr. Tyler Smith is as follows: ℞ Alum Sulph. ℥ss., Tannin ℥j.–℥ij. Aq. Oij. M. One-half to be used at night and the other in the morning. Dr. Graily Hewitt (p. 398) reports favourably of this injection. Some caution, however, is necessary is these cases. Dr. Tilt (p. 54) states that he has repeatedly known the prolonged use of alum injections produce an irritable, sub-inflammatory state of the cervix uteri; and he advises that when astringent injections are long required, those of alum, and zinc, and of acetate of lead should be used on alternate days. *In the Vulvitis of Children*, few remedies, according to Dr. Ringer (p. 137), can be compared to a solution of alum (gr. lx. ad Aq. Oj.), used as

[1] Brit. Med. Journ., July 10, 1869.

an injection, and as a wash kept constantly applied to the external parts. Like other remedies, however, it often fails.

75. *In Menorrhagia and Uterine Hæmorrhage*, alum administered internally often proves effectual in controlling the discharge. Dr. Tilt (p. 226) states that, in uterine hæmorrhage, alum given in solution with sulphuric acid is the first remedy to try, and that it often suffices. In purely atonic cases, alum in solution (gr. lx., Decoct. Querc. Cort. Oj.) may be used as a vaginal injection. It is inadmissible if any inflammatory symptoms are present.

76. *In Morbid Growths and Ulcerations of the Uterine Cavity, or of the Os Uteri*, an alum hip-bath (Oj. Alum. ad Aq. Cj.) is strongly advised by Dr. Ashwell, and its utility is confirmed by the reports of Delmas, Récamier, and others. Care should be taken that the fluid passes well up into the vagina. *In Prolapsus Uteri*, the same measure is attended with the best effects.

77. *In Hæmaturia*, which resists the action of the acetate of lead and other ordinary remedies, the injection into the bladder of a solution of alum (gr. xx. ad Aq. Oj.) is sometimes effectual in arresting the discharge. This should not be had recourse to, until it has been ascertained that the bladder, not the kidneys, is the seat of disease. Dr. Prout observes that he has "never seen any unpleasant consequences follow the use of this expedient; and that he has seen it immediately arrest the most formidable hæmorrhage, when all other remedies had failed, and when the bladder had repeatedly become again distended with blood almost immediately after its removal." If, after the use of the injection, coagula remain in the bladder, they should be broken up by repeated injections of cold water. Alum in doses of gr. x.–xv. may be given internally at the same time; although, as an internal remedy, it is less efficacious than gallic acid. *In Catarrh of the Bladder*, it is highly spoken of by Sir J. Eyre, in doses of gr. x.–xv. thrice daily.

78. *In the Ophthalmia of Infants*, one of the most effectual applications is a solution of alum (gr. iv.–vj. ad Aq. fl. oz. j.) It should be gently squirted into the eye with a small syringe every hour or half-hour, according to the severity of the case, the object being thoroughly to cleanse the eye from all discharge as often as it is re-secreted. At bedtime, a little spermaceti ointment should be smeared on the edges of the lids to prevent them gumming together. In mild cases of *Purulent and Gonorrhœal Ophthalmia*, the same solution, with or without the addition of sulphate of zinc (gr. j.), may suffice; but in severer cases, the nitrate of silver (*q. v.*) is more effectual. As the disease is very depressing, and the tendency to ulceration and sloughing of the cornea is increased as the vital energies of the patient are lowered, the strength should be supported by tonics,

diffusible stimuli, and a liberal diet (Mr. G. Lawson[1]). See also Argenti Nitras. *In Variolous Ophthalmia*, Mr. Marson[2] advises as a fomentation, a solution of alum in decoction of poppy (℥j. ad Oj.), and smearing the eyelids at night with Ung. Cetacii. Should this fail, the nitrate of silver, in substance or in solution (gr. xx. ad Aq. ℥j.), may be necessary. Generous diet, port wine, and quinine should be used at the same time.

79. *In the Ophthalmia of India*, commonly known as "Country Sore Eye," I can speak from experience of the efficacy of the following native application:—Place some finely powdered alum on a heated plate of iron, and whilst the salt is in a state of fusion, add a small portion of lemon or lime-juice, until it forms a black soft mass. This, whilst hot, is placed entirely round the orbit, taking care that none of it gets beneath the eyelids, as it causes, under these circumstances, intense agony. One or two applications, each being allowed to remain on for twelve hours, are sufficient in ordinary cases to effect a cure.

80. *In Ecchymosis of the Eye*, and in *some forms of Ophthalmia*, an alum poultice is an effectual application. It is made by agitating a small piece of alum with the white of an egg, until it forms a coagulum. This is placed between two pieces of thin rag, and applied to the eye for some hours.

81. *Hæmorrhagic Diseases.* The value of alum in menorrhagia and hæmaturia has been already considered. It likewise proves serviceable in purely *atonic Hæmoptysis.* When of tubercular origin, and the hæmorrhage is moderate but persisting, the following formula is advised by Dr. Symonds[3]:—℞ Alum gr. v., Acid Sulph. Dil. ♏xx.–xxx., Magnes. Sulph. gr. x. Aq. ℥x. M., repeated every three hours, or oftener, as required. Alum in substance, or alum lozenges, allowed to dissolve slowly in the mouth, are also adjuncts of some value in these cases. *In atonic Hæmatemesis*, alum in doses of gr. viij.–xij. thrice daily, in combination with opium, proves serviceable, although it is of inferior efficacy to the acetate of lead. *In profuse atonic Epistaxis*, the injection of a solution of alum (gr. cxx. ad Aq. fl. oz. vj.) into the nostrils often proves effectual in arresting the discharge. *In Hæmorrhage from leech bites, in that from the gums after the extraction of a tooth, and in other superficial hæmorrhages*, a saturated solution, or dried alum, locally applied, acts as an effectual styptic.

82. *Other Diseases. In the Chronic Stage of Hooping Cough*, no remedy is more generally efficacious than alum, in doses of gr. iij.–iv., every four or six hours, for a child from one to two years old. It may be given in either of the following forms:—℞ Alum gr. xxv., Ext. Conii gr. xii., Aq. Anethi fl. oz. iij., M.

[1] Practitioner, Dec., 1868.
[2] Reynolds's Syst. of Med., i. p. 460.
[3] Brit. Med. Journ., June 13, 1868.

Dose, a dessert-spoonful every four or six hours for a child æt. two to four years (Dr. Golding Bird); or, ℞ Alum gr. xxiv., Acid. Sulph. Dil. ♏xii., Syr. Rhœad. fl. drm. iv., Aq. fl. oz. ijss., M.; dose, fl. drm. iij., sextis horis (Dr. West). One of the advantages of alum is that it may be commenced, without prejudice, earlier in the disease than most remedies of the same class.

83. *In Chronic Skin Diseases* attended with much discharge, benefit sometimes results from a solution of alum (ʒj. ad Aq. ʒvj.), to which opium may be added, should it cause much irritation. *Indolent and Scorbutic Ulcerations* and *Fungous Granulations* improve under the application of dried alum; but as it is apt to cause much pain, it may be used in the form of ointment, with the addition of opium. Powdered catechu is often a valuable adjunct. Used thus, it is thought to hasten the process of cicatrization. *In Hospital Gangrene*, Dr. J. P. Walker[1] speaks in the highest terms of an ointment, containing calcined alum, catechu, opium, and rusot (extract of Berberis). It appears to be a very effectual application. A strong solution of alum has been advised for the removal of *Nævi*, but it is inferior to many other remedies. Compresses saturated with it require to be applied for weeks.

84. *To Chilblains*, an alum poultice (sect. 80) is stated to be an excellent application. It is only admissible in unbroken chilblains.

85. Ammonia. $NH_3 = 17$. At ordinary temperatures it is gaseous. By great pressure it is condensed into a transparent, colourless fluid. Sp. gr. 0·76. Dry Ammonia has no alkaline reaction, the presence of water is required for the manifestation of this property. By assuming the existence of the hypothetical metal Ammonium, NH_4, the chemical nomenclature of the salts of ammonia is assimilated to that of the salts of the other alkaline metals.

Phys. Effects of Ammonia and its Salts. Hufeland[2] observes that the officinal, and probably all, the salts of ammonia have the property, to a greater or less degree, of dissolving the blood corpuscles, although slowly, and the protein textures generally. When blood is combined with an ammoniacal salt, it acquires generally a brighter red; but this soon passes into a brownish red hue: it does not coagulate, but forms, at best, a loose, semi-fluid cruor, the corpuscles begin to disappear, and the whole becomes more limpid. Blood thus decomposed, progressively evolves distinct traces of ammonia. It is very probable that we may partially explain, upon chemical grounds (solution and disengagement of ammonia), why large doses of the hydrochlorate of ammonia act as poisons, and smaller doses, long continued, induce a scorbutic condition. Yet the same salt judiciously exhibited, furnishes a valuable stimulant to the secretory and

[1] Indian Ann. of Med. Sci., v. p. 83.

[2] Chemie und Med. &c., Berlin, 1841.

excretory apparatus. That chemical attraction is inadequate to account for the therapeutic and poisonous quality of the hydrochlorate is obvious, inasmuch as it exercises a general action and induces inflammation of the stomach, even when introduced into the subcutaneous cellular tissue.

Dr. B. W. Richardson[1] has come to the conclusion that the coagulation of the blood depends on the evolution from it of ammonia. Without going into the question of the correctness of this view, which has met with strenuous opposition both here and on the Continent, it is of importance to notice his observations on the physiological effects of ammonia. He has confirmed the statement that the effect of the addition of ammonia to freshly drawn blood, is to prevent coagulation, and to destroy and alter the blood globules. In this respect the action of ammonia resembles that of the fixed alkalies. When ammonia or its carbonate is administered for some time to animals or man, the effect is to modify the blood corpuscles; they become easily soluble, crenate at the edge, many-sided, colourless, transparent, collapsed, and loosely agglomerated, but not in rolls; and the blood when drawn, or after death, is absolutely fluid or loosely coagulated. These changes in the blood he thinks correspond closely with those observed by Jenner in the blood of patients suffering from typhous fevers. By making animals breathe or swallow ammonia, Dr. Richardson has been able to induce a condition resembling the typhoid in man. A superalkaline condition of the blood from the presence of an excess of ammonia is observed in yellow and typhous fevers, and other diseases of the typhoid type, and in cases where the function of the kidney is suppressed. In such conditions, therefore, he believes that the administration of ammonia and other alkalies is contra-indicated. The ammoniacal condition of the blood is recognised by the ammoniacal condition of the breath, tested by a rod dipped in hydrochloric acid. Ammonia acts in the first instance as an excitant to the heart and respiration, but in its principal effects he believes it does not differ from the other alkalies. It is most useful in all cases where fluidity of the blood and plastic tissues are required—in all cases of the inflammatory type when fibrin is in excess, and where there is a rapid oxidation—in cases of induration of the tissues; and it may be given as the other alkalies when acidity of the secretions is a prominent symptom, as in acute rheumatism.

Salts of ammonia with a vegetable acid, such as the acetate, citrate, or tartrate, exert no influence in producing an alkaline condition of the urine. The ammonia is either oxidized and converted into nitric acid, or more probably eliminated by the skin and mucous membranes. It does not pass through the renal organs.[2]

The vapour of ammonia is powerfully irritant; if inhaled, it produces spasm of the glottis, and death results from asphyxia. The diluted vapour causes much irritation of the lining membrane of the bronchial tubes, and also that of the mouth and nose. It is also a powerful nervine stimulant, as is best seen in the application of the vapour in *syncope*. Ammonia is the basis of the following preparations :—

86. Ammoniæ Acetatis Liquor. Solution of Acetate of Ammonia, $NH_4,C_2H_3O_2$, dissolved in water. Prepared by adding Acetic Acid (fl. oz. x.) to Carbonate of Ammonia (oz. iij$\frac{1}{4}$ or q.s.) until a neutral solution is formed, and then adding Distilled Water Oiiss.

Med. Prop. and Action.—Refrigerant and diaphoretic in doses fl. drm. ij.-vj. Its action appears to be much increased by combination with other remedies of the same class. Externally it is occasionally used as a lotion to sprains.

[1] Astley Cooper, Prize Essay on Coagulation of the Blood.
[2] Garrod, Med. Times and Gazette, Feb. 6, 1864, p. 147.

87. *Therapeutic Uses. In Febrile and Inflammatory Affections and Exanthemata*, few medicines are in more general use than Liq. Ammon. Acet. conjoined with Sp. Ætheris Nit., Ant. Tart., &c., and ordinarily it seems beneficial, but it may admit of a doubt whether the routine practice in all cases is a desirable one. Speaking of this and other salines, Dr. Waters (p. 50) observes that there can be no doubt that they are sometimes agreeable to the patient and afford relief to the distressing thirst which is occasionally present; further, by supplying water and certain constituents to the blood, they may promote the action of the skin, as well as other excreting organs, and thus have a curative effect. *In Catarrh and Influenza*, a combination of Liq. Ammon. Acet. and Nitric or Chloric Ether is often of great service. *For the Coryza of Childhood*, Dr. West (p. 290) supplies us with the following useful formula:—℞ Liq. Ammon. Acet. ʒj., Vin. Ipecac. ♏xvj., Pota Nit. gr. viij., Mist. Amygd. ʒvij. M. Dose, fl. drm. j. every four hours for a child æt. six months.

88. *In Sick Headache*, few remedies are so successful as a teaspoonful or two of this solution (Stillé). The same dose, repeated in a few minutes should the first be vomited, is reported by several German physicians quoted by Stillé (ii. p. 524.) to be very effectual in speedily putting an end to the phenomena of *Drunkenness*.

89. *To Sprains, Bruises, Glandular Enlargements*, it is occasionally used as a lotion, and Dr. A. T. Thomson (p. 886) speaks highly of it as a local application in *Porrigo of the Scalp*.

90. Ammoniæ Benzoas. Benzoate of Ammonia, $NH_4C_7H_5O_2$. Prepared by dissolving Benzoic Acid (oz. ij.) in Solution of Ammonia (fl. oz. iij.) previously mixed with Distilled Water (fl. oz. iv.), and evaporating at a gentle heat to crystallization.

Med. Prop. and Action.—Diuretic and stimulant of the mucous membrane of the urinary passages. Its action is that of Benzoic Acid (*q.v.*), but it is preferable on account of its greater solubility. It renders the urine acid and irritating, its benzoic acid being converted into hippuric acid, in which state it is eliminated by the kidneys. It exercises no influence on the formation or secretion of uric acid.

Dose, gr. x.–xx.

91. *Therapeutic Uses.* Similar to those of Benzoic Acid, *q.v.*

92. *In Chronic Inflammation of the Bladder*, Dr. Garrod has found much benefit from its employment. It is of considerable service where a tendency to phosphatic deposit exists.[1]

93. *In Ascites connected with Atrophy of the Liver*, Dr. Murchison (p. 257) states that the benzoate of ammonia (gr. x.–xx.), as well as the muriate, sometimes proves useful

[1] Med. Times and Gazette, Feb. 6, 1864.

as a diuretic, and may be advantageously combined with taraxacum.

94. *In the advanced stages of Scarlatina, when Albuminuria and Hæmaturia are present*, the benzoate (gr. v.) has been recommended, and Dr. Hillier (p. 319) states that it has sometimes appeared to him to exert a good effect.

95. Ammonii Bromidum. Bromide of Ammonium, NH_4Br.

Med. Prop. and Action. Dr. Gibb has investigated the physiological effects of this salt. He finds that as an absorbent in glandular and other enlargements it is not inferior to the bromide of potassium. It appears to exercise a beneficial effect in a number of diseases in which the ganglionic nervous system is functionally engaged. It also exercises a marked control over the mucous membranes of the entire body, and especially appears to deaden the sensibility of the fauces and palate. According to Dr. H. Purdon,[1] the first action of the bromide is to quicken the pulse, and when given in large doses, to act as a powerful anodyne, occasioning sleep and increasing the secretions.

Dose, gr. ij.–xx. thrice a day.

96. *Therapeutic Uses. In Hooping Cough*, Dr. Gibb has found it of great value. He finds that many cases may be readily cured by it. If there is a tendency to bronchial or pneumonic inflammation, he recommends that it be combined with ipecacuanha wine. It appears to control the special nervous symptoms of the disease rather than the catarrhal. The spasms diminish in frequency and severity, and the whoop is not so frequently heard. He has a greater faith in the permanent effects of nitric acid, but thinks the bromide of ammonium worthy of a more extended trial. The dose of the bromide for infants is gr. ij. or iij. three times a day. For older children gr. iv.–viij., or gr. x. when the symptoms are very severe.[2]

97. *In Epilepsy*, Dr. Gibb has prescribed it with the effect of arresting and diminishing the number of fits.[3] *In Vertigo* from overwork in the well-fed, where there is usually restlessness, insomnia, depression of spirits, with a sense of impending evil, Dr. Ramskill (ii. p. 152) states that he has found great help from the bromide given in an effervescing form with cascarilla. *In Delirium Tremens*, it has been employed by Dr. Peacock[4] with very good results.

98. *In Strumous Ophthalmia*, its effects are sometimes beneficial and decided. In *Conjunctivitis*, *Corneitis*, and *Leucoma*, *opacities* are found to diminish under its use. (Gibb.)

99. *In Glandular Enlargement* and *Atheroma*, it has been found to promote the absorption of the morbid deposit. *In Corpulency*, the adipose tissue is lessened, and the secretion from the oily sudoriferous glands is modified and diminished. (Gibb.)

[1] Jour. of Cutaneous Med., Oct. 1867.

[2] Lancet, Sept. 26, 1863, p. 365.

[3] Lancet, Jan. 3, 1863, p. 11.

[4] Brit. Med. Jour., July 3, 1869.

100. *In Prurigo*, Dr. H. Purdon (op. cit.) found great benefit from the bromide, in doses of gr. x., gradually increased to gr. xx. thrice daily, the only local application being the glycerine of borax.

101. AMMONIÆ CARBONAS. Carbonate of Ammonia. Sesquicarbonate of Ammonia. (*Ph. Lond. and Dub.*) Volatile or Smelling Salts. Salts of Hartshorn, $N_4H_{16}C_3O_8$.

Med. Prop. and Action. Antacid, stimulant, diaphoretic, and expectorant. It is preferable to all the other alkaline carbonates, in cases where the vital powers are much depressed. It is emetic in doses of gr. xxx.; in larger doses it causes colic, convulsions, and great disturbance of the nervous system. If taken for a long period, it occasions much itching of the scalp, and the skin generally. In inducing a liquid state of the blood, and in other respects, it resembles the other salts of ammonia (see sect. 85). It is very valuable as "smelling salts," in *syncope*, *hysteria*, and *asphyxia*. It is occasionally used for making effervescing draughts: 20 grs. of the carbonate = 6 fl. drs. of lemon-juice = 24 grs. of Citric Acid = 26 grs. of Tartaric Acid. The two former, the citrate of ammonia, and the latter, the tartrate, are very useful refrigerants in febrile attacks and in gastric irritation.

Dose:—As a stimulant and diaphoretic gr. iij.–x. As an emetic gr. xxx.

102. *Therapeutic Uses. Acidity of the Primæ Viæ, Heartburn, Flatulence.* In these affections, particularly when occurring in cases of atonic dyspepsia, or in hysterical females, the carbonate, in doses of gr. v.–viij. in some aromatic water or mild bitter infusion, proves very efficacious.

103. *Asthma.* In those forms of asthma arising from, or connected with disease of the heart, Dr. Hope (p. 414) states that he has derived more benefit from this salt, in doses of gr. x.–xv., than from any other remedy. In a very obstinate case which resisted all other medicines, the following formula afforded great relief:—℞ Ammon. Carb. gr. viij., Antim. Tart. gr. $\frac{1}{4}$, Aq. Anisi f℥iss., M. ft. haust, alternâ horâ sumend.

104. *Cancrum Oris.* Mr. Wallace[1] states that he has seen some very severe cases of cancrum oris cured by the internal use of the carbonate, in doses of gr. v., gradually increased to gr. x.–xx., every two or three hours, according to the severity of the symptoms. He advises the strong nitric acid as a local application, at the same time. A liberal diet should be allowed.

105. *Diabetes Mellitus.* Dr. Barlow[2] considered the carbonate of ammonia as the most clearly indicated and the most efficacious remedy in this disease. The following is the theory on which he formed this opinion. He believed that the sugar found in diabetic urine is not necessarily connected with, or dependent upon, perverted action of the kidneys, but that it is formed in the primæ viæ, in the early stage of the process of

[1] Dublin Hosp. Reports, vol. iv. [2] Guy's Hosp. Reports, vol. x.

sanguinification. The saccharine particles of food are not changed in the stomach, whilst the starch, which most articles of vegetable diet contain in considerable quantity, not having its peculiar properties annulled, and its proneness to saccharine fermentation being favoured by the warmth and moisture of the stomach, is converted into sugar, which, being readily soluble, is absorbed into the circulation. The sugar, thus absorbed, takes the place of the proper and higher product, albumen, and being unable to perform the duties of the latter in the system, is eliminated by the kidneys. According to this view, the first object will be, of course, to avoid all saccharine and amylaceous articles of food; the second, to introduce into the stomach a highly azotized substance, and, at the same time, by a diffusible stimulant, to exalt the assimilating powers of that organ. Both these indications appear likely to be obtained by ammonia. Whatever may be the therapeutical value of ammonia in the treatment of diabetes, and Dr. Barlow's expectations have been by no means universally confirmed, it will be remembered that the more modern theory of the disease refers its production to disordered function of the liver secondary to lesion of the nervous system. Dr. Barlow advises the carbonate, in doses of gr. v.–viij., with a few drops of T. Opii, in some light bitter infusion, every six hours. At the same time, animal food, together with cruciferous vegetables, as greens, brocoli, turnip-tops, &c., should be taken freely. On this latter point, Dr. Barlow places much stress. He relates cases illustrative of the decided benefit to be derived from this treatment.

106. *In Pneumonia*, when antimony in small doses is not indicated, Dr. Waters (p. 50) speaks highly of a combination of ammonia and chloroform. ℞ Ammon. Carb. gr. iv., Spt. Chloroformi ♏xx., Aq. Camph. ʒx., M. 3tis vel 4tis horis sumend. Both these substances, he remarks, are stimulants, and when given together seem often to have a beneficial effect. They may be given as required either with or without alcoholic stimulants. *In Gangrene of the Lungs*, it is one of the remedies most to be relied upon; it is best given in Decoct. Cinchonæ. *In Bronchitis*, except in the earliest stages, and when recent febrile action is present, the above formula often produces excellent effects. It may be often advantageously combined with ipecacuanha, squill, &c., when expectoration is scanty or difficult, or with T. Lobeliæ, if much spasm is present. In the advanced stages, infusion of senega may advantageously replace the camphor water as a vehicle. It appears peculiarly adapted for the *Asthenic Bronchitis of old age*. It likewise proves useful in *Catarrhal Affections*. *In the Coughs of Childhood*, when stimulant expectorants are indicated, the following formula of Dr. Hillier's may be tried:—

℞ Ammon. Carb. gr. viij.–xij., T. Scillæ ♏xx., Syrup ℥ij., Decoct. Senegæ ad ℥ij. M. Dose: Two tea-spoonfuls for a child three years old.

107. *In the advanced stages of Croup*, the carbonate has been prescribed as a stimulant, expectorant, and occasionally as an emetic, in order to promote the discharge of effused matter. When the patient is greatly debilitated, it may prove useful, but some caution is necessary in its use.

108. *In Chorea*, it is favourably mentioned by Dr. Radcliffe (ii. p. 138), who states that he has tried it in several cases singly and in combination, with eminently satisfactory results. *In Epilepsy*, though it has no claim as a curative agent, it often proves very valuable as a palliative. Pereira (i. p. 456) speaks very favourably of it in large doses (gr. x.–xx. for an adult), especially in the hysterical form of the disease. Dr. Anstie (p. 130) states that where there is time to administer a dose, previous to an impending attack, it is often effectual in warding it off, and this is in accordance with the experience of others. *In Hysteria*, the carbonate and the other preparations of ammonia are of great value.

109. *Diseases of the Skin. In Lepra and Psoriasis*, M. Cazenave[1] successfully employed this salt, in doses of gr. v., gradually increased to gr. xxiv. daily. In somewhat larger doses (grs. x. gradually increased to grs. xxx.–xl.), given largely diluted, it is the alkali from which Dr. M'Call Anderson[2] states that he has derived most benefit in *Psoriasis*. Sometimes, he remarks, it may be advantageously combined with arsenic, or with colchicum if there be a gouty tendency. *In Syphilitic Eruptions*, Dr. Schedel[3] states that he has known this salt succeed when mercurials have failed. The dose, gr. lx. daily in Oj. of barley-water. The remedy, he adds, is certainly disagreeable at first, and often causes nausea, but with a little patience the stomach is soon brought to bear it. *In Erysipelas, occurring in debilitated subjects*, it proves highly useful. Sir T. Watson (ii. 833) observes that, after a preliminary purgative, he commences the use of this salt, and that, generally speaking, a large proportion of the cases recover. It is also strongly recommended by Mr. Wilkinson (see sect. 111).

110. *In Scarlet Fever*, carbonate of ammonia ranks highest in our list of remedies; it is certainly one of most reliable medicines, and has the commendations of most of the best modern authorities. The strongest evidence of its efficacy is adduced by Mr. Wilkinson[4] and Dr. C. Witt.[5] Mr. Milton[6] ranks the introduction of this remedy as amongst the most

[1] Med. Times, Aug. 9, 1851.
[2] Glasgow Med. Jour., July 1865.
[3] Lib. of Medicine, vol. i. p. 440.
[4] Lond. Jour. of Med., Sept. 1851.
[5] An Effectual Remedy in Scarlet Fever. Lond. 1862.
[6] Diseases of the Skin, 1865, p. 73.

striking triumphs of modern medical discovery. From grs. iij. to grs. vj.–vij., according to the age of the patient, may be given at first every hour or two till a decided effect is produced upon the disease, after which it may be given less frequently. Camphor mixture, or cinnamon water, or milk, are the best vehicles. *In Scarlatina*, Mr. Milton remarks, the success has been marvellous; and its success in *Small-pox*, he adds, is equally cheering.

111. *In Rubeola*, *Urticaria*, *Roseola*, *Erythema*, and in other diseases of the same class, Mr. Wilkinson also bears witness to the value of the carbonate. He states that for seventeen years he has administered this remedy as advised in the last section, and that he has not only never lost a patient in the above diseases, but has never had a case of the kind that has ever appeared dangerous, or that has given him a moment's anxiety. *In Erysipelas*, he found it no less successful; and in this disease, and also in *Urticaria*, the lotion originally proposed by Peart may be employed with advantage to allay the irritation of the surface. ℞ Ammon. Sesquicarb. ℥j., Plumb. Acet. ℥j., Aq. Rosæ f℥viij., M. ft. lotio.

112. *In Acute Glanders*, it proved successful in a case which came under the care of Mr. Wilkinson.[1] The treatment employed is thus summed up:—1, An incision into each of the Whartonian ducts; 2, an emetic of ipecacuanha; 3, carbonate of ammonia in water, hourly, as concentrated as it could be swallowed; 4, an opiate at bedtime, with wine and nourishment in such quantities as the patient could be prevailed upon to take. He places great stress upon the ammonia having been given in a concentrated form.

113. *In Puerperal Insanity*, when great debility exists, together with defective subcutaneous circulation and cold extremities, the carbonate of ammonia (gr. vj.–viij.) with camphor, may be given every third hour, with advantage. (Dr. Prichard.)[2] *In Phlegmasia Dolens*, the carbonate in full doses, according to Dr. Mackenzie,[3] is often valuable, especially when there is great prostration.

114. *In Mercurial Erethism*, no internal remedy is more to be trusted than the carbonate, in conjunction with camphor and other stimulants.

115. *In Drunkenness*, after the stomach has been emptied, the carbonate may be given internally with advantage. Its application to the nostrils is also beneficial.

AMMONII CHLORIDUM. See AMMONIÆ HYDROCHLORAS.

[1] Op. cit.
[2] Lib. of Med. vol. ii. p. 142.
[3] On Phlegmasia Dolens. London, 1862.

116. AMMONIÆ CITRAS. Citrate of Ammonia. The B. Ph. contains a solution formed by dissolving citric acid (oz. iij.) in water (Oj.), and adding strong solution of ammonia till the liquid is neutral to test papers; dose, fl. drm. ij.–vj. A solution of this salt may be extemporaneously obtained by saturating gr. xx. of the Carbonate of Ammonia with fl. drs. vj. of Lemon-juice, or with gr. xxvj. of Citric Acid in solution.

Med. Prop. and Action. Febrifuge and refrigerant: it is best taken in the form of effervescing draughts, as above. It will frequently remain on the stomach when other medicines are rejected.

117. *Therapeutic Uses. In Gastric Irritation, depending upon an atomic condition of the mucous follicles*, the citrate of ammonia, in the form of an effervescing draught, is frequently productive of marked benefit. *In the Vomiting attendant on Ulcer of the Stomach*, it has also been advised; but Dr. Brinton (p. 171) considers that the salts of ammonia, in which he includes the effervescing mixture of the citrate and tartrate, generally do more harm than good.

118. *In Diabetes*, Dr. Prout considers the citrate the best diaphoretic we can employ. It should be conjoined with the use of Dover's powder, or ipecacuanha.

119. *In the later stages of Inflammatory and Febrile attacks*, the citrate, given whilst effervescing, is not only agreeable and refreshing, but acts as a refrigerant and diuretic. *In Scarlet Fever*, it is favourably spoken of by Sir T. Watson (ii. p. 822). If the pulse is feeble, and without hardness, he advises it to be given with an excess of ammonia.

120. AMMONIÆ FORMIAS. Formiate of Ammonia. A combination of 1 eq. of Formic Acid and 1 eq. of Oxide of Ammonium, NH_4O, C_2HO_3.

Med. Prop. and Uses. A general stimulant, introduced by Dr. Ramskill[1] as a *stimulant* in cases of *Chronic Paralytic Disease, accompanied by general torpor*. He finds it of greatest use in cases of reflex paralysis; next in those cases where, from disuse, the muscles and nerves have become unable to convey commands of the will, or to execute movements. It is of equal use in paralysis of sensation as of motion. It is contra-indicated wherever there is reason to suppose activity in or about the seat of the original lesion in the nervous centres, and in all cases of irritable stomach, whether the cause be cerebral or not. If given in larger doses than gr. v., it produces vomiting. When it agrees, its administration is followed by a feeling of warmth at the epigastrium. In some forms of *Epilepsy*, it appears to have done good; in others, harm. Dr. Ramskill's experience of its use warrants a further trial of this salt.

Dose, gr. v. in water three times a day.

121. AMMONIÆ HYDROCHLORAS. Hydrochlorate of Ammonia, Chloride of Ammonium, B. Ph., Sal Ammoniac, NH_4Cl.

[1] Med. Times and Gaz., Jan. 23, 1864, p. 90.

Med. Prop. and Action. The hydrochlorate is more frequently employed internally by British practitioners than formerly; and the Germans, who use it extensively in a variety of diseases, entertain a high opinion of its alterative and resolvent properties, and consider that its action on the system closely resembles that of mercury. From some interesting experiments with this salt, Dr. A. Lindsay[1] considers that it is deserving of a high place amongst our more valuable alterative, resolvent, and liquefacient remedies. From the relief which it affords in certain neuralgic affections, it deserves a place amongst the anodynes; and there is reason to believe that it possesses some power as an emmenagogue and a cholagogue. Dr. Anstie[2] characterizes it "a pure tonic stimulant to sensitive nerves, raising them to a level of tense vitality *too high* for the explosive perturbations which, when carried to the brain, are translated as *pain*, and to the vaso-motor system, directly inciting to a superior tone of the systemic vessels, which puts an end to that exaggerated passive congestion of viscera, which is known to be fatal to the healthy performance of the function of secretion." In over-doses, it acts as an irritant poison. Externally, it is used as a discutient application in *Hydrocele*, or (from the cold produced during its solution) as a cold lotion in *Fevers*, *Hernia*, &c. Sir A. Cooper's formula was—Potas. Nit., Ammon. Hydrochlor. āā ℥v., Aq. f ℥xvj., M. It is also used as a gargle (oz. ss.—Aq. fl. oz. xij.)

Dose, gr. v.—gr. xxx. in solution repeated every two to six hours. The addition of liquorice serves to disguise the taste.

122. *Therapeutic Uses. Abscess of the Mamma. Milk Abscess.* The following lotion, originally prescribed by Justamond, has been found in many cases of great service:—℞ Ammon. Hydrochlor. ℥j., Spt. Rosmarini Oj., M. Linen rags, wetted with the lotion, to be kept continually to the part. It is chiefly applicable in cases of induration of the mamma, after the abscess has suppurated. *In other Glandular Enlargements* and *Incipient Abscesses*, it is a very valuable application, and Dr. Lindsay found *Indolent Bubo* speedily subside under the application of a hot solution (℥ij. ad Aq. f ℥j.)

123. *Acne Simplex.* In obstinate cases, I have seen benefit from the following lotion:—℞ Ammon. Hydrochlor. ℥j., Alum ℥iij., Potass. Sulphuret. ℈j., Aq. Ros. ℔b. ss., M. ft. lotio.

124. *Albugo, White Opacity of the Cornea.* Scarpa advises the annexed formula:—℞ Ammon. Hydrochlor. ℈ij., Cupri Acet. gr. iv., Aq. Calcis f ℥iv., M. ft. collyrium. It is particularly adapted for *Albugo supervening upon Small-pox.*

125. *Aphonia.* A case is related by Dr. Gerner,[3] in which a young lady, in consequence of exposure to cold, entirely lost her voice. Numerous remedies were tried in vain, for three months. She, at last, completely recovered her voice in three days from the inhalation of ammoniacal vapour, disengaged from a mixture of a solution of the hydrochlorate of ammonia and carbonate of potash. The value of inhalations of chloride of ammonium vapour in this class of cases is attested by Dr. Beigel,[4] who obtained excellent results from it in several cases.

[1] Glasgow Med. Journ., 1856.
[2] Practitioner, Dec., 1868.
[3] Brit. and For. Med. Rev., 1839.
[4] Practitioner, Aug., 1868.

126. *Ecchymosis of the Eye*, vulgo *Black Eye*. A very good application is the hydrochlorate in solution, mixed with bread or linseed, so as to form a soft poultice (Tyrrell). It tends to prevent subsequent discoloration in all cases of *Bruises and Sprains*.

127. *Face Ache. Tic Douloureux. Rheumatic Affection of the Face.* Sir T. Watson (i. p. 717) states that he has found the hydrochlorate, in doses of ʒss., repeated four times daily, of great service in numerous cases, particularly when the pain partakes more of a rheumatic than a neuralgic character. It does not always succeed, he adds, but it often does. If the pain does not yield after four doses, you may cease to expect any benefit from it. Dr. Ebden[1] has found it most successful in many cases, and my own trials with it have been most satisfactory. *In other forms of Neuralgia*, its use is often attended with benefit. Dr. Anstie speaks highly of it in the *Intercostal Neuralgia often observable in suckling women and phthisical patients*, in the milder case of *Sciatica* occurring in the young, in *Hepatalgia* and *Ovarian Neuralgia*. The dose (gr. x.–xv.–xx.) may be repeated every three or four hours, till relief is obtained. Under the name of the *Facial Neuralgias of the Young*, including under this term what is often described as *Bilious and Hysterical Headaches*, Dr. Anstie states that the hydrochlorate (gr. x.–xx.), if given early enough, seldom fails to cut short, or greatly to mitigate the attack. It is especially useful in attacks occurring in hard-worked and delicate young females. With regard to its use in various forms of *Nervous Headache*, Dr. Barrallier[2] found that it constantly dissipates fits of *Idiopathic Headache*, *Headache consecutive on menorrhagia*, *Headache dependent on functional derangement of the stomach*, and *that supervening upon fevers*, whilst it is powerless to relieve hemicrania dependent on irregularity or suspension of menstruation. By others, however, it has been found of great service in the headache which accompanies amenorrhœa. It is only useful if given when the pain is most intense.

128. *In Amenorrhœa*, it is highly spoken of by Sundelin and other German writers. Dr. Anstie (op. cit.) states that, given in gr. x. doses thrice daily, in cases of amenorrhœa, marked rather by general feebleness than by anæmia, it has occasionally seemed to him to conduce directly and considerably towards the cure. He adds the just remark: "But of this, as of all other emmenagogues, it is pre-eminently true that they are worth absolutely nothing, unless used precisely at the fit occasion."

129. *Hydrocele of Childhood* may sometimes be removed by

[1] Ind. Ann. of Med. Science, April, 1854.

[2] Bull. Gén. de Thérap., April 15, 1859.

the application of a strong discutient lotion. For this purpose, the following formula of the late Mr. B. Cooper may be employed:—℞ Ammon. Hydrochlor. ℥j., Liq. Ammon. Acet., Spt. Vini Rect. āā f℥j. Aq. f℥iv., M. This, after a few applications, produces excoriation of the scrotum, and aids the process of absorption. In cases occurring in adults, it is vastly inferior to iodine injections. *In Enlarged Prostate*, the hydrochlorate internally (grs. xv.–xxx., three or four times daily) is occasionally useful. M. Vanoye[1] relates two cases cured by it.

130. *In Chronic Bronchitis, the advanced stages of Pneumonia, Congestion of the Lungs*, and the *Cough of Old Age*, the following formula is often productive of excellent effects:—℞ Ammon. Hydrochlor. ℥j., Ext. Glycyrrh. ℥j., Spt. Etheris Sulph. Co. f℥ij., Aq. ad f℥vj., M.; dose, a table-spoonful every two or three hours. Decotion of senega may often advantageously replace water as a vehicle; and ipecacuanha or squill may be added, according to circumstances.

131. *In Acute Jaundice, or Suppression of the Biliary Secretion, consequent on a powerful nervous shock or mental perturbation*, Dr. Anstie (op. cit.) states that in several instances he has seen two or three doses of this salt (gr. xx., every four hours) produce a decided change, and a marked recommencement of biliary excretion. He regards it as the most powerful of all biliary functional restoratives. *In Hepatalgia*, he also speaks highly of its efficacy. *In Passive Congestion, and in Chronic Affections of the Liver, characterized by want of action*, it is a remedy well worthy of attention. Dr. Budd[2] mentions a case of *Waxy Enlargement of the Liver*, in which a marked diminution in size, and eventual cure, followed the use of the hydrochlorate, in doses of gr. v.–x. thrice daily.

132. *Dropsical Affections.* The hydrochlorate has been little employed in England in these affections, but it is held in high esteem in various parts of Europe. It is stated to be particularly useful in *dropsy dependent upon hepatic disease;* and also in *Ovarian dropsy*. In the latter affection, where there are so few remedies of even reputed efficacy, it should meet with a fair trial. It is favourably spoken of by Dr. Copland (i. p. 617). In passive cases, he advises its combination with warm diuretic infusions.

133. *In Fibrous Tumours of the Uterus*, Dr. Atlee, of Philadelphia,[3] has found more benefit from the hydrochlorate, gr. x. twice or thrice daily, continued for weeks and months consecutively, than from any other remedy.

134. *Scirrhus of the Stomach.* Amongst others who strongly

[1] Bull. Gén. de Thérap., Ap. 15, 1859. [2] Dis. of Liver, p. 335.
[3] Brit. Med. Journ., Jan. 18, 1868.

advocate the use of the hydrochlorate in this affection, is Trussen.[1] He states that he derived decided benefit from it, in doses of gr. xv. every two hours, combined with extract of liquorice. It is reported to relieve the *vomiting* and *heartburn*, so constantly attendant on this disease, more speedily and uniformly than any other remedy.

135. *Hæmorrhages.* *In Hæmoptysis*, Dr. Copland (ii. p. 87) advises this salt, in combination with hydrochloric acid, thus:—℞ Ammon. Hydrochlor. ℥iss., Acid. Hydrochlor. f℥ss., Decoct. Hordei Co. Oj. M., Cap. coch. amp. iij. 2dis vel 3tis horis. It appears to be chiefly applicable to passive cases, when the vital powers are depressed. *In Hæmatemesis*, a formula similar to the above has been employed with advantage. *In Uterine Hæmorrhage*, Dr. Copland considers that it will prove serviceable, especially in cases of debility, and when the discharge is draining or remittent. It may then be given with cinchona or small doses of opium.

136. *In Senile Gangrene*, Dr. Gru[2] obtained good results by placing the part affected (the foot) in a pediluvium, containing oz. vij. of the hydrochlorate. It afforded relief to the pain when opium failed, and, under the use of fomentations containing the salt, recovery ensued.

137. *In Hooping Cough*, the hydrochlorate was recommended by Stoll at an early stage, with oxymel. Dr. Copland (ii. p. 249) states that he has found it an excellent refrigerant, anti-spasmodic, and tonic, in several instances. It might be advantageously combined with ipecacuanha.

138. *In Prurigo*, a solution of the hydrochlorate occasionally proves useful. The following ointment may also be employed:—℞ Ammon. Hydrochlor. ℥j., Pulv. Hellebor. Alb. ℥ss., Adipis ℥iij. M. (E. Wilson.)

139. *In Myalgia*, it is a remedy of much value. It is especially useful in the myalgia of the intercostals and the secti-abdominales so often met with in the over-worked and under-fed portion of the working classes in large cities, particularly in shoemakers, sempstresses, and others who work many hours a day in cramped positions which keep certain muscles of the trunk in a permanently contracted state. *Rest* is of course *the* remedy, but when this is impracticable, as it often is, Dr. Anstie (op. cit.) after extensive experience, declares "that nothing in the whole list of remedies comes near to this salt in efficiency." He gives it in doses of grs. x.–xx., in the belief that not even quinine in ague is a more reliable agent than the muriate in myalgia. With such testimony it certainly deserves a fair trial in all cases. *In Chronic Rheumatism*, it is highly spoken of by Dr. Fuller (p. 420) in doses of

[1] Hufeland's Journal, 1844. [2] Ranking's Abs., xlvi., 1867, p. 136.

gr. xv.–xx., proving serviceable in many cases when other remedies had previously failed. Its action he considers to be most marked in muscular rheumatism. When the periosteum or joints are affected it is seldom of use.

140. *In Gonorrhœa and Leucorrhœa*, a solution of the hydrochlorate (gr. lx.–oz. ss. Ad. Oj.) has occasionally been used as an injection. It has also been used as a lotion in *Scabies* and *Ulcers*. *In Snake Bites*, Mr. Minas[1] extols as an internal remedy the following:—℞ Ammon. Hydrochlor., Calcis Chlorinat. āā ℥j., Aq. f℥xxiv. boiled to f℥xx. : strain. Of this f℥j. to be given every half-hour for about six hours, after which the interval is increased, and so continued for twenty-four hours. Excision of the bitten part, cauterization with nitrate of silver, ligatures above the wound, are also to be had recourse to, and the patient should on no account be allowed to sleep for the first twenty-four hours.

141. AMMONIÆ HYDROSULPHURETUM. HYDROSULPHURET OF, OR HEPATIZED AMMONIA. Prepared by saturating a solution of ammonia with hydrosulphuric acid gas.

Med. Prop. and Action. This salt is considered to exercise a powerfully sedative action on the heart and arterial system, at the same time that it improves the tone of the digestive organs, increases the appetite, and promotes the urinary secretion. Its administration requires great caution, as even in small doses it occasionally causes vomiting, vertigo, and convulsions. According to the recent investigations of M. Bonnet, of Lyons, it exercises a peculiar action on the blood, completely destroying the globulin and hæmatin, and depriving the blood of the faculty of assuming the bright scarlet colour of arterialization. In this respect, therefore, its action is directly inverse to that of iron and its salts. Should these observations be confirmed, the action of this salt may be turned to valuable account in *Plethora and diseases connected with that state.*

Dose, gutt. iij.–vj. thrice daily, largely diluted.

142. *Therapeutic Uses.* As far as at present known, unimportant. It has been recommended in *Hypertrophy of the Heart*, *Diabetes*, *Phthisis*, *Cholera*, &c., but in none of these cases does it appear to merit any confidence.

143. AMMONII IODIDUM. Iodide of Ammonium. NH_4I. Obtained by the action of iodine on a solution of the hydrosulphuret of ammonia, or by saturating liquid hydriodic acid with caustic ammonia and evaporating to crystallization. It is a very deliquescent salt, and requires to be kept in well-stoppered bottles.

Med. Prop. and Action. Tonic, and anti-syphilitic. Gamberini in some cases carried the dose to grs. xvj. with no greater inconvenience than a sense of heat in the throat and stomach. It closely resembles the iodide of potassium, but is more powerful. It sometimes acts as a diuretic.

[1] Indian Ann. of Med. Sci., Jan., 1859.

Externally it is used in the form of ointment (gr. xx.—gr. lx. ad Ung. oz. j.) which should be freshly prepared when required for use, as it decomposes by exposure to the air.

Dose, gr. j.—gr. iij. or more.

144. *Therapeutic Uses.* As a remedy in *Skin Diseases*, it was first proposed by Biett, and Dr. Pennock[1] has recorded several cases of *Lepra* and *Psoriasis* cured by its means. It appears especially adapted for *Syphilitic Affections of the Skin.*

145. In *Syphilitic Affections*, it was first employed by Dr. B. W. Richardson, who reported favourably of its operation. More recently it has been systematically tried by Dr. Gamberini,[2] who considers—1. That it is suitable for all cases in which the iodides of potassium and sodium are employed; 2. That it leads to a rapid cure; 3. That there is great tolerance of the remedy; 4. That employed in friction with olive oil (gr. iij. ad Ol. ℥j.) it causes the disappearance of *Nocturnal Syphilitic Pains;* 5. That under its internal use *Indurations consecutive to Chancre* disappear, as do also *Indurated Glands of the Groin;* 6. That *Arthralgia*, *Rheumatoid Affections*, *Periostitis*, *Enlarged Glands*, and *Papulo-vesicular Syphilitic Eruptions*, are the forms of syphilis most readily cured by this salt; 7. The signs of intolerance are a sense of burning in the throat, and heat of the stomach, but these rapidly disappear on the suspension of the medicine for a couple of days. It seems well worthy of more extended use.

146. *In Scrofula, attended with Glandular Enlargement*, in *Incipient Phthisis*, and in *Chronic Rheumatism*, Dr. Richardson used the iodide with advantage. *In Enlarged Tonsils*, he found a solution of the iodide (℥ss.) in glycerine (f℥j.) very efficacious. It was applied every night by means of a large camel-hair brush.

147. Ammoniæ Liquor. Fortior. Strong Solution of Ammonia. Ammoniacal gas (NH_3) dissolved in water and constituting 32·5 per cent. of the solution. Sp. Gr. 0·891.

Ammoniæ Liquor. Solution of Ammonia. Is formed by adding to every Oj. of the strong solution Oij. of water. Sp. Gr. 0·959.

Med. Prop. and Action. The vapour, particularly of the stronger solution, is powerfully irritant to the mucous membranes of the air passages, the nostrils, and conjunctiva. When inhaled, or taken internally, largely diluted, it proves an excellent stimulant and restorative *in Syncope, in Hysteria, in the collapse of Cholera*, and in all cases where the vital powers are much depressed. It is one of the best antidotes *in poisoning by Hydrocyanic acid, Digitalis and other sedative poisons.* It possesses powerful

[1] Amer. Journ. of Med. Sci., Feb. 1835.

[2] Journ. de Pharm. et de Chim., Nov. 1859.

antacid properties. When larger doses of the solutions are swallowed, they act as violent corrosive poisons. *As a vesicant and counter-irritant*, it is a valuable and efficacious application. A simple mode of applying it is as follows:—Fill the lid of a wooden pill-box with circular pieces of lint or linen till they are above the level of the rim. Pour the strong Liquor on the lint so as to saturate the folds; the box is then to be instantly inverted over the affected part, and held on with firm but gentle pressure. At first it feels like a piece of ice; in a minute or less, a sense of heat and tingling is experienced; then a burning heat, and in a few minutes (from two to five) a blister is raised. M. Gondret's vesicating ointment, commonly employed in France, is composed of Lard ℥j., Oil of Almonds f℥ss., Liq. Ammon. Fort. f℥v. The two first are melted together with a gentle heat, then poured into a wide-mouthed bottle, and the ammonia added. It should be constantly agitated till it becomes cold. Counter-irritation thus produced is stated to be very successful in relieving the pain in *neuralgic*, *convulsive*, and *spasmodic* diseases. It is preferable to cantharides as a vesicatory, both on account of the rapidity of its operation and its not affecting the urinary organs.

Dose of Liquor Ammoniæ (not Fortior) ♏x.—♏xxx. properly diluted. The dose of Liq. Ammon. Fort. is one-third of that amount.

148. *Therapeutic Uses. Amenorrhœa and Chlorosis.* Dr. Ashwell states that he has found a mixture of f℥j. of Liq. Ammon. in Oj. of milk, injected into the vagina daily, very efficacious in chlorosis. It has also been successfully employed by Lavagna in amenorrhœa, and it has been favourably spoken of by Dr. Blundell.

149. *Asthma.* Rayer advises the application of Liq. Ammoniæ to the velum palati in cases of simple idiopathic asthma. He dips a roll of lint, four inches long, into a mixture of 4 parts of the solution and 1 of water, presses out the superfluous fluid, and immediately applies it for a few seconds to the velum palati. This, at first, causes a feeling of suffocation, with cough and much expectoration. This soon passes off, and great relief is experienced. It should be applied weak at first, and may be repeated if necessary. Great care is required not to apply the mixture to the back part of the pharynx; such an application may prove serious or even fatal. M. Rayer states that in 100 cases he has employed this treatment with success, and without any unpleasant consequences. It is, however, rarely employed.

150. *Apoplexy.* In atonic cases, in which bleeding is contra-indicated, diffusible stimulants may be given with advantage. Of these, one of the best is Liq. Ammoniæ (♏xij.–xv.) in water. The vapour may also be applied to the nostrils.

151. *Chronic Bronchitis.* The subjoined embrocation is an efficacious counter-irritant:—℞ Liq. Ammon. f℥ss.–f℥j., Ol. Amygd. f℥ss., Aq. f℥ij., Ol. Rosmarini f℥j., M. This formula may also be advantageously employed in *Chronic Pleuritis*, *Phthisis*, and other *chronic pulmonary affections*.

152. *Bites of venomous Snakes and Insects.* Ammonia, as a remedy for snake bites, was first introduced into France by

Jussieu,[1] in 1747, although it appears that Dr. Mead had employed it in England previous to that date. It is certainly a powerful nervine stimulant in these cases, and is more efficacious than brandy or any other stimulant. It may be given internally in doses of ♏x.–xx., in water or wine, every half-hour or oftener, if the urgency of the symptoms require it. Externally, it should be rubbed into and about the bitten part. The patient should not be allowed to lie down or go to sleep; he should be kept moving about, and his fears allayed in every possible way. Prof. Halford,[2] of Australia, strongly advocates the hypodermic injection of Liq. Ammoniæ in these cases, and he relates cases successfully treated by this method. He directs a mixture of strong Liq. Ammoniæ and distilled water (2 parts) to be directly but gradually injected, by means of an ordinary hypodermic syringe, into the blood by puncturing any superficial vein, and repeating it as soon as the beneficial operation ceases. Of twenty cases, some of them apparently hopeless, thus treated by different Australian practitioners, recovery took place in seventeen.[3] *In Bites of Scorpions, Centipedes, Mosquitoes, and other venomous Insects*, a liniment composed of equal parts of Liq. Ammoniæ, Ol. Olivæ, and T. Opii, well rubbed over the bitten part, affords great relief. A few drops of Liq. Ammoniæ in water may also be given internally.

153. *Epilepsy, Congestion of the Brain arising from Debility.* Dr. Hope[4] advises, in these cases, the internal use of volatile diffusible stimulants. Of these, he has found the subjoined formula by far the most efficacious:—℞ Liq. Ammon. ♏xij., Aq. Menth. Vir. f℥iss., M. ft. haust. If taken at the first warning of an attack, it seldom fails to arrest its supervention. Pereira (i. p. 444) quotes a case in his own practice, and another in that of Pinel, in which the inhalation of ammoniacal vapour immediately after the first warning of an attack, apparently averted its occurrence.

154. *Pruritus Pudendi.* Dr. Dewees (p. 50) relates a very obstinate case of pruritus in a female, which completely yielded to injections into the vagina of a mixture of f℥ss.–f℥j. of the solution in Oss. of water. "It succeeded like a charm." He adds that he has since successfully employed it in numerous cases. It should be freely injected into the vagina.

155. *Tic Douloureux, Neuralgic Affections of the Face.* M. Ducros[5] and other French physicians have found that Liq. Ammoniæ, applied with a camel-hair brush to the palate and gums, so as to cause a profuse discharge of tears and saliva, rapidly cured some obstinate cases of tic douloureux. It was

[1] Hist. de l'Acad. des Sciences, 1747.
[2] Lancet, Jan. 30, 1869.
[3] Brit. Med. Jour., Aug. 27, 1870.
[4] Lib. of Med., vol. ii. p. 19.
[5] Med. Chir. Rev., Jan. 1844.

also found productive of great benefit in the same cases, if given internally; gutt. xx.–xl. in a cupful of thick gruel at bed-time. Applied externally as a counter-irritant (*ante*), it often affords relief.

156. *In Chronic Hoarseness, Dryness of the Throat from deficiency of secretion*, and in *Chronic Asthma*, Mr. Smee[1] advises the inhalation of the vapour of diluted Liq. Ammoniæ, in order to promote secretion from the mouth, fauces, trachea, and bronchi.

157. *In Baldness, Alopecia*, Mr. E. Wilson (p. 430) states that the following stimulating wash is the best with which he is acquainted:—℞ Ol. Amygd., Liq. Ammoniæ āā f℥j., Spt. Rosmarini, Aq. Mellis āā f℥iij. M. ft. lotio.

158. *In Asphyxia*, ammoniacal vapour, used weak at first, has, in some cases, proved effectual in restoring animation. *In Alcoholic Intoxication* its action is often prompt and effectual. Stillé (i. p. 291) mentions having seen a man in a state of complete and helpless drunkenness speedily restored to his senses and the use of his limbs by a few drops of Liq. Ammoniæ, diluted and poured down his throat. He refers to other similar cases.

159. *Febrile and Inflammatory Diseases.* Pereira (i. p. 444) enumerates the following instances in which the internal use of ammonia proves serviceable, as a stimulant and sudorific. *In Continued Fevers*, which have existed for some time, and where all violent action has subsided, and the brain does not appear much disordered, it is occasionally of great service. Its diaphoretic action should be promoted by diluents and warm clothing. *In Intermittent Fevers*, it is sometimes of advantage, given during the cold stage, to hasten its subsidence. *In the Exanthemata*, when the eruption has receded from the skin, and the extremities are cold, it is sometimes of great benefit, on account of its stimulant and diaphoretic properties. When the recession arises from, or is connected with, an inflammatory condition of the bronchial membrane, it is inadmissible. The usual treatment must then be adopted. *In some Inflammatory Diseases*, especially *Pneumonia* and *Rheumatism*, where the violence of the vascular action has been reduced by proper evacuations, and where the habit of the patient is unfavourable to the loss of blood, ammonia has proved serviceable. In combination with decoction of senega, it proves useful in *Chronic Pulmonary Affections.*

160. Ammoniæ Phosphas. Phosphate of Ammonia. $(NH_4)_2$, HPO_4.

Med. Prop. and Action. This salt has been recommended as an excitant,

[1] Med. Gaz., April 7, 1843.

diaphoretic, and discutient; also, *as a solvent for Uric Acid calculus*, and as a remedy for diseases, acute and chronic, connected directly with the uric acid diathesis. (Dunglison.)

Dose, gr. v.—gr. xx. thrice daily.

161. *Therapeutic Uses. Gout and Rheumatism.* Dr. Buckler,[1] of Baltimore (U.S.), has published four cases of these diseases, in which the phosphate of ammonia, in doses of ʒj. daily, largely diluted, proved successful. The theory of its action is that it decomposes the insoluble urate of soda, which is the basis of gouty deposits, and converts it into phosphate of soda and urate of ammonia, both soluble salts, which may be readily eliminated by the secretions. Dr. Garrod has observed much good from its long-continued employment in chronic conditions of the gouty habit.

162. *In Diabetes*, Dr. Basham[2] employed the following formula with excellent results:—℞ Ammon. Phosph., Ammon. Carb. āā gr. x., Sp. Ammon. Arom. ♏xxx., A. fl. oz. j. M. This, added to the juice of a fresh lemon, to be taken thrice daily. It requires to be persevered in.

AMMONIÆ SESQUICARBONAS. See AMMONIÆ CARBONAS.

163. AMMONIÆ SPIRITUS AROMATICUS. Aromatic Spirit of Ammonia. Spirit of Sal Volatile. *Prep.* Carbonate of Ammonia oz. viij., strong Sol. of Ammonia fl. oz. iv., Volatile Oil of Nutmegs fl. drs. iv., Oil of Lemon fl. drs. vj., Rect. Sp. Ovj., Water Oiij. Mix and distil seven pints. Sp. Gr. 0·870.

Med. Prop. and Action. Stimulant. On account of its pleasant smell and taste, it is generally preferred to Liq. Ammoniæ, to which, though much weaker, it bears a close resemblance in medicinal properties.

Dose, ♏xxx.—fl. drm. j. in water.

164. *Therapeutic Uses.* Similar to those of Liq. Ammoniæ. *In Languor*, *Syncope*, *Hysteria*, and *Nervous Debility*, it proves very serviceable. *In the Flatulent Colic of Children* (gutt. ij.–v. in milk), it affords more speedy relief than any other remedy. *In Heartburn* and *Acidity of the primæ viæ*, it also proves speedily effectual.

165. AMMONIÆ SPIRITUS FŒTIDUS. Fœtid Spirit of Ammonia.

Prep. Assafœtida 1½ oz., Strong Solution of Ammonia fl. oz. ij., Rect. Spirit, q. s. Macerate the assafœtida in spirit fl. oz. xv. for twenty-four hours, distil off the spirit, mix the product with sol. of ammonia, and add spirit q. s. ad Oj.

Med. Prop. and Action. A valuable stimulant and anti-spasmodic.

Dose, ♏xxx.—fl. drm. j.

166. *Therapeutic Uses. In Hysteria, and in the Flatulent Colic*

[1] Med. Times, vol. xv. 1847. [2] Brit. Med. Journ., April 10, 1869.

of hysterical women, it may be given with great advantage, in doses of fl. drm. ss.–fl. drm. j. *In obstinate Flatulence in Children*, combined with Magnes. Carb. and Aq. Anethi, it will often succeed when other remedies fail.

167. AMMONIÆ VALERIANAS. VALERIANATE OF AMMONIA. A salt introduced in 1856, by M. Declat, of Paris, and favourably reported of by Dr. O'Connor,[1] in *Neuralgia*, and in *Nervous Affections*, as *Epilepsy*, *Chorea*, *Hysteria*, &c., but it is very deliquescent, and hence uncertain in its operation. Every good that could be expected from it will probably be more certainly obtained from the ammoniated tincture of valerian (*q. v.*) Dose, gr. ij.–viij. or more, dissolved in water.

168. AMMONIACUM. Gum Ammoniacum. A gum-resinous exudation from Dorema Ammoniacum, *Don. Nat. Ord.* Umbelliferæ. *Source*, Persia, and the Punjab *viâ* Bombay.

Med. Prop. and Action. Stimulant, expectorant. In asthenic pulmonary diseases it proves very useful, by promoting expectoration, when this is deficient, and by assisting expulsion when secretion accumulates in the air-passages, and the patient has not strength to expectorate. It is best given in the form of mixture (*infra.*) Externally, in the form of plaster, it acts as a stimulant.

Dose:—Of Ammoniacum gr. x.—xx., in emulsion or pill. *Of the Mixture* (Ammoniacum oz. ½, Water fl. oz. viij., triturate and strain) fl. oz. ½—j.; *Ammoniacum and Mercury Plaster* (Ammoniacum oz. xij., Mercury oz. iij., Olive Oil fl. drm. j.; Sublimed Sulphur gr. viij.), for external application only.

169. *Therapeutic Uses. In Spasmodic Asthma*, ammoniacum often proves highly serviceable, relieving the symptoms in a remarkable manner. It is best given combined with T. Scillæ, and a small portion of hyoscyamus or conium. Plasters of ammoniacum applied to the chest afford relief. *In hysterical Asthma* it also proves most useful. It should be combined with equal parts of assafœtida. *In the Chronic Catarrh of Old Age*, the following formula is a popular one in the United States. It is said to be very efficacious. ℞ Gum Ammon. ℥ij., Acid. Nit. Dil. f℥ij., Mist. Acaciæ f℥viij. Dose, f℥j.–f℥iss., in any bland fluid, every two or three hours. It is chiefly useful when much expectoration has accumulated in the air-passages.

170. *In Joint Affections consequent on Rheumatism and Rheumatic Gout*, Emp. Amm. et Hydrarg. is a very useful application. It proves equally serviceable when the tendons, bursæ, or periosteum are affected.

[1] Lancet, Jan. 18, 1862.

171. AMYGDALÆ AMARÆ. Bitter Almonds.

AMYGDALÆ DULCES. Sweet Almonds.

The Bitter and Sweet Almonds are obtained from Amygdalus communis, *Var.*, Amara and Dulcis *D.C.* respectively. *Nat. Ord.* Rosaceæ. *Source*, South of Europe and Asia Minor.

Med. Prop. and Action. Sweet almonds are demulcent and nutritive. They have no very sensible medicinal properties. They are chiefly used in making the compound powder and mixture. A bland fixed oil (Ol. Amygdalæ) is obtained from both varieties, which is gently laxative in doses of fl. oz. j.—fl. oz. ij. Both sweet and bitter almonds contain an azotized substance called *Emulsine* or *Synaptase*. Bitter almonds differ from sweet almonds in containing also another azotized substance named *Amygdaline*. By the action of a solution of emulsine on a solution of amygdaline are obtained, among other products, hydrocyanic acid and the volatile oil of bitter almonds. Bitter almonds, from containing amygdaline and emulsine, which together produce hydrocyanic acid, are sedative and poisonous, and have proved fatal even in moderate quantities. The essential oil of bitter almonds of commerce is a mixture of volatile bitter almond oil (Hydride of Benzoyl) and hydrocyanic acid, with small quantities of benzoic acid, benzoin, and benzamide. It is highly poisonous, being in general four times as strong as officinal hydrocyanic acid. It has been occasionally used as a substitute for hydrocyanic acid in doses of ♏ss to ♏j., but it is an uncertain and most dangerous remedy. The smallest dose occasionally produces urticaria and other unpleasant symptoms. Bitter almond water is also very poisonous.

Dose:—Of Almond Mixture (Compound Powder of Almonds oz. ijss., water Oj.,) fl. oz. i.—ij. *Compound Powder of Almonds, Confectio Amygdalæ, L.Ph.* (Sweet Almonds oz. viii., Powdered Refined Sugar oz. iv., Powdered Gum Acacia oz. j.), used only in preparing the mixture.

172. *Therapeutic Uses. In Eczema*, as an antipruritic, Mr. E. Wilson[1] strongly recommends the following: Emulsion of bitter almonds, 20 or 30 to Aq. ℥vj., dilute hydrocyanic acid ℥ij., spirit of wine ℥xiv., M. Sometimes borax may replace the hydrocyanic acid, and the spirit of wine be omitted; or the original lotion may be rendered stimulant by the addition of gr. j.-ij. of perchloride of mercury to each ounce. As soon as the lotion is dried, oxide of zinc ointment or other ointment should be applied. Emulsion of bitter almonds is a very soothing application in *Lichen Tropicus or Prickly Heat, in Urticaria, and other Skin Diseases* attended by much irritation.

173. *In Lumbago, Painful affections of the Joints, &c., connected with Chronic Rheumatism*, Dr. Fuller (p. 36) speaks highly of a liniment compound of essential oil of bitter almonds ℥j., and almond oil (℥xv.) In his hands it has proved very efficacious.

174. *In Diabetes*, Dr. Pavy advocates the use of a bread made with sweet almonds. Without containing a trace of starch, it is, unlike bran bread usually in use in this disease, pleasant to the taste, and if properly made, quite digestible.

[1] Journal of Cutaneous Med., Oct. 1869.

175. Amylene. An anæsthetic agent prepared by distilling Amylic Alcohol with Chloride of Zinc. *Comp.* $C_{10}H_{10}$. Discovered by Balard in 1844.

Med. Prop. and Action. Amylene was introduced as an anæsthetic in 1856 by the late Dr. Snow,[1] with whom it continued to be a favourite anæsthetic to the period of his death, in 1858. It was considered by him to possess the following advantages over chloroform and ether:—1. The greater ease with which it could be breathed, owing to its entire want of pungency and irritating property. 2. The greater readiness with which absence of pain is obtained, with less profound coma than usually accompanies chloroform or ether. 3. The greater promptitude with which patients generally recover from its effects. 4. The greater infrequency of vomiting. 5. The less amount of rigidity and struggling during its operation; and, 6. The small amount of headache which results from its use.

Other practitioners have not formed so high an estimate of the value or safety of amylene as Dr. Snow; indeed, the French Academy of Medicine (apparently on insufficient grounds) has condemned its employment as dangerous. Still, any statement coming from so experienced an observer as Dr. Snow demands every attention. His remarks will repay careful perusal.

176. Amyli Iodidum. Iodide of Starch. Prepared by rubbing Iodine (gr. xxiv. moistened with a few drops of spirit) with Starch (oz. j.) until the powder assumes a uniform blue colour, and drying with a gentle heat so as not to drive off the Iodine; it is to be kept in well-stoppered bottles.

Med. Prop. and Action. This preparation was first proposed by Dr. Buchanan,[2] of Glasgow, as the best mode of administering iodine, as by this means he considered that it might be introduced into the system in far larger quantities, and in a comparatively short period, without the occurrence of that gastric irritation and other unpleasant symptoms which occasionally attend the exhibition of iodine in its free state. The average dose is a teaspoonful, given in water-gruel thrice daily, and the dose gradually increased to a tablespoonful or more. Testimonies in its favour have been recorded by M. Quesneville[3] and M. Droste;[4] and though it is evident from the statements of Prof. Forget[5] that very large quantities may be taken with impunity, yet from a case related by Dr. Laurie,[6] it appears that in some constitutions it may produce serious or even fatal consequences. Unless carefully prepared, it is easy to understand how the iodine thus given in large doses may be productive of untoward accidents.

177. *Its Therapeutic Uses* are similar to those of iodine. In a case of *Ascites* related by M. Burguet,[7] the abdomen was covered with a thick layer of iodide of starch (Iodine gr. xx., Starch ℥xij.), under which the dropsical effusion gradually disappeared. As a local application to *Ulcerated Wounds and to Chronic Ulcers of all descriptions*, Dr. Castax,[8] an army surgeon in Algeria, states that for several years he employed the iodide with great success.

[1] On Anæsthetics, pp. 373–419.
[2] Med. Gazette, July 2, 1836.
[3] Ann. de Thérap. 1851, p. 262.
[4] Canstatt's Jahresbericht, 1851, Bd. v. S. 73.
[5] Gaz. des Hôpitaux, February 19, 1839.
[6] Med. Gazette, 1840, p. 590.
[7] Ann. de Thérap. 1848, p. 194.
[8] Gaz. des Hôpitaux, No. 26, 1858.

178. AMYLUM. Starch, procured from the seeds of Triticum vulgare, *Linn.* Common Wheat.

Med. Prop. and Uses. 1. An antidote in poisoning by Iodine. 2. A test for the presence of Iodine in the secretions. 3. In the form of powder, a cooling application in *Erysipelas, Small-pox, and other external inflammations.* 4. An absorbent powder in *Excoriations.* 5. In the form of decoction or infusion, an emollient enema in dysentery, &c. 6. To thicken bandages in fractures and diseases of the joints. 7. *As a means of preventing Pitting in Small-pox*, Dr. Belcher[1] mentions having used a thick mucilage of starch as a local application, with excellent effect. The entire surface of the body was first sponged with tepid water. It is applicable also to various forms of *Acute Skin Diseases.*

The Mucilage (*off.*) is prepared by triturating and boiling for a few minutes Starch gr. cxx. in Water fl. oz. x. The *Glycerine of Starch* (Starch oz. j., Glycerine fl. oz. viij., intimately mixed, subjected to great heat, and constantly stirred till it forms a uniform jelly) is a valuable emollient application.

179. ANETHI FRUCTUS. DILL FRUIT. The fruit of Anethum graveolens, *Linn.* *Nat. Ord.* Umbelliferæ. *Hab.* Europe and Asia.

Med. Prop. and Action. Stomachic and carminative. The distilled water (fl. drm. ij.–x.), or the volatile oil (♏ij.–v.), are the best forms for administration.

180. *Therapeutic Uses. In Flatulence, Flatulent Colic, and Hiccough of Infancy*, no carminative is more generally used or more efficacious than dill water, with the addition of a few grains of magnesia or compound cinnamon powder.

ANGUSTURA. See CUSPARIA.

181. ANILINE. $C_{12}H_7N$. A volatile oily alkaloid, obtainable from indigo and other sources, but principally from coal tar, from which it is extensively prepared for the purpose of forming certain dyes.

Med. Prop. and Action. Sedative and antispasmodic; acting apparently in a direct manner on the nervous system, according to the researches of Dr. J. Turnbull,[2] who first proposed it as a therapeutic agent. The sulphate of aniline, which appears to be destitute of the local irritating properties of the aniline itself, is the form in which it has been chiefly employed. One peculiarity which marks its action is the presence of a remarkable blue colour of the lips, tongue, and nails, together with a more or less dusky appearance of the complexion, which, however, disappears in a few hours after the medicine has been discontinued. In some cases it occasions headache and a depression of the nervous system, which are also only of a temporary nature. According to the experiments of Schuchardt[3] on animals, it produces anæsthesia of the hinder limbs, and lowers the temperature of the body. In large doses it is poisonous, death being preceded by violent convulsions. The blue discoloration above described is attributed by Dr. Turnbull to the formation of a colouring matter or dye,

[1] Dublin Hospital Gaz., April 1st, 1856.

[2] Lancet, Nov. 16th, 1861, p. 469.

[3] Virchow's Archiv. xx. 1861.

produced by the oxidation of the aniline in the blood. The dose of the Sulphate is gr. j. twice daily, gradually increased to gr. jss.–gr. ij., in solution, either with or without a few drops of dilute sulphuric acid. Its use should be intermitted for a few days, on the appearance of blueness of the lips or depression of the nervous system.

182. *Therapeutic Uses.* *In Chorea*, it was first employed by Dr. Turnbull, who details the particulars of six cases in which it was successfully administered. Some of these cases were of considerable severity, and had previously resisted the action of other ordinary remedies. The dose was gradually increased from gr. j. to gr. iij. of the sulphate thrice daily. In two cases of *Epilepsy*, it was also used with decided benefit. In the latter disease, Dr. Anstie[1] employed it in six cases, and also in other *Chronic Convulsive Diseases*. It is, he remarks, a most serious mistake to administer the sulphate, or indeed any other sedative, in large doses, with the view to arrest convulsive muscular action. In two cases in which this agent was pushed to the extent of a large dose, a serious aggravation of the fits occurred. In doses of gr. j., thrice daily, with an additional grain to be taken immediately on the occurrence of any *prodromata* of a fit, aniline seemed materially to have benefited four patients, to the extent of delaying or mitigating the paroxysm; and in three instances the fit seems to have been altogether averted for a considerable time.

183. Anisi Fructus. Aniseed. The fruit of Pimpinella anisum, *Linn.* *Nat. Ord.* Umbelliferæ. *Hab.* Europe, Egypt, Asia. Oil of Anise distilled from the fruit of Illicium anisatum (Star Anise) is imported from China.

Med. Prop. and Action. Carminative and stomachic. The volatile oil (♏ij.–v.) is a good form for internal use.

Dose of Aniseed, gr. xv.–lx.

184. *Therapeutic Uses.* Similar to those of Carum Carui.

185. *Phthisis.* Dr. Prout is of opinion that aniseed has considerable power in allaying the irritation on which the cough depends. He infuses ʒiij.–ʒss. of the bruised seeds in Oss. of water, at 120°, and lets it stand till it is cool. Sir T. Watson (ii. 215) says that he has tried this as a vehicle for T. Camph. Co. when the same dose in other vehicles has failed, and that it has been frequently followed by a marked abatement of the frequency and violence of the cough.

186. Anthemidis Flores. Chamomile Flowers. The dried single and double flower-heads of the Common Chamomile, Anthemis nobilis, *Linn.* *Nat. Ord.* Compositæ. *Hab.* Europe: cultivated in India.

[1] Medical Times, April 5, 1862.

Med. Prop. and Action. Aromatic tonic, said to be slightly anodyne. A strong infusion, drunk when tepid, causes vomiting, and it is frequently employed to promote the action of other emetics, but a weak infusion taken cold is said materially to allay gastric irritability. Externally, they are used in infusions as fomentations, and occasionally as enemas. *Active principles.* 1, A Volatile Oil; 2, Bitter Extractive. The volatile oil is stimulant and anti-spasmodic. The flowers should not be given in decoction, as boiling dissipates the oil, and renders them inert.

Dose:—Of the Extract, gr. ij.–x. *Of the Infusion* (oz. ½ boiling water, fl. oz. x.) fl. oz. j.–ij. Cold, as a tonic and stomachic, or taken warm *ad lib.* as an emetic. *Of the Oil*, ♏ij.–v.

187. *Therapeutic Uses. In Dyspepsia, Debility, Hysteria*, and in *all cases where the tone of the digestive organs, or the system generally, is depressed*, the infusion of chamomile, in doses of fl. oz. jss. thrice daily, may be given with advantage. If the stomach is irritable, a few drops of T. Opii may be added.

188. *In Flatulence and Flatulent Colic*, the volatile oil (gutt. ij.–iij.), or a strong infusion, will often afford relief when other remedies fail.

189. *In Intermittents*, when given in doses of gr. cxx., it was formerly in high repute as a febrifuge. Morton[1] speaks highly of its efficacy. He found it successful in some cases, when cinchona had previously been ineffectual.

190. *As a remedy for Scabies*, it has been employed in France. The formula used is composed of equal parts of fresh chamomile flowers, olive oil, and lard. This is stated to effect a cure in three frictions, to soothe irritation instantly, and not to give rise to any secondary affections. (M. Bazin.)[2]

191. ANTIMONIUM. Antimony. Sb. = 122. This metal, though not used in its metallic state internally, at the present day, was formerly employed as an emetic and purgative. Its chief medicinal value is as the basis of the following preparations:—

192. ANTIMONIUM TARTARATUM. Tartarated Antimony. Antimonii Potassio-Tartras; Potassio-Tartrate of Antimony; Antimonium Tartarizatum; Tartarized Antimony; Tartar Emetic, $KSbC_4H_4O_7.H_2O$.

Med. Prop. and Action. In doses of gr. $\frac{1}{8}$–$\frac{1}{6}$, diaphoretic and expectorant; of $\frac{1}{4}$–$\frac{1}{2}$, nauseating and sudorific; of gr. i.–iv. (in solution) emetic. Its emetic property is much increased by the addition of ipecacuanha and by vegetable acids, and its diaphoretic, by the addition of the sulphate or nitrate of potash. In excessive doses it acts as an irritant poison, forty grains having proved fatal. When administered internally, or applied to an abraded surface, it is absorbed into the system; it has been detected in the blood, viscera, and urine; it exerts a specific action on the stomach and alimentary canal, as is shown by the fact that, when injected into the

[1] De Febribus, cap. iii.

[2] Brit. and For. Med. Chir. Rev. Jan. 1851.

veins or the rectum, or applied to the denuded skin, it produces nausea and vomiting. It is supposed to exercise a specific action also on the lungs, and this opinion is strengthened by the fact, that the lungs of animals killed by it were found congested, of an orange, red, or violet colour, and, in some cases, hepatized. M. Bonamy[1] carefully examined the effects of Tartar Emetic on the pulse in 25 cases. In 23, the diminution in the number of pulsations observed on the day succeeding the first administration, was 15, 30, 10, 24, 40, 3, 20, 8, 10, 5, 24, 23, 18, 13, 23, 12, 10, 15, 10. In two cases only there was no change in the frequency of the pulse. On the second and third day, the slowness of the pulse was generally more marked. Diaphoresis was observed in 4 cases only out of 55. M. Bonamy, therefore, considers that this is an accidental effect of tartar emetic, probably occasioned by the nausea and vomiting, and not by the remote action of the drug. The sedative effect of tartar emetic on the nervous powers, he regards as an indirect effect, consequent on the weakening of the circulation. From his numerous observations he concludes, 1, that a tolerance of the remedy is not necessary to its efficient therapeutic action; 2, that, as an antiphlogistic, it is most usefully exhibited in frequent small doses not exceeding the fraction of a grain. Under its use, the proportion of urea in the urine is increased, and also uric acid and the pigment, but to a smaller amount. The water and chloride of sodium are lessened, owing probably to increased perspiration. (Dr. Ringer, p. 187.) The purging which it occasionally induces may be controlled by the addition of a few drops of T. Opii. If long continued, it occasionally produces irritation of the throat and fauces, and also an aphthous ulceration of the mouth, with a great increase of saliva. Under these circumstances it should be immediately discontinued. By cautiously increasing the dose, a degree of tolerance of the remedy may be established in the system, so that large doses may be given without producing any great sensible effect. It should be given with extreme caution to young children and infants, an ordinary dose having proved fatal when given at an early age. When tartar emetic is given in small doses, continued through a long period of time, to a healthy person, poisonous effects result. Sickness and watery purging, diaphoresis without febrile excitement, a pustular eruption on the skin or palate, or a red efflorescence on the skin, symptoms of congestion of the lungs, with great weakness and emaciation, and ultimately death, are the results. Externally applied, it acts as a counter-irritant. In poisoning by tartar emetic, the best antidotes are decoctions or infusions containing tannin and gallic acid, as of oak-bark, galls, &c. (See Antidotes, Part ii.)

Dose:—Of Tartarated Antimony, gr. $\frac{1}{8}$–$\frac{1}{6}$, as a diaphoretic and expectorant; gr. $\frac{1}{4}$–$\frac{1}{2}$, as a nauseant and sudorific; gr. i.–iv., as an emetic. *Of Antimonial Wine* (Ant. Tart., gr. xl., Sherry, Oj.) ℥x–xxx., as a diaphoretic and expectorant; fl. drm. j.–ij., as a nauseant; fl. drm. iv.–viij., as an emetic; or fl. drm. ij. every ten minutes, until the desired effect is produced. As an emetic for children, ℥xxx.–lx.: in most cases, however, ipecacuanha is far preferable for the young. Each fl. oz. of the Wine contains grs. ij. of tartar emetic. *Prep. for External Use. Ointment of Tartarated Antimony* or *Tartar Emetic Ointment.* (℞ Tartarated Antimony in fine powder oz. $\frac{1}{4}$, Simple Ointment oz. j. Mix thoroughly.) Powerful counter-irritant, producing, after a few applications, a pustular eruption, attended with more or less inflammation. The points to be particularly observed in using this ointment are, 1, to take care that the salt is finely powdered; 2, to avoid, carefully, applying it to excoriations or wounds, as from leeches, &c.—gangrene has followed the non-observance of this point; 3, to suspend its use if the salt becomes absorbed, and produces constitutional derangement; and, 4, not to apply it to very young children.

193. *Therapeutic Uses. In acute Inflammatory and Febrile*

[1] Études sur le Tartre Stibié. Paris, 1848.

Diseases, tartar emetic, from its depressing action on the vascular system, from its power of subduing morbidly increased action of the heart and arterial system, and of determining freely to the skin, constituted an important element in the antiphlogistic treatment which for a long period was deemed the most effectual mode of treating this class of diseases. With the change in our views of the nature of inflammation and febrile action, a corresponding change has taken place in our views as to the applicability or even the safety of antimony in this class of affections. Still there are a large number of cases—larger, perhaps, than most persons imbued with the prevailing views are ready to admit—where there is an undoubted abnormal increase in vital action, the symptoms of which in the aggregate constitute true inflammation and fever, in which the antiphlogistic treatment generally, and antimony in particular, are clearly indicated and unmistakeably useful. To be able to discriminate with any degree of exactitude between the cases to which antimony on the one hand, and stimulants on the other, are best adapted, is often a matter of difficulty, and requires much experience and judgment. This point is considered more at length in Art. Stimulants, Part ii. As a general rule, it may be said that antimony is best adapted to inflammatory and febrile affections occurring in the young and plethoric, when there is much vascular excitement, with a full, bounding, unyielding pulse, hot, dry skin, and scanty urine. Its utility is chiefly limited to the earliest stages of the attack; its influence in advanced stages is comparatively small. It appears better adapted for controlling parenchymatous inflammation, *e.g.*, *Hepatitis* and *Pneumonia*, or local and superficial inflammation, than that of serous membranes. Its efficacy often appears to be increased by combination with other remedies, as opium, calomel, or salines, as may in each case be indicated. The usual dose is gr. $\frac{1}{4}$–$\frac{1}{2}$, every two or three hours. There is one objection to antimony in these cases which has been too much overlooked, viz., the anorexia which follows its use. Whatever differences of opinion may exist as to the employment of stimulants in these cases, it is now generally admitted that they are benefited by nutritives to supply waste of tissue; and antimony, by inducing nausea and destroying the appetite, interferes with the patient's taking the requisite supply of nourishment, so necessary to support and replace the waste of tissue which is constantly going on, and in this manner it operates injuriously.

194. *In Intermittent Fevers*, an antimonial emetic given at the outset of the attack, unless contra-indicated by pre-existing gastric irritability, often seems of great service. In mild uncomplicated cases, a complete cure has sometimes followed the continued use of tartar emetic in doses of gr. $\frac{1}{8}$ to $\frac{1}{6}$ every

two hours; strict attention being at the same time paid to the state of the bowels. This mode of treating the intermittents of Upper India proved very successful in the hands of Dr. Moore.[1]

195. *In Pneumonia*, the treatment formerly in vogue, of administering large and repeated doses of tartar emetic, is now well-nigh abandoned. In cases occurring in young, robust subjects, when febrile action is strong, and in the earliest stages of the attack, small doses (gr. $\frac{1}{16}$–$\frac{1}{4}$) act beneficially; it seems to promote perspiration, and thus give great relief, and it appears further to have a beneficial influence on the pulmonary membrane, rendering its secretion less viscid and facilitating expectoration, but it exercises no specific influence on pneumonic inflammation, as was formerly supposed. The cases are very few which are benefited by its prolonged administration; indeed, in the words of Dr. Waters (p. 47) "there are very few cases that are not injured by such a practice, and whenever the drug produces a depressing effect, or whenever it gives rise to sickness or purging, it does harm and should not be persevered with. At the same time," he adds, "there can be no doubt that larger doses (grs. j.–ij.) may be safely given in some cases, and continued even for days without producing its physiological effects—vomiting, purging, &c.—and in such instances the antimony appears to do good; the symptoms of the pneumonia yield during its administration, and convalescence becomes established. But whilst these full doses of tartar emetic are well borne by some patients, it is doubtful whether it is ever desirable to exhibit them, for I believe," he adds, "we can get all the good effects which the drug is capable of affording by using it in smaller quantities." The treatment employed by Dr. Waters, under which he lost only 1 case in 44, consisted mainly, apart from the occasional use of antimony as above, of carbonate of ammonia, chloric ether, and opium, with a liberal nutritious diet, beef-tea, milk, &c., and the judicious use of alcoholic stimulants from an early period. Turpentine stupes, sinapisms, and linseed-meal poultices in the early, and blisters in the more advanced stages, were employed. *In the Pneumonia of Children*, antimony has been almost wholly cast aside on account of its tendency to induce debility, which is one of the great dangers of the disease. Antimony, observes Dr. Hillier (p. 31), is seldom necessary or desirable; if given at all, it should be confined to those cases in which the pulse is full and strong, the temperature very high, and the skin and mucous membranes very dry and injected; and it should only be given for a short time at an early stage of the disease. *In Broncho-Pneumonia*,

[1] Indian Register of Med. Science, Oct. 1848.

when emetics are required, ipecacuanha is preferable to antimony, as causing less depression. With some slight modification, the above remarks on pneumonia apply equally to *Acute Pleuritis* and *Bronchitis;* in the earliest stages in young plethoric subjects, and where much febrile action is present, small doses of tartar emetic (gr. $\frac{1}{16}$–$\frac{1}{4}$) may prove serviceable, but the period of its utility is very limited, and perseverance in its use may prove hurtful, either by its depressing action on the vascular system, or by inducing nausea, which interferes with the due use of nutritives, which are of so much importance in these cases. In the advanced stages and chronic forms of these affections, as well as in *Phthisis*, *Asthma*, and *Laryngitis*, counter-irritation by tartar emetic ointment to the chest is occasionally useful, but as a general rule it is inferior in efficacy to T. Iodi, or Ung. Potass. Iod.

196. *In Croup*, tartar emetic is a remedy of established value. At the outset of the attack the prompt administration (repeated in half-an-hour if required) of an emetic of antimonial wine, or of ipecacuanha wine, or of both combined in equal proportions, is a measure attended with the best effects; after its operation there is generally great relief to the distress of breathing, and quiet sleep will follow. Should there, however, be persistence of the febrile symptoms, of the cough, or of any laryngeal quality in the breathing, ♏xxx. Vin. Ant. should be given, with the alkaline citrate of potash (gr. x.), or chlorate of potash (gr. v.) every four hours, or a smaller dose at more frequent intervals, taking care with young children that it is given less frequently as the symptoms subside, and that it is omitted altogether as soon as relief is obtained. The emetic, however, should always be at hand, so that in cases of a threatened paroxysm its full effect may be again induced. Antimony, adds Dr. W. Squire (i. p. 263) to the above directions, has great power in moderating the intensity of the first stage of the inflammation; it may, therefore, be used alone to cause vomiting, and as it will be necessary to repeat it with this object, it is better not to give it in frequent small doses, which by inducing in the system a tolerance of its influence, render its emetic effects less easily obtained: for the same reason it is not to be the only emetic employed; where it is of service, its good effect is soon observable, and can be secured by giving it in small doses with other emetics. In the later stages of the disease it is entirely inadmissible.

197. *In Acute Idiopathic Mania*, Prof. Van der Kolk (p. 103, *seq.*), places great reliance on tartar emetic, given in such a manner as to produce its depressing effect on the brain and vascular system without its concomitant vomiting and purging, the occurrence of either of which effects he looks upon as interfering with its beneficial operation on the disease. To

this end he exhibits it in substance with sugar in the form of powder, or in pill (never in solution) commencing with gr. $\frac{1}{4}$ or gr. $\frac{1}{3}$ several times in a day, and gradually increasing the dose, giving it on a full stomach after a meal, and with a bit of biscuit before going to bed. By this method, he observes, we can more easily increase the dose; and this causes a continuation of the peculiar quieting or depressing effect on the brain, so that the patient becomes calmer and clearer, and often progresses rapidly towards recovery. The simultaneous use of vegetable acids and copious diluents should be avoided, as these are apt to develop the evacuant properties of the drug. If, with these precautions, tartar emetic is not tolerated, but immediately causes nausea and vomiting, it is an indication that the intestinal canal is in a state of erethism, which must be subdued by sedatives, &c., before it is again resorted to. If the patient improves under this treatment, then his tolerance of tartar emetic diminishes, and he can no longer bear without vomiting the large doses which he took every day during the earlier excitement, and apparently without especial effect. Accordingly the rule is as follows:—At the commencement of the disease increase the dose every second day or even daily, until an indication of nausea occurs, and then keep at the same dose. If in the further course the patient becomes more calm, if lucid intervals occur, which are usually interrupted by repeated accessions of greater vivacity, although the disease gradually diminishes, the dose of tartar emetic must be lessened in the same proportion as the patient becomes more sensitive to the remedy. If the bowels are sluggish, a laxative may be necessary, but if a purgative of any kind be added to the tartar emetic, the patient does not tolerate it in nearly so large doses as if taken unmixed. When much vascular excitement is present, it may be given combined with nitre, but even this after a short time has frequently to be discontinued, from its causing gastric irritation. *In Chronic Mania*, where violent irritation of the brain occurs, tartar emetic, according to Van der Kolk, still holds the first place in our list of remedies. Here it may often be advantageously combined with aloes (*q.v.*) *In Puerperal Mania*, he also advises it in frequently repeated doses; and Dr. Churchill (p. 488) observes that when the pulse is quick and the face flushed, its use may supersede the necessity of blood-letting.

198. *In Delirium Tremens*, German physicians are said to place much reliance on tartar emetic; and it has found an advocate in Dr. Peddie,[1] who relates several cases successfully treated with it. Still, as a general rule, the practice seems of very doubtful propriety, but if adopted it should be given in

[1] Edin. Monthly Journ., June, 1854.

the manner advised by Professor Van der Kolk in acute idiopathic mania (sect. 197). There can, however, be little doubt of its value as an adjunct to opium in this affection, often inducing tranquillity and sleep when opium alone has failed to produce these effects.

199. *In Puerperal Convulsions*, tartar emetic in doses sufficient to induce nausea without vomiting, has the commendation of Drs. Collins, Murphy, Kennedy, and others, but it is applicable only to convulsions of a truly sthenic character occurring in plethoric subjects.

200. *In Epilepsy depending on Plethora*, Dr. Cheyne speaks highly of the influence of antimony. Dr. Bell,[1] regarding the proximate cause of epilepsy to be congestion of some portion of the nervous centres, advocates the use of tartar emetic. He relates some cases successfully treated by it in doses of gr. $\frac{1}{4}$–$\frac{1}{8}$ every four hours; but as other remedies were simultaneously employed, the force of his statements is weakened. He regards its use as not confined to sthenic cases only, but extends them to those characterized by asthenia. The value of this agent in epilepsy has been confirmed by MM. Bouley, Gillette, and Bonfils.[2]

201. *In Acute cases of Chorea*, Dr. West speaks highly of antimony in full doses, but Dr. Hillier justly observes (p. 237), "Chorea is certainly a disease of weakly, ill-fed children, and it does not seem likely that such a depressing agent as antimony can be useful." His trials with it tend to confirm his views as to its inutility.

202. *In Acute Hydrocephalus*, tartar emetic in large doses, either alone or combined with calomel and opium, was formerly employed with the idea of reducing inflammatory action within the cranium, and of acting on the cutaneous and intestinal secretions, but it has been generally abandoned as less efficacious than cod-liver oil, iodine, and nutritives. Counter-irritation by Ung. Ant. Tart. to the scalp or nape of the neck, was formerly employed both in the *acute and chronic forms* of the disease, but Dr. Hillier (p. 172) states that he has seen no benefit from it; hence he has ceased to recommend it.

203. *In Acute Rheumatism*, tartar emetic in large and repeated doses has been advocated by Laennec,[3] Bricheteau,[4] and others, but experience has shown that, however valuable it is in moderating local action, it is insufficient of itself to effect a safe and speedy cure of the disease. On this point Dr. Fuller (p. 96) observes, "In the young, the active, and plethoric, in whom it serves to obviate the necessity for bleeding and other antiphlogistic measures, it may be employed in conjunction with

[1] Glasgow Med. Journ., Oct. 1857.
[2] See Ranking's Abstract, 1858, vol. xxviii., p. 86.
[3] Traité des Malad. des Poumons, &c., 2nd ed., p. 512.
[4] Clinique Médicale, 1835.

remedies having more decidedly curative properties; but to the more weakly, and to those whose symptoms are less acute, it often proves extremely depressing; and as it is unnecessary for the relief of the local inflammation, recourse should seldom be had to its administration." There is a great tolerance of the remedy in this disease, and large doses may be given without disorder of the intestinal canal, or a general disturbance. In a case of *Acute Articular Rheumatism* mentioned by Prof. Forget,[1] the dose was gradually raised to 72 grains! It is in this form of the disease that antimony has been thought to be most useful. *In Hydarthrosis*, also, it was extolled, especially by Gimelle,[2] but it has fallen into disuse as an internal remedy; it is, however, occasionally used locally as a counter-irritant in this affection and in *Chronic Synovitis;* but it is, on the whole, inferior to iodine and its preparations.

204. *In External or Superficial Inflammations*, tartar emetic often exercises a marked influence. *In Erysipelas*, its use was introduced by Desault, who administered it in one-grain doses largely diluted. The efficacy of this treatment has been attested by Dr. Walsh,[3] who considers that it exercises a specific influence on erysipelatous inflammation, and that it is equally applicable to all forms of the disease. It has, however, been superseded in a great measure, if not entirely, by T. Ferri Perchlor. (*q.v.*) Given early in *Inflammation of the Mammæ after delivery*, in small and often repeated doses, it frequently acts most beneficially. Two illustrative cases are given by Dr. J. Spender,[4] in which gutt. xv. Vin. Ant. (gr. $\frac{1}{16}$) repeated every hour in one case for 12, and in the other for 14 hours, entirely removed the inflammatory action without the production of the slightest nausea or vomiting. He also mentions a case of *Whitlow* successfully treated in the same way. *In Bubo*, according to Mr. Milton,[5] tartar emetic in one grain doses every second hour has a marked effect in reducing the inflammatory symptoms, so much so as to supersede in the majority of cases the necessity for surgical interference. If, in spite of the remedy, pus forms in any of the above cases, no good, but probably harm, would result from persisting in its use. *In acute Orchitis*, marked benefit often follows the use of tartar emetic as advised in bubo, but it should not be used to the exclusion of local measures.

205. *To Nævus*, Mr. H. Bateman[6] states that for fifteen years he has successfully applied a plaster composed of tartar emetic (1 part) and melted Emp. Resinæ (2 parts), spread on thin leather or linen. It should entirely cover the nævus, but need not extend beyond it; should it become detached before it has

[1] Gaz. des Hôpitaux, Feb. 19, 1839.
[2] Brit. For. Med. Rev., Jan. 1841.
[3] Dublin Quart. Journ., Aug. 1850.
[4] Brit. Med. Journ., March 23, 1867.
[5] Med. Times, Oct. 4, 1851.
[6] Lancet, Nov. 6, 1869.

produced sufficient inflammation and pustulation, it should be renewed immediately; if there be too much inflammation, poultices and fomentations may be applied. Should the skin be unusually insusceptible or the nævus unusually thick, equal parts of tartar emetic and emplastrum resinæ may be used. Its employment should be continued till the nævus sloughs. A somewhat similar treatment is advocated by Dr. Zeissl.[1] Mr. T. Smith[2] regards it as inferior to perchloride of iron or nitric acid (*q.v.*)

206. *In Influenza*, tartar emetic has been strongly recommended, but Dr. Parkes (i. p. 48) regards it as too lowering in many cases; in his hands it proved of little service, and he believes it better avoided altogether.

207. *Albuminuria.* Dr. Barlow[3] recommends the administration of tartar emetic in the acute forms of this disease. He considers that it is a remedy suggested by the nature of the affection, and calculated to fulfil the most obvious and important indications; namely, equalizing the circulation, subduing the inflammatory action, and restoring the functions of the skin. It is not to be used to the exclusion of other remedies, as moderate blood-letting, hydragogue cathartics, the warm bath, and the application of large linseed-meal poultices to the loins. Dr. Barlow relates several cases in which the antimonial treatment was attended with decided benefit.

208. *In obstinate Constipation dependent upon the absence of mucus to lubricate the intestines*, tartar emetic sometimes produces relief. Dr. Nevins (p. 353) mentions, in illustration, the case of an old man who had no evacuation from the bowels for eleven days, notwithstanding the employment of purgatives of every description, and of glysters, great and small. He administered the salt in doses of gr. $\frac{1}{4}$, every hour, with one drachm of sulphate of magnesia. He was constantly nauseated by it, and in six hours passed a mass of hardened fæces; after which he had no further ailment.

209. *In strangulated Hernia and long-standing Dislocations*, tartar emetic was formerly used as an adjunct to bleeding and the hot bath, with the view of relaxing the muscular system, and thus facilitating reduction. For this purpose, however, it has been abandoned in favour of chloroform and other anæsthetics, which are far more effectual. In these cases, chloral (*q. v.*) promises to be of great value.

210. *In Purulent Ophthalmia, and other inflammatory affections of the Eye*, tartar emetic constituted a conspicuous part in the antiphlogistic treatment formerly employed; but recent experience has shown the superiority of the tonic system, and

[1] Med. Times, Oct. 2, 1862.
[2] Lancet, Aug. 17, 1867.
[3] Guy's Hospital Rep., vol. x.

has led to its abandonment (see Argenti Nitras). Dr. Ringer (p. 186) states that it may be given with advantage (gr. $\frac{1}{36}$–$\frac{1}{48}$, 3 or 4 times daily) in *Strumous Ophthalmia*. *In Chronic Ophthalmia and Opacities of the Cornea*, a solution (gr. j. Aq. fl. drm. ij.) has occasionally been used as a stimulant collyrium.

211. *In Sub-acute Ovaritis*, Dr. Rigby speaks highly of counter-irritation by tartar emetic ointment over the seat of disease. When the eruption appears, he directs it to be dressed with lint until a slight degree of sloughing is produced. He states that he knows no application so efficacious. At the same time that counter-irritation is thus kept up, Dr. Graily Hewitt (p. 583) advises the following pill night and morning:—℞ Opii gr. $\frac{1}{2}$, Ext. Cannabis Ind., Camphoræ, āā gr. j. M. ft. pil.

212. *In Tedious Labours depending upon rigidity of the os uteri*, tartar emetic has been employed with success in inducing relaxation of the parts. Dr. E. Kennedy, of Dublin, introduced its use, and Dr. Churchill[1] recommends the following formula:—℞ Magnes. Sulph. ℥j., Infus. Sennæ fl. oz. viiss., Ant. Tart. gr. iij.; Syr. Zingib. fl. oz. ss., M. Dose:—Two tablespoonsfuls every hour or half-hour, so as to keep up a degree of nausea short of actual vomiting. Thus given, antimony, observes Dr. Churchill, is an exceedingly valuable remedy, perfectly safe and very successful. Dr. Tyler Smith[2] also bears testimony to its efficacy.

213. *In Uterine Hæmorrhage* in robust subjects, tartar emetic sometimes proves useful. In the first and second stages of flooding, Dr. Tilt (p. 225) states that he has seen nauseating doses of it gradually arrest the discharge. It is inadmissible in weak, debilitated subjects.

214. *Tic Douloureux and other forms of Neuralgia* are sometimes benefited by tartar emetic counter-irritation over the affected part; but according to Dr. Fuller (p. 469), the pain and discomfort occasioned by it more than counterbalance the benefit obtained, nor, indeed, does it possess any special advantages.

215. ANTIMONII IODIDUM. Iodide or Ioduret of Antimony.

ANTIMONII OXY-IODIDUM. Oxy-iodide of Antimony.

Med. Prop. and Action. Alterative and diaphoretic. Dr. Vanden Corput,[3] of Brussels, from an examination of these preparations, concludes that the oxy-iodide is the only chemical form in which the combination of iodine and antimony can be conveniently used as an internal remedy; the iodide becoming too readily decomposed by contact with the liquids of the digestive canal. The oxy-iodide is a drug of great efficacy, being at the same time an expectorant and a powerful alterative.

[1] Midwifery, p. 206.
[2] Lancet, Nov. 25, 1848.
[3] Bull. Gén. de Thérap., Jan. 30, 1862.

In doses of from 5 to 25 centigrammes (from about gr. $\frac{3}{4}$ to gr. iiiss.), it frequently excites nausea, and sometimes vomiting; at other times it produces frequent and copious stools. The effects may be easily modified by opiates or some other narcotic agent capable of deadening the susceptibility of the stomach. Tolerance appears to be easily established, the dose being gradually increased from 20 to 50, or even to 70 centigrammes (from about gr. ij.$\frac{3}{4}$ to gr. vij., or even to gr. x.), in twenty-four hours. These doses excite primarily much diaphoresis, which is soon followed by considerable depression of the circulation. The number of inspirations is diminished in frequency, and this effect is accompanied by extreme muscular weakness. The iodide externally applied in the form of ointment or plaster, is a powerful revulsive, analogous in its action to tartar emetic. Like it, it creates a pustular eruption; but it has this advantage, that independent of its local derivative action, it operates beside on the organism in a general manner, by giving up a part of its iodine, which is then either directly absorbed, or, by being vaporized by the heat of the body, surrounds the patient with an iodized atmosphere.

Dose:—Of the oxy-iodide of antimony, as an alterative and diaphoretic, gr. $\frac{1}{8}$ gradually increased to gr. j., or even more, if tolerance be established.

216. *Therapeutic Uses.* The oxy-iodide is particularly serviceable in *Inflammation of the parenchyma of the Lungs, and especially in the second stage of Pneumonia*, also in the treatment of *Sub-acute Bronchitis* and of *Œdema of the Lungs*. Its alterative and diaphoretic properties are also manifest in the treatment of *Rheumatic Affections*, as well as in certain *Inflammatory Diseases of the Heart*. The iodide, as an external application, proves advantageous in the same affection as tartarized antimony, but it should be borne in mind that its action is more powerful.[1]

217. ANTIMONII OXIDUM. Oxide of Antimony. Sb_2O_3. It is the active ingredient in the following officinal preparation.

PULVIS ANTIMONIALIS. Antimonial Powder. A mixture of oxide of antimony oz. j.; precipitated phosphate of lime oz. ij.

Med. Prop. and Action. Nauseant and diaphoretic in *febrile conditions*, alterative in *chronic diseases of the skin*. The action of oxide of antimony is the same as that of tartar emetic, except that its effects are modified by its inferior solubility. Slowly acted on by the fluids of the stomach, the oxide is believed to be less irritating, less sudden, and more lasting in its effects than the tartrate (Garrod). The *Pulvis Antimonialis* (Ph. B.) is intended to supersede the secret remedy known as *Pulvis Jacobi Verus*, *James's Powder*, and the *Compound Antimonial Powder* of the Pharm. Lond. Large quantities of both these powders have been given without producing sensible effects. Dr. Elliotson found 120 grains of the latter nearly inert. On the other hand, in five-grain doses, James's powder has produced copious vomiting and purging. The mode of preparation of the *Pulvis Antimonialis* (Ph. B.) precludes any possibility of variation in the proportion of the soluble oxide. The oxide of antimony is well adapted

[1] Brit. and For. Med. Chir. Rev., July, 1862.

for administration in powder or pill. In the *Pulvis Antimonialis*, the phosphate of lime is insoluble and probably inert.

Dose:—Oxide of antimony, gr. j.–iv.; Pulvis Antimonialis, gr. iij.–x.

218. ANTIMONIUM SULPHURATUM. Sulphurated Antimony. Sulphide of Antimony, Sb_2S_3, with a small and variable amount of oxide of antimony, Sb_2O_3.

Med. Prop. and Action. Alterative; emetic. It is very uncertain in its operation; its chief value is as an ingredient in Pil. Hydrargyri subchloridi (*q.v.*) Under its use all the constituents of the urine, especially the urea and sulphuric acid, are increased (Dr. Parkes).

Dose:—Alterative, gr. j.–v.; emetic, gr. x.–xx.

219. APIOL. APIOLUM. The peculiar principle of the seeds of Common Parsley, Petroselinum sativum, *Linn.*, obtained by treating them with alcohol at 158° to 176° F. It occurs in the form of a yellowish oily liquid, with an odour somewhat resembling the powdered seeds and an acrid piquant taste. Is soluble in acohol, ether, and chloroform.

Med. Prop. and Action. Tonic, anti-periodic, and emmenagogue. Joret and Homolle[1] found that, when taken in doses of gutt. vij.–xv., it occasioned slight cerebral excitement, similar to that produced by coffee, together with epigastric warmth. In doses of f℥ss.–f℥j. it caused vertigo, tinnitus aurium, headache, &c., similar to the effects produced by a strong dose of quinine. Occasionally, its use was followed by nausea, colic, and bilious diarrhœa.

Dose:—Gutt. viij.–xv. in syrup.

220. *Therapeutic Uses. In Intermittent Fevers*, the value of apiol has been examined by Joret and Homolle (op. cit.) Of 43 cases of all types, collected from various parts of France, 37 were cured, and in the remaining 6 the fever was modified, but not removed. Of 30 cases occurring in hot climates, only 16 were cured. From these facts it is concluded that, if apiol be not of equal value to quinine in the intermittents of hot climates, it may yet be very well substituted for it in indigenous, *i.e.*, European, intermittents: other facts in favour of this remedy are adduced by M. Joret.[2] Dr. Jacquot,[3] however, subjected it to a trial in the military hospitals at Rome, and expresses great doubt as to its efficacy; only one case in six yielding completely to the remedy. It apparently deserves to be classed amongst those minor remedies which often prove successful in mild cases of intermittents. The usual dose is gutt. xv., gradually increased. In *Intermittent Neuralgia* and in the *Night Sweats of Phthisis*, Joret and Homolle consider that this remedy is likely to prove serviceable.

221. *In Amenorrhœa and Dysmenorrhœa*, apiol, according to

[1] L'Union Méd., Jan., 1855.
[2] L Union Méd., June 26th, 1856.
[3] Archiv. Gén. de Méd., June 1854, p. 678.

Dr. Joret,[1] is one of the safest and best emmenagogues which can be employed, not being contra-indicated even in cases of incipient pregnancy. It is thought to be especially adapted for these states when they arise from a diminution or excess or perversion of the vitality of the uterus, attended with local or general nervous symptoms. To be effectual, it requires to be administered at those periods when the menstrual discharge would be naturally expected to return, and to be continued for five or six successive days. A dose should be taken night and morning. Dr. Tilt (p. 95) states that he has found apiol act like a charm in some cases of nervous dysmenorrhœa, but that it is of little use when dysmenorrhœa depends upon disease of the uterus.

222. Apomorphia, a base contained in opium: obtained by subjecting morphia to the continued action of pure hydrochloric acid at a high temperature for several hours. The base can be obtained from the resulting hydrochlorate of apomorphia by dissolving in water, adding excess of bicarbonate of sodium, and extracting with ether or chloroform. In composition, apomorhia is morphia *minus* an atom of water. It occurs in the form of a snow-white powder, soluble in cold, and to a greater extent in warm water. Its aqueous solution is colourless at first, rapidly changing to a dark olive green, and at the end of a few weeks almost black. For other particulars consult a paper by its discoverers, MM. Mathiessen and Wright, in No. 112 of the "Proceedings of the Royal Society."

Med. Prop. and Action. Powerful emetic in doses of gr. ¼ by mouth, or gr. $\frac{1}{10}$–gr. $\frac{1}{15}$ injected subcutaneously. In these doses it produces vomiting in from five to twelve minutes, the usual premonitory symptoms being absent, or coincident with the expulsive effort, and the subsequent depression slight and of short duration. Dr. F. M. Pierce employs a solution of the hydrochlorate of apomorphia (gr. j. aq. ℥cc.) in dose of ℥ℓ. v. (gr. $\frac{1}{12}$th) for children to whom he has frequently prescribed it. In almost all cases it was administered subcutaneously. He states that he has used it in *Pneumonia*, *Diphtheria*, *Scarlatina*, *Drunkenness*, and in cases of *Poisoning*. In one case only (a case of *Chorea*, in which it acted beneficially) was it found to produce drowsiness. In both adults and children, with a dose not exceeding gr. $\frac{1}{15}$, very slight inconvenience followed its use. The alterations of the temperature were very slight, the pulse not peculiarly affected, the pupils generally a little dilated. No action on the bowels or kidneys was observed. In conclusion, as an emetic, apomorphia is pre-eminent in the smallness of the dose required; the certainty, rapidity and completeness of its action; the unimportance of its baneful effects, and its non-irritating character. It contrasts most favourably with the old-fashioned emetics: the only drawback at present is its costliness (Dr. Pierce).[2] Dr. S. J. Gee,[3] however, considers that the drawback to the value of apomorphia as an emetic, is its contra-stimulant effect; not that

[1] Bull. Gén. de Thérap., Aug. 15th, 1860.
[2] British Medical Journal, Feb. 26, 1870.
[3] St. Bartholomew's Hosp. Reports, vol. v., 1869, p. 215.

this occurs in all cases, far from it, but sometimes it does occur to such an extent as to cause anxiety, the patient seeming as if his muscular power were gone; the vascular system, however, does not appear to be depressed to an equal extent. As an example of the rapidity with which it occasionally acts, Dr. Gee mentions a case in which vomiting occurred eighty seconds after its injection subcutaneously. A case of *Protracted Labour depending upon rigidity of the os uteri*, in which apomorphia in gr. ¼ dose acted speedily as a relaxant, is recorded by Dr. Milne.[1] He suggests its use hypodermically.

223. ARGENTUM. Silver. Ag. = 108. A metal, which, in its native state, appears to be totally inert. Medicinally, it is, however, of great value, as the basis of the following preparations.

224. ARGENTI NITRAS. Nitrate of Silver. $Ag.NO_3$. Lunar Caustic.

Med. Prop. and Action. Tonic, anti-spasmodic, and sedative, in doses of from gr. ¼ to gr. j. or gr. ij. In very large doses, it is a corrosive poison. If taken in small doses for a great length of time (two or three months), it occasionally communicates a peculiar blue appearance to the skin. When applied to the skin, mucous membranes, or ulcers, it produces a white mark, owing to the union, according to Dr. Pereira, of the salt with the coagulated albumen of the cuticle; this gradually becomes bluish grey, purple, and ultimately black, owing to the partial reduction of the silver. Its probable action, when given internally, is that of astringing the mucous coats of the intestines. It is also a powerful tonic of the nervous system, but its *modus operandi* in the latter case has not yet been satisfactorily explained. Heller[2] carefully examined the blood and urine of epileptics who had undergone long courses of the nitrate, but failed to detect any traces of silver, whilst he found the fæces to contain, in the form of the chloride, the greater part of the silver which had been administered. Still we are justified in believing that a portion of the salt becomes absorbed, and exercises a tonic influence on the nervous system, independent of the local chemical action it may exercise on the mucous coats of the stomach and intestinal canal with which it comes in contact. Externally applied, it is stimulant, vesicant, and escharotic. The nitrate lightly applied three or four times to the moistened skin causes vesication in a few hours.

225. *Obs. on the use of the Nitrate of Silver.*

1. Previous to commencing a course of the nitrate of silver, administer a mild aperient to carry off any superabundant acid or fæcal accumulations.
2. It is rarely admissible as long as inflammation is present. When this is subdued, it may be given with advantage.
3. It is best given in some mild vegetable powder with mucilage or extract; the usual vehicle, bread crumbs, is objectionable, from their commonly containing a portion of common salt, which decomposes the nitrate.
4. The nitrate should be finely powdered before being made into pills. Its efficacy is thereby greatly promoted.
5. During a course of this medicine, it should be occasionally intermitted for a day or two, and a mild aperient administered. If this is done, the course may be continued for a longer period without any of

[1] Edinburgh Med. Jour., Jan., 1870.

[2] Archiv. für Physiol., 1846, vol. i. p. 324.

the ill consequences which would otherwise ensue. The gums and fauces should be frequently and carefully examined, and the slightest discoloration indicates the necessity of immediately discontinuing the salt.

6. During its use the quantity of salt or salt food taken should be small, and never immediately before or after the remedy.

7. It is also advisable that the patient should not be much exposed to the sun. In some instances exposure seems to have promoted or hastened the blue appearance of the skin.

8. The course may be continued with safety for a month or six weeks. Dr. J. Johnson says for three months.

9. If discoloration of the skin occur, the remedies from which most benefit is derived are iodine, nitric acid, and acid tartrate of potash.

10 Before commencing its use the patient should be made acquainted with the possible ill consequences which may result from it.

11. It may be administered in larger doses and for a longer period in the form of pill than in that of solution.

12. If, in the application of the solid nitrate to the fauces, urethra, &c., a piece be accidentally left in any of the passages where it cannot be extracted or where it causes great pain, a solution of common salt should be used as an injection.

13. When solutions are to be injected into any of the cavities, a glass syringe should be employed.

14. The local application of the nitrate in solution to the eye is sometimes followed by a blackish or bluish grey discoloration of the conjunctiva. It is usually described as "indelible," but it may be partially or altogether removed by a weak solution of the hyposulphite of soda (gr. x., Aq. fl. oz. j.)—(Dixon.)

Dose of the Nitrate:—gr. $\frac{1}{4}$–gr. 1 or more.

226. *Therapeutic Uses. Diseases of the Abdominal Viscera.* The value of nitrate of silver in *Dyspepsia* was first established by the late Dr. James Johnson (p. 669), who relates many obstinate cases, attended by morbid sensibility and hypochondriasis, which yielded to its use. He considers that its probable action consists in lessening the sensibility of the nerves, and thereby rendering them insusceptible of irritation. He advises a formula similar to the following:—℞ Argent. Nit. gr. $\frac{1}{2}$, Ext. Hyoscyam. gr. ij.–iv., ft. pil. omni nocte sumend. The quantity of the nitrate may be gradually increased to gr. ij.–iij. daily, and this may be continued with safety for six or eight weeks, but not beyond that time. Strict attention to the diet should be observed. In some cases, it may be advantageously combined with small doses of quinia. Dr. Fleming[1] prefers administering it in solution (Argent. Nit. Crystal. gr. j.–iv., Aq. Destil. fl. oz. $\frac{1}{2}$) to be taken at bedtime on an empty stomach, and repeated every night, or every second, third, or fourth night, according to the severity of the disease.

227. *In Gastralgia and Gastrodynia*, especially when attended with vomiting, the nitrate often exercises a speedy and beneficial influence. It may be given in doses of gr. $\frac{1}{3}$ to $\frac{1}{2}$ twice or thrice daily, in combination with taraxacum. Dr. Symonds,[2] in bearing testimony to its efficacy, states that he

[1] Med. Times, Jan., 1859.

[2] Lib. of Med. vol. iv. p. 83.

has found it chiefly useful in those cases which present a combination of nervous irritability with chronic or passive congestion of the stomach. In *Pyrosis*, according to Mr. J. Kent Spender,[1] the nitrate is superior to all other remedies. In *Chronic Gastritis* of the worst kind, Professor Wood (i. p. 393) states that this is the most effectual remedy he knows. Dr. Fleming (op. cit.) advises that in these cases the crystallized nitrate dissolved in distilled water be injected into the stomach.

228. *In Chronic Diarrhœa*, when the stools are watery or mucous, the nitrate has been found serviceble when other astringents and tonics have failed. *The obstinate Diarrhœa of Children* often improves under the following formula originally proposed by Dr. Willshire:—℞ Argent. Nit. gr. j., Acid Nitric dil. ♏ v., Mucilag Acaciæ, Syr. Simp. āā ʒvj. M. sumat fʒj. 4tâ quâque horâ. It may be given safely to children of a year old. The French physicians employ it largely, not only by mouth, but in the form of enema. M. Trousseau advises from gr. $\frac{1}{6}$ to gr. ij. to be dissolved in fl. oz. x. of fluid, and to be thrown high up into the intestine, having previously employed an enema of common salt. In mild cases he recommends one injection daily for three or four days; but in bad cases it may be repeated twice in twenty-four hours. *In the Diarrhœa of Phthisis*, Dr. Graves (ii. p. 228) regards nitrate of silver, in doses of gr. j. three or four times daily, one of the best remedies. *In the Diarrhœa of Enteric Fever*, Dr. Tweedie and M. Trousseau speak in high terms of the nitrate in doses of gr. $\frac{1}{4}$–gr. j. with gr. i.–ij. of Pil. Sapon. Co. every 3 or 4 hours. Dr. Tweedie[2] states that he has prescribed it extensively in these cases, and continued its use for a considerable time without having observed any approach to discoloration of the skin. According to Dr. Harley it is inferior to Cupri Sulph. (*q.v.*)

229. *In the Advanced Stages of Acute Dysentery, and in Chronic Dysentery*, no remedy in my hands has proved more uniformly useful than nitrate of silver, in doses of gr. $\frac{1}{2}$ to gr. $1\frac{1}{2}$ daily, reduced to fine powder and conjoined with Pulv. Ipecac. Co. in the form of pill. Its effects are often very remarkable, and even in young children, to whom I have prescribed it extensively, no ill effects have followed its use. Others have also testified to its value in these cases. It has also been extensively employed in the form of enema; and some few years since considerable attention was called to Dr. Hare's[3] plan of treatment of *Acute and Sub-acute Dysentery*, which consisted, in the main, of first throwing into the transverse colon, by means of the flexible tube of a stomach pump,

[1] Practitioner, Oct., 1868.
[2] On Continued Fevers, p. 233.
[3] Indian Ann. of Med. Sci., i. p. 486.

large enemata of warm water or milk and water, 3, 4 or 6 pints, so as thoroughly to break down and bring away fæcal accumulations, and then to follow them up with enemata of Oiiss.–Oiij. of distilled water, holding in solution gr. xv. of nitrate of silver. The solution thus applied directly to the ulcerated surface of the colon and lower intestines, was considered to hasten the curative process. Notwithstanding the testimony borne to the efficacy of this treatment by Dr. Hare and some other medical officers in India, it has never come into general use; and since the re-introduction of the ipecacuanha treatment, its claims to notice are greatly weakened. In obstinate cases, if it be determined to give this treatment a trial, the patient should lie on the left side, and the tube should be introduced with the greatest caution per rectum, to the extent of about six or seven inches, or at any rate till it reaches the sigmoid flexure of the colon, and the fluid injected gently. It is not always easy or even practicable to introduce the tube as directed above; the natural sharp fold at the junction of the rectum and colon may cause obstruction; and Mr. Erle has shown that the bowel not unfrequently makes a horizontal curve to the right before descending into the pelvis. Great gentleness is therefore requisite in introducing the tube, otherwise the intestine may be perforated or other serious mischief ensue. In obstinate chronic cases, when the ulceration is confined to the lower part of the intestine or rectum within the reach of an ordinary enema, a solution of the nitrate (grs. ij.–iij.) in distilled water, with or without a portion of opium, in some cases hastens the process of cicatrization.

230. *In Ulcer of the Stomach*, the nitrate has been thought valuable, but Dr. Brinton (p. 180) considers that there is no good evidence of its efficacy. As ordinarily prescribed, he believes it to be, as far as gastric ulcer is concerned, absolutely inert. He prefers bismuth (*q.v.*)

231. *In Cholera*, Mr. Garlike[1] states that he has successfully employed the nitrate of silver. The mode of application he advises is to inject into the colon, by means of a long flexible tube, a solution of the nitrate (gr. xvj. Aq. Dest. fl. oz. iv.) Ten minutes afterwards he administers another enema, composed of T. Opii f℥iv. in fl. oz. vj. of gruel. In the first case in which he employed this treatment, the patient was in a state of collapse, apparently sinking fast. After the introduction of the nitrate, the purging ceased, but the vomiting continued; after forty-eight hours, the bowels acted naturally. A complete cure followed. Several others were treated in precisely the same way, and with "equally happy results." The quan-

[1] Med. Times, Jan. 27, 1849.

tity of the nitrate employed must be regulated according to the age and strength of the patient, and the urgency of the symptoms. It merits a further trial. Dr. Barry[1] used it internally with great success (gr. j. after each stool) in an epidemic of this disease at Assam, in 1853.

232. *Diseases of the Eye. In Gonorrhœal and in the severer forms of Purulent Ophthalmia*, a solution of the nitrate, varying in strength from gr. x. to gr. xxx. Aq. fl. oz. j., according to the severity of the case, is a very effectual application. The lids should be everted, and the conjunctival surfaces painted over with the solution, which should be allowed to remain a few seconds so as to whiten the parts, and then be washed off by gently syringing over the granular surface a stream of cold water, or what is better, a solution of common salt (gr. x. Aq. fl. oz. j.), to wash away and neutralize all the surplus nitrate, so as to prevent its irritating the eye, or blackening the ocular conjunctiva. This should be repeated once daily, and in very bad cases a second application may be necessary. When the lids are so swollen that they cannot be everted, two or three drops of a weaker solution of the nitrate (gr. ij.–x. Aq. fl. oz. j.) may be dropped twice a day into the eye, after it has first been cleansed by syringing away the discharge with cold water. During the intervals, in all cases, lint soaked in cold or iced water may be kept applied over the eyelids. Constitutional treatment is most important: a few years ago, this consisted in excessive bleedings, and in the use of strong depressants. Experience has shown the error of such proceedings, and by now adopting a directly opposite course, a far larger proportion of cases recover, with good and useful eyes. From the very commencement of an attack, the strength of the patient should be supported by tonics, diffusible stimuli, and a liberal diet. Having first acted on the bowels by a moderate purgative, quinine (grs. ij.), or cinchona with the mineral acids, should be given every four hours. If there be much pain or irritability, opium should be given, either in small quantities frequently repeated, or in one full dose at bedtime. When there is heat of skin, with thirst and a furred tongue, an effervescing mixture with ammonia should precede the use of tonics. The diet should be one with meat or beef-tea, and with a certain amount of wine or brandy, according to the state of the patient. This is stated to be the best treatment of gonorrhœal ophthalmia, and also of the severer cases of purulent ophthalmia, by Mr. George Lawson, surgeon to the Royal London Ophthalmic Hospital, Moorfields.[2]

233. *For the cure of the muco-purulent discharge, dependent on granular lids, resulting from Purulent Ophthalmia*, Mr. G. Lawson

[1] Ind. Ann. of Med. Sci., i. p. 449. [2] Practitioner, Dec., 1868.

(op. cit.) has found most benefit from a solution of the nitrate (gr. v.–x. Aq. fl. oz. j.) dropped into the eye, and after letting it remain 30 or 40 seconds, to allow it to take full effect, washing off the surplus with a stream of cold water, or a weak solution of common salt. *For the Purulent Ophthalmia of Infants*, the strength of the solution should not exceed grs. iv. ad Aq. fl. oz. j. The general treatment should approximate to that advised in the last section, modified, of course, by the age of the patient.

234. *In Scrofulous Ophthalmia*, a collyrium of the nitrate (gr. iv.–vj. Aq. fl. oz. j.) is stated to be efficacious; but more benefit is derived from the mode of treatment first proposed by Mr. Wormald, and subsequently advocated by Drs. Hocken[1] and Lanyon.[2] It is as follows: the eyelid is put on the stretch, so as to present a smooth surface, and, after being slightly moistened, the caustic is to be passed once or twice lightly over it, so as to produce a slight blackness of the skin. A single application often suffices to remove the lachrymation, the photophobia, &c. Iodine, applied in the same manner, is equally efficacious. *In Ophthalmia Tarsi*, a pencil of the nitrate lightly passed over the diseased surface is advised by Quadri, of Naples, and others. *In Epiphora*, a solution of the nitrate (gr. iij. Aq. fl. oz. j.) once or twice daily is sometimes productive of benefit. *In Pterygium*, especially when this is combined with catarrhal conjunctivitis, benefit occasionally follows its use (Mackenzie.) *In Indolent Ulcers and Opacity of the Cornea*, a collyrium of the nitrate (gr. j.–iv. Aq. fl. oz. j.) often proves serviceable.

235. *Diseases of the Genito-Urinary System. In Amenorrhœa*, Dr. Lubanski[3] speaks highly of the efficacy of applying the nitrate in substance lightly to the os uteri, at the time of the expected appearance of the menses. He states that in all cases, excepting where the amenorrhœa is symptomatic of some other disease, it proved effectual. It has also been found successful by Dr. Egan,[4] who recommends its employment in obstinate cases.

236. *In Leucorrhœa*, the nitrate in solution (gr. iij., Aq. Dest. fl. oz. j.) has been advised as a vaginal injection. Dr. Hudson[5] states that in *Uterine Leucorrhœa* he has derived great benefit from the internal administration of the nitrate. He relates several cases illustrative of its efficacy. The following formula is advised:—℞ Argent. Nit. gr. ¼, Opii gr. ¼, Pulv. Rhei, Ext. Hyosyam. āā gr. j. M. ft. pil. in die sumend.

237. *In Gonorrhœa*, the nitrate in solution often proves an effectual injection. Ricord advises in solution (gr. x. Aq.

[1] Lancet, Nov. 19, 1844.
[2] Ibid., June 21, 1843.
[3] Ann. d'Obstet., 1843.
[4] Dublin Journal, 1848.
[5] Ibid., vol. xvii. p. 238.

fl. oz. viij.) at the very outset of the attack; he states that, by this means, the disease may be invariably cut short in the first stage. A similar opinion is expressed by Dr. Graves, Mr. Acton, and other experienced writers. The injection is to be repeated twelve times, desisting, however, if the discharge is rendered thin and bloody, an ordinary effect of the application; a weak solution of zinc or alum should then be substituted, and continued until the discharge ceases. Antiphlogistics, aperients, and copaiba should be employed at the same time. The above practice has been objected to as being likely to induce orchitis and other bad consequences; but there appears to be no real foundation for this fear. *In the Chronic stage of Gonorrhœa*, an injection of the nitrate (gr. j.–iv. Aq. Dest. fl. oz. j.) often proves serviceable.

238. *In Chronic Urethritis in the Female*, Dr. Braxton Hicks[1] states that the solid nitrate is a very efficient, though painful application. It should be held in a small caustic holder on the end of a stilette, and sliding easily within a small silver tube, from which the caustic can only be made to project a short distance. The nitrate should be sheathed in the tube when passed into the urethra, and then, being projected beyond the tube, should be slowly withdrawn. By this means, the mucous membrane is lightly touched throughout its whole extent. It is more painful than tannin (*q.v.*), but the pain soon passes off, and in a day or two much relief is obtained. It should be repeated in a week, and a third time at the same interval, if required.

239. *In Ulceration of the Os and Cervix Uteri*, the nitrate is one of the best and safest caustics we can employ. The surface to be operated upon having been well exposed by aid of the speculum, the adherent secretions should be removed by means of a piece of lint or cotton-wool, held firmly by a pair of long speculum forceps. The surface having been made dry and clean, the solid stick of the nitrate should be pretty firmly pressed against each portion of the surface in succession, to the required extent. If the surface be made previously perfectly clean, one such application will be sufficient in the majority of cases to remove, at all events for a time, the hypertrophied condition of the papillæ. A solution of the nitrate, of varying strengths, may be substituted, when the solid nitrate is considered too powerful (Dr. Graily Hewitt, p. 372.) *In Inflammation of the Cervix*, without ulceration or hypertrophy, Dr. J. H. Bennett regards the nitrate as the most advantageous of all caustics; and a similar estimate of its value is expressed by Dr. Tilt. In applying the nitrate to the uterus or uterine passages, it is advisable to commence with injections of tepid or cold water,

[1] Lancet, Oct. 12, 1867.

so that the surface may be as free from mucus as possible. The solid nitrate should not be applied oftener than once a week. The solution (gr. xl. Aq. Dest. fl. oz. j.) gives less pain, but requires to be more frequently applied. A bright silver probe, coated with the nitrate by repeatedly dipping it into nitrate that has been melted by heat, is a convenient way of applying it to the lining membrane of the cervix (Dr. Tilt, p. 161.)

240. *In Follicular Inflammation of the Labia, in Eczema, in Prurigo Pudendi and Pruritus*, both external and vaginal, a piece of cotton-wool should be soaked in a solution of the nitrate, and carefully rubbed for two or three minutes over the diseased portion of the skin and mucous membrane; to be repeated at first daily, then every other day, and then every fourth or fifth day, until the skin becomes soft and pliable. The fingers of the operator should be well greased with cold cream to prevent them being stained, and folded cloths should be placed under the patient, otherwise her clothes will be spoilt (Dr. Tilt, p. 165.) For allaying *Pruritus* in obstinate cases, a rather strong cauterization of the os uteri with the solid nitrate will, according to Dr. Graily Hewitt (p. 656) sometimes succeed when other measures fail.

241. *In Permanent Stricture of the Urethra*, the direct application of the nitrate to the seat of the disease is a powerful agent in deadening the sensibility of very irritable stricture, but is liable, if mismanaged, to produce inflammation, hæmorrhage, and other serious mischief. It may be applied by means of a small fragment firmly fixed into the end of a bougie, or by a special instrument designed for the purpose, such as the *porte-caustique* of Lallemand, in which a stilette coated with the solid nitrate can be protruded: there is also an instrument used by Mr. H. Smith and others, in which the stilette is covered with sponge dipped in a solution of the nitrate; and, still better, a catheter devised by Mr. Erichsen, for injecting a few drops of the caustic solution into any part of the urethra it may be desired to operate on (Druitt, p. 615.) Many experienced surgeons condemn this treatment; others prefer in these cases caustic potash (*q.v.*)

242. *Spermatorrhœa.* Sir E. Home was the first who recommended cauterizing the urethra as a means of arresting involuntary spermatic discharges. It was subsequently introduced into France, and adopted by Lallemand, who strongly advocates the practice as the most certain and efficacious. In England it has also met with an able advocate in Dr. Ranking, of Norwich.[1] There can be no doubt, however, that, used injudiciously, it is capable of doing much mischief.

[1] Lancet, Oct. 14, 1843.

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243. *Incontinence of Urine in Children.* In confirmed cases, after the failure of other treatment, especially for those who have arrived at puberty or thereabouts, a mild caustic solution (Argent. Nit. gr. x. Aq. 1 fl. oz.) to the prostatic urethra has proved successful in the hands of Sir H. Thompson (p. 163.) A stronger solution may be tried should this fail.

244. *To Primary Chancres*, the application of the solid nitrate immediately on the first appearance has been advised, with the view of destroying the specific character of the ulcer, decomposing the venereal poison, and preventing its absorption into the system. On this point Dr. Druitt observes: "Whilst the chancroid or soft sore should be destroyed by caustic, it is generally agreed now that such a proceeding is useless in the common infecting chancre. It is of no use whatever as a means of preventing secondary symptoms; for Langston Parker and Diday have thoroughly destroyed chancres within a few hours of their first appearance, and yet an indurated cicatrix and indolent enlargement of the nearest lymphatic glands have come on, and been succeeded by secondary symptoms." *Indolent Bubos* are sometimes stimulated to healthy action by the application of a strong solution of the nitrate, or the solid nitrate, lightly to their surface. *In Acute Orchitis*, Mr. Furneaux Jordan[1] advocates the application of a strong solution to the scrotum, followed by gentle pressure. For several years, he states, he has employed this treatment with unvarying success.

245. *In Hæmaturia arising in connection with vesical tumour*, Sir H. Thompson (p. 168) states that he knows nothing so valuable as injections into the bladder of nitrate of silver, commencing with a very weak solution. *In Chronic Cystitis*, he also recommends (p. 150) injection of the nitrate, certainly not more than gr. j. to 4 oz. of warm water to commence with, going up to about ½ gr. or gr. j., at the most to the ounce. It should be employed in the manner laid down in Art. Injections. *In Chronic Inflammation of the Prostate*, in exceptional cases, where chronic gleet is a prominent symptom, the application of a solution of the nitrate (gr. v.–x. Aq. fl. oz. j.) to the prostatic urethra may be very serviceable (Sir H. Thompson, p. 156.)

246. *Spasmodic Diseases. In Chorea and Epilepsy*, prolonged courses of the nitrate were formerly much in vogue, and many cases cured by these means are on record; but the danger of "turning blue," taken in connection with the fact that other remedies of equal if not greater efficacy have been discovered, has tended to bring it into comparative disuse.

247. *In Spasmodic Asthma*, a course of the nitrate, gr. j.

[1] Brit. Med. Jour., Aug. 22, 1868.

daily in the form of pill, appears in some cases to act beneficially in reducing the force and frequency of the paroxysm. I have seen benefit from it when thus administered. Employed similarly in *Angina Pectoris*, it is favourably spoken of by Dr. Copland (i. p. 68.)

248. *In Hooping Cough*, after the acute stage is passed, the nitrate is strongly advised by Trousseau. He uses the subjoined formula:—℞ Argent. Nit. gr. ½, Syr. Simpl. f℥ss., Aq. Dest. f℥j. M. The dose for a child of one year old is a teaspoonful. It is probably inferior to alum (*q.v.*) Dr. Eben. Watson[1] relates several cases cured by the application of the nitrate (gr. xv. Aq. fl. oz. j.) to the glottis.

249. *Diseases of the Mouth and Throat. In Diphtheria*, when the whole of the false membrane is visible, and its margins within reach, a useful application is a solution of the nitrate (1 part to 3 of distilled water.) It should be well applied to the patch and the surrounding turgid mucous membrane. The superficial whiteness left by it will clear off in twenty-four hours, and is easily distinguishable from the points of exudation. By some, hydrochloric acid (*q.v.*) is preferred, but it leaves a more permanent white mark than the nitrate. When there is much redness and pain, a weaker solution (1 part to 8 or 12 of water) pencilled over the whole surface tends to prevent further exudation, and affords relief to local discomfort. The solid nitrate is objectionable (Dr. Squire, i. p. 404.) A similar plan of treatment has been advised in *Croup* and in other *Laryngeal and Pharyngeal Inflammations. In Chronic Sore-throats*, where the tissues are relaxed and covered with pus, a solution of the nitrate (gr. ij.-v. Aq. fl. oz. j.) may be applied with benefit (Ringer, p. 162.) Dr. Gibb found[2] a solution of the nitrate applied to the larynx very beneficial in *Functional Aphonia*, arising from paralysis of the vocal cords, and it has been found equally serviceable in *Clergyman's Sore-throat*. In all these cases the solution may be applied by means of a probang and sponge, or in an atomized state by means of the spray producer. *In Aphthæ*, occurring in the advanced stages of acute or in chronic diseases, Dr. Symonds[3] advises a solution of the nitrate (gr. x. Aq. fl. oz. j.) to be applied with a brush once or twice daily.

250. *Exanthematous and Cutaneous Affections. In Small-pox*, to prevent pitting, the practice of opening each vesicle on the third or fourth day of the eruption, and touching each with a stick of the nitrate scraped to a point, was advocated by Velpeau and other French writers, but the process is tedious, painful, and, as has been shown by Girardin, not without danger. In place of this, Mr. Higginbottom recommends the

[1] Dublin Med. Press, Feb. 1850.
[2] Med. Times, Jan. 2, 1864.
[3] Brit. Med. Journ., March 14, 1868.

face to be washed on the fourth or fifth day with a strong solution (gr. xx. Aq. fl. drm. j.); but this Mr. Marson (i. p. 460) pronounces as far too strong, as it would blister the whole surface, if used; half this strength, he thinks, would suffice. As a local application in *Herpes Zoster*, it is favourably spoken of by Mr. E. Wilson (p. 210) and others.

251. *In Erysipelas*, the value of the nitrate as a means of subduing external inflammation was first pointed out in 1829 by Mr. Higginbottom. After forty years' experience in its use, he maintains that for this purpose no agent is so safe, powerful, and efficacious as the nitrate.[1] He directs the affected part to be well washed with soap and water, then with water alone, to remove every particle of soap, which would decompose the nitrate, and then to be wiped dry with a soft towel. The solution of the nitrate (grs. lxxx. Aq. Dest. fl. drm. iv.) is then to be applied two or three times carefully over the whole of the inflamed surface, and beyond it on the healthy skin to the extent of two or three inches. It may be applied by means of a piece of clean linen attached to the end of a short stick. In about twelve hours it will be seen whether the solution has been well applied; if any of the inflamed surface be found unaffected, it must be re-applied. Mr. Higginbottom speaks highly of this means of subduing or mitigating the inflammation. It is, without doubt, a valuable application, though, according to Dr. Davies and others, inferior to iodine (*q.v.*) The extension of the disease may be sometimes arrested by applying the nitrate so as completely to encircle the inflamed part. It often succeeds, and if it fail, no ill consequences follow the application.

252. *In Pemphigus*, after the bullæ have burst, and excoriations remain, Mr. E. Wilson (p. 192) found that the best application to promote a cure was a solution of nitrate of silver (gr. ij. Aq. fl. oz. j.) *In Molluscum Simplex*, he advises touching the tumours with the solid nitrate; and, in some instances, he opens the tumour with a lancet, and applies the nitrate to the interior. *Erythema Infantum* is greatly benefited by being pencilled with a weak solution of the nitrate. (gr. i.–ij. Aq. fl. oz. j.) *In Frambæsia, or Yaws*, Mr. Mason[2] derived great benefit from the direct application of the nitrate to the tubercles; and in one recent case, this treatment being continued for a few months, the papulæ disappeared, and no other tubercular yaws were formed. *In Lupus*, the nitrate is a useful local application. It may be commenced in solution (gr. x. Aq. fl. oz. j.), and the strength rapidly increased; and after a few applications, the solid nitrate may be resorted to.

[1] Practitioner, Jan., 1869.

[2] Edin. Med. Surg. Journ., vol. xxxv.

Dr. Purdon gives the patient chloroform, and then bores the nitrate deep down below the surface of the ulcer. His treatment seems to have been very successful (Mr. Milton.)[1] Dr. Graves (ii. p. 352) speaks highly of the value of a strong solution of the nitrate (gr. x.–xv.–xx., Aq. fl. oz. j.) in *Tinea Capitis*, but there are better and safer applications. Obstinate cases of *Psoriasis*, *Porrigo*, and *Impetigo* often improve under the local use of the nitrate in substance or in solution. If used in substance it should not be applied extensively at once, but small portions should be successively cauterized at intervals of a few days.

253. *In Scrofulous Enlargements of Glands, &c.*, Mr. Balman[2] speaks favourably, in the absence of all inflammatory action, of pencilling the part with the solid nitrate a few times, at intervals of a week or ten days. He thinks it milder and safer than the use of blisters, the action of which is more diffusive and irritating.

254. *To Sore or Chapped Nipples*, nitrate of silver is very effectual. The nipple should be first carefully dried, and touched lightly with a sharp point of the nitrate, care being taken to insinuate the pencil into the fissures. The part is then to be washed with a little warm milk and water. The pain which this causes soon subsides, and a few dressings of zinc ointment will complete the cure.

255. *To Corns*, the local application of the solid nitrate is advised by Mr. Higginbottom. The corns should be first soaked in hot water, and pared down. The nitrate should be lightly passed over the surface, and repeated every ten or twelve days until the corn is destroyed. *In removing Warts*, it is also very effectual; it may be repeated once or twice a week until their removal is effected. *In Onychia*, a resolution of the disease has apparently followed blackening the diseased surface with the nitrate in substance or in solution. Mr. Liston[3] indeed regarded it almost as a specific. *Severe Hæmorrhage from leech bites, or after the extraction of teeth*, may often be effectually arrested by applying the nitrate, sharpened to a point, to the bleeding part.

256. *In In-growing Toe-nail*, Mr. F. Mason,[4] of Westminster Hospital, has followed with much success the plan of applying a sharp-pointed stick of the nitrate to the base or under surface of the granulations, and then carefully inserting a small piece of dry lint or lint dipped in black wash, and then surrounding the whole toe in water-dressing. An astringent or other lotion may be subsequently applied. The highly sensitive surface is thus destroyed, and the patient is enabled to

[1] Journal of Cutaneous Med., July, 1867.
[2] Med. Gaz., Aug. 22, 1851.
[3] Surgery, part ii. p. 317.
[4] Lancet, May 29, 1869.

follow his avocations in comparative comfort. To be successful, it is essential that the nitrate be finely pointed, and be applied freely to the base of the granulations. The pain of the application may be reduced to a minimum by the use of ether spray.

257. *In many forms of Ulcers*, the nitrate is effectual in establishing a healthy surface, and promoting cicatrization. *To healthy Ulcers if extensive, or, if exuberant granulations exist, to weak and indolent Ulcers, and also to irritable Ulcers*, the nitrate, either in substance or solution (gr. j.–vj., Aq. Dest. fl. oz. j.), may be used with advantge. Mr. Higginbottom advises, when the ulcer is not very extensive, and free from inflammation, to apply the nitrate in substance to the sore, and also very lightly over the surrounding skin; a scab forms, and in most cases, when suppuration ceases, and the scab is removed, cicatrization is complete. After the application of the nitrate, the ulcer should be covered with goldbeater's skin, and exposed to the light. If suppuration continues, an incision with a lancet is made in the centre of the eschar, to allow the escape of the pus. Mr. Higginbottom strongly insists on the superiority of the ordinary brittle stick nitrate of silver to the "tough lunar caustic points" which have been introduced of late years. The latter, on account of greater insolubility, he considers worthless as an application in surgical cases.[1]

258. *Other Diseases. In Deafness depending upon a thickened state of the Membrana Tympani*, Mr. Toynbee[2] found great improvement follow the use of a solution of the nitrate (gr. xxx.–lx. Aq. fl. oz. j.) Proceeding from the exterior of the orifice of the meatus, the passage may be touched to an extent varying from one-half to two-thirds of its length, every three or four days. In some cases, the membrana tympani may also be washed with a solution (gr. vj., Aq. fl. oz. j.) When congestion exists, leeches should be applied at the same time, below, not behind the ear. It is advisable to combine this treatment with an alterative course of mercury. Dr. T. M'Call Anderson recommends a similar local treatment in *Eczema* of the external auditory passages (*Eczema meatus*).[3]

259. *In Hysterical Headaches*, Dr. Graves (ii. p. 314) speaks highly of the efficacy of nitrate of silver in considerable doses. When the paroxysm has abated, the greatest benefit, he observes, may be derived from the nitrate, continued for five or six days at a time, in doses of gr. $\frac{1}{2}$, four or even six times daily. When the bowels are constipated, he states that there is no better combination than the nitrate with minute doses of Pil. Coloc. Co., a formula recommended by Dr. J.

[1] Lancet, July 4, 1863, p. 14.
[2] Monthly Journal, March, 1849.
[3] Med. Times, Aug. 8, 1863.

Johnson, and which he has found invaluable, not merely in the headaches of hysterical young women, but in those of men, particularly the habitual *Stomach Headache*, to which delicate and literary men are so subject. *In Facial Neuralgia*, Romberg,[1] often found the nitrate (gr. j. several times daily) of great, but not permanent benefit.

260. *In Acute Synovitis*, the local application of the nitrate almost to vesication is often attended with the best effects, the swelling, pain, and tenderness disappearing in the course of 24 hours (Dr. Furneaux Jordan).[2] Similar treatment has been found beneficial in promoting the absorption of *Articular Effusions;* but generally iodine is more effectual for this purpose.

261. *In Chronic Arthritis, particularly in that of the hip joint*, M. Jobert employed friction of the diseased part with an ointment composed of from 4 to 12 parts of the nitrate, and 30 of lard, commencing with the weakest strength. A modification of this has since been very generally adopted in France, particularly by Briquet and Guerard.[3] The ointment which they employ is composed of from 1 to 5 parts of the nitrate, and 32 of lard. This is rubbed in daily over the diseased part, which is then covered with a poultice to promote absorption. The treatment is continued until the disappearance of the disease. The stronger ointment causes great irritation. It is reported to be a successful mode of treatment.

262. *As a preventive against Hydrophobia*, Mr. Youatt extols the nitrate of silver. Immediately on the bite being received, the caustic should be freely applied to the wound; an eschar forms, and the ulcer should be allowed to discharge freely for some weeks. Mr. Youatt states that he has employed it four times on his own person, when bitten by rabid dogs, and that, by the early and free use of this remedy, he has experienced no ill consequences. Others, however, have not been so successful in its use, and it appears, on the whole, that excision of the part is decidedly the safer practice. When, however, the nitrate is used, it should be sharpened to a point, and applied freely to *every* recess and sinuosity of the wound. The same remarks apply to the *bites of the Cobra and other Venomous Snakes.*

263. As an application to *Dissection Wounds*, it is advised by Mr. Stafford. It should be applied to the parts surrounding the wounds, and along the inflamed absorbents, if inflammation has supervened. It seemed, in some cases, to arrest the progress of the disease. It should be applied as early as possible, and not allowed to interfere with the constitutional and other treatment.

[1] Dis. of Nerves, i. p. 54.
[2] Brit. Med. Journ., Aug. 22, 1868.
[3] Med. Times, vol. xvii. p. 214, 1848.

264. *To Burns*, Mr. Skey[1] directs in the case of infants or young children that the burnt surface, if not very extensive, be washed with a solution of the nitrate (gr. v.–vj., Aq. fl. oz. j.), and immediately afterwards enveloped in cotton wool. (For adults, the strength may be gr. xij.–xv., Aq. fl. oz. j.) Should pain return, the solution may be advantageously resorted to at an early stage of treatment.

265. *In Mercurial Palsy*, nitrate of silver has been successfully employed by Dr. Sementini.[2] He commenced with $\frac{1}{8}$ of a grain daily, and gradually increased the dose. By the time it reached gr. iij., the good effects were manifest, and in twenty days more a cure was effected. Similar results followed its use in five cases.

266. *In Progressive Locomotor Ataxy*, the only remedy, according to Dr. Althaus,[3] which seems to have done some good in a very large proportion of cases, is nitrate of silver in doses of gr. $\frac{1}{10}$–$\frac{1}{2}$ two or three times daily. Professor Wanderlich, of Leipzig, was the first who employed it; and in 1862 MM. Charcot and Vulpain tried it in five cases, in each with benefit. Since then it has been employed in most cases of ataxy, and with somewhat variable success. In some it so disagreed that it was necessary to discontinue its use; in others it had little or no effect; while, in the majority of cases, it has proved, if not curative, at least very useful, and is the one upon which most reliance can be placed. Dr. Althaus combines its use with hypophosphite of soda, and thus given it seems to do more good than either of these remedies given singly. The safest plan is to give it for four or six weeks consecutively, and then discontinue it for two or three weeks, giving in the meantime a slightly aperient mineral water. Recourse may then be had again to the nitrate, and continued for a month or two. On the appearance of the slightest blue coloration of the gums, which should be inspected from time to time, it should be discontinued. Sulphur baths may be simultaneously employed.

267. Argenti Oxidum. Oxide of Silver. Ag_2O. Obtained by decomposing nitrate of silver with solution of lime.

Med. Prop. and Action. Tonic, sedative, and anti-spasmodic, approximating in its operation to the nitrate, over which it possesses the advantage of being milder in its effect, and less liable to produce discoloration of the skin. It has been thought to be anthelmintic. Salivation occasionally follows its use, and under its continued administration the stools assume a dark or black colour. It has been considered to act specifically on the uterine system, but this is doubtful. The rules given for the administration of the nitrate apply equally to this preparation. Externally

[1] Lancet, Oct. 5, 1861.
[2] Giornale de Ziscia, vol. xi.
[3] Lancet, Dec. 30, 1865.

applied, it is astringent and mildly caustic; it may be used in the form of ointment (gr. lx. ad Ung. oz. j.)

Dose:—Gr. ½–ij., twice or thrice daily, in the form of pill.

268. *Therapeutic Uses. In Atonic Hæmorrhages, especially from the Lungs and Stomach*, Sir J. Eyre[1] speaks highly of the efficacy of the oxide in doses of gr. ½–j. thrice daily. *In Menorrhagia*, occurring in persons of relaxed habits and debilitated constitutions, he obtained from it excellent results. He deprecates its use in larger doses than gr. iij. daily. Its efficacy in menorrhagia is supported by the testimony of Dr. Butler Lane[2] and Dr. Thweatt.[3]

269. *In Gastralgia, Gastrodynia*, and in those forms of *Dyspepsia* attended with irritable stomach and pain after food, the late Dr. Golding Bird[4] regarded it as a highly valuable sedative and tonic, possessing all the good qualities of the nitrate without its inconveniences. Sir J. Eyre employed it with manifest benefit in *Pyrosis*. In these cases it cannot be combined with creasote; decomposition, attended by the generation of great heat and even flame, taking place when these substances are mixed together.

270. *In Gonorrhœa and Gleet*, Dr. Lane obtained good results in several cases from the introduction into the urethra of a bougie smeared with the oxide ointment (gr. v.–x., Lard ʒj.) It was also found very serviceable in *Leucorrhœa*, administered internally.

271. *To Syphilitic Ulcerations*, Dr. Lane states that he has constantly used an ointment of the oxide (gr. v.–x., Lard ʒj.), and that he has generally found it answer better than any other local appplication. In *Ulceration of the Cornea*, with thickening and congestion of the eyelids, and in some forms of *Ophthalmia*, an ointment (Oxide ʒj., Ol. Olivæ fl. oz. j.) applied with a camel-hair pencil, is said to prove highly beneficial.

272. Armoraciæ Radix. Horse-radish Root. The fresh root of Cochlearia Armoracia, *Linn. Nat. Ord.* Cruciferæ. *Hab.* Europe and North America.

Med. Prop. and Action. Stimulant, sudorific, and diuretic. Taken internally, it causes warmth in the epigastrium, expels flatus, promotes digestion, and increases the appetite; under its use the cutaneous and urinary secretions are increased. Taken in the form of hot infusion, it acts as a speedy emetic. Locally applied, it is irritant and vesicant, and when chewed causes a copious flow of saliva. Its activity resides in a volatile oil, identical with oil of mustard. In India, an excellent substitute for it exists in the root of Moringa pterygosperma, *Gærtn*, or Horse-radish Tree.

[1] On some Exhausting Diseases, 1845.

[2] Lancet, Feb. 6, 1841; and Med. Chir. Rev., July 1840.

[3] American Journal of Medical Science, July 1849.

[4] Quoted by Dr. Lane (op. cit.)

Dose:—Of the Compound Spirit (Horse-radish Root, Bitter Orange Peel āā oz. xx., Nutmeg oz. ½, Proof Sp. Cj., Water Oj. Mix and distil Cj. with moderate heat), fl. drm. j.–ij. *Of the Infusion*, L. Ph. (Horse-radish Root oz. j., Mustard oz. j., Comp. Spirit (*ante*) fl. oz. j., Water Oj.), fl. oz. j.–ij.

273. *Therapeutic Uses. In Dropsical Affections*, it was much employed by Sydenham and the older physicians; and Rayer observes, that of all diuretics it is the one which appears to him to offer the best chance of success. The compound spirit is an excellent adjunct to diuretic mixtures in this class of cases: it is too much neglected.

274. *In Paralytic, Rheumatic, and Arthritic Affections*, poultices of the fresh root form a ready counter-irritant. If allowed to remain on too long it will cause vesication. It may also be given internally.

275. *In Vomiting connected with Uterine Affections*, Dr. Tilt (p. 326) states that he has seen relief from the patient taking repeatedly a small portion of horse-radish scraped and moistened with vinegar.

276. *In Scurvy*, it has long been esteemed a remedy, but it does not appear to possess any special claim.

277. *Toothache* is occasionally relieved by slowly masticating a piece of the fresh root, in virtue of its sialogogue action. An infusion has been found useful as a gargle in *Hoarseness* arising from relaxation of the throat.

278. Arnicæ Radix. Arnica Root. The dried rhizome and rootlets of Arnica montana, *Linn. Nat. Ord.* Compositæ. *Hab.* Mountains of Central and Southern Europe.

Med. Prop. and Action. Nervine, stimulant and diaphoretic; in overdoses an acro-narcotic poison, producing vomiting, purging, vertigo, tetanic twitchings of the muscles, and convulsions. The flowers partake of the same qualities even in a more marked degree; according to Van der Kolk, they are more exciting and less tonic than the root. Its activity resides in an alkaloid, *Arnicine*, and is a bitter acrid extractive, analogous to *Cystisin*. The powdered leaves are occasionally used as an errhine. Externally applied, in the form of Tincture, it is employed as a sedative and resolvent in glandular swellings, rheumatism, and bruises; but it is necessary to watch its effect when thus used, as a very troublesome eruption is apt to result when too long persevered in (Dr. Fuller.) When the infusion is prepared for internal use, it should be carefully filtered, otherwise it is apt to produce much gastric irritation.

Dose:—Of the powdered Root, gr. v.–x. (?) *Of the Tincture* (Arnica Root oz. j., Rect. Sp. Oj.), fl. drm. j.–ij. *Of the Infusion*, see *infra*.

279. *Therapeutic Uses. In Idiopathic Mania*, when it passes into the chronic stage, when as the excitement decreases, the patient becoming weaker, quieter, and apathetic, the pulse small, the hands cool, the head, however, remains hot, or when signs of imbecility or paralysis present themselves, Prof. Van der Kolk (p. 116) speaks highly of the value of arnica. He here advises the flowers in infusion (℥ss.–℥ij.,

Aq. fl. oz. vij.–viij. strained) with diluted sulphuric acid, a mild laxative if necessary being employed at the same time. From the timely use of the remedy he states that he has seen the most excellent results. If the patient is yet more weakened and the cachectic condition more strongly developed, if there is a tendency to diarrhœa or dropsy, he then prefers a decoction of the root (ʒss. Aq. fl. oz. vij.) in doses of fl. oz. j. four or five times daily. With this he states he has rarely failed to arrest exhausting diarrhœa; but he adds, it acts no less well if no diarrhœa is present, and in many cases of chronic mania he has succeeded by this drug in bringing about recovery from an almost hopeless state. Against the involuntary evacuation of fæces and urine in this stage it is also indicated. In persons exhausted by *Onanism*, he states that he has seen recovery follow the use of arnica root given as above. In very developed *Cachexia*, he also has used with good results a combination of arnica flowers and cinchona but as a general rule he prefers arnica root to cinchona, the latter wanting that exciting action on the nervous system for which arnica root is distinguished. Should the excitement and congestion of the head induced by its means be great, it should be discontinued, and calmatives and derivatives substituted. It is contra-indicated so long as active symptoms are present. Alibert[1] reports favourably of it in *Paralysis*, and Dr. Meyer[2] records a case of *Paralysis of the Bladder* which yielded to its use. *In Amaurosis*, it has long been a popular remedy in Germany; an obstinate case cured by its means is related by M. Maunoir.[3]

280. *In Typhus and Typhoid Fevers and in Chronic Dysentery*, when the vital powers are greatly depressed, Stoll, Collin, and other good German authorities, extol the virtues of arnica; but it has not found favour with British practitioners.

281. *In Rheumatic Gout*, Dr. Fuller (p. 365) reports very favourably of the tincture (ɱx.–xxx.) or infusion of the flowers or of the root (ʒvj. Aq. Ferv. Oj.) in doses of ʒiv.–ʒj. in combination with cod-liver oil, vegetable bitters, and alkalines or the mineral acids, according to the nature of the case. The class of patients to whom it proves most serviceable, are the feeble and exhausted, whose skin is cool, pulse weak and slow, and the urine of low specific gravity. In these it increases the nervous force, rouses the circulation, and so promotes more perfect assimilation, and a more healthy action of the different excretory organs. Given in inappropriate cases it is apt to produce headache, nausea, or even vomiting, wakefulness, and other symptoms of disturbance of the nervous system. In such, its use should be discontinued.

[1] Elémens de Thérap., p. 141.
[2] Brit. For. Med. Rev., April, 1845.
[3] Med. Chir. Rev., July 1, 1842.

282. *To Bruises, Sprains, and Lacerations*, the tincture used as a liniment or diluted as a lotion is extensively employed as a local sedative, and in most cases is very effectual. Dr. Garrod considers that the efficacy of the remedy is dependent on the spirit contained in it; but this view is not supported by common experience. *To Chilblains*, the tincture is an extremely useful application (Dr. Purdon.)[1]

283. ARSENICUM. Arsenic. As=75. A metal not employed as a medicine in its native state, although it appears capable of acting as a powerful poison when taken into the stomach. Its chief value is as the basis of the following preparations:—

284. ACIDUM ARSENIOSUM. Arsenious Acid. As_2O_3. White Oxide of Arsenic. Arsenicum Album. White Arsenic, *vulgo* Arsenic. An anhydrous acid, obtained by roasting arsenical ores, and purified by sublimation.

Med. Prop. and Action. Arsenious acid, in continued doses of from one-sixtieth to one-twelfth of a grain, is tonic, increasing the appetite and improving the quantity and quality of the secretions. In somewhat larger doses, it is a powerful anti-periodic. When swallowed, or applied to a denuded surface, it is absorbed into the system, and has been detected in the blood, in the urine, and also in the liver, spleen, kidneys, stomach, and muscles. It possesses a powerful antiseptic property, arresting, in a manner almost peculiar to itself, the process of putrefaction; the stomach and alimentary canal of persons who have died from its effects have been found in a perfect state of preservation, months after interment. *Post-mortem* examinations of persons who have died from excessive doses show a great extent of intestinal inflammation, of which the stomach, small intestines, and rectum are the chief seats; in some cases, ulceration has been observed; and, more rarely, gangrene. The fauces and windpipe are occasionally involved. The morbid appearances of other parts vary in almost every case. Small doses, long continued, accumulate in the system, and occasionally produce serious, and even fatal effects. Under its prolonged use, it occasions a general sinking of the vital powers, with derangement of the digestive and nervous systems; a small, quick, and sometimes irregular pulse, want of sleep, and swelling of the face and extremities. These effects, however, are only observed where the remedy has been injudiciously administered for too long a period. Of 320 cases in which this remedy was given by Dr. Fowler, no immediate operation occurred in one-third; relaxed bowels, in somewhat more than one-third; nausea, in one-third; vomiting, purging, swellings, and anorexia were comparatively rare. Mr. Hunt observes among the effect of medicinal doses, 1, an irritation of the conjunctiva; 2, swelling of the face; 3, a slight desquamation of the skin, observable only under a magnifying glass; 4, the portions of the skin protected from the access of light assume a dingy brown appearance. Sir T. Watson also mentions, amongst other symptoms, a peculiar silvery whiteness of the tongue. Salivation has also been observed in some instances; and, if the medicine be too long continued, the urine occasionally acquires a jaundiced appearance. With respect to the tolerance of this medicine acquired by habit, Dr. T. Von Tschudi states that, in Austria, the peasants take it in large quantities, in order to gain *embonpoint*, and to render themselves long-

[1] Medical Press, Nov. 22, 1865.

winded. For this purpose, they commence with about half a grain, and gradually increase the dose, until a piece of about the weight of 4 grains is taken. He mentions the case of one man of about 60 years of age, who for more than 40 years had followed the practice. It appears to produce no ill effect, so long as the drug is continued; but, when the indulgence is stopped, symptoms of illness are sure to appear, which have the closest resemblance to those produced from poisoning by arsenic. The symptoms produced by excessive or poisonous doses are very various. Dr. Guy (p. 466) gives the following instructive analysis of 25 cases:—*Vomiting* present in 23; in 1, not until artificially induced; in 1 or 2 it was absent. *The vomited matters* consisted, in 3 cases, of blood; in 1, of mucus only; in 1, of water containing arsenic; in 1, of bile; and in 1 of bile and fæces. *Diarrhœa* was present in 11, excessive in 7, absent in 4. *The matters passed by stool* consisted, in 3 cases, of blood; and in 2, of matter resembling green paint. *Pain*, present in 19, absent in 1; in 2, it subsided after a short time. *The tongue and throat* constricted, hot, painful, and tense, in 9 cases. *Thirst:* Of 17 cases, it was present in 15, absent in 2; and in 13 it is described as intense. *Countenance* flushed and swollen in 7 cases; and pale and anxious in 5. *Eyes* inflamed, swollen, or smarting, in 7 cases. *Skin*, hot and dry in 6 cases; covered with cold perspiration in 4; profuse perspiration, with petechiæ, in 3; universal desquamation in 1; eczematous eruption in 1. *Headache* in 9 cases, absent in 1; described as intense in 4. *Pulse*, generally very frequent, but variable, ranging from 90 to 140 or more; in 1, from 30 to 49. *Violent Palpitations* in 2. *Extreme restlessness* in 5. *Extreme debility* in 10. *Coma* in 3; and *delirium* in 3. *Mind unimpaired* in 6. *Cramps of legs* in 9 cases; in 4, extending to the arms. *Convulsions* in 6. *Paralysis of the tongue and gullet* in 3. *Tetanus* in 2. *Chorea* in 1. *Hysteria* in 1. *Epilepsy* in 2 cases. *Death* took place in 3 cases, in the midst of convulsions; and, in 1, after a horrible fit of convulsive laughter, followed by a rigid spasm of the whole body.

Dose:—Gr. $\frac{1}{60}$–gr. $\frac{1}{12}$.

Contra-indications. 1, all sthenic diseases, attended by strong arterial action; 2, irritable states of the stomach and alimentary canal; 3, inflammatory pulmonary affections; 4, infancy and childhood.

285. *Rules for the Administration of Arsenic.*

1. The bowels should be well cleared out by a purgative, previous to commencing a course of arsenic.
2. It should never be taken upon an empty stomach: directly after a meal is the best time for its administration.
3. It should always be commenced in small doses, and given with the greatest regularity, at stated times.
4. During its employment the eye of the patient should be examined daily; if the eyelids and conjunctiva become inflamed, the medicine should be discontinued or suspended.
5. When the urine is high-coloured and scanty, with lithate of ammonia sediment, the tongue loaded, especially at its tip and edges, the medicine generally disagrees, and aggravates the symptoms; but it is often useful, when the visceral disorders on which these symptoms depend, are removed.
6. When, under its use, the urine, from being pale and copious, becomes scanty, acid, and high-coloured, the medicine should be suspended.
7. If cough and other symptoms of bronchial irritation arise during the use of the remedy, it should be omitted.
8. If there is a sensation of swelling and stiffness of the palpebræ and face; heat, tenderness, and itching of the tarsi; or tenderness of the mouth,—these may be considered as indications that the remedy has been carried as far as it can with safety.

9. During a course of arsenic, it is advisable to omit its use for a day or two, every fortnight or three weeks, and to exhibit a mild aperient, in order to prevent the remedy from accumulating in the system.

10. Any nausea or vomiting which it may occasion will be prevented by the addition of a few drops of laudanum.

Some further rules for the administration of arsenic, by Mr. Hunt, will be found in the section of SKIN DISEASES.

286. *The hypodermic and endermic methods of introducing arsenic into the system* have received attention at the hands of Dr. Radcliffe (i. p. 135), and merit due consideration and further trial. With regard to the first method, he states that he has employed it with more or less satisfactory results in *Neuralgia*, *Epilepsy*, and other *Nervous Affections*, notably in *Chorea*, of which he gives two illustrative cases. The doses and intervals between the injections will be seen in the following statement.

Three minims of Liq. Arsenicalis on the 12th Jan., 1866; ℥v. on 15th and 17th; ℥vj. on 19th; ℥viij. on 22nd; ℥vij. on 25th and 29th; ℥viij. Feb. 1st; ℥ix. on 3rd; ℥x. on 6th; ℥xj. on 8th; ℥xij. on March 1st and 10th; ℥xiij. on 12th; and ℥xiv. on the 14th. On the 21st the patient left the hospital almost well. To avoid local irritation, it is advisable to use the solution, diluted with an equal part of water.

The endermic method, as practised by Dr. Radcliffe, consists in dropping ℥xv.–xx. of Liq. Arsenicalis upon lint moistened with water, and applying this, under oil silk, night and morning, to a raw blistered surface. This gives rise to considerable local irritation; indeed, it generally, before a week is over, has the effect of covering the blistered surface with a thin dry eschar, and of causing a zone of angry pimples to appear on the surrounding parts. On this account, it is generally necessary to make pauses in the treatment every six or seven days. In two cases of *chorea* thus treated, one was well in 28 and the other in 32 days. The comparative merits of these two modes of treatment are *sub judice*, but it is evident that the hypodermic is the less painful and probably the most successful mode of cure.

287. *Therapeutic Uses. In Intermittent and Periodic Diseases*, arsenic holds a high place. It has maintained its character for centuries amongst Eastern nations; and its efficacy has been attested in England by Drs. Fowler, Arnold, Withering, Brown, and others. The Tasteless Ague Drop, so long celebrated in England, is a solution of arsenic. It ranks next in value to quinine, over which it has the advantages of being of a less disagreeable taste, and of being cheaper. Dr. Chapple,[1] as the result of his experience with this agent in the treatment of the Intermittents of India, remarks that when the fever is uncomplicated, the attack well marked, and the medicine administered in sufficient doses, arsenic will generally prove as efficient an anti-periodic as quinine. Sir Ranald Martin (p. 343), speaking of the treatment of old cases of intermittents chiefly from tropical countries, in which quinine had been previously used and failed, often employs arsenic, and characterises it as "indeed a noble remedy." Dr. Adamson[2] considers the powers of arsenic to be greatly increased by the addition of the carbonate of ammonia (grs. v. ad Liq. Arsenicalis ℥vj., Aq. f℥j.) repeated every two or three hours,

[1] Med. Times, March 2, 1861. [2] Edin. Med. Journ., May, 1862.

according to the frequency of the paroxysms. It may either be given in substance, or in the form of Liquor Arsenicalis: the dose of the former is from $\frac{1}{12}$ to $\frac{1}{8}$ of a grain; of the latter, from ij. to viij. or x. drops, twice or thrice daily. When one preparation fails, the other is sometimes successful, and it is often productive of the best effects, when quinine has proved ineffectual. Amongst the strongest advocates for arsenic, in this class of diseases, is M. Boudin,[1] the late Physician-General of the French troops in Algeria, but others have failed to obtain equally striking effects. From a careful consideration of all that has been written on the subject, it may be concluded—1. That arsenic is a powerful anti-periodic. 2. That in recent and severe cases it is greatly inferior to quinia. 3. That it not unfrequently succeeds when quinia fails, and *vice versâ*. 4. That arsenic and quinia conjoined often succeed when each remedy singly has failed to produce good effects. 5. That arsenious acid in substance will sometimes succeed better than the soluble preparations.

288. *Neuralgic and Spasmodic Diseases.* *In Neuralgia*, arsenic is often of great value and more widely applicable than quinia, proving useful both in the malarial and non-malarial type. In the former, it should be given in large doses, *e.g.*, Liq. Arsenicalis ♏x. increased to ♏xxx. thrice daily; in the latter, ♏v. thrice daily, or gr. $\frac{1}{16}$ of arseniate of soda in pill with extract of hop, will effect all the good which this medicine can produce. *In Cardiac Neuralgia*, including under this term every variety of *Angina Pectoris*, *i.e.*, cases marked by sudden and spasmodic cardiac pain, with evident embarrassment of the heart's movements, and a sense of impending dissolution, Dr. Anstie states that he has seen the most remarkable relief afforded by arsenic. Some persons whose alimentary canal is too irritable, are unable to bear this remedy, but it is usually well borne and often extremely efficacious. It may also be effectively administered by subcutaneous injection, or by the inhalation of the smoke of arsenical cigarettes (Anstie.)[2] The value of arsenic in angina pectoris was pointed out long since by Mr. Alexander.[3]

289. *In Hemicrania*, arsenic has often the best effect. Sir T. Watson (i. p. 718) speaks favourably of it. He believes that gutt. iv.–vj. of Liq. Arsenicalis, three or four times a day, with due attention to the state of the bowels, will be almost sure to remove hemicrania, in nine cases out of ten.

290. *In Chronic Rheumatism*, arsenic often proves highly serviceable. Dr. Fuller remarks that arsenic, judiciously administered and carefully watched in its effects, is one of the most

[1] On Intermittent Fevers, Paris, 1842.

[2] Reynolds's Syst. of Med., *ii.* p. 745, and Brit. Med. Journ., Aug. 22, 1868.

[3] Med. Commentaries, xv. p. 373.

valuable remedies we possess in the chronic forms of this disease. Dr. Christison also bears witness to its efficacy; and Dr. Begbie, who entertains a high opinion of it, relates several cases illustrative of the benefit to be derived from it.[1] Dr. Begbie regards arsenic as a special alterative in the rheumatic diathesis—a true anti-rheumatic. M. Gueneau de Mussy[2] speaks of the great benefit derivable from arsenical baths in *Rheumatic Gout*. To each bath he adds Carb. of Soda ʒiijss. and Arseniate of Soda gr. xv. gradually increased to gr. xxx. These, however, failed in the hands of M. Trousseau.[3] In *Rheumatic Gout*, especially when characterized by extreme inactivity of the skin, which is cold, harsh, and dry, arsenic is very favourably spoken of by Dr. Fuller.[4] If the urine be turbid, he gives Liq. Arsenicalis ♏viij.–xv. with Liq. Potass. or Potass. Acet.; if the urine be clear and of a low sp. gr., he gives Liq. Arsen. Chlorid. ♏x.–xx. either alone or with bark; and if acids be indicated, with hydrochloric acid.

291. *In Toothache*, a minute portion of arsenic (gr. $\frac{1}{20}$) introduced into a carious tooth, is an effectual mode of destroying the exposed pulp, and thus permanently relieving the pain. It may be conjoined with a small portion of morphia, and the whole may be kept *in situ* by proper stopping. In some cases the pain is at first aggravated, but this soon ceases.

292. *In Asthma*, Fowler's Solution (gutt. ij. night and morning, gradually increased to gutt. vj.) is advocated by Dr. Duclos.[5] It is inadmissible in asthma connected with organic disease of the lungs and heart.

293. *In Hooping Cough*, arsenic was formerly held in high esteem. Mr. Simmons[6] relates several cases successfully treated with it. He speaks highly of its efficacy and safety; but it is regarded, at the present day, as too powerful a remedy for young children.

294. *In Chorea*, arsenic is a remedy of established value. Strong evidence in its favour exists in the writings of Dr. Gregory,[7] Pereira (i. p. 714), Hillier (p. 236), Ringer (p. 198), Romberg, and others. Dr. Begbie, indeed, states that in an experience of thirty years he has never known arsenic to fail; he prescribed gutt. v. Liq. Arsenicalis twice daily after a meal, and added a drop to the dose every day until the specific effects of the mineral appeared, when he suspended it for a time, and then resumed its use. Dr. Radcliffe (ii. p. 133) states that though he has great faith in the efficacy of arsenic in these cases, he has often had to abandon it on account of the gastric disturbance it is apt to create; but it appears

[1] Edin. Med. Journal, May, 1858.
[2] Gaz. des Hôpitaux, Aug., 1861.
[3] Journ. de Méd. Prat., Nov., 1861.
[4] Brit. Med. Jour., March 28, 1857.
[5] Bull. Gén. de Thérap., 1861.
[6] Annals of Medicine, 1797.
[7] Med. Chir. Trans., xi.

probable from some trials made with it by Dr. Radcliffe, that it may be used with a good chance of success if introduced into the system hypodermically or endermically (*ante*). *In Epilepsy*, arsenic has also been employed, but the evidence of its utility is far less conclusive than that adduced in chorea.

295. *Diseases of the Skin.* It is in this class of diseases that the value of arsenic is most manifest. Amongst others who have brought it into general use is Mr. Hunt,[1] who, after studying its remedial powers for thirty years, lays down the following excellent rules, the value of which the subsequent experience of others has tended to establish.

1. Arsenic should never be commenced while signs of active cutaneous inflammation are present.

2. It should be well mixed with the food or drink, and never taken on an empty stomach.

3. It should be given in three or four doses daily, and with the greatest regularity.

4. Five minims of Liq. Arsenicalis is generally a sufficient dose to commence with, *i.e.*, ♏xv. daily. As soon as the conjunctiva becomes affected, this dose may be reduced; but it is desirable to reduce it gradually.

5. During the administration of the minimum dose, should conjunctivitis supervene, the dose should be further reduced; if necessary, it may be wholly discontinued for a very short period.

6. The minimum dose (*i.e.*, a dose which, if given continuously, affects the conjunctiva in the slightest possible degree) should be persevered in with unremitting regularity for as many months after the disappearance of the disease as it had previously existed years. This is necessary to prevent a relapse.

7. Should the disease appear to advance instead of recede during any period of the minimum dose, the course should not be intermitted on this account. Leeches or purgatives in the sthenic, and quinine, with generous living, in the asthenic cases, will generally be sufficient.

In order to test more strictly the value of the remedy, Mr. Hunt occasionally intermitted the course, and with the most uniform result, viz., a relapse of the disease. For the same purpose, he abstained from all external applications (leeches excepted), and states that he never found them necessary to the cure.

Dr. T. M'Call Anderson,[2] in advocating the use of arsenic in *Eczema*, recommends that it be given in doses of ♏v. of Liq. Arsenic. thrice daily, and at the end of a week or so the dose is

[1] Lancet, Jan. 17, 1846. [2] Med. Times, June 27, 1863.

to be increased by a drop every second or third day. He does not think it necessary to stop if irritation of the eyes or slight puffiness of the face is induced. If these symptoms, however, become aggravated, and are accompanied by pains in the stomach and head, anorexia, and nausea, the dose should be diminished, or omitted for a few days. But he recommends that its administration be not stopped altogether because these physiological effects are produced. In the case of infants at the breast, he prescribes arsenic for the mother. Administered in the manner above indicated, arsenic has been found to exercise a more or less powerful influence in *Lepra*, *Psoriasis*, *Eczema*, *Impetigo*, *Acne punctata and rosacea*, *Prurigo*, *Pemphigus*, *Lichen*, *Sycosis*, *Urticaria*, *Chloasma*, and *Alopecia*. Local applications should not be neglected, and require to be varied according to circumstances.

296. *In Furunculus*, arsenic has been employed by Dr. Schweich,[1] who relates some cases which yielded to Liq. Arsenicalis, in doses of gutt. iv., gradually increased to gutt. vj., twice or thrice daily.

297. *In Onychia Maligna*, much benefit arises from the application of diluted Liquor Arsenicalis (fl. drs. ij., Aq. fl. oz. ij.) Mr. Luke[2] regards an arsenical ointment (Arsenious Acid gr. ij., Lard ʒj.) as almost a specific.

298. *In Lupus of the head and face*, Mr. Milton[3] regards arsenic as the best remedy. After correcting any disorder of the digestive or general system, should occasion require, he commences its use in doses of ♏xij. of Liq. Arsenici Hydrochlor. thrice daily, increasing the dose until its full physiological effects are developed. He reports highly of its efficacy.

299. *In Elephantiasis Græcorum*, arsenic has for centuries been held in high esteem in India. M. Benet,[4] formerly physician to the King of Lahore, states that he has in numerous instances seen the following formula prove very efficacious:—105 grains of arsenious acid are triturated with five or six times the quantity of black pepper. This is made into a mass, and a pill the size of a "tare" is taken night and morning. This is the celebrated "Tanjore Pill," and, by the native practitioners of India, is regarded as an almost certain cure.

300. *In Frambœsia or Yaws*, I have seen great amelioration follow a prolonged course of Liq. Arsenicalis, in doses of gutt. iv.–v., gradually increased to gutt. viij. thrice daily. Many cases, however, resist this as well as all other treatment.

301. *In Cancer*, arsenic was formerly regarded almost as a specific, and though much reliance is not to be placed on it.

[1] Brit. and For. Med. Rev., 1848.
[2] Pereira's Materia Medica, vol. i. p. 716.
[3] Journal of Cutaneous Medicine, July, 1867.
[4] Gaz. des Hôpitaux, Dec. 14, 1842.

the symptoms sometimes improve under its use (*see* Cancer of the Uterus.) As a local application it has enjoyed high repute, but deaths having been reported to have been caused by its absorption into the system, it has fallen into disrepute. "Such an untoward result," observes Dr. Ringer, "probably only occurs when certain well-known precautions are disregarded, as the absorption of arsenic can be effectually prevented if sufficient be employed to excite active inflammation, for inflamed tissues lose the power of absorption more or less completely. If enough be used to produce active inflammation, the patient is safe, but if through fear of poisoning, too weak an application is employed, the most certain way is adopted of accomplishing what it is desired to avoid. Again, if the tissues to be destroyed are extensive, the arsenic should be applied to a part only of the surface at a time, and the cure can be accomplished by several applications. When employed to remove large growths like cancer, if the skin be unbroken, incisions are first made, and into them the arsenical paste is laid. It soon excites deep-seated and active inflammation, and the growth dies for a considerable depth. Often the whole tumour sloughs away from the healthy tissues—is enucleated, as it is said—and leaves a clean and healthy sore, which heals without trouble in 15 or 30 days." The following application has been much used by Dr. Marsden to remove *Epitheliomatous Growths:* Arsenious acid and powdered acacia āā oz. j. water fl. drms. v. In using any powder of arsenic to destroy the tissues, it should be seen that the arsenic constitutes one-fifth or one-sixth of the powder. Of such a strength, it will be sure to excite sufficient inflammation to prevent the absorption of the poison (Dr. Ringer, p. 188.) *In Cancrum Oris and Malignant Ulcers of the Tongue*, the internal use of arsenic is stated to prove highly efficacious.[1]

302. *As a remedy for the Bites of venomous Snakes*, the Tanjore Pills, a composition of arsenic and black pepper (s. 299), have long been highly esteemed by the native practitioners of India. In 1816 this remedy was given a fair trial by Mr. Ireland,[2] of the 60th Regiment, in the bites of a very poisonous snake in the West Indies. Several persons had died of the bites of the same snake previous to being seen by Mr. Ireland. In the first case attended by him, he administered a draught composed of Liq. Arsenicalis f℥ij., T. Opii ♏x., Aq. Menth. Pip. f℥jss., M. This was added to fl. oz. ½ of lime-juice, and, as it produced a slight effervescence, it was given in that state. This remained on the stomach, and was repeated every half-hour for four successive hours. In the meantime the parts were fomented, purgative glysters administered, and the

[1] Med. Chir. Trans., viii. p. 201. [2] Med. Chir. Trans., vol. ii. p. 393.

following liniment applied to the parts:—℞ Ol. Terebinth., Liq. Ammoniæ, Ol. Olivæ āā fʒss., M. This case, as well as four others treated in precisely the same manner, perfectly recovered.

303. *Uterine Affections.* *In Carcinoma of the Uterus, in Irritable Uterus*, and in several cases of *Menorrhagia*, arsenic has been used with decided benefit by Mr. Hunt,[1] of Dartmouth, who advises it, in doses of gr. $\frac{1}{20}$, thrice daily, immediately after meals. *In Cancer of the Uterus*, Dr. Atlee,[2] of Philadelphia, has much faith in a long course of small doses of arsenic internally, with the application of a strong solution of iodine in glycerine locally. *In Chronic sub-acute Uterine Inflammation*, with marked tendency to relapses, Dr. Tilt (p. 65) states that he has given arsenic with good result. *In Menorrhagia, Leucorrhœa*, and *Uterine Hæmorrhage in threatened Abortion and after Delivery*, Dr. A. Burns[3] speaks of arsenic as a most reliable remedy. He prescribes, in hæmorrhage, at first ♏x.–xx. of Fowler's Solution, according to the severity of the case, and repeats ♏x. every fifteen or twenty minutes, till the discharge ceases. In leucorrhœa he gives ♏v. thrice daily till a cure is effected.

304. *In Phthisis*, arsenious fumigation by means of cigarettes has been advocated by Trousseau and others, but they are of doubtful utility, and should only be used with the greatest caution. In nine cases it was tried internally by Dr. Leared,[4] who considers that it would prove useful in virtue of its action on the respiratory system, as well as by its tonic properties, but that it is ill borne by the digestive system even when combined with sedatives. This remark applies equally to *Chronic Bronchitis*, in which it has been occasionally found serviceable when copious expectoration and much emaciation are present. It is very favourably reported of by Dr. Thorowgood,[5] who has derived great benefit from it; at times, indeed, he states it will act quite like a specific in improving the breathing. He mentions a case of three months' standing cured by Liq. Arsenicalis (♏ij.) in alkaline infusion of calumba thrice daily. *In Chronic Coryza* it may also often be given with great advantage.

305. *In Plethora*, with determination of blood to the head, arsenic is reported to have been used with great advantage. *In Apoplectic Congestions*, the use of arsenic is advocated by Dr. Lamaire Piquot,[6] who considers that it acts by reducing in a remarkable manner the excess of the red globules of the blood, which in these cases he supposes to exist in a morbid

[1] Medico-Chir. Trans., vol. xxi.
[2] Brit. Med. Journ., Jan. 18, 1868.
[3] Amer. Journ. of Med. Sci., Oct. 1859.
[4] Med. Times, Jan. 28, 1863.
[5] Lancet, Nov. 13, 1869.
[6] Gaz. Hebdom. de Méd., Jan. 20, 1860.

and dangerous degree. Its use is limited to strong plethoric subjects, and is not applicable to old weakly subjects when there is a disposition to apoplectic congestion. He prescribes arsenious acid in doses of gr. $\frac{1}{15}$–gr. $\frac{1}{6}$, in a f℥iv. mixture daily, one-half at each meal. In one case of this description, I witnessed more relief from the use of Liq. Arsenicalis, in combination with Liquor Potassæ, than from the local abstraction of blood, blisters, and setons.

306. *Gastrodynia*, especially when partaking of a neuralgic character, is often signally benefited by arsenic. If the pain be violent, and if it come on generally when the stomach is empty and be not dependent upon one of the causes specified below, the remedy will, according to Dr. Leared,[1] almost to a certainty succeed. If the patient live in a district where ague prevails, especially if he have had the disease, or if he have had neuralgia of the face or head, there are strong indications for this remedy. But if the papillæ of the tip of the tongue be red and prominent, if the epigastrium be constantly tender on pressure, if the skin be hot and dry and the pulse quickened, arsenic will not succeed. It should be given after a meal, in small doses at first (Liq. Arsenicalis ♏iij.), and gradually increased: when large doses are reached, a few drops of laudanum may be added to prevent purging. The constitutional effects of arsenic will indicate the necessity of diminishing the dose or discontinuing the remedy. The conditions under which it fails are, unnatural sensibility of the stomach to the contact of food; pyrosis, not of malarious origin; subacute gastritis, ulcer of the stomach, co-existence of disease of the heart, and cancer. Dr. Leared, from whose paper the above remarks are quoted, speaks highly of its efficacy, and in the hands of others it has proved successful. *In many forms of Chronic Dyspepsia, Chronic Diarrhœa, Ulceration of the Stomach*, &c., arsenic is highly spoken of by Dr. Ringer (p. 190–191). He gives Liq. Arsenicalis ♏j.–ij. shortly before each meal. He also speaks of it (p. 295) as very effectual in checking the morning *Vomiting of Drunkards*.

307. *In Hay Fever*, Dr. Mackenzie[2] states that he has seen arsenic most serviceable, particularly when it partakes more of a catarrhal than an asthmatic character. Where the disease has been slight, or the medicine has been given with a view of improving the tone of the mucous membrane, rather than of correcting morbid action, doses of ♏iij. of Liq. Arsenicalis, or even less, are preferable; whilst, on the other hand, if the irritation has been excessive, or resists these, larger doses may

[1] Braithwaite's Retrosp. lvii. p. 92, 1868.

[2] Lond. Journ. of Med., Jul 1851.

be given, and their action modified or assisted, in different cases, by remedies of a kindred character.

308. *In some forms of ordinary Catarrh*, Dr. Mackenzie (op. cit.) found arsenic productive of the best effects, but more especially in those cases in which the affection was of a local character, and there was an absence of inflammatory action, as well as of febrile disturbance. These states contra-indicate its use.

309. *In Catarrhal Ophthalmia*, and more especially in those forms which are of a passive, subacute, or chronic character, or where the irritability of the conjunctiva is excessive, arsenic has proved very beneficial in the hands of Dr. Mackenzie. In *Strumous Ophthalmia*, Dr. Thorp[1] states that arsenic is a most valuable agent in inveterate cases, more especially when complicated with chronic eruptions of the scalp or cutaneous surface generally.

Arseniate of Iron. See Ferri Arsenias.

Arseniate of Soda. See Sodæ Arsenias.

310. Arsenici Iodidum. Iodide of Arsenic. AsI_3.

Med. Prop. and Action. Alterative tonic. When given internally, it is absorbed into the system, and is eliminated by the urine, saliva, and perspiration. It is a powerful remedy, and requires to be given with great caution. Externally, it is used in the form of ointment (gr. ij.-iij., Lard oz. j.) It should never be applied to a large ulcerated surface.

Dose:—Gr. $\frac{1}{20}$, gradually increasing to gr. $\frac{1}{3}$.

311. *Therapeutic Uses. In Cancer*, Dr. Walshe[2] regards the iodide of arsenic as one of the most valuable remedies we possess; but it must not be looked upon as a curative agent. After extensive employment of it, Dr. Walshe has drawn the following conclusions on the subject:—

1. Given in doses of from $\frac{1}{16}$ to $\frac{1}{12}$ of a grain, twice a day, two hours after eating, the iodide of arsenic is well borne, and may be continued without risk for several months.

2. The system, generally, soon gives evidence of its action; unusual palpitation, with dryness of the fauces and of the alimentary canal, occur; sometimes slight headache is complained of; but this is rare; and I have known the most violent *periodic headache*, which had affected a lady for years, disappear while she was under the influence of this salt.

3. The pain of the tumour decreases in violence.

4. The size of the breast generally diminishes; and, if the tumour itself does not actually lessen in bulk, I have at least found that its enlargement, previously more or less

[1] Dub. Quart. Journ., Aug. 1857. [2] On Cancer, p. 201-2.

active and apparent, becomes, as far as can be determined, suspended.

5. The general health improves.

312. *In Lupus, or Noli me Tangere*, the iodide, given internally, in the doses and in the manner directed by Dr. Walshe in cancer, often occasions temporary and, in some cases, permanent amelioration.

313. *In Lepra, Psoriasis, and Impetigo*, the iodide, in doses of $\frac{1}{10}$ of a grain, has been employed by Dr. A. T. Thomson with great success. Dr. Neligan,[1] who has also used it with benefit, advises the following formula:—℞ Liq. Arsenicalis f℥ij., Potass. Iodid. ℥ss., Syr. f℥ij., Aq. f℥ss., M. Dose, a tea or dessert-spoonful, thrice daily, in water. Or with the addition of iodine:—℞ Liq. Arsenicalis ♏lxxx., Potass. Iod. gr. xvj., Iodi gr. iv., Syr. Flor. Aur. f℥ij. Dose:—A teaspoonful in a wine glass full of water thrice daily. This formula has been found by Dr. T. M'Call Anderson of use in some cases of *Eczema*.

314. *In Tinea Capitis*, Dr. Neligan[2] regards the iodide as the best constitutional remedy. He advises it in doses of $\frac{1}{10}$ of a grain, gradually increased to a $\frac{1}{4}$ for an adult, $\frac{1}{15}$ for a child of six years old, and from $\frac{1}{18}$ to $\frac{1}{20}$ for younger children. It may be given to adults in the form of pill, and to children in a little sugar. The scalp should be washed with an alkaline lotion (see POTASSÆ CARB. and SODÆ CARB.), and an ointment of the iodide of lead will complete the cure. The iodide of arsenic is, generally, too powerful a medicine for young children.

315. LIQUOR ARSENICALIS. Liquor Potassæ Arsenitis (Ph. Lond.) Fowler's Solution. *Prep.* Place Arsenious Acid and Carb. of Potash (āā gr. lxxx.) in a flask with Distilled Water (fl. oz. x.), and apply heat until a clear solution is obtained. When cool add T. Lavand. Co. fl. drm. v., and Distilled Water q.s. ad Oj.

Med. Prop. and Action. Similar to those of Arsenious Acid (*q.v.*) It occasionally, however, succeeds when the acid fails, and *vice versâ*. It is the form of arsenic best adapted for children, when it is considered advisable to administer so powerful a medicine; fl. oz. j. contains gr. iv. of arsenious acid, and fl. drm. j. gr. ½.

Dose:—♏ij.-v.-viij. twice or thrice daily.

Therapeutic Uses and Rules for Administration. See ACIDUM ARSENIOSUM.

316. LIQUOR ARSENICI HYDROCHLORICUS. HYDROCHLORIC SOLUTION OF ARSENIC. VALANGIN'S SOLUTION. *Prep.*

[1] Dublin Quart. Journ., Nov. 1849. [2] On Diseases of the Scalp, 1848.

Boil Arsenious Acid, in powder, gr. lxxx. with Hydrochloric Acid (fl. drm. ij.) diluted with Distilled Water (fl. oz. iv.) until it is dissolved, and then add Distilled Water q.s. ad Oj.

Med. Prop., Action, and Uses.—Similar to those of Liquor Arsenicalis, with which it corresponds in strength, and it may be given in similar doses, ♏ij.-viij. It is supposed to produce less gastric irritation than Liq. Arsenicalis, but there is no satisfactory evidence in support of the opinion, It is nearly three times the strength of Liq. Arsenica Chloridi, L. Ph.

17. Liquor Arsenici et Hydrargyri Iodidi. Solution of the Iodide of Arsenic and of Mercury. Liquor Arsenici et Hydrargyri Hydriodatis (Ph. D.) Solution of the Iodo-Arsenite of Mercury. Commonly known as Donovan's solution; so called after its inventor, Mr. Donovan, of Dublin. Each fluid drachm of the solution contains a quantity of teriodide of arsenic, equivalent to gr. $\frac{1}{8}$ of arsenious acid, and of iodide of mercury, equivalent to gr. $\frac{1}{4}$ of the peroxide of mercury, and gr. $\frac{3}{4}$ of iodine, converted into hydriodic acid.

Med. Prop. and Action. Alterative in doses of ♏xxx. thrice daily. Mr. E. Wilson (p. 281) regards this dose as too large, in many cases giving rise to headache, nausea, and occasionally salivation; but these symptoms disappear when the medicine is discontinued. It is a very valuable preparation.

Dose:—♏v.-♏xxx.

318. *Therapeutic Uses. In obstinate Cutaneous Diseases*, particularly in *Psoriasis*, *Lepra*, *Pityriasis*, *Ephelis*, *Lupus*, and *Impetigo*, the solution has been found highly successful by Mr. Donovan, Drs. Osbrey,[1] Byron,[2] Graves, and others. Dr. Osbrey advises the following formula:—℞ Liq. Ars. et Hyd. Iod. gutt. lxxx., Aq. Dest. f℥viij., Syr. Zingib. f℥ss., M. Dose, f℥j. every third hour. *In Sycosis* it has been found highly useful by Mr. E. Wilson (p. 418.) *In Urticaria*, Dr. Osbrey found the solution in doses of gutt. vj. thrice daily, productive of signal benefit. *In Cancer*, Dr. Tilt (p. 245) thinks that this solution (♏xxx. thrice daily) should have a fair trial.

319. Assafœtida. A gum resin obtained by incision from the living root of Ferula Asafœtida, *Linn.* (Narthex Assafœtida, *Falconer*, in B. Ph.) *Nat. Ord.* Umbelliferæ. *Hab.* E. Persia, Turkistan, Affghanistan, and extreme Western Himalayas. Imported *viâ* Bombay.

Med. Prop. and Action. Stimulant, antispasmodic, expectorant, and

[1] Dublin Journ., vol. xxi. p. 401, and vol. xviii. p. 97.

[2] Ibid., vol. xxii. p. 57.

anthelmintic. It is the most active and powerful of all the fetid gums. When taken internally, it is absorbed into the system, and communicates its odour to the urine, milk, and perspiration. It may also be detected in the breath. The Arabians place it among their aphrodisiacs, and throughout the East it is considered to be of so stimulating a nature, that if administered to a pregnant woman, it will cause the death of the fœtus. Recent observations in Europe partially support this opinion. Lombard, however, regards it as a sedative; he found it diminish and render more regular the movements of the heart, and produce a state of tranquillity not easily excited. It is best administered in the form of tincture. It occasionally enters into the composition of enemas.

Dose:—Of Assafœtida, gr. v.-xx., in pill or emulsion. *Of the Compound Pill* (Assafœtida, Galbanum, Myrrh āā oz. ij., Treacle oz. j.), gr. v.-x. *Of the Tincture* (Assafœtida oz. ij.½, Rect. Spirit Oj.), fl. drm. ½-j. It may also be used in the form of *Enema* (Assafœtida gr. xxx., Water fl. oz. iv.)

320. *Therapeutic Uses. In Spasmodic Asthma*, assafœtida is sometimes very beneficial. It is best given in combination with other anti-spasmodics and with narcotics, thus:—℞ T. Assafœt. fl. drm. ½, T. Opii ♏xx., Spt. Æther. Sulph. Co. fl. drm. ½, Mist. Camph. fl. oz. j½, M. ft. haust. *In Angina Pectoris*, the same formula is also, occasionally, of great use.

321. *In the Chronic Stage of Hooping Cough*, M. Rieken[1] found assafœtida more useful than any other remedy. He advises its administration in glysters. Gr. ½ incorporated with the yolk of an egg, and mixed in fl. oz. vj.-fl. oz. viij. of water, is sufficient for ten or twelve glysters for children under one year of age; four or six for those under three years; and two or three for elder ones. Two glysters are administered daily. Olive oil may be added, if they cause tenesmus. Its internal use was advocated by Millar in 1769, but Hufeland reported unfavourably of its efficacy. *In the advanced stages of Pneumonia and Bronchitis in Children*, Prof. G. B. Wood (i. p. 612) regards it as an admirable remedy. His testimony in its favour is very strong; he considers that he has seen many lives saved by its judicious use. It is particularly useful in relieving nervous exhaustion, when freely used and repeated every one or two hours. *In Laryngismus Stridulus*, it is said also to have proved effectual.

322. *In Flatulence and Flatulent Colic*, especially in that occurring in hysterical women, an assafœtida enema often affords immediate relief. *The Tympanitis of Fever* is also often relieved by the same means. In the former cases, the compound pill, in combination with Pil. Rhei Co. and Ext. Hyoscyami, is often productive of good effects.

323. *In Hysteria*, assafœtida is one of the most useful medicines which we possess. Its operation is generally speedy, uniform, and permanent. Its use is not confined to one form more than another, although its effects are more readily evi-

[1] Ed. Med. and Surg. Journ., April, 1843.

denced in persons of weak and debilitated constitutions than in the stout and robust. The following is a popular form for its administration:—℞ T. Assafœtid., T. Castorei, T. Valerian Am. āā fl. drs. ij., Mist. Camph. fl. oz. vij., M. Dose one or two tablespoonfuls every hour. It may also be used in the form of enema.

324. *In Excessive Palpitations of the Heart*, Dr. Lombard,[1] of Geneva, states that assafœtida, applied externally, in the form of plaster over the region of the heart, seldom fails to quiet palpitations. Internally exhibited it produced the same effect, which was of a more permanent character than that induced by other remedies.

325. *In Dyspepsia attended with Hypochondriasis and other Nervous Affections*, assafœtida, in combination with bitter tonics and mild aperients, may often be given with advantage. In these cases, it is best given in the form of compound pill.

326. *In Nervous Affections connected with Uterine derangement*, it is also a remedy of much value. When it is desired to produce a speedy and decided effect, the tincture should be given; but its effects are more permanent if administered in substance. Dr. Pollock[2] relates a case of *Epilepsy* in which he employed, with the most satisfactory results, a combination of Tinct. Assafœtid. (♏ xxx.) and Carb. of Ammonia gr. iij. thrice daily.

327. *In the Convulsions of Childhood during Dentition*, an enema, containing a small portion of assafœtida, appears to mitigate the severity and the duration of the convulsion.

328. *Against Lumbrici or Round Worms*, Dr. Cazin[3] regards assafœtida as a valuable vermifuge, particularly when the presence of intestinal worms gives rise to sympathetic nervous affections. It thus fulfils a twofold indication. He mentions two cases of *Chorea* and one of *Epilepsy*, in which assafœtida not only revealed the true cause (*Lumbrici*), but effected a cure. He advises it in doses of gr. iv.–gr. xxx., in powder, in combination with calomel; or, in anæmic subjects, with the black oxide of iron. *Against Guinea-Worm*, it is regarded, in India, as a specific.[4]

329. Atropa Belladonna, *Linn.* Deadly Nightshade. *Nat. Ord.* Solanaceæ. *Hab.* Europe and Western Asia.

Med. Prop. and Action. The leaves and root (*off.*) are anodyne and antispasmodic, their activity residing chiefly in an alkaloid, *Atropia* (*q.v.*), and partly in another principle, *Belladonnine*, first described by Luebekind. The physiological effects of atropia have been carefully examined by Dr. Harley, and it may be premised that a similar train of symptoms follow the exhibition of the alkaloid, or of belladonna in substance,

[1] Brit. and For. Med. Rev., vol. i. p. 265.

[2] Lancet, Aug. 21, 1869.

[3] Dublin Quart. Journ., May, 1850.

[4] Edin. Monthly Journal, vol. ii. p. 304.

whether introduced into the system hypodermically or by the alimentary canal, and that $\frac{1}{100}$th gr. of the alkaloid is sufficient to produce the full effects of the plant. The following are the effects of a full medicinal dose:—Acceleration of the pulse from 20 to 70 beats, with a slight increase of its volume, and a considerable increase in the force of the cardiac and arterial contraction, a general diffusion of warmth throughout the cutaneous surface; a gentle throbbing or heaving sensation in the carotid; a slight feeling of pressure under the parietal bones; giddiness, heaviness, and drowsiness, or actual somnolency, accompanied by a tendency to quiet dreamy delirium and nervous startings; complete dryness of the tongue, roof of the mouth, and soft palate, extending more or less down the pharynx and larynx, rendering the voice husky, and often inducing dry cough and difficulty of deglutition; a parched condition of the lips; occasional dryness of the Schneiderian and conjunctival mucous membranes, and increasing dilatation of the pupils. After continuing about two hours, the dryness of the mouth suddenly gives way to a viscid, sticky, acid secretion, of a peculiar and very sickly offensive odour; and the mouth becomes foul and clammy, and the tongue usually covered with a white fur. A short time before moisture returns to the mouth, the pulse is observed to fall, and it now rapidly resumes its ordinary rate and character. The pupils have now reached the maximum degree of dilatation; but they will still contract to a fourth, sixth, or even eighth of an inch, varying according to the original dimensions of the pupil when exposed to the brightest light.

During the action of the medicine, there is observable a slight elevation of the temperature of the surface, rarely exceeding one degree; and a still slighter and less appreciable rise of the internal temperature of the body. No difference has been observed in the rate of respiration, except such as may happen in a nervous woman, a little emotional excitement on the sudden accession of the giddiness. The breathing remains as tranquil as before the injection. The patient occasionally heaves a deep sigh, or more frequently gives a prolonged yawn, as he sits still in a dull, apathetic, or drowsy condition.

After the pulse has resumed its ordinary rate, and the mouth has moistened, the giddiness and drowsiness pass off, and the patient appears tolerably lively and brisk in mind and body; but he may continue to feel, for some hours longer, such languor of body and mind as will render him incapable of active bodily or mental exertion. A little dimness of vision may also remain, and occasionally there is so much, that the patient is unable to thread a needle, or even to read.

Headache, either during the action of the medicine or afterwards, is a rare and exceptional occurrence. The desire for food returns soon after the operation of the medicine; but, during its action, insalivation and deglutition are almost, if not quite, impossible.

If a larger dose than is sufficient to produce the above symptoms be given, there is superadded a fluttering sensation in the cardiac region; slight delirium, manifested by picking and other motions of the hands and fingers in the air, as if they were in contact with real objects; muttering and smiling; staggering, or complete inability to walk.

Atropia is rapidly eliminated by the kidneys, in whatever way it is introduced into the system, appearing in the urine in less than twenty minutes after the injection of even the $\frac{1}{50}$th of a grain. The fact is easily demonstrated by dropping into the eye, at intervals of 10 or 20 minutes, for two or three hours, one or two drops of the urine. That the $\frac{1}{100}$th of a grain of atropia may be detected in the urine is a fact of considerable importance in a medico-legal point of view. In ten patients, the urine secreted immediately before and during the operation of the medicine were analysed. The result was uniform. During the action of the belladonna, the urea and the sulphates and phosphates were increased; and, as a rule, the chlorine was proportionately diminished. The increase of the urea was disproportionate to, and considerably less than, that of the phosphates and sulphates. Hence, as Dr. Harley observes, atropia is, in the true sense of

the word, a diuretic, and a more powerful one, probably, than any other we possess.

Certain conditions modify or interfere with the action of Belladonna:—

1. Children are remarkably insusceptible to the action of belladonna. They occasionally bear very large doses before dryness of the mouth or cerebral effects of any kind are produced; but the stimulant effect upon the heart and the dilatation of the pupil, are as readily induced in young people as in adults and old people.

2. Amongst adults of apparently equal vigour, some are more susceptible to its action than others; and the $\frac{1}{60}$th of a grain will sometimes produce as much effect upon one individual as double that quantity upon another.

3. The influence of pregnancy is doubtful.

4. The fixed alkalies, as Dr. Garrod has observed, by decomposing the active principle, annul the operation of belladonna. This, however, only occurs after a time; for, if the caustic alkali was mixed with the belladonna or atropia only a few minutes before it was administered, it in no way interfered with its action. Further, caustic ammonia and lime-water have the same destructive action upon atropia; and the latter, used in large quantities, promises to be the appropriate antidote in cases of belladonna poisoning.

Mr. Hughes,[1] in an able paper on Belladonna, shows that its chief physiological effects and therapeutic uses as an internal remedy, depend upon the influence it exercises on the pneumogastric nerve.

The alleged antagonism of belladonna and opium will be considered in Art. Opium.

Dose:—Of the powdered Leaves, gr. ½–gr. j. (a bad form of administration). *Of the Extract*, gr. ¼–gr. j. *Of the Tincture* (oz. j. of powdered leaves, Proof Sp. Oj.), ♏v.–xx. *For external use only: Liniment*, Belladonna (Root oz. xx., Camphor oz. j., Rect. Spirit ad Oj.); *Ointment* (Ext. of Belladonna gr. lxxx., Lard oz. j.); *Plaster* (Ext. of Belladonna, Resin Plaster āā oz. iij., Rect. Spirit fl. oz. vj.)

330. *The power of Belladonna to cause dilatation of the pupil*, which renders it so peculiarly valuable in some diseases of the eye and in ophthalmic surgery, has been variously explained. Dr. Harley ascribes it to a paralyzing action on the ciliary branches of the third pair of nerves, while Dr. B. Bell considers that it depends upon a contraction of the radiating fibres of the iris. Mr. Wharton Jones regards it as due to a temporary diminution of the general sensibility of the retina conferred by the fifth pair of nerves; and Dr. A. Fleming supposes that it acts by causing a contraction of the ciliary arteries, and preventing the turgescence of the iris with blood, while the radiating fibres are drawn into action by functional sympathy with the contracted arteries (Stillé). Dilatation of the pupil equally occurs if belladonna be applied locally to the eye or be taken internally, but in the latter case the process is much lengthened, and the effect attended with more or less constitutional derangement. By long-continued use, it does not generally lose this property; thus, Sir W. Lawrence mentions two patients of his own, one of whom used it habitually for four or five years, and the other for fourteen or fifteen years, and it dilated the pupil just as well at the end of these periods as it did

[1] Brit. Med. Journ., May 20, 1860.

at the commencement. Occasionally, however, it loses its dilating power, but regains it if the application be suspended for a week or two and then resumed. In some rare cases, the local application of belladonna to the eye produces a peculiar state termed microscopia, or micropia, in which all objects appear much smaller than natural: it passes off, however, when the medicine is discontinued.

331. *Remarks on its Use.*—1. An easy test of the activity of the extract (one of the best forms for internal use) is to rub a grain or two on the eyelids; if good, it produces full dilatation of the pupil in the course of a few minutes.

2. Commence with small doses generally, and gradually increase them till it produces its physiological effects, dryness of the throat, vertigo, &c., and then diminish the dose or discontinue it altogether.

3. If on the appearance of its physiological effects, the disease for which it has been administered does not yield, its continued employment will be useless, perhaps injurious.

4. The full effects of belladonna can be more speedily (and equally safely) induced by the hypodermic injection of atropia, than by the internal administratiou of belladonna. (*Vide* Atropia.)

332. *Therapeutic Uses. Spasmodic and Nervous Diseases. In Spasmodic Asthma*, belladonna is productive of much benefit, but in order to obtain its full effects it should be given in the manner advised by Dr. Hyde Salter.[1] He directs one full dose, sufficiently large to produce the full physiological effect of the drug, to be given every night at bedtime. This he regards as infinitely superior to the plan of giving it in divided doses several times a day. This treatment is curative as well as prophylactic, as by preventing the attack for a series of nights in succession, it breaks through the habit which, in diseases of this class, is most important. In order to ascertain the requisite dose in each case, as there is a marked difference in the tolerance of belladonna in individuals it should be commenced in small doses, *e.g.*, ℿ x. of the tincture, and increased gradually till the proper dose is ascertained. Some excellent remarks on the action of belladonna in asthma have been published by Dr. Lee.[2] Dr. Anstie obtained excellent results in a case of spasmodic asthma by the hypodermic injection of atropia. A similar case occurred in the practice of M. Courty.[3] In other forms of *Spasmodic and Nervous Cough*, belladonna likewise proves very serviceable, both administered internally, and applied externally in the form of plaster to the chest.

333. *In Hooping Cough*, the value of belladonna is well esta-

[1] Lancet, Jan. 30, 1869.
[2] Practitioner, July, 1869.
[3] Comptes Rendus, Nov. 7, 1859.

blished. Amongst others who have advocated its use is Dr. Williams, who prescribes the extract in doses of gr. $\frac{1}{4}$ thrice daily to a child of two years old; gr. $\frac{1}{2}$ to one of four years; and gr. j. to one of eight years of age; and increases the dose till the physiological effects (dilatation of the pupils) are developed or relief is obtained. He considers it safer and more effectual than hydrocyanic acid. Dr. Fuller and Mr. Garraway[1] advocate its use in combination with sulphate of zinc (*q. v.*) Frictions of belladonna liniment to the spine may also be used with advantage in these cases. *In Laryngismus Stridulus*, it promises to be a remedy of considerable value; it seems well worthy of attention in these cases.

334. *In Chorea*, attended with much nervous irritability or excitement, Cullen and others have thought highly of belladonna; but later experience tends to support Dr. Hillier's verdict (p. 236), that "it is of little or no service." *In Epilepsy*, it has testimony in its favour from Trousseau,[2] Dr. Wilks,[3] and others, but it has been almost entirely superseded by bromide of potassium, which possesses superior efficacy. In the failure or absence of this salt, a combination of belladonna and zinc is worthy of a trial. Dr. Harley (p. 268) mentions having found it serviceable in epilepsy arising from emotional excitement.

335. *In Tetanus*, belladonna was successfully employed in several cases by Dr. Hutchinson.[4] Another case cured by atropia (gr. $\frac{1}{60}$th every 3 hours) is related by Dr. G. Oliver;[5] belladonna liniment was also rubbed over the spine and rigid muscles every six hours. The patient was kept under its influence for three weeks, and then completely recovered. A case in my own practice recovered under the use of the extract given internally, and applied locally to the wound (on the foot) on the surface of a rice poultice. He was kept under its influence for several days, and made a good recovery. It probably acts in these cases in the manner pointed out by Brown-Séquard, by reducing congestion of the blood-vessels of the spinal cord and its membranes.

336. *In Sciatica, Tic Douloureux, and other Neuralgic Affections*, belladonna takes the first rank in the list of sedatives and anodynes, both as an external and internal remedy; but, like all other remedies of this class, it occasionally fails to afford any relief. Dr. Fuller (p. 457) considers it especially adapted for the cases which are marked by spasmodic twitchings of the muscles, whether manifested by cramp or by starting of the limb; and in these cases he advises the extract in doses of $\frac{1}{4}$–$\frac{1}{3}$ or even $\frac{2}{3}$ gr. two or three times daily. Its action should be

[1] Lancet, Oct. 17, 1863.
[2] Med. Times, Aug. 25, 1855.
[3] Ibid., Jan. 23, 1869.
[4] Lancet, 1844, vol. i., p. 274.
[5] Practitioner, Dec., 1868.

carefully watched, and it should be discontinued when dilatation of the pupil, headache, and other constitutional effects manifest themselves. As a local application he recommends the following:—℞ Ext. Belladon. ʒj., T. Opii ℥j., Glycerini ʒiij., M. A piece of lint wetted with this mixture, and covered with oiled silk, often affords very great relief when placed along the course of the nerve. When the neuralgia is superficial, Trousseau found belladonna, or a compress saturated with a solution of atropia (gr. v., Aq. fl. oz. iij.) effectual, but in cases of any severity all other plans are inferior in efficiency to the subcutaneous injection of atropia. Dr. Anstie speaks in the highest terms of the last-named treatment, especially in cases where morphia similarly employed had previously failed. *For every kind of pain in the Pelvic Viscera*, atropia in this form is, according to Dr. Anstie, incomparably the best of all remedies. It is also effectual in relieving the *Intercostal Neuralgia attendant on Herpes Zoster*. For dose, &c., see Atropia.

337. *In Acute Rheumatism* (*Rheumatic Fever*), Dr. Harley states that he has employed belladonna with marked success. He injects gr. $\frac{1}{50}$–$\frac{1}{40}$ of the sulphate of atropia into the integument over the affected joint, as soon as the first indication of inflammatory action arises in the part. The anodyne action, he remarks, is so direct, speedy, and enduring, that the use of opium is rendered altogether unnecessary.

338. *In all conditions and diseases in which there is depression of the sympathetic influence, such as Syncope from asthenia or shock, or the collapse of Cholera, in failure of the heart's action from Chloroform, or other cardiac paralysers*, the subcutaneous use of sulphate of atropia in doses of gr. $\frac{1}{100}$–$\frac{1}{40}$ is, according to Dr. Harley, the appropriate and most hopeful means of resuscitation. He considers that it should stand at the head of our stimulants, for there is no medicine in the materia medica, he adds, which at all approaches belladonna in its simple, direct, immediate, and powerful influence in exalting the force and rapidity of the heart's action.

339. *External or Local Inflammations. In Acute Inflammation of the Mamma*, Mr. C. Heath[1] found great benefit from the extract applied to the inflamed surface, leaving the areola and nipple untouched in order that the infant might be able to suck with safety. He also speaks very favourably of it as a local application in *Inflammatory Swelling of the Lymphatic Glands of the Neck, in Inflammation of the Lower Jaw depending upon alveolar abscess, in Painful Lymphatic Affections, in Sympathetic Bubos, and in the earlier or inflammatory stages of Boils and Carbuncles*. In these cases, the extract softened with glycerine

[1] Practitioner, Nov. 1868.

should be freely applied over the affected surface, and occasionally when the pain is very severe, a poultice may be placed over the extract for a few hours only.

340. *Diseases of the Eye.* Belladonna, from its property of dilating the pupil, is a valuable agent in the treatment of diseases of the eye and in ophthalmic surgery (sect. 330). It assists materially in allowing the surgeon a fuller view of the disease, thereby affording further scope for his manipulations. Dilatation of the pupil by its means is a necesary preliminary to examination with the ophthalmoscope.

341. *In Iritis, whether Syphilitic or Idiopathic*, it is of importance to keep the edge of the iris free, and to allay the deep-seated pain which so generally accompanies this disease. Both these indications are answered by the introduction into the eye of a drop or two of a filtered solution of the extract (gr. xx., Aq. fl. oz. j.), or better still, of a solution of atropia. The same applications are advisable in *deep Ulcers of the Cornea*, when the object is to prevent the iris becoming implicated in the ulcerative process. It is particularly necessary when the ulcer is situated near the centre of the cornea. *In painful Iritis and threatening Glaucoma*, Dr. Anstie considers that the hypodermic use of atropia promises to prove valuable. In two cases of the latter affection, he believes that he succeeded in preventing its development by the use of $\frac{1}{60}$th grain subcutaneous injections of atropia. *In Rheumatic Iritis*, great relief to pain is often obtained by the local use of belladonna or its alkaloid; it proves equally serviceable in *Scrofulous Ophthalmia*, but it should not be used to the exclusion of constitutional treatment. Mr. Dixon's experience, however, is adverse to the use of belladonna in the acute stages of iritis.

342. *In Cataract*, many advantages are derived from belladonna. It is generally admitted that an operation should be deferred until the cataract is mature; that is, until the sight has totally failed. To ascertain this point, a drop or two of a solution of atropia should be dropped into the eye, night and morning, so as to dilate the pupil fully. When, after this application, the patient is unable to distinguish objects, the cataract may be considered mature, and the time arrived for an operation. Previous to having recourse to this manipulation, the atropia solution should be dropped into the eye, to allow the operator a full view of the seat of the disease, and to facilitate the operation.

343. *In Photophobia*, Mr. R. B. Carter[1] recommends a perfectly neutral solution of sulphate of atropia, gr. j. ad Aq. fl. oz. j., for an adult; half that strength for a young child, repeated every four hours. He directs a large quill, cut in the

[1] Practitioner, Jan. 1869.

form of a scoop, to be dipped in the solution, so as to take up a drop; the lower eyelid should then be depressed sufficiently to allow the scoop to touch its internal surface near the outer canthus, when the drop will enter between the lids and diffuse itself over the surface of the eye. Should there be much lachrymation, so as to dilute the solution, it may be applied more frequently. In some rare cases belladonna, in any form, occasions so much irritation that its use has to be abandoned. In long-standing or severe cases, Mr. Carter advocates the division of the orbicularis muscle at the external canthus.

344. *Diseases of the Genito-urinary System. In Spasmodic Stricture of the Urethra, and of the Sphincters of the Bladder and Rectum*, the extract smeared on a bougie and introduced into the urethra, or rubbed into the perinæum, often has the effect of relaxing the spasm and affording relief. Mr. C. Heath[1] prefers its internal administration in these cases, and he mentions one troublesome case of spasmodic stricture of the urethra in which great benefit was derived from ℥ij. of the tincture every four hours. Mr. R. Harrison,[2] believing that belladonna possesses a special power of directly influencing and effecting a change in the obstructing matter of urethral strictures, employs it in the form of urethral suppositories, (Ext. Belladon. gr. ij., Cocoa Butter q.s.) which are introduced twice daily, in conjunction with the use of the metallic bougie; they should be continued for some time after the latter has been left off. Under this treatment, he considers that very great and permanent benefit has accrued, when the use of bougies alone had only effected very temporary relief. He also speaks strongly of the value of belladonna in the form of *Irritable Bladder*, most frequent in females, in which the epithelium is copiously deposited in the urine. The value of this remedy in *Irritable states of the Bladder* had been previously pointed out by Mr. Behrend.[3]

345. *In Suppression of the Urine*, whether accompanied by uræmia or not, belladonna is indicated. As both the sluggish circulation and the torpid kidney are simultaneously aroused by this medicine, there is ground for expecting a restoration of the renal secretion (Dr. Harley.) *In Acute Nephritis*, benefit may also be expected from belladonna, which coming in contact with the irritated and congested organ, will doubtless calm the nervous irritation, and at the same time contract the dilated blood-vessels. Dr. Harley is also of opinion that it will prove very serviceable in *Chronic Albuminuria*, provided that the kidney has not passed into the degenerative state bordering on fatty degeneration. From a consideration of its physio-

[1] Practitioner, Nov. 1868.
[2] Ibid., Jan. 1869.
[3] Lancet, June 25, 1859.

logical action, there is solid ground for a fair trial of belladonna in all these cases.

346. *In Orchitis*, when the inflammatory symptoms have subsided, Dr. Philippe,[1] of Bordeaux, successfully employed an ointment composed of 1 part of ext. belladonnæ and 3 of lard. Of this, gr. xxx. are to be rubbed on the scrotum twice daily for five or ten minutes. It may also be advantageously administered internally at the same time.

347. *In Phimosis and Paraphimosis*, belladonna ointment (12 parts of the extract to 30 of lard) has occasionally been found effectual. The ointment is to be gently rubbed over the parts every hour until relief is obtained.

348. *In Chordee*, great relief follows the use of an ointment composed of equal parts of extract of belladonna and glycerine, to which a few grains of camphor may be added. It should be well rubbed into the lower surface of the penis at bedtime.

349. *In Uterine and Ovarian Neuralgia, and in Neuralgic Dysmenorrhœa*, Dr. Anstie[2] recommends the extract in doses of gr. $\frac{1}{6}$ as a palliative; or, still better, the subcutaneous injection of the sulphate of atropia ($\frac{1}{120}$–$\frac{1}{60}$ gr.) injected twice daily and continued for several weeks, carefully keeping within the line of toxic symptoms and at once reducing the quantity when marked diplopia or dryness of the throat appeared. Thus employed, it was found sufficient, in many cases, to remove the neuralgic tendency. Some constitutions, however, are very intolerant of belladonna in any form; in these morphia (gr. $\frac{1}{6}$ of the acetate) may be advantageously substituted for the atropia. In all these cases it is, of course, of primary importance to remove, if possible, all local, temporary, or extrinsic sources of irritation. *Most cases of Dysmenorrhœa and many other painful and irritable states of the Uterus*, are benefited by the application of a belladonna plaster to the sacrum. The extract in the form of suppository is also frequently of great service.

350. *In Incontinence of Urine in Children*, belladonna often proves serviceable.[3] Sir H. Thompson (p. 163), who speaks highly of its value in these cases, directs small doses of the tincture to be given in the afternoon and evening, increasing the dose gradually when necessary; and if the bladder, he adds, is thus made to retain the urine all night for a few weeks, on relaxing the dose gradually, the habit of retaining it is found to be formed and to persist.

351. *Diseases of the Abdominal Viscera. In obstinate Constipation*, belladonna is often, in virtue of its antispasmodic action, successful when the strongest purgatives fail. As

[1] Journ. des Conn. Médicales, Oct. 1845.

[2] Brit. Med. Journ., Aug. 22, 1868.

[3] See Rankin's Abstract, xxv., p. 213.

advised by Trousseau, it may be given in doses of gr. $\frac{1}{6}$–$\frac{2}{3}$ every morning at rising, conjoined with the extract of gentian, grs. i.–ij. A severe case of *Colic and Constipation*, in the practice of Dr. Murchison,[1] recovered under the use of gr. $\frac{1}{2}$ of the extract every four hours, with belladonna ointment to the abdomen, a warm bath, and castor-oil enemas, after numerous other remedies had failed. *Ileus* was successfully treated with it by Dr. Becker;[2] and Dr. Staal[3] relates a case of *Intus-susception of the Bowels*, which yielded to an enema containing gr. iv. of the extract. *In the Passage of Gall-stones*, Dr. Murchison (p. 350) states that on several occasions he has seen marked utility from the extract, gr. $\frac{1}{2}$ every two or three hours. *In the Vomiting of Pregnancy*, Dr. Routh[4] found large doses of the tincture (♏ xx.–xxx.) every three or four hours of great service; a case in which it proved successful is mentioned by Dr. Greenhalgh.[5] Benefit has also been derived in these cases by frictions of belladonna over the hypogastric region. *In Stricture of the Œsophagus*, frictions with belladonna liniment to the sternum are often very useful as a palliative.

352. *In Fissures of the Anus*, Dupuytren, with the view of inducing relaxation of the sphincter, employed with advantage the following ointment:—℞ Ext. Belladon., Plumbi Acet. āā ʒj., Adipis ʒvj., M., applied three or four times daily. In slight cases Mr. C. Heath (op. cit.) found great benefit from the use of a bougie smeared with equal parts of the extract and mercurial ointment. Belladonna ointment, locally applied, often affords great relief in *Painful Hæmorrhoidal Tumours and Piles*. Dr. Mulvany[6] relates some severe cases in which signal benefit followed its internal administration.

353. *Scarlet Fever*.—The prophylactic power of belladonna in scarlet fever has attracted considerable attention during the last half century, but the question of its powers in this character must be considered still *sub judice*. A full *résumé* of all the facts bearing on the subject is given in the "British and Foreign Med. Chir. Review" for January, 1855, and the conclusions arrived at are as follows:—1. Numerous facts attest its want of success. 2. All those facts which apparently testify in its favour, admit of other and ready explanations. 3. These explanations are, in themselves, perfectly satisfactory and philosophical. Amongst other facts adduced, that relating to an epidemic of scarlet fever at the Royal Military Asylum at Chelsea, is peculiarly worthy of attention. Dr. Balfour selected 151 boys, of whom he had tolerably satisfactory evidence that they had not had the disease previously; to 76

[1] Lancet, Jan. 19, 1867.
[2] Gazette de Paris, May 8, 1841.
[3] Oppenheim's Zietscrift, Feb., 1844.
[4] Brit. Med. Jour., Aug. 22, 1868.
[5] Ibid.
[6] Med. Press and Circular, June 10, 1868.

of these he gave belladonna, to the other 75 he gave none. The result was, that two in each section were attacked by the disease.[1] The majority of practitioners of the present day agree in the opinion of Dr. Hillier (p. 314), that we know nothing which will affect the spread of the disease, besides avoidance of infection. When a patient has suffered from this disease it is not safe to allow him to return amongst the healthy until desquamation is completed, or if there be not much desquamation, for a month from the beginning of the illness; sheets, blankets, &c., should be put into, and kept for some time, in *boiling* water, and other bedding and woollen materials, which cannot be so used, should be put into stoves so as to insure a temperature of 200° to 250° F. Attendance to these rules will prove a surer preventive than belladonna.

As a remedial agent in Scarlet Fever, belladonna appears to be a valuable remedy. Dr. Burne, Mr. E. Wilson, and others, have reported favourably of its efficacy; and Dr. J. Gardner[2] states that he has employed it in thirty cases with decided benefit. He advises the extract, in doses of gr. $\frac{1}{2}$–gr. j., every three, four, or six hours, dissolved in water; to be continued until it produces dilatation of the pupil and a degree of stupor. He adds that he does not allow low delirium, even from the first, to deter him from giving belladonna, and that he administers no other medicine whatever, except an occasional dose of castor oil. Sponging the body and gargles are allowed. Mr. Green,[3] of Peckham, also testifies to the efficacy of this treatment. In most cases, however, carbonate of ammonia is preferable.

354. *In Small-pox*, the treatment advised for Scarlet Fever has been found effectual. Mr. E. Wilson (p. 96) states that he has seen this remedy exhibited with the greatest benefit, both as a prophylactic and as a curative measure.

355. *In Erysipelas*, the internal use of Belladonna, in repeated doses of $\frac{1}{16}$ of a grain, is often very effectual in reducing the excitement of the arterial system, and in procuring rest. It is best given after the exhibition of aconite (see sect. 35). Mr. C. Heath speaks favourably of it in these cases. Belladonna has been administered internally in cases of *Severe Burn* by Mr. Hutchinson.[4] He has found it of most use in children in whom general febrile symptoms, attended with restlessness and loss of appetite, have set in without local complication. Where the burn itself is very painful, and the patient unable to procure sleep, belladonna is inferior to morphia.

356. *In Phlegmasia Dolens*, much benefit sometimes arises

[1] Edin. Monthly Jour., Sept., 1849.
[2] The Institute, Jan. 4, 1851.
[3] Ibid., Feb. 1, 1851.
[4] Medical Times, Jan. 2, 1864.

from the local application of an ointment, composed of equal parts of mercurial ointment and extract of belladonna.

357. *In Palpitation connected with Valvular Disease of the Heart*, very often rest in bed, with a belladonna plaster or lotion over the heart, or even rest alone, soon causes the palpitation to cease (Dr. Waters, p. 375). In severe cases it is inferior in efficacy to digitalis (*q.v.*) Dr. Harley (p. 247) speaks highly of the benefit he has derived from belladonna in *Pneumonia*. Under its use the grave symptoms rapidly subsided, and convalescence was speedily established.

358. *In Insanity*, belladonna has been favourably noticed by Dr. Millengen and others, and Schroeder Van der Kolk (p. 156) states that he has many times used it with good effect as an anti-spasmodic combined with aloes (sect. 57). As a general narcotic, however, he ascribes to it rather an injurious action. "The sleeplessness of idiopathic mania," he remarks, "must not be opposed by narcotics, which would have only an injurious effect. Sedative narcotics are only suitable where the sleeplessness is a residuum of increased sensibility without any appearance of excited activity of the vascular system."

359. *In Typhus and other Low Fevers, attended with a contracted state of the pupil*, Dr. Graves advises belladonna, with a view of correcting that condition of the brain which gives rise to this symptom. He looks upon a contracted state of the pupil as contra-indicating the administration of opium, and mentions several cases remarkably benefited, when that symptom was present, by the exhibition of belladonna, combined with musk or tartar emetic. *In Typhoid (Enteric) Fever*, the value of belladonna is strongly insisted upon by Dr. B. Kelly,[1] of Dublin, who considers that it counteracts the poison of typhoid. He waits till the fever is fully developed, and then commences with the tincture in doses of gutt. xx.–xxv. every four hours, varied, of course, according to circumstances. He generally uses the following mixture:—℞ T. Bellad. fl. drm. ij., Syr. Aurant. fl. oz. ½, Aq. Menth. Pip. fl. oz. vij. ½, M. Sumat. part. ⅙ 4tis horis, to be continued with little or no variation for not less than two weeks. Nothing more serious than moderate dilatation of the pupil and slight dryness of the fauces follows these large and continued doses. Stimulants during its exhibition are absolutely interdicted, but a nourishing diet, soup, milk, arrowroot, &c., is advised. Dr. Kelly's statements as to the efficacy of this treatment are most encouraging, and sufficiently conclusive to warrant further trial. Dr. Harley (p. 256) testifies to its value in these cases, and he also found it serviceable in modifying the more prominent symptoms in *Typhus Fever*.

[1] Medical Times, Feb. 5, 1870.

360. *Lacteal Congestion threatening Mammary Abscess.*—The lactifuge property of belladonna was first noticed by Dr. Goolden.[1] He cites two cases in which the external application of the extract around the areola of the breast was followed by a marked decrease and eventual arrest of the lacteal secretion. Its efficacy is attested also by Mr. Burrows,[2] of Liverpool, and Mr. Blytham.[3]

361. ATROPIA. Atropia. $C_{17}H_{23}NO_3$. An alkaloid obtained from belladonna.

LIQUOR ATROPIÆ. Take of Atropia gr. iv., Rect. Spirit fl. drm. j., Dist. Water fl. drm. vij., dissolve the atropia in the spirit, and add this gradually to the water, shaking them together.

ATROPIÆ SULPHAS. SULPHATE OF ATROPIA.

LIQUOR ATROPIÆ SULPHATIS. Take of Sulph. of Atropia gr. iv., Dist. Water fl. oz. j.; dissolve.

Med. Prop. and Action.—The same as belladonna, but far more energetic in its action. It is a powerful poison, and should only be given internally with the greatest caution. Introduced hypodermically it is an extremely valuable anodyne, and anti-spasmodic. For this purpose it should be employed in the form of a solution of the sulphate, ℥iv. containing $\frac{1}{60}$ gr.; of this ℥ij. (or gr. $\frac{1}{120}$) will be the proper commencing dose in adults, unless the pain to be relieved is very severe. It should be cautiously increased to $\frac{1}{60}$ or $\frac{1}{30}$ gr.; more can seldom be needed, and poisonous effects are apt to follow larger doses. The occurrence of slighter symptoms of atropism (dryness of the throat, vertigo, and diplopia) which are occasionally produced by smaller doses than those indicated above, is an indubitable sign that it would be unsafe to push the remedy to a greater extent. Atropia does not appear to be a direct hypnotic, but it makes sleep possible by relieving severe pain. It is somewhat less frequently tolerated than morphia, but some persons who are unable to bear morphia will bear atropia, and *vice versâ*; and in cases where both remedies are equally tolerated, sometimes morphia, and sometimes atropia (the latter most frequently) will produce a *permanent* effect (Dr. Anstie.)[4] Dr. Brown-Sequard[5] suggests the advisability of employing a combination of atropia and morphia, so as to obtain the good effects of both these agents at once, and counteract any ill effects which either alkaloid singly might produce. Externally it may be employed in the form of ointment (Atropia gr. viij., Rect. Spirit. fl. drm. ½, Lard oz. j. Dissolve the atropia in the spirit, add the lard, and mix thoroughly).

36½. For the purpose of dilating the pupil, Liq. Atropiæ diluted with four times its bulk of water may be employed. One drop of this solution is to be applied to the eye. Mr. Streatfeild[6] proposes for local use in eye diseases, "Atropine paper," prepared by imbuing coloured tissue-paper with a solution of the sulphate, of such a strength that a small square

[1] Lancet, Aug. 9, 1856.
[2] Brit. Med. Jour., March 29, 1857.
[3] Ranking's Abstract, vol. xxvii., p. 214.
[4] Practitioner, July, 1868.
[5] Lancet, March 10, 1866.
[6] Ophthalmic Hospital Report, April, 1862.

piece of it is equal to or contains as much of the salt as a drop of the strong solution in ordinary use. The little piece of paper (one-fifth of an inch square) is taken up on the top of the forefinger, previously damped; and the patient's lower lid being drawn down, he is told to look upward, and the scrap of paper is put on the sclerotic conjunctiva below the cornea, almost without the knowledge of the patient; the lid is then let go, and the piece of paper left *in situ*. A handkerchief is then tied over the eyes. The full mydriatic effect is induced quite as rapidly as with the solution, and the paper is more readily carried, and more easily applied. It may be subsequently easily removed. Blue paper is preferable to white for this purpose, as it is more readily distinguishable when it has to be removed. Subsequent observations have induced Mr. Streatfeild and Mr. E. Hart, who has also investigated the subject, to substitute thin plates of atropised gelatine for paper. The gelatine being soluble in the secretions of the eye, does not require removal. Mr. Hart employs squares of this substance containing only 100,000th of a grain of atropia to the square. He finds that the higher strength originally proposed by Mr. Streatfeild (240th of a grain) produces, for a time, paralysis of the accommodation of the eye, and consequent inability to adjust vision for near objects. Recontraction is effected by similar squares of gelatine impregnated with extract of Calabar bean.[1] Occasionally, as pointed out by Mr. G. Lawson,[2] atropia locally applied to the eye, induces great irritation and even an erysipelatous condition. The cases, however, are rare, and depend upon the idiosyncrasy of the patient.

Dose of Atropia, gr. $\frac{1}{50}$—$\frac{1}{20}$. It is rarely given internally.

Therapeutic Uses. See Atropa Belladonna.

Aurantii Cortex et Flores. See Citrus Aurantium.

363. Avena Sativa. The Common Oat. *Nat. Ord.* Gramineæ. It is an important article of food, and as such it is chiefly employed, particularly in Scotland. It is highly nutritious, containing about 64 per cent. of starch, and being richer in oily or fatty matter and in proteine than any other grain.

Its Medicinal Uses are various. *In Habitual Constipation*, and in some forms of *Dyspepsia*, oat bread, or oatmeal porridge (*vulgo* "stir-about"), is sometimes very effectual as a laxative. *In Poisoning by Acrid Substances*, oatmeal gruel may be given with advantage as a demulcent. Oatmeal also forms a useful suppurative poultice. Gruel prepared from oatmeal is sometimes used as a substitute for milk, for infants and young children. It is objectionable when there is a tendency to diarrhœa.

364. Balsamum Peruvianum. Balsam of Peru. A balsam obtained from the stem of Myroxylon Pereiræ, *Klotzsch. Nat. Ord.* Leguminosæ. *Hab.* Western Coast of Central America.

[1] Lancet, July 11, 1863; Jan. 16, 1864; Med. Times and Gaz., Jan. 30, 1864.

[2] Ophthalmic Hospital Report, April, 1868.

Med. Prop. and Action. Stimulant and expectorant. In common with the other balsams, it appears to act upon the mucous surfaces generally, but particularly upon that of the air-passages. Externally applied, it is a mild stimulant.

Dose, ℥x.–xv. or more. It may be taken in the form of emulsion with mucilage, or on sugar, or made up into pills with some absorbent powder.

365. *Therapeutic Uses. In Chronic Bronchitis, Coughs, &c.*, the balsams of Peru and Tolu are very useful stimulant expectorants, and may be advantageously added in the form of emulsion to squills and other remedies of the same kind. Benefit has also been derived from inhaling the vapour of these balsams, generated by placing them upon hot coals or a heated piece of iron. So long as inflammatory action is present they are inadmissible. The vapour has also been found useful in *Chronic Laryngitis.*

366. *In Otorrhœa*, Dr. A. T. Thomson (p. 564) states that he has found a mixture of fl. drm. j. of the balsam, and drms. ij. of ox gall extremely useful, when dropped into the ear every day. The aural passage should be first well syringed out with soap and water.

367. *In Cancrum Oris*, Prof. Graves (ii. p. 520) found a linctus, composed of fl. oz. j. of the balsam, and fl. oz. ij. of honey, a very useful local application.

368. *To Indolent and Foul Ulcers* and *Bed-sores*, the local application of the balsam renders the surface more healthy, and hastens the healing process. It is rarely applied. It may be used pure, or in the form of ointment (fl. drms. ij., lard oz. j.)

369. *To Sore and Chapped Nipples*, the topical application of the balsam in the form of ointment (fl. drm. ss., lard oz. j.) often proves serviceable in mild cases. *To Chapped Lips and Hands*, the same formula may be used with advantage. *To Unbroken Chilblains*, the following is Dr. Purdon's[1] favourite application :—℞. Bals. Peruv. ℥xxx., Sp. Rect. fl. oz. j. ½. Dissolve and add Acid. Hydrochlor. ℥xxx., T. Benzoin Co. fl. oz. ½, M. This may be rubbed on occasionally, or may be applied continuously on a piece of lint. At first it causes a little smarting.

370. *In Alopecia or Baldness*, Dr. Copland (ii. p. 138) states that he has, in several instances, employed the following formula with complete success :—℞ Adipis ℥ij., Ceræ Alb. ℥ss. ; melt before a slow fire, and add Balsam of Peru f℥ij., Ol. Lavand. ℥xij. ; stir till cold. This, he adds, has the effect of rendering the hair thick and persistent, and of promoting its growth in parts from which it had fallen out from impaired action of the follicles.

371. *In the Scabies of Children*, Dr. Monti, of Vienna, has

[1] Med. Press, Nov. 22, 1865.

successfully employed frictions with this balsam, ℥xl. at a time, well rubbed in for half an hour, preceded by a warm bath and friction with "green soap."[1]

372. Balsamum Tolutanum. Balsam of Tolu. A balsam obtained by incision from the stem of Myroxylon Toluiferum. *H.B.K.* *Source*, New Granada.

Med. Prop. and Action. Stimulant expectorant. It is particularly recommended by its pleasant aromatic flavour, and is one of the mildest of the balsams; but it is, nevertheless, contra-indicated in all active inflammatory states of the lungs and air-passages. The Syrup is an agreeable and useful adjunct to cough mixtures.

Dose:—Of the Balsam, gr. x.–xx. *Of the Syrup* (Balsam of Tolu oz. 1½, Sugar lb.ij., Water Oj.), fl. drm. j.–ij. *Of the Tincture* (Balsam of Tolu oz. ij. ½, Rect. Sp. Oj.), ℥ xx.–xl.

Therapeutic Uses. Similar to those of Balsam of Peru, but milder.

373. Barii Chloridum. Chloride of Barium. $BaCl_2 2H_2O$. Muriate of Barytes.

Med. Prop. and Action. For internal use, this salt should be given in the form of solution (Barii Chlor. gr. lx., Aq. Dest. fl. oz. j., dissolve and strain). In small doses, gutt. viij.–x. of the solution, it is stimulant, tonic, alterative, and resolvent; in large doses, a powerful acrid, irritant poison. Its use requires great caution, and it should always be commenced in the smallest dose, and gradually increased as the patient is able to bear it. If nausea, or purging, or giddiness ensue, the dose should be decreased, or the remedy relinquished altogether. Under its use the appetite increases, there is augmented secretion of urine, and slight diaphoresis, at the same time that the general health improves. A very instructive case, showing the danger of large doses, is related by Dr. Fergusson,[2] of Dublin. In large doses, it manifestly affects the brain and nervous system, and causes death by its action on those parts, and on the heart.

Dose:—Gr. ½ to gr. j., or gr. ij.

374. *Therapeutic Uses.* *In Scrofula*, it was first proposed as a remedy by Crawford.[3] Mr. R. Phillips[4] prefers it in many cases to iodine, and states that where the tallow-like complexion, the pale tongue, and languid circulation, accompanied by irritability of the mucous surfaces, are present, the virtues of the chloride of barium are often remarkably demonstrated. Mr. Balman[5] entertains a very favourable opinion of its efficacy, particularly in chlorotic, cachectic, and other cases attended with a languid circulation and much general debility. He considers, therefore, that it is well adapted for females of a lymphatic temperament, and attended with any irregularity of the menstrual functions. In such cases he advises the following formula:—℞ Barii Chlor. gr. x., T. Ferri Sesqui-

[1] Practitioner, Nov. 1868.
[2] Dublin Quart. Jour., Feb. 1, 1844.
[3] Medical Communications, vol. ii.
[4] On Scrofula, 8vo, London, 1846.
[5] Med. Gazette, Aug. 22, 1851.

chlor. f℥ij.–f℥ss., Syr. Aurant. vel Aq. Dest. f℥x., M. Dose, f℥ss.–f℥j. twice or thrice daily.

375. *In Scrofulous Diseases of the Joints and White Swellings*, Dr. Torget[1] speaks highly of its employment. He considers it a most valuable remedy, and believes that, in some cases, it has alone sufficed to effect a cure, whilst the majority of cases were greatly relieved by its use. He advises it in considerable doses, and to be persevered in for a month. *In Epilepsy and Headaches occurring in connection with Scrofula*, it is spoken of very favourably by Hufeland; and in *Scrofulous Ophthalmia*, it has been used by Dr. Pay,[2] internally as well as locally, as a collyrium. For the latter purpose, it should be largely diluted.

376. Beberiæ Sulphas. Sulphate of Beberia. $C_{35}H_{40}N_2O_6H_2SO_4$. The sulphate of an alkaloid from the bark of the Bebeeru-tree, Nectandra Rodiæi (*q.v.*)

Med. Prop. and Action. Tonic and anti-periodic. Its superiority over quinine is stated to be, 1, its cheapness; and 2, its not producing headache and cerebral disturbance; and it is, consequently, preferable in plethoric subjects. It is also found to cause less gastric and vascular excitement. Warburgh's Drops are said to contain a considerable portion of this alkaloid (Royle). Its intensely bitter taste is an objection to its use.

Dose:—Of Sulphate of Beberia, as a tonic, gr. j.–v.; as an anti-periodic, gr. v.–x., thrice daily, in solution with sulphuric acid.

377. *Therapeutic Uses. In Intermittent and other Periodic Fevers*, beberia was first introduced in 1843, by Dr. Maclagan,[3] and the success which attended its use in his hands led to its extended employment in the East and West Indies; and the reports of its efficacy were on the whole favourable, particularly in cases where much cerebral disturbance was present. The usual plan is to give gr. iij.–iv. every three or four hours, so that gr. xx. be taken before the expected paroxysm. It has not, however, maintained its character as an anti-periodic; indeed, Dr. Maclean (i. p. 65) states, as the result of an extensive and careful trial with it, that it is useless in the treatment of all forms of intermittent fever. *In Convalescence after Fevers, and other debilitating diseases*, it is, however, an eligible tonic.

378. *In Neuralgia, Tic Douloureux, and in the Periodical Neuralgia of Pregnancy*, Dr. Maclagan (op. cit.) found it eminently successful, even in cases in which quinine had previously failed. He records instances in which the benefit derived was most unequivocal. In some cases, one dose of gr. x. night and morning, is preferable to several small ones. Its efficacy in this class of cases has been attested by Sir J. Y. Simpson, Dr. Macfarlane, and others.

[1] Bull. Gén. de Thérap. Sept. 1840.
[2] Revue Médicale, April, 1840.
[3] Edin. Med. Surg. Journ., 1843, and April 1, 1845.

379. *In Scrofulous Ophthalmia*, Dr. H. L. Williams[1] states that the sulphate of beberia is equally efficacious with quinine. In one case, which he publishes at length, it effected a cure in three weeks. The dose employed was gr. ij. night and morning. Blisters, purgatives, and astringent collyria were simultaneously employed.

BELLADONNA. See ATROPA BELLADONNA.

380. BENZOINUM. BENZOIN. A balsamic resin obtained from the incised stem of Styrax Benzoin, *D.C. Nat. Ord.* Styraceæ. Imported from Siam and Sumatra. It contains a resin, 76 to 80 per cent., a volatile oil, and a peculiar acid, Benzoic Acid (*q.v.*)

Med. Prop. and Action. Expectorant and stimulant of the mucous membranes, particularly of the urinary and bronchial. The benzoic acid it contains is converted into hippuric acid, and is eliminated by the kidneys, the urine becoming more acid and stimulating during its administration. It is contra-indicated in all inflammatory and febrile affections. It is rarely given internally. Externally, under the name of Friar's Balsam, the compound tincture has long been a popular stimulant application to *wounds*, *ulcers*, &c.

Dose:—Of Benzoin, gr. x.–xxx. in emulsion. *Of the Compound Tincture* (Benzoin oz. ij., Prepared Storax oz. 1½, Balsam of Tolu oz. ½, Socotrine Aloes gr. 160, Rect. Sp. Oj.), fl. drm. ½–j. *Benzoated Lard* is prepared by melting together Benzoin gr. 160 and Prepared Lard lb.j.

381. *Therapeutic Uses. In Constipation depending apparently upon Stricture of the Colon*, Drs. C. Hastings and Streeten[2] state that the tincture of benzoin will serve to keep up the peristaltic motion without irritating the bowels. In their practice they have seen gutt. xx., taken thrice daily, succeed in keeping the bowels active and regular. On the other hand, it has proved successful in *Chronic Dysentery and Mucous Diarrhœa*, in the hands of Dr. Chipperfield,[3] of Madras, given as follows:—For adults, ℞ P. Acaciæ gr. xxx., T. Benz. Co. f℥i.–℥ij., T. Opii ♏xx.–xl., Aq. Carui ad f℥vj. M. Dose: ¼ part every four hours. For infants and children, ℞ T. Benz. Co. f℥j., Vin. Ipecac. f℥j., Syrup. f℥ss., Aq. ad ℥ijss. M. Dose: one to three teaspoonfuls every two, three, or four hours. It need not interfere with other remedies which may be required.

382. *In Pyrosis*, the late Dr. Baillie was in the habit of employing fl. drm. j. of the tincture with mucilage. He states that he generally found it most efficacious. Dr. Symonds[4] bears testimony to its value in this affection.

383. *In Strumous Laryngitis*, attended with cough and

[1] Med. Times, Nov. 4, 1848.
[2] Cyc. Pract. Med., vol. iv. p. 586.
[3] Madras Quart. Med. Journal, June, 1867.
[4] Library of Med., vol. iv., p. 86.

copious expectoration, Dr. Cheyne[1] found the following formula particularly serviceable:—℞ T. Benzoin. Co. f℥j., Mucilag. Acaciæ f℥j., Syr. Papav. Alb. f℥j., Aq. Cinnam. f℥vj., M. ft. haust.

384. *In Chronic Laryngitis and Chronic Catarrhs*, MM. Trousseaux and Pidoux (i. p. 467) consider that benzoin fumigations are of great service. They advise the air of the patient's apartment to be impregnated with the vapour of benzoin, the drug being thrown upon burning coals; or it may be inhaled from a common inhaler, the balsam being placed in boiling water.

385. *In Irritable States of the Bladder*, Dr. Prout (p. 399) derived much benefit from the tincture of benzoin associated or alternated with infusion of diosma. It should be given, he observes, in small doses largely diluted, and persevered in for a long time, a seton or issue being at the same time established over the region of the kidneys. Mr. Soden,[2] of Bath, relates four cases successfully treated with this medicine. On account of the benzoic acid it contains, it would be indicated as a diuretic where the kidneys require stimulating, and in cases of phosphatic deposit and of alkaline urine.

386. *In Pruritus Scroti*, Mr. E. Wilson (p. 344) states that pencilling the parts with the compound tincture will be found useful. Dr. Ringer (p. 419) speaks highly of a solution of benzoic acid (gr. x.–xx., Aq. $O\frac{1}{2}$) as a means of allaying the *pruritus of Chronic Urticaria, and in that arising from Scabies and the presence of Pediculi;* these latter, indeed, he considers it possesses the power of destroying, and thus it may effect a perfect cure. The irritation and eruption caused by the external application of *Iodine* may, he states, be relieved by the same solution.

387. Benzoic Acid. Acidum Benzoicum. $HC_7H_5O_2$. A crystalline acid obtained from Benzoin by sublimation.

Med. Prop. and Action. Stimulant, particularly of mucous surfaces; the vapour causes great irritation of the air-passages. In the system it is converted into Hippuric Acid by the assumption of the elements of glycocoll ($C_{14}H_6O_4 + C_4H_5NO_4 = C_{18}H_9NO_6 + 2HO$.) (Garrod.) It renders the urine acid and stimulating. It is best administered internally, in the form of benzoate of ammonia (*q.v.*)

Dose:—Of Benzoic Acid, gr. x.–gr. xv.

388. *Therapeutic Uses. Calculous Diseases.* Mr. Ure[3] observed that when benzoic acid was taken into the system, it was converted into hippuric acid, and that in this form it was excreted in the urine. He considered that this change was

[1] Cyc. Pract. Med. vol. iii. p. 16.
[2] Loc. cit.
[3] Med. Chir. Trans., vol. xxiv., p. 30.

effected by the benzoic acid acting upon the uric acid, and therefore he proposed it as a means of correcting the uric or lithic acid diathesis. Dr. Keller showed this supposition to be incorrect; and the experiments of Dr. Booth[1] on this subject give the following results:—1, that the introduction of benzoic acid into the system does not in any way affect the uric acid; 2, that the time required for the conversion of benzoic into hippuric acid, and its subsequent appearance in the urine, is about twenty minutes, and the effect lasts from four to eight hours; 3, that the amount of hippuric acid exceeds that of the benzoic by about one-third; 4, that urea is not in combination with hippuric acid in the urine. These results prove the inutility of benzoic acid as a remedy for uric acid diseases. Dr. Garrod,[2] in repeating these experiments, found that he could by means of this acid produce a very acid state of the urine, enabling that fluid to hold in solution a large amount of phosphatic salts. He employed it in a case of paraplegia, when the urine was highly alkaline, and deposited a large amount of the phosphates. He administered gr. xl. of the acid four times a day, and the *phosphatic deposits* soon became lessened, and in a few days entirely ceased. The urine also, when voided, was acid. When the medicine was discontinued, the abnormal state of the urine did not return. Mr. Ure[3] has recorded a case of *Inertia of the Bladder*, with stagnation of urine (that fluid being strongly ammoniacal, and containing a large quantity of ropy mucus and some pus), in which the administration of gr. x. of benzoic acid, in a mucilaginous draught, three times a day, was attended with the best effects.

389. *In Gout*, benzoic acid was advised by Mr. Ure and Dr. Prout, to prevent the deposition of, and to remove when formed, the masses of urate of soda, which so commonly occur about the joints of gouty subjects. It was recommended on the supposition that benzoic acid converted the uric acid deposits into hippuric acid; but if the conclusions of Drs. Keller, Booth, and Garrod be correct, this medicine will exercise no remedial effect in these cases. (See the preceding section.)

390. *In Chronic Cystitis*, benzoic acid may, from its balsamic character, prove useful; it should be given in the form of pill (grs. iij.–iv. with glycerine), but to do good, not less than gr. xxiv. must be given daily (Sir H. Thompson, p. 154.) *In Incontinence of Urine in Children*, Dr. Delcour[4] speaks highly of the value of benzoic acid. He relates two cases successfully treated by it when all other remedies had failed. As a remedy in *Jaundice*, benzoic acid has recently attracted much attention. It is applicable only to jaundice arising from suppression of

[1] Trans. of American Philosoph. Society, vol. ix.
[2] Lancet, Dec. 30, 1848.
[3] Lancet, Nov. 21, 1863.
[4] Gazette des Hôpitaux, Dec. 21, 1844.

the biliary secretion. Dr. Harley[1] mentions some cases in which benefit followed its use.

391. Bismuthi Carbonas. Carbonate of Bismuth. $2(Bi_2CO_5)$ H_2O. Subcarbonate of Bismuth.

Med. Prop. and Action. This preparation has been proposed by Prof. Hannon,[2] of Brussels, as a substitute for the subnitrate. According to this writer, it is readily soluble in the gastric juice; its action is rapid, it produces no sensation of weight in the stomach, rarely constipates, colours the stools less than the subnitrate, and may be employed for a long time without oppressing the stomach. It also possesses the great advantage over the subnitrate of readily neutralising the acids in excess which are found in the primæ viæ. Its action appears to be sedative during the first days of its employment, and subsequently it acts as a tonic. It is perfectly insipid, excites no repugnance, and may be taken before meals.

Dose for adults, gr. xv.–xlv. in divided doses daily; for children, gr. j.–v. Adults take it in water, children in honey. It may also be given in the form of lozenge.

392. *Therapeutic Uses.* These closely resemble the subnitrate, it being chiefly recommended in *Gastric and Intestinal Affections.* Dr. Hannon remarks that *all cases of Gastralgia* consecutive upon phelgmasiæ of the digestive passages, and those in which digestion is laborious, accompanied with putrid or acid eructations, or in which there is a tendency to diarrhœa and spasmodic vomiting, demand the employment of the carbonate. *In the Vomiting of Children* during dentition, and in the *Diarrhœa of weak Children*, it may also be employed with every prospect of success.

393. Bismuthi Subnitras. Subnitrate of Bismuth. $BiNO_4$, H_2O. Bismuthum Album, B. P. 1864, called also the Nitrate of Bismuth. White Bismuth.

Med. Prop. and Action. Sedative, astringent, and alterative. When given internally, it is absorbed into the system, and has been detected in the urine and in the milk. In very large doses, it is usually regarded as poisonous, and a death from gr. cxx. of this salt is recorded. M. Monneret,[3] however, regards the idea of its being an irritant poison as purely hypothetical. He states that he has constantly employed it, in doses varying from ʒiij.–ʒijss. daily, without the slightest inconvenience; that children in his hospital take it by tablespoonfuls, so innocuous is it; and that he has never observed the slightest irritation from the largest doses (ʒijss.) given either to the healthy or to the sick. This widely differs from the experience of others; and, until the subject has been more fully investigated, it would be advisable to continue its use in the ordinary doses. If benefit is not derived from gr. xv. four times daily, larger doses generally prove equally inefficacious. Its continuous administration, Dr. Brinton (p. 169) observes, frequently gives rise to the formation of a bluish-red line along the dental edge of the gums, analogous to, but wider and redder than that resulting from the use of lead. M. Monneret observes, that *post-mortem* examination proves that, beyond patches of black discoloration, the nitrate produces no effect upon the mucous membrane, the consistence of which remains normal. Prof. Graves (ii. p. 212) usually prescribes the nitrate with powdered gum arabic (1 part of the salt to 3 of the gum);

[1] On Jaundice, &c., 8vo, 1863.
[2] Bull. de Thérap., Feb. 15, 1857.
[3] Med. Chir. Rev., July, 1849.

this he directs to be mixed with a wine-glassful of warm milk, which may be allowed to stand for a quarter of an hour, and ought to be briskly stirred immediately before it is swallowed. *Externally*, it is a mild stimulant, and may be applied in the form of ointment (gr. cxx.–Lard oz. j.)

Dose:—Of the subnitrate, gr. v.–xx. *Of the Lozenges*, each of which contains gr. ij. of the subnitrate, 1 to 6.

394. *Therapeutic Uses. In Diseases of the Stomach*, the subnitrate is a remedy of established value. *In Atonic Dyspepsia*, few medicines are more to be relied upon. Dr. Brinton (p. 329) regards it as specially useful in that form of dyspepsia which constitutes the "morbid sensibility of the stomach" of old writers. Here, he remarks, its effects in allaying flatulence and nausea and in preventing vomiting, and still more, in checking the pain caused by food, are so marked, that we may fairly accept the term of sedative often applied to it. *In the milder forms of Gastric Inflammation*, bismuth, according to Dr. Wilson Fox (ii. p. 865), has a peculiarly favourable influence, and he states that he knows no remedy more beneficial in the *Gastro-intestinal Catarrh of children*. He directs gr. iij.–v. for children; gr. x.–xx. for adults; it may be combined with magnesia or hydrocyanic acid, or when pain or diarrhœa is present, with morphia or laudanum. *In Pyrosis*, bismuth, combined with opium, seldom fails to relieve, though in order to complete a cure, a more direct astringent, *e.g.*, P. Kino Co. is required (Dr. Fox.) Prof. Graves (ii. p. 208) speaks of it as one of the best remedies we possess in *Gastrodynia*. *In Ulcer of the Stomach*, Dr. Brinton (p. 168) extols the subnitrate in doses of gr. x.–xx. every six or eight hours, either alone or with P. Kino Co. gr. v.–x. It often has a remarkable effect in relieving the pain and vomiting, as well as the diarrhœa when present. His estimate of it in these cases is very high. *Vomiting*, arising in connection with stomach diseases, is often allayed by bismuth, especially in combination with hydrocyanic acid; but in sympathetic vomiting, *e.g.*, from uterine disorder, it is of little or no value. *In Diarrhœa, attended with debility or accompanying Phthisis*, Dr. T. Thompson[1] found great benefit from the subnitrate in doses of gr. v. three or four times daily. *In Subacute and Chronic Dysentery*, it is spoken of in high terms by MM. Récamier and Trousseau. It may be advantageously combined with Dover's powder.

395. *In Chronic Laryngitis*, MM. Trousseau and Belloc speak highly of the efficacy of the local application of the nitrate, by means of insufflation. (See that article, part ii.) Dr. Williams[2] states that, thus applied, he has seen it used with safety and advantage in the worst forms of chronic laryngitis, even in that accompanying phthisis. Its use, however, in the manner here advised, is far from being unobjectionable.

[1] Med. Chir. Trans., 1848. [2] Lib. of Medicine, vol. iii. p. 50.

396. *In Epilepsy*, Dr. Copland (i. p. 807) states that he has tried this salt in two or three cases, both alone and with other tonics and anti-spasmodics, the bowels being kept freely open, and that it has appeared to be quite as beneficial as the preparations of zinc.

397. *In Ringworm*, Dr. Dick recommends an ointment of the nitrate (℥j., Adipis oz. j.) to be rubbed into the diseased parts night and morning. (E. Wilson, p. 449.)

398. *In Ulceration of the Septum Nasi*, and also as a local application in *Chronic Skin Diseases*, Dr. Pereira (i. p. 761) states that he has used the ointment (*ante*) with advantage. Bismuth may also be applied locally as a sedative and astringent, mixed with glycerine. *In a sore Erythematous condition of the Tongue, met with in chronic diseases*, Dr. Symonds[1] advises the following application :—℞ Bismuth Subnit. gr. xx., Glycerini fl. oz. j., Aquæ Rosæ vel Sambuci fl. oz. vj., M. ft. lotio. M. Follin applies a mixture of equal parts of bismuth and glycerine to the inflamed surface in *Chronic Granular Conjunctivitis*, and in *Ciliary and Glandular Blepharitis*. M. Dubout uses the same mixture as an application to *Eczema* of the axillary, anal, or vulvar regions, and to *Chapped Nipples, Lips, and Hands*. M. Trousseau employs one part of bismuth with three of glycerine as an application to *Fissures of the Anus*.

399. *In Chlorosis*, Sir H. Marsh[2] pronounces bismuth an efficient substitute for iron, when from any cause the latter is not well borne. *In Leucorrhœa*, Dr. Caby[3] found the nitrate, applied by means of a speculum to the whole of the vaginal mucous membrane, most efficacious. The powder on a small piece of charpie was applied once a day. In *Gonorrhœa* and *Gleet*, Dr. Caby likewise found the nitrate, suspended in water and used as an injection, a most valuable means of cure. The results of Mr. De Méric's[4] experience with it, however, in 140 cases, are not encouraging. He considers it, nevertheless, useful, especially in *Gleet*.

400. Bismuthi et Ammoniæ Citratis Liquor. Solution of the Citrate of Bismuth and Ammonia. A colourless solution, with a saline and slightly metallic taste; neutral or slightly alkaline to test-paper. Sp. Gr. 1·22. Each fl. drm. contains gr. iij. of the oxide of bismuth.

Med. Prop. and Action. The advantages of this fluid are derived from the fact that the metal is in a state of perfect solution. It mixes with water and other fluids without precipitation. Dr. Martyn,[5] of Bristol, states that he finds it act better than the older preparations. It allays pain in acute irritability of the stomach (without nausea or much acidity),

[1] Brit. Med. Jour., March 14, 1868.
[2] Med. Press, March 6, 1867.
[3] Rev. Méd. Chir., Aug. 1854.
[4] Lancet, May 12, 1860.
[5] Ibid., July 11, 1863.

especially that which remains after ulceration. He is in the habit of giving it simply diluted with water.

Dose, fl. drm. ss.–fl. dr. j.

Therapeutic Uses. Same as those of the subnitrate of bismuth (*q.v.*)

BORAX. See SODÆ BIBORAS.

401. BROMUM. BROMINE. (Br = 80.) A liquid non-metallic element, obtained from sea-water, and from some saline springs.

Med. Prop. and Action. In its pure state, bromine is caustic and irritant. When properly diluted, and in small doses, it is tonic, diuretic, and resolvent, and increases the activity of the lymphatic system. Its vapour is very irritating, producing violent cough, a sense of suffocation, heat of the alimentary canal, and general uneasiness. When taken in large doses, it is absorbed into the system, having been detected in the blood and in the urine. Taken in long-continued doses, bromine and its compounds are apt in some constitutions to induce a train of symptoms to which the term *Bromism* has been applied. These, as observed by Voisin, are as follows:—"A peculiar odour of bromine in the breath, redness of the soft palate, an increased or diminished secretion of saliva, a diminution and then complete abolition of reflex sensibility of the palate, root of the tongue, and the epiglottis, although the tactile sensibility and that of pain in these parts remain unimpaired; frequently a craving for food, constipation, some diuresis, sedation of the genital function, diminution and retardation of the menstrual flow; frequently pulmonary catarrh, a general heaviness or inertness, drowsiness, diminished clearness of intellect; a sedative action on the excito-motor function of the spinal marrow, and an impairment of general sensibility; the memory, especially for words, is enfeebled (see an interesting case of this in Brit. Med. Journ., Oct. 16, 1869), eruptions of acne frequently appear upon the skin, which acquires a muddy or browned aspect; the muscles are enfeebled, and the gait is often unsteady and tottering, and frequently there is loss of flesh." (Stillé.) It is extremely rare for all these symptoms to exist in one individual at the same time; more frequently they manifest themselves singly or in small groups, or one or more in succession. They all pass off, leaving no evil after-effects when the remedy is discontinued. In animals poisoned by it, it produced dilated pupil, insensibility, and convulsions. *Externally*, it may be applied in solution (4 parts of bromine to 40 of water), or in the form of ointment (gr. x.–xv. to oz. j. of lard.) Dr. Glover regards bromine as intermediate in medicinal action between iodine and chlorine, but nearer that of chlorine.

Dose, gutt. vj.–viij. of a solution of 1 part of bromine in 40 of water.

402. *Therapeutic Uses. In Scrofula*, bromine appears to exercise considerable influence. Dr. Glover[1] considered it superior in efficacy to iodine, and it has been supposed probable that the value of cod-liver oil in scrofula depends upon the combination of these two substances, bromine and iodine. In 1837, M. Bonnet[2] pointed out the value of this remedy in scrofula, and referred to the former researches of M. Pourché. He relates a case of scrofulous enlargement of

[1] Edin. Med. Sur. Journ., No. clii. [2] Bull. Gén. de Thérap., July, 1837.

the glands of the neck, in a woman who had been thus affected for seven years. A cure was completed in three months by the internal and external use of bromine. At first, gutt. vj. in fl. oz. iij. of water were given daily, in three doses. Subsequently, gutt. x. were given; in ten days, the dose was increased to gutt. xiv., and at last to gutt. xxx., daily. Cataplasms, moistened with a solution of bromine, were applied to the swellings. No unpleasant symptoms occurred, and the woman perfectly recovered. Other similar cases are recorded. A very good strength for internal use is 1 part of bromine in 40 of water. Of this, the dose to commence with is gutt. vj., three or four times daily. Besides some cases of *Scrofulous Enlargements and Scrofulous Ulcers*, Dr. Glover mentions cases of *Eczema and Carbuncle*, which recovered under its internal and external use. Bromine has been used as a disinfectant. Mr. Goldsmith,[1] of the United States army, found the following solution useful as a local application in *Hospital Gangrene, Erysipelas, and Sloughing Sores*:—℞ Bromine ℥j.; Bromide of Potassium gr. clx.; Distilled Water q.s. ad f℥iv. M. He employed the same solution as a prophylactic in wards in which *Erysipelas* had appeared, and he found the inhalation of the vapour of service in *Diphtheria*. *In Cancer of the Uterus*, a solution of bromine in spirit is preferred by Dr. Routh[2] to all other caustics.

Broom Tops. See Scoparii Cacumina.

403. Brucia. An alkaloid obtained from the bark and seeds of Strychnos Nux Vomica. It differs from strychnia in being more readily soluble in water and in alcohol, and in being coloured bright red by nitric acid.

Med. Prop. and Uses. Thought to be the same as strychnia, and considered by Magendie to possess about one-twelfth of the activity of that alkaloid. It appears, however, when pure, to be almost or altogether inert, and that any activity it possesses is due to the proportion of strychnia with which it may be associated. As far as is known, it possesses no superiority to strychnia, and the uncertainty of its operation is a great objection to its use. Commencing dose, gr. $\frac{1}{3}$–$\frac{1}{2}$.

404. Buchu Folia. The leaves of Barosma Betulina, *Bart. et Wendl.*, B. crenulata, *Hooker*, and B. serratifolia, *Willd. Nat. Ord.* Rutaceæ. *Hab.* Southern Africa.

Med. Prop. and Action. Tonic, diaphoretic, and diuretic. It exercises a peculiarly soothing effect on the genito-urinary organs, whilst its tonic operation is manifested by the returning strength and increased appetite of the patient. To obtain its beneficial effects, the medicine requires to be persevered in. *Active principles*, a volatile oil and a bitter extractive, *Diosmin*.

Dose:—Of the powdered leaves (a bad form of administration) gr. xx.–xl.

[1] American Med. Times, 1863. [2] Brit. Med. Journ., Feb. 19, 1870.

Of the Infusion (Buchu leaves, oz. ss.; Boiling Water, fl. oz. x.), fl. oz. j.–iv. twice or thrice daily. *Of the Tincture* (Buchu leaves, oz. ijss, Proof spirit, Oj.), fl. drm. j.–ij.

405. *Therapeutic Uses. In Affections of the Bladder depending upon disease of the Kidneys*, Sir B. Brodie (p. 141) states that he has seen it productive of the most beneficial effects. It requires to be persevered in, and should be combined with alkalies or acids, as may be indicated by the state of the urine. *In Cystitis*, it proves serviceable, but in order that it should do so, Sir H. Thompson (p. 151) considers that the infusion should be carried to the extent of half a pint daily.

406. *Renal Affections* are often remarkably benefited by a persevering use of this remedy. Dr. Carter[1] regards it as one of the most valuable remedies we possess in these affections, often affording decided relief when other remedies fail.

407. *In Rheumatism*, particularly when it assumes an intermittent character, the infusion of buchu proves serviceable. It is a popular remedy amongst the natives of Southern Africa.

CACAO BUTTER. See THEOBROMÆ OLEUM.

408. CADINI OLEUM. Oil of Cade. A tarry oil obtained by the dry distillation of the wood of Juniperus Oxycedrus. *Nat. Ord.* Coniferæ. Manufactured at Aix-la-Chapelle.

Med. Prop. and Action. Applied externally, it is stimulant and detergent; given internally, it is stimulant and diuretic. It has also been given as an anthelmintic. It is rarely prescribed, except as an external application in chronic skin diseases. An Oil of Cade soap is manufactured at Aix-la-Chapelle, and is used in the treatment of skin affections.

Dose, when given internally, a few drops.

409. *Therapeutic Uses. In Chronic Eczema*, *Lepra*, and other obstinate skin diseases, the oil of cade proves a most useful application. Dr. T. M'Call Anderson[2] recommends that it and other tarry applications should not be used in eczema until the declining stage, when the itching and infiltration are moderated. It should be rubbed firmly over the eruption thrice daily, by means of a piece of flannel, and allowed to dry on. It should then be washed off with soft soap or petroleum soap. Or the following formula may be prescribed:—
℞ Saponis Mollis, Spt. Rectif., Olei Cadini āā fl. oz. j.; Olei Lavandulæ fl. drs. jss. A little to be rubbed over the eruption night and morning, and washed off before each re-application.

410. CADMII IODIDUM. Iodide of Cadmium, CdI_2, may be formed by direct combination of iodine and cadmium in the presence of water.

[1] Cyc. Pract. Med. vol. iii. p. 164. [2] Med. Times, July 11, 1863.

Med. Prop. and Action. Similar to those of the iodide of lead, over which it possesses the advantage of not causing yellow discoloration of the skin. It may be employed in the form of ointment (gr. lxij., ad. Ung. oz. j.) in *Scrofulous Enlargement of the Glands*, *Splenic Enlargement*, and in many *Chronic Skin Diseases*.

411. CADMII SULPHAS. Sulphate of Cadmium. Obtained by dissolving carbonate of cadmium in diluted sulphuric acid, and evaporating the neutral solution to crystallization.

Med. Prop. and Action. Similar to those of the sulphate of zinc, than which it is said to be ten times more powerful. It is used externally in the form of collyrium (gr. ½–gr. iv., Aq. fl. oz. ij.), lotion (gr. iv.–viij., Aq. fl. oz. ij.), or ointment (gr. ij., Adipis gr. lxxx.) Given internally in large doses, it is a powerful irritant poison. It is said to possess anti-syphilitic properties.

412. *Therapeutic Uses.* *In Opacities of the Cornea*, it has been successfully used on the Continent by Rosenbaum and Kopp, and in England by Mr. Middlemore.[1] *In Chronic Ophthalmia*, it has been employed by Gräfe and Giordano; and in *Otorrhœa* as an injection, by Lincke. (Pereira.)

CAFFEINE. See COFFEA ARABICA.

413. CAJUPUTI OLEUM. Oil of Cajuput. The volatile oil of the leaves of Melaleuca minor, *D.C.* *Nat. Ord.* Myrtaceæ. *Source*, Batavia and Singapore.

Med. Prop. and Action. Diffusible stimulant, anti-spasmodic, and diaphoretic. When taken internally, it causes a sensation of warmth in the stomach, excites the action of the heart and arterial system, and subsequently induces copious diaphoresis. Externally, either alone or combined with equal parts of soap liniment or olive oil, it is a useful rubefacient and stimulant embrocation. It is a medicine of much power and value, and one too much neglected in general practice.

Dose:—Of the Oil, ♏j.–v. *Of the Spirit* (Oil of Cajuput fl. oz. j., Rect. Spirit fl. oz. xlix.), fl. drm. ss.–j.)

414. *Therapeutic Uses.* *In Gout and Rheumatism*, much benefit follows the external and internal use of cajuput oil. *In Retrocedent Gout* it is particularly serviceable, in doses of gutt. v.–vj., frequently repeated. *In Lumbago and other forms of Chronic Rheumatism*, Dr. Fuller advises the following embrocation:—℞ Ol. Cajuputi ʒv., Ol. Terebinth. ʒv., Lin. Ammon. vel T. Aconiti ʒvj., M. Lin. Aconiti (B. Ph.) may be substituted for the T. Aconiti. Sometimes T. Arnicæ (ʒiv.) may be advantageously added, but care is necessary, as a troublesome eruption is apt to result where its use is long persevered in.

415. *In Neuralgic Affections* it may also be employed externally and internally. It is occasionally of great service. It is

[1] Ann. Report of the Birmingham Eye Infirmary, 1835.

inadmissible if the neuralgia appears to be connected with inflammatory action.

416. *In Spasmodic Cholera*, cajuput oil, employed both externally and internally, has been highly lauded; but experience does not appear to warrant the high encomiums which have been passed on it. Some cases which have recovered under its employment are recorded, but it frequently fails to produce any sensible effect.

417. *In Hysteria*, much benefit attends the internal use of cajuput oil; but it is inferior in uniformity of action to assafœtida or valerian.

418. *In Flatulence and Flatulent Colic*, immediate relief often attends the exhibition of cajuput oil, in repeated doses of gutt. iij.–v.

419. *In the Low and Typhoid stages of Fever*, it may be advantageously prescribed as a stimulant, in doses of gutt. v.–viij., in emulsion. It has occasionally been found serviceable.

420. *In Toothache*, a small piece of cotton, saturated with cajuput oil, and introduced into a carious tooth, is stated to be an efficacious remedy.

421. *In Sprains, Contusions, and to Paralytic Limbs*, an embrocation of cajuput oil, diligently rubbed in, has been found useful in stimulating the parts, and relieving pain when present.

422. *In Nervous, Rheumatic, and Neuralgic Headaches*, Thunberg prescribed this oil externally, but Dr. Copland (ii. p. 153) states that he has derived most advantage from its internal administration.

CALAMINA PRÆPARATA. Calamine. See ZINCI CARBONAS.

423. CALCII CHLORIDUM. Chloride of Calcium. $CaCl_2$. Called also the Muriate and Hydrochlorate of Lime.

Med. Prop. and Action.—In small doses, the chloride of calcium is stimulant, increasing the action of the secreting organs; if long continued, it appears to act specifically upon the lymphatic glandular system, causing the reduction or absorption of glandular and other tumours. In large doses, it acts as an acro-narcotic poison, drs. iijss. proving fatal to a dog in six hours. It should always be commenced in small doses, increased with caution, and immediately discontinued if it produce nausea, vomiting, or giddiness. An aqueous solution (℥iij. ad Aq. Dest. f℥xij.) was officinal in D. Ph., of which the dose is ♏xx. gradually increased to f ℥j. Milk is the best vehicle for its exhibition. In medicinal action it very much resembles the chloride of barium.

Dose, gr. x.–xx. in aqueous solution.

424. *Therapeutic Uses. In Scrofula*, the chloride formerly enjoyed considerable repute; indeed, Dr. A. T. Thomson (p. 748) says that he found more benefit from it than from any other medicine; but its use has been quite superseded by iodine and cod-liver oil. *In Chronic Skin Diseases*, especially in *Lupus*,

Eczema, and *Impetigo*, it is well spoken of by Cazenave,[1] in doses of gr. xv.–xxx. daily, in some vegetable infusion.

425. *In Fibrous Tumours of the Uterus*, Dr. M'Clintock, following Dr. Rigby's recommendation, gave an extended trial to chloride of calcium (♏xxx.–xl. Liq. Calcii Chlor., Dub. Ph., thrice daily in a bitter infusion), and in one instance its prolonged use was followed by a complete cure (Dr. Graily Hewitt, p. 558.) Dr. Tilt (p. 340) advises that its administration should be watched, for its long-continued exhibition in young subjects, he remarks, has been known to cause arcus senilis and other evidences of arterial degeneration. He prescribes it in doses of gr. x. twice daily. Mr. Spencer Wells[2] states that it has appeared to him to be very useful in these cases by leading to atheroma or calcification of the nutrient vessels of these growths. *In non-malignant Tumours of the Ovaries*, it is recommended by Dr. Seymour, and it was found serviceable by Dr. Hamilton in *Ovarian Dropsy*.[3]

426. Calcis Carbonas Præcipitata. Precipitated Carbonate of Lime, $CaCo_3$. A white crystalline powder precipitated on the admixture of solutions of chloride of calcium and carbonate of soda.

Med. Prop. and Action. Similar to those of Creta Præparata (*q.v.*)

Dose, gr. x.–lx.

427. Calcis Carbolas. Carbolate of Lime. Obtained by the action of carbolic acid on carbonate of lime.

Med. Prop. and Action. Commercial or ordinary carbolate of lime is used as a disinfectant and deodorizer; that carefully prepared, as by Mr. Squire, of Oxford-street, has been successfully employed by Dr. Habershon[4] in *Flatulent Distention of the Colon attended with Diarrhœa*, and also in the *Diarrhœa of Phthisis*, where there is evidence of fermentive changes in the colon. He gives it in gr. j. doses, combined with henbane.

428. Calx Chlorata. Chlorinated Lime. Chloride of Lime; called also Hypochlorite of Lime, Bleaching Powder. Obtained by exposing slaked lime to the action of chlorine gas as long as the latter is absorbed.

Med. Prop. and Action. In doses of gr. j.–v.–vj. in solution, it has been employed as a stimulant. It is also used as a lotion (gr. lx.–oz. ss., Aq. Oj.), ointment (gr. xx.–gr. lx., Adipis oz. j.), gargle (gr. cxx., Aq. Oj., filter and add Honey oz. j.), and enema (gr. x.–xv. in solution), with a view of correcting the fetor of discharges, and stimulating the parts to which it is applied to a more healthy action. In most cases it is very effectual in fulfilling both these indications. It is the best antidote in *Poisoning by Hydrosulphuric Acid, Hydrosulphuret of Ammonia, Sulphuret of Potassium, and Hydrocyanic Acid;* it should be given internally if practicable,

[1] Provincial Journ., April 2, 1851.
[2] Brit. Med. Journ., Jan. 18, 1868.
[3] Dis. of Ovaries, London, 1830.
[4] Lancet, Jan. 4, 1868.

and the vapour should be inspired. As an antiseptic and disinfectant, it is a valuable agent; its power of destroying bad odours renders it particularly useful in hospitals, jails, sick chambers, and dissecting rooms. For this purpose a solution may be sprinkled thickly over the floor and walls, or cloths wrung out in the solution may be hung in the room; chlorine gas is slowly evolved. Or the solution may be placed in a saucer, and a small portion of dilute hydrochloric acid, or even a solution of common salt, may be added to it. This causes a rapid evolution of chlorine gas. Its power of arresting the progress, or of destroying the infection of diseases, is not well established; but its deodorizing property renders it invaluable when any infectious disease exists; and it may thus *indirectly* prove, in some cases, a disinfectant. It is, however, inferior to carbolic acid.

Dose:—Of Chlorinated Lime, gr. j.–v., largely diluted. *Of the Solution* (Liq. Calcis Chloratæ), ℥xx.–xxx., diluted. Chiefly used as a disinfectant and deodorizer.

429. *Therapeutic Uses.* *In Cancrum Oris*, Rilliet and Barthez speak highly of the dry chloride of lime, applied with the point of the finger to the ulcerated surface. The mouth should be well washed out a few seconds after each application. When cicatrization commences, a gargle, composed of 1 part of the chloride, 30 of mucilage, and 15 of syrup, is recommended by the same authors.

430. *In Scorbutic and other Ulcerations of the Mouth, and in Ptyalism*, a gargle composed of chloride of lime gr. cxx.–gr. ccxl., water Oj., and honey oz. j., is very useful in correcting the fetor, and stimulating the parts to healthy action. The solution should be filtered before adding the honey.

431. *In Gangrene of the Lungs*, the chloride, in doses of gr. iij., in combination with gr. j. of opium, thrice daily, was employed with advantage by Dr. Graves. Dr. Waters (p. 211) does not think much of its influence in these cases; he, however, sees no objection to its use, provided stimulants and tonics are given at the same time; but, he adds, if it produce any nauseating effects, or interfere in anywise with the functions of the stomach, it must not be persevered with, as in these cases it is of first importance for the patients to take plenty of nourishment.

432. *In Hay Fever*, it has been employed with advantage by Dr. Elliotson. In a very severe case he directed the patient to place the chloride in saucers in the chambers, to have rags dipped in it and hung about the house, to wash his hands and face with it night and morning, and to carry a small bottle of it about with him to smell at in the course of the day. This plan gave so much relief, that it was tried in other cases; and, although it did not succeed in all, it did in most of them. Three patients out of four derived advantage from it. It acts either by destroying the emanations, or by lessening the irritability of the mucous membranes (Sir T. Watson.)

433. *In Fetid Discharges from the Uterus, Vagina, or Rectum*, an injection composed of gr. lx.–gr. cxx. of the chloride, in Oj.

of water (filtered), proves highly useful, by its deodorizing influence. It may be used either warm or cold, and should not be of sufficient strength to cause pain. The same injection also proves serviceable *in Fetid Discharges from the Ears and Nostrils.*

434. *In the Purulent Ophthalmia of Infants*, Dr. Pereira (i. p. 640) states that he has found a weak solution of the chloride very successful. *In the Purulent Ophthalmia of Adults*, it has also been used with benefit.

435. *In Erysipelas*, a solution of the chloride (gr. lx.–gr. cxx., Aq. Oj.) has been found very serviceable as a lotion. The parts should be kept constantly wetted with it.

436. *In Scabies*, a strong solution of the chloride (fl. oz. j.–Aq. Oj.) is stated by Derheims[1] to be an effectual remedy. *In Tinea Capitis*, it has also proved useful. Mr. E. Wilson (pp. 247, 367) advises it in *Ecthyma*, and also to correct the unpleasant smell of the cutaneous secretion in *Osmidrosis.*

CALCIS HYPOPHOSPHIS. See SODÆ HYPOPHOSPHIS.

437. CALCIS LIQUOR. Solution of Lime. Aqua Calcis. Lime Water is thus prepared:—Take Slaked Lime 2 oz., Distilled Water 1 gallon. Introduce the lime into a stoppered bottle containing the water, and shake well for two or three minutes. After twelve hours the excess of lime will have subsided, and the clear solution may be drawn off with a syphon as it is required for use, or transferred to a well-stoppered green glass bottle.

Med. Prop. and Action. Antacid, lithontriptic, and astringent. Milk is the best vehicle for its administration. In large or long-continued doses, it occasions thirst, constipation, and derangement of the digestive organs. It renders the urine alkaline. Unlike other alkalies, it diminishes the action of secreting organs, and hence has been termed astringent. Externally it is applied to ulcers, cutaneous affections, &c.

Dose:—Of Liquor Calcis fl. oz. ss.–iv. For external use, the *Linimentum Calcis* (Solution of Lime, Olive Oil āā fl. oz. ij.), formerly known as Carron Oil, is a valuable application in burns, &c.

438. *Therapeutic Uses. In Acidity of the Primæ Viæ, in Cardialgia*, and *in Dyspepsia arising from or connected with Acidity of the Stomach*, lime water, in doses of fl. oz. jss.–fl. oz. ij., is often speedily and permanently effectual. It is particularly useful in dyspepsia occurring in persons whose urine shows a strong acid reaction, and when vomiting is a prominent symptom. It is best given in milk. Milk with lime water has also been found of great service as an article of diet in *Ulcer of the Stomach.*

439. *In Diarrhœa, depending upon Acidity*, lime water may be

[1] Journ. de Chim. Méd., Dec. 1827.

given with manifest benefit. In these cases, mucilage is the best vehicle. It is especially of use in the diarrhœa of infants and young children, and is administered with the best effect when purging and acidity result from artificial feeding. A sixth or fourth part of lime water may be added to each pint of milk. *In Chronic Dysentery*, used in the form of enema, it proves useful in some instances. It may also be given by mouth.

440. *In many forms of Vomiting*, lime water often acts very promptly; it appears to have far less influence on sympathetic vomiting than in that connected with functional derangement of the stomach. It will sometimes succeed when hydrocyanic acid and other remedies fail. It has even been found efficient in the *Vomiting of Yellow Fever;* the reports of its efficacy are very encouraging. Dr. Hosack used it most successfully combined with milk, and with porter when milk could not be retained. Dr. Macdonald[1] considers that more stress ought to be laid on the importance of this agent by English writers.

441. *As a Solvent for Urinary Calculus*, lime water was first employed by Dr. Whytt, of Edinburgh, in 1743; and subsequently by Drs. Hales, Butler, and Campbell. They confined their experiments chiefly to injecting a weak solution of lime water into the bladder, but Dr. Butler, in 1755, also employed it as a drink, and in the form of an enema. If we are to credit their reports, their practice was signally successful, not only affording relief, but in many instances effecting a perfect cure. The practice, however, fell into disuse until the investigation into the claims of Miss Stephens's nostrum for dissolving calculi, when it was discovered that the basis of her much-famed formula was carbonate of lime. It does not appear, however, to possess any particular virtues over the other alkalies as a solvent. It is occasionally useful as a palliative, but cannot be regarded as a curative agent.

442. *In Pruritus Pudendi*, an effectual removal of the distressing symptoms is occasionally effected by the topical application of tepid lime water, together with perfect rest and light clothing. *To prevent Pitting in Small-Pox*, Dr. J. Bell[2] recommends the application of cotton wool soaked in Lin. Calcis. He speaks highly of its efficacy.

443. *In Croup and Diphtheria*, lime water is considered to possess the power of dissolving the pseudo-membranes; hence its local use has been advocated by Dr. Geiger, of Philadelphia, and Dr. Biermar. Dr. Beigel[3] employed it in several cases, in one of which it afforded relief when other inhalations had proved fruitless. It is used in the proportion of 1 part to

[1] Reynolds's Sys. of Med., vol. i. p. 675.

[2] Glasgow Med. Jour., June, 1861.

[3] Practitioner, Aug. 1868.

30 parts of water, each inhalation lasting about a quarter of an hour, and repeated every two hours as long as bad symptoms are present. It is best applied in the form of spray by means of a suitable apparatus.

444. *In Scarlet Fever, when Coryza is troublesome*, and the discharge thin and acrid, Dr. Hillier (p. 317) advises syringing the nostrils with lime water; or with a solution of common salt (℥j. ad Aq. fl. oz. ij.), or when the secretion is tenacious, with soap and water.

445. *In Cancer of the Uterus*, Dr. Dewees (p. 270) speaks favourably of lime water as a palliative. He advises it a little warmed, to be thrown up into the vagina by a syringe, several times a day.

446. *In Leucorrhœa and Gleet*, an injection of a weak solution of lime water occasionally effects a cure when other remedies fail.

447. *In Scrofula*, lime water is sometimes productive of benefit. Dr. Shapter[1] states that, taken with milk to the extent of f ℥ss., three or four times a day, it has, in his practice, in many cases been of the most eminent service, especially in scrofula of long standing, where gland after gland becomes the seat of abscess and ulcer. *In Scrofulous Ulcers*, Dr. Pereira (i. p. 618) states that he frequently employs lime water as a wash, and that, in many instances, its power of checking excessive secretion has been most marked. *In Phthisis*, lime water and milk has been strongly recommended by Dr. T. K. Chambers and others as an ordinary beverage.

448. *In Burns and Scalds*, there are few local applications more generally useful or efficacious than linimentum calcis. Linseed, or other oils, may be substituted for olive oil, should the latter not be available.

449. *In Poisoning by the Mineral and Oxalic Acids*, lime water acts as an antidote.

450. *In Tinea Capitis, and other Cutaneous Diseases*, with profuse discharge, lime water proves useful as a stimulant and astringent wash. *In Ephelis and Freckles*, Mr. E. Wilson derived benefit from a liniment composed of equal parts of lime water and olive oil, with a small quantity of liquor ammoniæ.

451. *In Ascarides*, injections of three or four ounces of lime water have been recommended by Dr. Price,[2] of Margate. He has found two or three repetitions sufficient in the most obstinate case.

452. Calcis Liquor Saccharatus. Saccharated Solution of Lime is thus prepared:—Take Slaked Lime 1 oz., Refined

[1] Lib. of Medicine, v. p. 180. [2] Lancet, March 26th, 1864.

Sugar 2 oz., Distilled Water 1 pint. Rub the lime and sugar together in a mortar, transfer the mixture to a bottle containing the water, cork the bottle and shake it occasionally for a few hours. The clear solution to be drawn off with a siphon and kept in a stoppered bottle. Each fluid oz. of this solution contains 7·11 grains of lime. Dose, ♏xv.–lx., well diluted.

Calcis Saccharas. Saccharate of Lime, introduced in 1859 by Dr. J. Cleland,[1] is prepared as follows:—Slake ℥viij. of Quicklime; rub up with it ℥v. of White Sugar, and add Water Oj. Stir and filter. The product should be perfectly clear, with only a slightly yellowish tinge. Each ounce by weight should contain 18 grains of lime. Under the same name M. Béral proposed a preparation formed by saturating simple syrup with lime and filtering—a much stronger formula than that above mentioned, and less generally applicable.

Med. Prop. and Action. The solubility of lime in water is increased by the sugar. These preparations are therefore valuable when it is desirable to administer lime in full doses. *The Medical Action and Therapeutic Uses* of saccharate of lime are thus summed up by Dr. Cleland:—"It is, of course, a powerful antacid, and probably the best we have, since it is stronger and pleasanter than magnesia, and does not weaken the digestion like the alkalies. Far from doing so, its most important use is as a tonic of the alimentary system in cases of *Obstinate Dyspepsia*. As such, its action is more powerful than that of the vegetable stomachic tonics. It is suitable for cases with too little, as well as for those with too great, secretion of gastric juice. It seems particularly serviceable in *Gouty Constitutions*. In dyspepsia of hysterical and anæmic cases, it does not seem to be of much use. It should not be taken early in the morning on an empty stomach, as then it is liable to create nausea. The best period for taking it is after meals; its alkalinity does not at all interfere with digestion. So far from causing constipation, it is a very valuable means of overcoming gradually that *Chronic Constipation* which so frequently accompanies dyspepsia; and persons who for years have been in the constant habit of using aperient medicines, have been able to abandon them, in a great measure, after taking this remedy for some time. It will also be found serviceable in checking *the Diarrhœa of Disordered Digestion*, acting as lime water does; only that the latter is so dilute, that it is often impossible to administer it to adults in the quantity desirable. It may be found useful also in *allaying the cravings of the intemperate*."

Dose.—♏xv.–fl. drm. ss. or fl. drm. j.

453. *Therapeutic Uses. Chronic Diarrhœa of Children.* M. Béral's saccharate of lime was first employed in medicine by Dr. Capitaine; and Trousseau and Pidoux (ii. p. 382) state that they have employed it with advantage in the treatment of the *Chronic Diarrhœa of Children*. They have also been in the habit of adding ten grains of it to each quart of milk intended for the supplementary diet of children at the breast; and they

[1] Edin. Med. Journ., Aug. 1859.

consider that by this precaution the milk is prevented from becoming speedily sour, and thereby the tendency to diarrhœa is diminished. This mode of administration is well worthy of trial. The dose for infants is gr. xv.–gr. xxx.; that for adults gr. lxxv.–gr. cl. diluted with 20 or 30 times its weight of simple syrup.

454. CALCIS PHOSPHAS. Phosphate of Lime. $Ca_3P_2O_8$. Prepared by dissolving bone-ash in hydrochloric acid, precipitating with ammonia, and drying at a temperature not exceeding 212°.

Med. Prop. and Action. Alterative and antacid.

Dose of Phosphate of Lime, gr. x.–xx.

455. *Therapeutic Uses. In Scrofula and Scrofulous Affections*, the phosphate of lime is highly spoken of by Dr. Bencké.[1] He considers, that although it cannot be said really to cure the scrofulous disease, yet that it is of the most eminent service as a palliative. *In Scrofulous Ulcers*, it was given with the most marked benefit, in doses of gr. viij.–gr. xx. daily. It should be taken with the breakfast, dinner, and supper, so as to be thoroughly mixed with the food. *In Scrofulous Diarrhœa*, he also obtained from it, in doses of gr. vj.–x. daily, the most marked and satisfactory results.

456. *In Chronic Syphilitic Ulcers*, given as above, he also found it highly useful.

457. *In Rickets*, it has been administered, on the theory that this disease arises from a deficiency of lime in the system; but the treatment has not been always found successful. Dr. Budd,[2] however, reports very favourably of the practice. He prescribes gr. v.–x. in chalk mixture thrice daily, adding a chalybeate if anæmia is present. He believes that the deterioration in the teeth of children is due to the insufficient supply of inorganic constituents of these organs in the food, and suggests, as an article of diet, biscuits containing a portion of the phosphate. It may be advantageously combined with cod-liver oil. *In promoting the Formation of Callus in Fractured Bones*, the evidence of M. Milne-Edwards,[3] whose experiments were performed on animals, is decidedly favourable to the internal administration of the phosphate. He believes that it may be usefully employed as an adjuvant—expediting the union in ordinary fractures, and tending to prevent non-solidation in others. M. Gosselin[4] also speaks favourably of its use in minimum doses of gr. vijss. daily.

458. *In the Anæmia of young rapidly-growing persons*, and

[1] Lancet, April 19, 1851.
[2] Brit. Med. Journ., June 7, 1857.
[3] Comptes Rendus, 1856, vol. xi.
[4] Gaz. des Hôpitaux, 1855.

in Debility dependent on over-lactation, &c., Dr. Ringer (p. 121) praises this salt; and he states that those whose health has been broken by too long residence in towns, or by over-work, and who from other causes are languid and incapable of doing much work, may be very much benefited by this salt. In such cases he advises a combination of phosphate of lime (gr. j.), phosphate of iron, and carbonate of lime; but he adds that the phosphate of lime will act admirably by itself. He also states that it is of great value in checking *Chronic Tubercular and non-Tubercular Diarrhœa*, and *other Profuse Discharges such as are met with in Leucorrhœa*, *Chronic Bronchitis*, and large *Abscesses*, in all of which states it effects both a general and local improvement. He considers gr. j.–ij., several times daily, a sufficient dose.

459. Calcii Sulphuretum. Sulphuret of Calcium. Called also Hepar Calcis.

Med. Prop. and Action. The sulphuret is not given internally; it is chiefly used in solution as a bath in *Scabies* and other cutaneous diseases. *In Ringworm*, M. Gibert and Mr. E. Wilson have successfully employed the following ointment:—℞ Calcii Sulphuret, ʒj., Camphor gr. xv., Adipis ℥j., M.

Calomel. See Hydrargyri Subchloridum.

460. Calumbæ Radix. Calumba Root. The Root of Jateorhiza Columba, *Miers*, and J. Miersii, *Oliver*. *Nat. Ord.* Menispermaceæ. *Hab.* Forests of E. Africa, between Ibo and the Zambesi.

Med. Prop. and Action. A pure bitter tonic and stomachic. It is a very mild and valuable tonic, and is, in most cases, easily retained on the stomach, when the more powerful vegetable bitters are rejected. It gives rise to little, if any, arterial excitement, and does not cause constipation. As it contains neither tannic nor gallic acids, it may be given in combination with the salts of iron. The infusion requires to be freshly prepared daily, as, in consequence of the large proportion of starch which it contains, it rapidly decomposes. It contains a non-nitrogenized crystallizable principle, *Calumbine*, which is but slightly soluble in water or proof spirit; an alkaloid, *Berberine;* and an acid, *Calumbic Acid*.

Dose:—Of Calumba Root in powder, gr. v.–xx. *Of the Extract*, gr. v.–x. *Of the Infusion* (Calumba Root oz. ½, Cold Water fl. oz. x.), fl. oz. i.–ij. *Of the Tincture* (Calumba Root oz. ijss., Proof Spirit Oj.), ♏xxx.–fl. dr. ij.

461. *Therapeutic Uses. In Affections of the Stomach* requiring vegetable bitter tonics, calumba is one of the best which can be used, for not only does it allay irritation, but it strengthens the digestive organs, increases the appetite, and gives tone to the system generally, and that, too, without inducing either arterial excitement or subsequent constipation. *In Atonic Dyspepsia*, the infusion may be safely resorted to at a far earlier period than that at which it would be advisable to

administer other remedies of the same class; it forms in these cases one of the best vehicles for other appropriate medicines. *In many forms of Vomiting, particularly in that of Pregnancy*, it has been found in some cases to succeed when other remedies have failed; its efficacy, however, is greatly increased by combination with sedatives, especially hydrocyanic acid. *In Ulcer of the Stomach*, according to Dr. Brinton (p. 171), the vomiting, painful nausea, and flatulence, may often be relieved by a combination of infusion of calumba, iodide of potassium, and bicarb. of potash.

462. *In Diarrhœa, especially in that attendant on Dentition*, calumba in infusion proved very successful in the hands of Dr. Percival,[1] to whom is due the credit of introducing this drug into English practice in 1773: but it is rarely prescribed alone; hence it is difficult to determine how far the benefit is ascribable to the calumba.

463. *In Debility and Convalescence after Fevers, or when the Stomach remains irritable*, calumba is especially indicated, and often proves very useful. It may be given in infusion, or the tincture ℥xxx.–xl. may be added to an ordinary effervescing draught. As a tonic it is peculiarly adapted for the puerperal state and for childhood.

464. CAMBOGIA. Gamboge. A gum resin obtained from Garcinia Morella, *Desrous, var.* pedicellata. *Nat. Ord.* Guttiferæ. Imported from Siam.

Med. Prop. and Action. Hydragogue, cathartic, and anthelmintic. It often causes violent vomiting and griping, but this may be in a great degree obviated by combining with it soap, the carbonate of potash, rhubarb, or calomel; or by giving it in a liquid form, properly diluted, or in a state of minute subdivision. When taken internally, it becomes absorbed into the system, and communicates its colouring principle to the urine, the quantity of which secretion it also increases. It may be advantageously given either in the form of the Compound Gamboge Pill; or, Gamboge oz. ss., Carb. of Potash oz. j., Alcohol fl. oz. xij. Macerate for a week. Dose, ℥xl.–fl. drm. j. in a convenient vehicle.

Dose of Gamboge:—In powder gr. j.–iv. *Of the Compound Gamboge Pill* (Gamboge, Barbadoes Aloes, and Compound Cinnamon Powder āā oz. j., Hard Soap oz. ij., Syrup q. s.), gr. v.–x.

465. *Therapeutic Uses. In Dropsical Affections*, gamboge, from its powerful hydragogue cathartic property, often proves serviceable. Dr. Christison[2] speaks highly of it. He states that he has found gamboge act in these cases with great force, both in occasioning free watery evacuations and in reducing the dropsy, yet without any particular tormina, exhaustion, or other uneasiness being occasioned, although administered once every two days, or even daily. He advises it in doses of gr.

[1] Essays, ii. p. 3.
[2] On Granular Diseases of the Kidneys, pp. 152–4.

v.–vij., or even ix., every other day, finely powdered, and combined with cream of tartar. Of all hydragogues, he regards gamboge as the most certain and the most easily managed.

466. *In Obstinate Constipation*, the compound gamboge pill (*ut supra*), in doses of gr. v.–viij. every day or every other day, is stated to be very efficacious, when this state depends upon want of tone in the intestines. *In Constipation arising from Torpor of the Colon*, Dr. Symonds[1] enumerates this pill, in combination with equal parts of compound colocynth pill, amongst the most efficient purgatives.

467. *In Cerebral Affections*, when it is desirable to produce revulsion from the brain, the compound gamboge pill, in combination with calomel, will often be found to fulfil this indication. It is inadmissible, however, when the vital powers are greatly depressed, or when great debility is present.

468. *Against Tænia, or Tape-Worm*, gamboge in small repeated doses has been employed as an anthelmintic, but it acts thus solely in virtue of its purgative action; it exercises no specific influence on the entozoa, hence it has been superseded by male-fern, kamala, and other tænicides of acknowledged power.

469. Camphora. Camphor. A concrete volatile oil obtained from the wood of Camphora Officinarum, *Nees. Nat. Ord.* Lauraceæ. Imported from China and Japan.

Med. Prop. and Action. In doses of gr. ij.–v.–x. camphor acts as a stimulant; it increases the action of the heart and arteries, exhilarates the spirits, excites warmth of body and diaphoresis; the pulse is rendered softer and fuller. These effects are very transitory, and are followed by depression. In somewhat larger doses, it allays spasm and pain, and induces sleep. Prof. Christison (p. 257) points out that camphor taken largely in coarse powder is apt to occasion gastric pain, nausea, and vomiting, proving fatal, with symptoms of irritant poisoning; but that when taken in a state of fine division or solution, large doses excite little else than narcotic symptoms such as giddiness, staggering, obscurity of vision, confusion of ideas, and delirium—a state, in short, which considerably resembles intoxication, is attended with increased frequency of pulse, and ends in stupor, interrupted by occasional convulsions. It acts chiefly on the nervous system; and, like sulphur, it transudes through the skin, and is exhaled by the lungs. Camphor is an extremely diffusible stimulant, being rapidly extended over every part of the system, and disappearing sooner than any other narcotic. When it is desired to exert a stimulant influence, it should be given in small doses, frequently repeated. When its sedative effects are required, it should be administered in large doses, and at long intervals. It exercises a powerful influence on the genito-urinary system, and is regarded as anaphrodisiac; occasionally it causes strangury, yet by some it has been advised to relieve the strangury produced by cantharides. It has also been recommended as an antidote in poisoning by opium. Externally, dissolved in oil, it forms a valuable anodyne embrocation. It is a common ingredient in tooth-

[1] Lib. of Med., vol. iv. p. 139.

powders, but it is stated, perhaps without sufficient reason, that its continued use in this way renders the teeth brittle.

Dose:—Of Camphor, gr. j.–x. in the form of pill, or suspended in mucilage. *Of Camphor Water* (Camphor oz. ½, Water Cj.), fl. oz. j.-iij. *Of the Spirit* (Camphor oz. j., Rect. Spirit fl. oz. ix.), ♏x.–xxx. *Of the Compound Tincture, Tinct. Camph. c. Opio B. Ph.*, 1864, *Paregoric Elixir* (Camphor gr. xxx., Opium, Benzoic Acid āā gr. xl., Oil of Anise fl. drm. ½, Proof Spirit Oj.), ♏xv.–lx. For external use, *Camphor Liniment* (Camphor oz. j., Olive Oil fl. oz. iv.); *Compound Camphor Liniment* (Camphor oz. ij. ½, Oil of Lavender fl. drm. j., Strong Solution of Ammonia fl. oz. v., Rect. Spirit fl. oz. xv.)

470. *Modes of Administration.* In addition to the above, camphor has been used in a variety of ways; thus, the fumes of it are inhaled in the early stages of *Coryza* and *Catarrh*, and it is said with considerable benefit. Dissolved in chloroform (3 of camphor to 1 of chloroform) it is sometimes sold under the name of "*Soluble Camphor.*" Finely powdered it is either incorporated with other fine powders, or it is applied directly, sprinkled over the surface of a poultice for the relief of local pain. *Raspail's* "*Eau Sedative*" is another form for external use (℞ Solution of Ammonia, 100 parts, Water 900 parts, Common Salt 20 parts, Camphor 2 parts, Oil of Roses q. s., M.) It is held by many in considerable repute. Lastly it may be used in the form of vapour bath. The patient is to be covered with a blanket, which should be pinned close to the throat, and camphor (oz. ½–oz. j.) placed on a heated plate within the blanket. In a few minutes it produces profuse perspiration.

471. *Therapeutic Uses. In Typhus and Typhoid Fevers, and in Fevers, whatever may have been their original character, when they assume an asthenic type*, camphor proves a remedy of considerable value. Dr. Copland (i. p. 1030), after quoting a large number of German writers in its favour, observes that he has prescribed camphor, not only in the above fevers, but also in *pestilential, exanthematic, puerperal, and common continued fevers*, and that he is satisfied as to its good effects, either when exhibited as above, or when combined with other appropriate medicines, and when given in proper doses. In the stage of excitement attended by vital prostration, the dose, and the medicines which should be associated with it, should have reference to the state of vital power, to the mildness or severity of the disease, and to the nature of the prominent affection or complication. As the disease passes into the nervous stage, and more especially as this stage passes into extreme exhaustion, the dose of camphor should be increased, and conjoined with stimulants, tonics, and antiseptics. The inflammatory state of any organ supervening in the course of typhoid fevers does not contra-indicate the use of camphor, if given appropriately to the degree of vascular action and of vital power. Hufeland directs a solution of camphor in acetic acid to be taken internally, and used externally, early in most states of typhoid fever. Prof. Huss,[1] who speaks highly of the efficacy of camphor in these diseases, considers its contra-indications

[1] Dublin Journ. of Med. Science, Sept. 1845.

to be—1, a flesh-red tongue; 2, tenderness of the abdomen; 3, diarrhœa.

472. *In Asthenic Inflammations, and also in the advanced stages of Acute Inflammation when the vital powers are greatly exhausted*, camphor in large doses, conjoined with other stimulants and sedatives, proves in the highest degree beneficial.

473. *In Inflammation of the Brain*, when great watchfulness is present, or great irritability or mental excitement exists, narcotics may, in some instances, be given with advantage. Great caution is necessary in their selection and employment; but as Dr. Copland observes, where the propriety of having recourse to these medicines admits of a doubt, they should be combined with moderate doses of camphor. *In Delirium accompanied by depression of the nervous energy, and of the vital powers*, camphor proves eminently serviceable, and should be conjoined with tonics, sedatives, &c. If the delirium be accompanied by coma or stupor, it may be given in large doses, combined with the more powerful stimulants. Its use in these cases requires caution.

474. *In Small-pox and the Exanthemata*, camphor, given internally, is stated to be effectual in restoring the eruption, when, from any cause, it has receded. This, however, is very doubtful. In confluent or malignant small-pox, when the vital power is greatly depressed, camphor alone, or combined with opium, may be advantageously employed.

475. *In Insanity*, the value of camphor has been variously estimated by different writers. This has probably arisen from its indiscriminate use in all cases, and from neglect to the due regulation of the dose. In cases where much vascular excitement exists, it proves, according to Van der Kolk (pp. 142, 155) prejudicial; but where, in the absence of this, great excitement of the nervous system has to be subdued, it exercises a sedative influence and renders important service. The double action of camphor, (1) stimulating vascular action, and (2) subduing nervous excitement, should be kept in view in prescribing it in these cases. The doses require to be large, because small doses seem to have an exciting rather than a calming effect. Van der Kolk mentions a severe case of mania in which opium, leeches, purgatives, &c., failed, but in which gr. xx. of camphor combined with nitre, in the twenty-four hours, effected a cure. He, however, pronounces camphor very variable in its action on individuals, and adds it is impossible to determine beforehand whether it will agree or not. He failed to observe its sedative action on the sexual organs described by others. In a few cases of *Puerperal Mania*, he obtained good results from large doses of camphor with nitre (p. 148.)

476. *In Delirium Tremens* occurring in persons of a nervous

habit, where the exhaustion is great and morphia inadmissible, Dr. Laycock[1] states that camphor (gr. ij.–iij. every third hour) sometimes proves useful, or it may be given combined with carbonate of ammonia and henbane.

477. *In Asthma*, camphor, observes Dr. Copland (i. p. 147), is one of the most generally beneficial of any of the class of narcotics or anti-spasmodics; and, when judiciously exhibited, is applicable to nearly all the forms and complications of the disease. In the nervous and spasmodic varieties it is most serviceable when given in large doses (gr. iij.–x.) and combined with musk, castor, assafœtida, &c., or with sedatives. *In Angina Pectoris*, he (i. p. 67) also speaks favourably of its operation, particularly when given in combination with opium or hydrocyanic acid. *In Hooping-Cough*, he (ii. p. 248) likewise found it of great service. It should be given in very small doses with diaphoretics at an early period; and in larger quantities with tonics, anti-spasmodics, &c., in the advanced stages. *In Asthenic Pneumonia*, camphor, he observes, is one of the most valuable remedies that can be employed. It may be given in doses of gr. ij.–vj., or viij., every four, five, or six hours, combined with calomel and opium, or with antimony and henbane, according to the character of the attack. The latter combination may be preferred, when the inflammation approaches the sthenic form, and then the camphor may be given in smaller doses (Copland, ii. p. 777). When the disease progresses to *Gangrene of the Lungs*, it may also be given with advantage.

478. *In Chorea*, Dr. Radcliffe (ii. p. 138) states that he places considerable confidence in camphor; he prescribes it generally dissolved in cod-liver oil (*q. v.*), and he considers that this combination is decidedly beneficial. *In Epilepsy*, it has been advised by Locher,[2] and others. It appears to be chiefly indicated when the disease is associated with hysteria, or with uterine derangement, and should be given in combination with tonics and anti-spasmodics.

479. *In Puerperal Convulsions*, Dr. Copland (ii. p. 433) advises a combination of camphor (gr. v.–x.), calomel (gr. x.), and musk (gr. x.), followed by a purgative of croton oil. These means, aided by a cathartic or anti-spasmodic enema, will, he observes, seldom fail of producing a solution of the paroxysm. He adds that his experience of the excellent effects of camphor are confirmed by Dr. Hamilton, although Chaussier expresses an unfavourable opinion of it.

480. *In Rheumatic and Nervous Headaches*, the local application of Raspail's "Sedative Water" (*ut supra*) has, in many instances, been found to afford speedy relief. Another appli-

[1] Edin. Med. Journ., Nov. 1862. [2] Observ. Pract., No. xl.

cation useful in these cases is camphor (oz. j.) dissolved in vinegar (Oj.) and freely diluted with 1 or 2 parts of water.

481. *In Diseases of the Heart*, camphor, according to Lombard, of Geneva, in doses of from gr. iij. to xij. daily, renders regular the most tumultuous *Palpitations*, and removes the *Dyspnœa attendant on Hypertrophy of the Heart with dilatation*. Quinine and Iron may be given as tonics, at the same time.

482. *Diseases of the Genito-urinary Organs. In Dysmenorrhœa*, Dr. Dewees (p. 137) regards camphor as the most certain and uniform palliative. He advises it in doses of gr. x. every one or two hours, until relief be obtained; or gr. xxx.–lx. in mucilage, with T. Opii f℥j., may be given as an injection. Its external application to the loins, in the form of ointment or liniment, affords great relief. He also speaks highly of the value of camphor in *Irritable states of the Uterus*, and in *Inflammation of the lining membrane of that organ; and in Cancer of the Uterus*, he states (p. 274) that he has found camphor procure rest where opium had failed or disagreed. *In after pains*, also, he advises oz. j. of camphor to be suspended in oz. vj. of mucilage, and of this mixture he directs a tablespoonful to be given every one or two hours, till relief is obtained. Occasionally, however, he found it disagree, and had to discontinue its use. Camphor liniment also often affords relief to the *Lumbar pains which some women suffer from in the latter months of pregnancy*. Dr. Graily Hewitt (p. 379) states that he has often found a combination of camphor and Indian hemp of great service in relieving *Uterine and Ovarian Pain;* it is most useful when the pain is of a spasmodic character.

483. *In Pruritus Pudendi*, camphor in doses of gr. v.–x. twice or thrice daily in the form of emulsion, affords relief in some cases. Its local application in the form of powder with starch dusted over the parts also occasionally proves useful. *In Nymphomania*, camphor has from the earliest ages been held in esteem as an anaphrodisiac, but little reliance is placed on it at the present day. Van der Kolk states that he has failed to observe the sedative action of camphor on the sexual organs described by others. *In Spermatorrhœa*, camphor is often signally useful. In three cases of involuntary spermatic discharges, I have effected a speedy improvement and subsequent cure by camphor (gr. iij.–iv.) with gr. $\frac{1}{4}$ of opium, thrice daily. The only other measures employed were mild purgatives and out-door (walking) exercise. *In Chordee*, camphor, employed internally and locally, is one of the best remedies we possess. It may be given in doses of gr. iij.–v., with gr. j. of opium, in the form of pill, at bedtime. Camphorated mercurial ointment, or camphor (gr. xx.–xxx.) in a poultice, to the perinæum, is also very efficacious.

484. *In Incontinence of Urine*, M. Guérard found great benefit from enemas composed of gr. iv. of camphor, dissolved in the yolk of an egg, and mixed with fl. oz. j. of water, so that it may be retained in the rectum.

485. *Other Diseases.* *In Hysteria*, camphor proves most serviceable; it may be given alone, or combined with assafœtida or opium. Dr. Dewees considers that it is chiefly indicated and most efficacious in the hysterical paroxysms which precede the appearance of the menses. It may be given in doses of gr. v.–x., in julep or in powder, as may be most convenient.

486. *In Mammary Congestion threatening Abscess*, the local application of camphor seems worthy of a trial. According to Dr. Harriss,[1] a saturated solution of camphor in glycerine, applied over the breast, is more effectual than belladonna in arresting the secretion of milk.

487. *In Toothache*, relief is sometimes afforded by introducing into a carious tooth a pill of camphor and opium, or a solution of camphor in spirit of turpentine.

488. *In Chronic Rheumatism*, friction with camphor liniment proves highly serviceable. Dr. Pereira (ii. p. 458) states that camphor (gr. v.–viij.) and opium (gr. j.) given internally prove useful by their sudorific and anodyne properties. Camphor fumigations are also occasionally attended with excellent effects. *In Syphilitic Rheumatism*, inunction of camphor with mercurial ointment is beneficial.

489. *In Summer Diarrhœa, and even in Cholera*, no remedy, Dr. Ringer observes (p. 265), is perhaps so efficacious as camphor, but it must be employed at the very commencement of the disease or it will be without effect. His testimony in its favour in *Cholera*, drawn from personal experience, is very strong: "By it, the vomiting and diarrhœa are generally at once controlled, and often altogether checked, while the cramps are removed and warmth is restored to the extremities." To obtain these effects, gutt. vj. of a strong alcoholic solution of camphor should be given at first every ten minutes, and when the symptoms have abated, less frequently. Dr. Rubini, of Naples, is reported not to have lost a single patient out of 592 cases of cholera treated with a solution of camphor in alcohol at 60° overproof (equal parts.) Of this the commencing dose is four drops every five minutes; in severe cases, twenty drops, or more, to be persevered in till reaction sets in. The patient is to lie down well wrapped up in blankets. As a preventive, he gives five drops of the saturated solution daily. It should be given on sugar, not in water, as in the latter the camphor solidifies, and loses its power.[2]

[1] Braithwaite, Retro., vol. xlv. p. 296. [2] Ibid., vol. liv. p. 399.

490. *In Gangrene*, when the vital powers are greatly depressed, and when at the same time much nervous irritability is present, full doses of camphor, combined with opium and other stimulants, prove highly serviceable. When vascular excitement is great, it may be advantageously combined with nitre.

491. *As a means of allaying Tetanoid symptoms from Strychnia*, Dr. Arnett[1] found camphor effectual in one instance. Of a saturated solution of camphor in whisky, he gave 2 fl. oz., and repeated it in half an hour.

492. *To prevent Bed Sores*, Dr. Graves[2] advises washing the parts with camphorated spirits of wine, when any discoloration occurs. *In Eczema* and other *Skin Diseases attended with burning heat*, camphor may be advantageously employed as a local sedative. For this purpose, Dr. Hillier (p. 362) recommends the following powder to be dusted over the part: ℞ Camphor ʒj., Sp. Vin. Rect. q.s., Zinci Oxid., Pulv. Amyli āā ʒvj. M. Dr. T. M'Call Anderson[3] recommends that the eczematous surface be sprinkled over with a small quantity of a powder containing camphor, and that a cold potato starch poultice be afterwards applied.

493. Canellæ Albæ Cortex. Canella Bark. The bark of Canella alba, *Murray*. *Nat. Ord.* Guttiferæ. *Source*, West Indies.

Med. Prop. and Action. Aromatic stimulant, and carminative, chiefly used as an adjunct to resinous and other cathartics, to correct their griping quality. Its activity resides in a volatile oil, resin, and a bitter extractive. It is an ingredient in Vinum Rhei.

Dose:—Gr. x.–gr. xxx. in powder.

494. *Therapeutic Uses*, very limited. It is occasionally employed in *Dyspepsia*, *Atonic Gout*, *Chronic Rheumatism*, *Secondary Syphilis*, *Debility*, and other diseases, when a warm aromatic is indicated, but it possesses no special virtues.

495. Cannabis sativa, *Linn.* Cannabis Indica. Indian Hemp. *Nat. Ord.* Urticeæ, grown in India. The dried flowering-tops of the female plant, from which the resin has not been removed. (*Gunjah.*) *Churrus* is the Hindústani name of the resinous exudation from the leaves, stems, and flowers; and *Bang*, *Subjee*, or *Sidhee*, that of the larger leaves and capsules without the stalks. *Hashish* (*Arab.*) consists of the dried tops and tender parts of the plant collected immediately after inflorescence.

Med. Prop. and Action. The intoxicating properties of Indian Hemp appear to have been known for a long period in the East; but its medicinal qualities were first investigated by Sir W. O'Shaughnessy, in 1838. The

[1] Ranking's Abstract, 1857, vol. xxv. p. 50.

[2] Clin. Lect., vol. i. p. 187.

[3] Med. Times, July 11, 1863.

first effect of a large dose, he observes, is decidedly stimulant, producing increased arterial action and a great exhilaration of spirits; the patient is very talkative, singing songs, asking for food, and declaring himself in perfect health. This state gradually passing off, is followed by a complete state of catalepsy, which lasts for some hours, and then subsides, leaving the patient without headache, pain, or any other ill consequence. In all the cases in which it was tried, the effects were closely analogous; alleviation of pain in most, remarkable increase of appetite, unequivocal aphrodisia, and great mental cheerfulness. The pupils were freely contractible on the approach of light. In those who habituate themselves greatly to its use, or in those who try it for the first time, there occasionally occurs a species of insanity closely resembling delirium tremens. This state is at once recognised by the strange balancing gait of the patient, a constant rubbing of the hands, perpetual giggling, and a propensity to caress the bystanders. The eye wears an expression of cunning and merriment; there is no increase of heat or frequency of the circulation; the skin and functions remain natural. In a few instances the patients are violent, in many highly aphrodisiac, and all voraciously hungry. A blister to the nape of the neck, antimonials, and salines are sufficient to remove this state. Dr. Anstie (p. 189) draws an interesting comparison between the inebriation caused by hashish and that by alcohol and chloroform. Upon the brain of civilized men, he remarks, this narcotic rarely works so as to produce that fierce uncontrollable outburst of passion which is so often witnessed in the drunkenness due to either of the other two agents. Its effects upon the mind are almost equally decisive as regards the obliteration or disturbance of the consciousness of surrounding circumstances as those of alcohol or chloroform; but instead of violent bursts of passion, a placid, self-complacent vanity is developed, which makes the subject of it feel himself the greatest being, physically and mentally, in the universe. Yet even hashish, taken by the half savage of some wild oriental tribe, has as powerful an influence in letting loose fierce passions as the rawest whisky has upon the most brutish navvy. After extensive trials with Indian hemp, Dr. Clendenning[1] characterizes it as "a soporific or hypnotic, in conciliating sleep; as an anodyne, in lulling irritation; as an antispasmodic, in checking cough and cramp; and as a nervine stimulant, in removing languor and anxiety." Much variety of opinion has been expressed as to the hypnotic powers of Indian hemp: the fact seems to be that it is not, in the true sense of the word, a narcotic, but that by its powerful anodyne operation it relieves pain and spasm so effectually that sleep becomes possible; it is thus *indirectly* soporific. The great objection to its use is the uncertainty of its operation; some constitutions being little affected by it. A dose which will produce powerful effects in one individual, will perhaps exercise little or no influence on another. Dr. Bryan[2] found the tincture (mxx. every four hours) act effectually as a diuretic, especially when diuresis had been first established by other remedies: it seemed then to maintain the action already begun. Drs. Ballard and Garrod (p. 41) observed that it communicates a peculiar odour to the urine when taken internally; but subsequent writers mention no such effect. According to Dr. Christison, it possesses the power of inducing uterine contractions in labour. Larger doses are stated by O'Shaughnessy to be required in cold than in hot climates to produce the equivalent effects. Its effects appear to reside in an acrid resin, *Cannabin*.

Dose:—Of the Extract, gr. ¼-gr. j. *Of the Tincture* (Extract of Indian Hemp oz. j., Rect. Sp. Oj.), mv.–xx.

496. *Therapeutic Uses. Nervous and Spasmodic Diseases. In Tetanus*, cannabis has been largely employed, but with varying

[1] Med. Chir. Trans., vol. xxvi. [2] L'Union Méd., 1857.

results. The trials with it in twenty-six cases, by Dr. Laurie,[1] of Glasgow, tended to show that it possesses little or no influence; whilst the results obtained by O'Shaughnessy,[2] Prof. Miller,[3] of Edinburgh, and Dr. Chuckerbutty,[4] of Calcutta, are such as to warrant a belief that it is a remedy of real value in these cases; and Dr. Miller observes, that in those cases in which it failed to cure, it never failed to afford relief. He advises gr. iij. of the extract or gutt. xxx. of the tincture, every half-hour, hour, or two hours, the object being to produce and maintain narcotism. At the same time he gave purgatives, and applied cold to the spine. Dr. Chuckerbutty gave in his cases ♏xxx.–xl. of the tincture every two or three hours. The results, on the whole, are encouraging. O'Shaughnessy mentions a case of *Hydrophobia*, in which the extract, in large doses, afforded great temporary relief, though the result was fatal.

497. *In Chorea*, it has been thought useful, but Dr. Radcliffe and Dr. Hillier (p. 236) think slightingly of its power. Dr. Douglas,[5] however, relates a case in which it proved successful; ♏vj. of the tincture every two hours. He considers that small and often-repeated doses, like the above, are more safe and effective than larger doses at longer intervals. *In the Sleeplessness attendant on severe Chorea*, Dr. Oxley[6] states that he has found the tincture more effectual than any other hypnotic. He prescribes ♏x. for a child æt. 7, and so on. *In Epilepsy*, it has also been advised, but Dr. Russell Reynolds (ii. p. 280) states, that though it has been found to relieve headache and restlessness, it has not cured nor notably relieved epilepsy.

498. *In Delirium Tremens*, O'Shaughnessy, after an extensive trial with cannabis, reported highly of its powers, but it does not appear to have come into general use. A case in which its effects were very manifest is related by Mr. H. J. Tyrrell,[7] after three doses of ♏xx. of the tincture every third hour; opium in this case was contra-indicated, and capsicum had failed. When there is any reason, from the quality of the pulse, to believe that the circulation is much enfeebled, Dr. Anstie (ii. p. 91) regards Indian hemp as preferable to opium, and from it, he states, he has seen excellent results. He prescribes gr. $\frac{1}{4}$–$\frac{1}{2}$ of a good extract. *In Nocturnal Delirium occurring in Softening of the Brain*, judicious administration of liquid nourishment, with small quantities of wine, may suffice to give relief. Should this fail, the most useful medicine is

[1] London and Ed. Monthly Journ., Nov. 1844.
[2] Bengal Disp., p. 598.
[3] Brit. and For. Med. Chir. Rev., Jan. 1851.
[4] Ind. Ann. of Med. Sci., July, 1868.
[5] Edin. Med. Journ., March, 1869.
[6] Liverpool Med. Surg. Reports, 1868.
[7] Med. Press, March 13, 1867.

Ext. Cannabis, in doses of gr. $\frac{1}{4}$–$\frac{1}{2}$. (Drs. Russell Reynolds and Bastian.[1])

499. *In Sciatica, Tic Douloureux, and other forms of Neuralgia*, Indian hemp ranks next in value to morphia and atropia (*q.v.*) It has been especially brought forward by Dr. Reynolds. Of a *good* extract, gr. $\frac{1}{4}$ to gr. $\frac{1}{2}$, rarely gr. j., in the form of pill, is very effective in some forms of neuralgia, particularly in *Clavus hystericus* and *Migraina*. Even in the severest and most intractable forms it often palliates greatly. It should be given every night, whether there be pain or not. (Dr. Anstie, ii. p. 749.) Dr. Fuller (p. 458) states that the tincture (♏xij.–xx.) often allays pain and produces repose after other sedatives have failed. Its action, however, as he justly remarks, is capricious. Mr. Donovan[2] quotes several cases in which it was of unequivocal benefit.

500. *In Chronic Rheumatism*, when opiates disagree or fail to give relief, recourse may be had to Indian hemp. Dr. Fuller mentions some cases in which it produced speedy and complete relief, when other remedies had failed to induce sleep. Caution, however, is necessary in its use; if it fails in producing a narcotic effect, it is apt, even in doses of ♏xij.–xv. of the tincture, to produce considerable excitement; hence it should be restricted to cases accompanied by nervous exhaustion. It is applicable to the very cases in which opium, belladonna, and other pure narcotics so often prove useless; whilst in cases characterized by nervous excitement, hot skin, or hurried pulse, it proves rather hurtful than beneficial. (Fuller, p. 424.)

501. *In Asthma*, it has obtained some reputation, which, from its physiological action, Dr. Hyde Salter[3] observes, may be well deserved, but in the few cases in which he gave it a trial, it proved a complete failure. *In Hay Fever and Hay Asthma*, Dr. Mackenzie[4] states that he has seen such favourable effects from Indian hemp, in cases of morbid irritability of the nervous system, that he is induced to recommend a trial of it in the present disease. *In Senile Catarrh*, it is highly spoken of by Dr. Waring-Curran,[5] as a sedative and expectorant. He prescribes the following mixture :—℞ T. Cannabis f℥ij., P. Trag. Co. ℥j., Æther Chloric ℥jss., Aq. Anisi ad ℥vj. M. Dose, fl. oz. j. every second hour.

502. *In Menorrhagia and Uterine Hæmorrhage*, the tincture of hemp, in doses of gutt. v.–x., thrice daily, has been successfully employed by Dr. Churchill,[6] of Dublin, on the recommendation of Dr. Macguire. Dr. Churchill, after an extensive

[1] Reynolds's System of Med., vol. ii. p. 477.
[2] Dublin Med. Journ., vol. xxvi. p. 401
[3] On Asthma, p. 242.
[4] Lond. Journ. of Med., July, 1851.
[5] Med. Press, Sept. 9, 1868.
[6] Midwifery, p. 64.

trial of its virtues, states that it was productive of extraordinary success, both in the number relieved and the rapidity of cure. *In impending Abortion*, he also found it very effectual in several cases. Dr. M'Clintock found it capable of controlling *hæmorrhage arising from the presence of fibrous tumours of the uterus*. *In Cancer of the Uterus*, Dr. Graily Hewitt (p. 379) remarks that Indian hemp, in many cases, undoubtedly exercises a marked influence in allaying or preventing pain. Like others, however, he finds it affect different individuals very unequally. *In Dysmenorrhœa*, he also regards it as a valuable medicine in certain cases (p. 443.)

503. *In lingering and protracted Labours depending upon Atony of the Uterus, and Insufficiency of Uterine Contractions*, Dr. Christison[1] found the tincture of Indian hemp highly serviceable. He relates several cases in which it was given with unequivocal effect. He gave it in doses of gutt. xxx., and remarks that in none of the instances in which he administered it, were the ordinary physiological effects produced; there was no excitement or intoxicating action, and there did not seem to be the least tendency to sleep. Compared with ergot of rye, he observes:—1, While the effect of the ergot does not come on for some considerable time, that of hemp, if it is to appear, is observed within two or three minutes; 2, The action of ergot is of a lasting character; that of hemp is confined to a few pains, shortly after its administration; 3, The action of hemp is more energetic, and perhaps more certainly induced, than that of ergot.

504. *In violent Palpitation of the Heart*, Dr. Christison found the Indian hemp succeed when all other remedies had failed to afford relief. He quotes a case of twenty-one years' standing in which it had a very beneficial effect.

505. *In Eczema, with intense itching*, when morphia in large doses not only failed to procure sleep, but appeared to aggravate the severity of the pruritus, the tincture, in doses of gutt. xxv., induced sleep and comparative ease. It was continued every night for six weeks, without increasing the original dose, until the eruption was nearly removed, but the itching continued as before when the patient was awake. (Christison.) It might prove useful in *Prurigo Pudendi Muliebris*.

506. *In Cholera*, Indian hemp has been highly spoken of, especially by Dr. Willeman,[2] of Cairo, who relates several cases successfully treated with the tincture in repeated doses of ♏ x.–xxx. Sir W. O'Shaughnessy considered that there was no remedy equal to it in the treatment of the disease amongst Europeans: he found it fail with the natives. Perhaps it has fallen into unmerited neglect.

[1] Monthly Journ. of Med. Sci., 1851. [2] Med. Times, vol. xix. p. 58.

507. *In Ulcer of the Stomach*, Dr. Brinton (p. 190) remarks that the extract of hemp sometimes answers admirably as a sedative; indeed, he adds, were its effects more uniform, it might often be advantageously substituted for opium itself.

508. *In Hysteria*, Indian hemp has proved of service when other remedies have failed, but in the majority of cases it is of little use. (Dr. Russell Reynolds.)

509. *In Dropsical Affections*, the tincture (℥xx. every four hours) proved effectual as a diuretic in the hands of Dr. Bryan (op. cit.); and in *Bright's Disease* it seems occasionally of service, especially when blood is present in the urine, but except as a palliative it is of little use.

510. Cantharis. Cantharis vesicatoria, *Latr.* Cantharides. The Blister Beetle or Spanish Fly. A Coleopterous insect, collected chiefly in Hungary; it is also found in other parts of Europe. It has its representatives in various parts of the world: thus the Mylabris Cichorii (*vern. Telini*) occurs in Syria and throughout the East; the Mylabris trianthemæ and Lytta gigas occur in Senegal; the Lytta vittata in America; and the Lytta ruficeps in Chili.

Med. Prop. and Action. All the above species of Cantharis, Mylabris, and Lytta, when applied to the skin, are powerful irritants and vesicants; their irritant property depending upon the presence of an acrid crystallizable principle, *Cantharidine*, which is common to the whole family. Their value as external applications is considered in the article Blisters, part ii. Cantharidine is soluble in ether, strong acetic acid, and chloroform, and is the active ingredient in the various blistering fluids and blistering tissues which are used as substitutes for the ordinary blister plaster. Internally, cantharides is only employed in the form of tincture, in doses of ℥v. cautiously increased to ℥xxx. daily, with the copious use of diluents and demulcents. Thus given, it is a stimulant diuretic, and appears to exercise a peculiar action over the mucous membrane of the genito-urinary system, and particularly on the neck of the bladder. From a series of carefully-conducted experiments on twenty-two subjects, students, Dr. Giacomini[1] draws the conclusion that cantharides is a powerful depressant, contra-stimulant, and antiphlogistic, and that it may be advantageously employed as such in acute inflammations. In every case (twenty-two) he found a remarkable dimunition in the force and frequency of the pulse, and a great depression of the vital powers. Its antiphlogistic powers have been also asserted by Borda, Rasori, and Larber. Cantharidine being rapidly soluble in oil, it is injudicious and unsafe to administer oleaginous substances at the same time as cantharides, as the active principle may thus become freed, and, being absorbed into the system, may produce poisonous effects. In large or poisonous doses, it causes a burning pain in the throat and pit of the stomach, extending at length over the whole abdomen; excessive pain in swallowing; dryness of the fauces; copious discharge of blood or bloody mucus from the stomach, and in less quantity from the bowels; tenesmus; distressing strangury; bloody urine; priapism; and inflammation of the genital organs. The patient is restless, the breathing laborious, the pulse quick and hard; headache, delirium, and convulsions are sometimes superadded.

[1] Med. Chir. Rev., No. lx. p. 603.

Occasional Symptoms. Salivation, vomiting of tenacious mucus, or apparently of the mucous membrane itself, redness of the eyes, lachrymation, and violent nausea.

Post-mortem appearances. Inflammation of the whole alimentary canal, and of the urinary and genital organs; the brain gorged with blood. The powder of cantharides has been found in the stomach nine months after death.

Treatment of an over-dose. Copious diluents, vomiting by emetics, or warm liquids, emollient and opiate enemas, opiates by mouth, bleeding (local or general), and strict antiphlogistic diet.

Dose:—Of the Tincture (Cantharides in coarse powder, oz. ¼, Proof Spirit Oj.), ℥v.–xx., twice or thrice daily. For external use only. *Acetum Cantharidis, Liq. Epispasticus.* (Lin. Cantharidis, B. Ph., 1864.) *Emp. Cantharidis, Ung. Cantharides, Charta Epispasticus, and Emp. Calefaciens.*

Therapeutic Uses. Diseases of the Genito-urinary system.

511. *In Amenorrhœa*, Dr. Dewees (p. 122) places much confidence in the internal use of tincture of cantharides. He commences with a dose of gutt. xx., and gradually increases the quantity to gutt. xxxv. or xl. If it does not succeed in these doses, he does not consider that it will prove ultimately useful.

512. *In Leucorrhœa*, the value of cantharides has been extolled, especially by Drs. Robertson,[1] Dewees (p. 75), and Dr. D. Davis.[2] It was given in doses of gutt. xx. of the tincture thrice daily in a demulcent draught, and the dose subsequently increased to gutt. xl.–l., until it produced slight strangury, when it was discontinued, or the dose diminished. The average period of cure, under this treatment, was about four months. Though so higly spoken of, it has fallen into comparative disuse.

513. *In Paralysis of the Bladder*, and in *Incontinence of Urine*, dependent on an atonic state of the bladder, the tincture of cantharides may often be given with excellent effect. It appears to act locally upon the urinary organs, stimulating the parts, and restoring to the bladder its healthy tone. Its use should be confined to adults. In a case recorded by Dr. Roots,[3] he administered it in doses of ℥xv., every six hours, suspended in mucilage. Although a long-standing case, a perfect cure was effected in a few days. *In Impotence*, it is occasionally employed as a stimulant of the generative organs. It is of doubtful efficacy. Dr. Ringer (p. 288) states that a drop of the tincture, thrice daily, will, in the majority of cases, remove *Chordee*. Pereira found benefit from a mixture of equal parts of T. Ferri Perchlor. and T. Cantharidis in *Gonorrhœa of long standing*, and even in the acute and earlier stages, cantharides has been employed, but the practice is of doubtful utility, or even of safety.

[1] Treatise on Cantharides, 1806.
[2] Obstet. Med., 2nd edit., p. 281.
[3] St. Thomas's Hospital Report, No. iv.

514. *In Suppression of Urine*, cantharides proved successful in the hands of Sir A. Cooper, and in the practice of others it has occasionally been useful; but the treatment is not devoid of danger, and it will often prove ineffectual.

515. *Other diseases. In Albuminuria*, cantharides internally has been employed with alleged benefit, and in purely chronic cases, it may prove serviceable; but even here, unless used with the greatest caution, it may prove highly prejudicial. *In Passive Dropsy*, the tincture is occasionally used in combination with other stimulant diuretics, and appears serviceable, but its use demands much caution, as it is capable of doing mischief if given in improper cases. It is inadmissible so long as acute symptoms are present.

516. *In Paraplegia*, Sir T. Watson (i. p. 547) recommends tincture of cantharides. It certainly has, he observes, sometimes a very beneficial effect. Generally, when it does good, it acts as a diuretic; and Dr. Seymour suggests, that it is most likely to be useful in cases of serous effusions into the spinal cavity, or *Spinal Dropsy*. He recommends the tincture as a good diuretic; and supposes that it acts beneficially in paraplegia by tending to produce absorption of the serum effused within the vertebral canal.

517. *In Chronic Hooping Cough*, the following formula, proposed by Dr. Beatty, is stated by Dr. Graves[1] to be very efficacious in many instances:—℞ Infus. Cinchon. Co. f℥vj., T. Canthar., T. Opii, āā f℥ss., M. sumat. coch. min. aut mag. ter in die.

518. *In Deafness* depending upon a thickened state of the membrana tympani, and where there is much irritation of the meatus externus, Mr. Toynbee[2] states that he has seen great benefit follow the application of an ointment composed of gr. xxx. of powdered cantharides and oz. j. of lard. It should be applied below and behind the ear twice daily; and at the same time he advises alterative doses of blue pill, or some other mercurial.

519. *In Chronic Skin Diseases, especially in Lepra, Psoriasis, and Eczema*, cantharides, internally, was formerly highly thought of, but it has been almost entirely superseded by arsenic, which is safer and more effectual. *In Alopecia and Loss of Hair after Fevers, &c.*, a mixture of 1 part of T. Cantharidis and 8 of castor oil, well rubbed into the roots of the hair night and morning, is often very serviceable. *In Tinea Decalvans*, Dr. Hillier (p. 358) has found it most useful to apply, at long intervals, acetum cantharidis to the bald patches, and to paint them every other day with T. Iodi; to wash the head twice a week with soap and cold water; and

[1] Dub. Jour. of Med. Sciences, No. iv. [2] Monthly Journal, March, 1849.

to apply a wash containing T. Cantharidis ℥j., Spt. Ammon. Arom. ℥ss., Aq. ℥x., and Rum Oj., to the parts of the head which are not bald, twice a week. Arsenic appears to aid the cure sometimes; in others, iron proves useful.

520. *In obstinate Ulcerations*, Mr. Tait[1] speaks highly of the value of cantharides employed both internally and externally. For internal use he advises the following:—℞ T. Canthar. ♏xij., Potas. Iod. ℥ss., T. Cinchon. Co. f℥j., Aq. f℥vij., M. Sumat f℥j., ter in die. For local application:—℞ T. Canthar. ♏xij., Acid Nit. Dil. ♏xx., T. Cinchon. Co. f℥ij., Aquæ f℥j., M. Under the use of these formulæ, he found the most obstinate ulcerations met with in Burmah, to yield completely. *To unbroken Chilblains* the following is an excellent application:—℞ T. Canthar. f℥j., Lin. Sapon. f℥vj., M. nocte maneque applicand.

521. Capsicum. Capsici Fructus. The dried ripe fruit of Capsicum fastigiatum, *Blume*. (C. annum, *Linn.*) *Nat. Ord.* Solanaceæ. Cultivated throughout the tropics of both hemispheres.

Med. Prop. and Action. An acrid stimulant. In small medicinal doses it causes a sensation of warmth in the stomach, promotes the digestive process, and stimulates the genito-urinary organs. In excessive doses it is an irritant poison. Externally applied it is rubefacient. Its activity depends upon a volatile principle, *Capsicine*, which Pereira states is so powerful an irritant, that half a grain of it, volatilized in a large room, causes all who inspire it to cough and sneeze.

Dose:—Of Capsicum powdered, gr. j.–iv. *Of the Tincture* (Capsicum bruised oz. ¾, Rect. Spirit Oj.), ♏x.–xx.

522. *Therapeutic Uses. In Scarlatina*, the following formula, originally proposed by Dr. Stephens,[2] has been used with much success, particularly in that form of the disease which occurs in the West Indies. Take two tablespoonfuls of capsicum and two teaspoonfuls of salt; beat them into a paste, and add half a pint of boiling water. When cold, strain, and add half a pint of vinegar. Of this mixture, the dose for an adult is one tablespoonful every four hours. The quantity is to be diminished for children, according to age or the severity of the attack. The same formula forms an excellent gargle in the sore throat which accompanies the disease.

523. *In Cynanche Maligna, or Putrid Sore Throat*, ♏xxx. of tincture of capsicum added to Oss. of port wine, forms an excellent stimulating gargle. *In many other forms of Sore Throat*, a gargle of the tincture (♏lx.) and decoction of cinchona (fl. oz. vj.–viij.) sweetened with honey, proves very useful. Dr. Graves (ii. p. 2) recommends a similar gargle in

[1] Lancet, May 10, 1851.

[2] Med. Commentaries, vol. ii.

Hoarseness depending upon a relaxed or weakened condition of the chordæ vocales.

524. *In Atonic Dyspepsia*, especially that occurring in hard drinkers, and in that of persons who have been long resident in hot climates, capsicum is a very eligible stimulant and stomachic. The following pills may be employed with advantage, two being taken daily an hour before dinner:—℞ Pulv. Capsici gr. ij.–iij., Pil. Rhei Co. gr. v., Pulv. Ipecac. Rad. gr. ½, M. ft. pil. ij. *In Diarrhœa arising from putrid matters in the Intestines, and especially when it is occasioned by fish*, Dr. Copland (i. p. 523) regards capsicum as almost a specific.

525. *In Yellow Fever*, Dr. Wright[1] speaks in high terms of capsicum, given internally, as a means of obviating the black vomit.

526. *In Delirium Tremens*, much attention has recently been called to the efficacy of capsicum, especially by Dr. Kinnear and Dr. Lyons,[2] of Dublin, under whose care numerous cases have rapidly and completely yielded to capsicum in doses of gr. xx.–xxx., in the form of bolus. The greatest improvement was often manifest after a single dose, especially when given early in the attack. It is generally given alone without the aid of other stimulants or opium. Dr. Lyons considers that it acts by the direct influence it exerts upon the gastric expansions of the vagi, and so indirectly upon the cerebro-spinal centres. This treatment seems worthy of an extensive trial. *In the Delirium and Coma of Fever, and in Apoplexy*, capsicum cataplasms to the feet act as powerful and excellent revulsives. If kept on too long, they will cause vesication.

527. Carbazotic Acid. Acidum Carbazoticum. Picric Acid. Indigo Bitter. $C_{12}H_2(NO_4)_3O,HO$. Is obtained by the action of nitric acid on indigo, and some other organic substances. It occurs in the form of bright yellow shining scales, of a very bitter taste. It is soluble in water, uniting with salifiable bases, and forming compound salts.

Med. Prop. and Action. This acid and its salts (carbazotates) are tonic and astringent; but according to Dr. Moffatt (who has been the first to introduce them as therapeutic agents), they act in the latter character indirectly, *i. e.*, they restrain discharges by improving the general tone of the system. In doses of grs. v.–x. and xv. the acid in the experiments of Prof. Rapp proved rapidly fatal to animals; convulsions and complete insensibility preceding death. One marked peculiarity attending the use of this acid and its salts is the production of a more or less bright yellow tinge to the skin, eye, and other organs of the body. This phenomenon has been examined by Prof. Crace Calvert, and Dr. Moffatt,[3] who draw the following conclusions:—1. Under the use of the acid and its salts, patients

[1] Med. Facts and Obs., vol. vii.
[2] Med. Press, 1865, 1866.
[3] Assoc. Med. Journ., Aug. 10, 1858, p. 742.

become as yellow as if they had a severe attack of jaundice; not only the skin, but the conjunctiva becoming coloured. 2. The time necessary for this coloration varied from two to sixteen days, the average duration being seven days. 3. The quantity of acid generally required to produce this coloration was about fifteen grains. 4. The coloration disappears in two or three days after the medicine has been discontinued. 5. The presence of this acid could be detected in the urine during the whole period of coloration, but not otherwise. This coloration, according to Dr. Moffatt, may depend either upon a change in the colour of the serum of the blood, or upon some change produced in the biliary system, but he inclines to the former of these theories. For medicinal uses the salts are preferable to the acid, and it is thought that in their action they approximate to quinine.

The *Dose* of Carbazotic Acid or of the Carbazotates of Ammonia, Iron, Zinc, or Nickel, is about one grain thrice daily.

528. *Therapeutic Uses. In a case of Continued Fever complicated with sub-acute Peritonitis and Tympanitis*, Dr. Moffatt prescribed the acid in grain doses thrice daily; and the patient got well just as if quinine had been administered. A case of *Chronic Eczema* recovered also under its use; but in a case of *Anæmia*, and in another of *Scarlatina Maligna*, in which it was employed, it was productive of little or no advantage. Two cases of *Cephalagia*, treated with the carbazotate of iron (gr. j. twice daily,) recovered under its use. In both these cases, quinine with conium had previously failed. Two cases of *Diarrhœa*, one supervening on continued fever, and the other a chronic case of eighteen months' standing, yielded to the carbazotate of ammonia, in grain doses thrice daily. (Moffatt.)

529. Carbo Animalis. Animal Charcoal. Bone Black. The residue of bones which have been exposed to a red heat, without the access of air. It consists principally of charcoal and phosphate, and carbonate of lime.

Carbo Animalis Purificatus. Purified Animal Charcoal. Animal charcoal from which the earthy salts have been almost wholly removed by the action of hydochloric acid.

Med. Prop. and Action. Used in pharmacy as a decolorising agent. Like wood charcoal, it may be employed as a deodorizer and antiseptic. *As an antidote in poisoning by certain vegetable substances, the alkaloids, &c.*, it was first proposed by Dr. Garrod.[1] The results of his experiments, and those of Wapen, Graham, and Chevalier Rand, may be summed up in the following articles:—

1. Animal charcoal is capable of removing from their solutions, in some cases only by the aid of heat, the bitter, resinous, and active principles of quassia, and the other simple bitters; of colocynth, aloes, and other purgatives; of krameria, and other astringents; of guaiacum, cinchona, opium, nux vomica; and, in short, all vegetable substances submitted to its influence.

[1] Pharm. Journ., vol. v. p. 325, 1846.

2. That it precipitates from their solutions a large number of oxides. The acid salts, arsenious acid, the arsenites of potassa and soda, the acid nitrate of mercury, the cyanide and ferrocyanide of potassium, are exempt from its action.

3. That it has the power of combining in the stomach with the poisonous principles of animal and vegetable substances, and that the compounds thus produced are innoxious; therefore, when given before these poisons have become absorbed, it will act as an antidote.

4. That a certain amount of animal charcoal is required; about oz. ½ to each grain of morphia, strychnia, or any other alkaloid; but of course much less for the substances from which they are obtained, as opium, nux vomica, &c. Gr. xx. of nux vomica require about oz. ½ of charcoal.

5. That the antidote itself exerts no injurious action on the body.

6. That when given as an antidote, it should be mixed with water as hot as the patient can swallow, as its action is much aided by an elevated temperature.[1]

Dr. Taylor (p. 84) and Dr. Pereira (i. 326) agree in regarding the experiments adduced as inconclusive. They admit that it is certainly capable of acting mechanically, and thereby impeding the action of poisons; but beyond this they deny its antidotal power. The weight of evidence is decidedly in favour of its efficacy, and it should never be neglected when opportunity offers of testing its real value.

530. Carbo Ligni. Wood Charcoal. Wood charred by exposure to a red heat without access of air.

Med. Prop. and Action. Antiseptic, disinfectant, and deodorant. In a minor degree it appears to be tonic and febrifuge. When taken internally, it is said to be absorbed into the system; Prof. Oesterlen[2] stated that he discovered it in the blood of the mesenteric veins and the vena porta, and in the liver and the lungs of animals which had been fed on food containing it. The surface of the intestinal canal was found perfectly healthy. Eberhard also believed that he had detected its presence in various parts of the body; but M. Mialhe failed to discover it. It is much used as a toothpowder, and is thought to check caries of the teeth. Externally, powdered charcoal (oz. ½) mixed with linseed meal (oz. j. ½), forms an excellent poultice to gangrenous and foul ulcers. The many valuable purposes to which charcoal may be applied as a deodorant and disinfectant, have been fully pointed out by Dr. J. Bird, Dr. Stenhouse,[3] and others.

Dose:—Of Wood Charcoal, gr. xx.–gr. lx. or more.

531. *Therapeutic Uses. In Dyspepsia attended with obstinate Flatulence and Gastrodynia*, charcoal was formerly much employed, but it fell into disuse. In 1849, M. Belloc[4] again called attention to its efficacy; he found it successful in many instances, when bismuth, iron, and lead had failed. He advises it in doses of a dessert-spoonful after each meal. Dr. Leared's observations on the use of charcoal in this class of diseases tend to show, 1, that its efficacy in these cases depends

[1] Ranking's Half-yearly Abstract, vol. xiii. 1851, p. 360.

[2] Constatt's Journal, band i. p. 27, 1848.

[3] Ranking's Abstract, vol. xxi. p. 1.

[4] Rev. Medical Chir., February, 1848.

solely on its gas-absorbent property; 2, that charcoal, made from the most solid vegetable substances, is greatly superior as a gas absorbent to that made from the lighter kinds—like Belloc's preparation—and that that made from vegetable ivory is the best; 3, that the absorbent power of charcoal is slightly weakened by pulverization, is much impaired by exposure to the atmosphere and damp, or by soaking in water, and is altogether impeded by being covered with water; 4, that to be effective against gastric flatulence, it must be introduced into the stomach in the same state as when fresh from the crucible; to effect this, the freshly-prepared charcoal should be at once enclosed in gelatine capsules, each of which will contain gr. x. of the heavy vegetable ivory charcoal. Of these two (gr. xx.) are a sufficient dose in ordinary cases. The large nauseous doses prescribed by Belloc are thus obviated.

532. *In Dysentery*, Dr. Chapman[1] (U.S.) found charcoal, internally administered, entirely removed the acrid and offensive character of the stools. It is also advised by Jackson and Crawford, in drachm doses. In the *Diarrhœa of Measles*, Dr. Wilson[2] used common wood charcoal with advantage. He also speaks of its efficacy in *Cholera*.

533. *In Intermittent Fevers*, Dr. Calagno[3] first called attention to the efficacy of charcoal. He gave it in doses of ℈j.–℥j. three or four times daily. Dr. Calvert,[4] physician to the British forces at Palermo, also employed it with success. He states that it appears especially useful where a marked disturbance of the digestive organs, nausea, flatulence and diarrhœa are present.

534. *To Foul and Gangrenous Ulcerations*, a charcoal poultice (a common linseed poultice to which charcoal is added) is highly serviceable in correcting the fetor of the discharge, and in arresting the progress of the ulceration. *In Gangrene and Phagedæna*, it is a valuable application.

535. Carbolic Acid. Acidum Carbolicum. Phenic Acid. HC_6H_5O. An acid obtained from coal-tar by fractional distillation and subsequent distillation. It occurs in colourless acicular crystals, which at 95° F. become an oily liquid having a strong odour and taste resembling those of creasote, which it also resembles in many of its characters and properties. Sp. gr. 1·065. The crystals readily absorb moisture on exposure to the air, and are thus liquefied; slightly soluble, however, in water, but freely so in alcohol, ether, and glycerine.

[1] Elements of Therapeutics, 1825.
[2] Ranking's Abstract, 1857, vol. xxv. p. 23.
[3] Lond. Med. Rep., vol. iii. p. 7.
[4] Ed. Med. and Surg. Journal, vol. x.

536. *Med. Prop. and Action.* In the pure state, escharotic; diluted, rubefacient, anæsthetic, and antiseptic; internally administered, carminative and sedative, closely resembling creasote in its power of allaying vomiting and gastric irritability. The principal effects noticed by Dr. Keith[1] induced by its internal administration in a large number of cases were—*a*, profuse perspiration; *b*, reduction of the heart's action, the pulse falling within a few hours from 120 to 60; and *c*, in some cases a smoky appearance of the urine. Its powers as a disinfecting and deodorizing agent are very marked. A very small quantity added to stinking urine or fetid evacuations rapidly and completely removes all smell. Its antiseptic powers are no less striking. If it be added in a very small proportion to freshly voided urine, it will keep for a long period in an unchanged state. In fact, it has a specific influence on all organic and inorganic matter, retarding or preventing the process of putrefaction. It proves fatal to all the lower forms of animal and vegetable life. We shall have occasion subsequently to notice several modes in which it is employed for this purpose; for general use the best form is the Glycerine of Carbolic Acid, B. Ph., which is prepared by triturating together Carbolic Acid (oz. j.) and Glycerine (fl. oz. iv.) until the acid is dissolved. *Calvert's Disinfecting Fluid* is a solution of carbolic acid.

537. *In the "Antiseptic Treatment" in Surgery*, carbolic acid holds a foremost place. Its advantages are lucidly set forth by Prof. Lister,[2] of Glasgow, to whom is due the credit of bringing this plan of treatment prominently to the notice of the profession in this country. The permanence of the action of the chloride of zinc gives that agent a decided superiority, when from the circumstances of the part concerned, it is impossible to maintain an efficient external antiseptic dressing; but with this exception, Prof. Lister regards carbolic acid as superior to all other antiseptic agents. It presents, indeed, he observes, a remarkable combination of advantages. In the first place, it possesses the essential requisite of being a most potent poison to all the low forms of life which determine putrefaction, and it retains this power even when diluted to such a degree as to be almost entirely unirritating to the tissues of the human body. In the second place, it is volatile, and its vapour is also efficacious as an antiseptic. This gives it a great advantage over chloride of zinc, or any other non-volatile substance, enabling the dressings impregnated with the acid to exert their influence not only upon objects in actual contact with them, but also upon their vicinity. Again, carbolic acid is a local anæsthetic, and exercises a most soothing influence upon a painful wound. Lastly, the acid is soluble in a variety of liquids of different properties, as different, for example, as water and oil, and each of the solutions has its own special value in practice. The strength usually employed is 1 part of the acid to 4 or 5 of a fluid oil, but in many cases it is desirable to apply it in a solid form: this is accomplished by employing a paste composed of common whiting (carbonate of lime) mixed with 1 part of carbolic acid in 4 parts of boiled linseed oil, so as to form a firm putty. Adhesive plaster containing but 1 per cent. of carbolic acid is used as strapping, and carbolised ligatures are also used for tying the arteries. The object of all these measures, which space will not permit of being considered more in detail, is to destroy as far as possible the germ poison, upon the presence of which the putrefactive process depends. Dr. J. R. Wolfe,[3] of Aberdeen, to whom is due the priority of employing this agent in this country, observes that the only objection to carbolic acid is its strong and rather disagreeable smell. To obviate this, he advises that cotton wool should be saturated in the pure acid, and then pressed to get rid of the excess of acid, and then dried and kept in a closely covered vessel. Sufficient acid remains in the cotton wool to act upon the wound without leaving enough to make

[1] Lancet, Jan. 23, 1869.
[2] Brit. Med. Journ., July 18, 1868.
[3] Med. Times and Gaz., Nov. 25, 1865.

the smell disagreeable. Mr. E. Gutteridge[1] relates some cases of *Compound Fractures*, *Wounds*, and *Burns*, strikingly benefited by carbolised oil—1 of the acid to 4 of boiled linseed oil.

Mode of Application. The following directions, abridged, are furnished by Prof. Lister[2] for the use of surgeons engaged in the Franco-Prussian war. Wash the wound thoroughly and also the surrounding skin with a saturated solution of the crystallised acid (1 to 20 of water), introducing the fluid by means of a syringe, and manipulating the parts freely so as to cause the lotion to penetrate into all the interstices of the wound, and at the same time squeeze out such clots of blood as it may contain. The fluid should be introduced repeatedly to insure its thorough penetration. The bleeding vessels should be tied with antiseptic catgut, or in its absence by torsion, or when a ligature is indispensable, by silk or linen thread previously steeped in a strong oily solution of the acid. When the catgut is employed the ends should be cut close to the knot, but when silk or linen thread is used the ends should be left projecting at the wound. Where sutures are required, silk steeped in an oily solution of the acid should be used. While the antiseptic lotion is in the wound all foreign matters should be, as far as possible, removed. Then place upon the wound two or three layers of oiled silk smeared on both sides with a solution of the acid, in five parts of any of the fixed oils—almond, olive, linseed, &c.—the oiled silk being made large enough to cover the raw surface completely, and slightly overlap the surrounding skin. Next apply, without loss of time, lint, charpie, or cloth (linen or cotton) well steeped in the oily solution of the acid, the cloth or lint being folded sufficiently to produce a layer at least a quarter of an inch in thickness, and extending a considerable distance—say three inches beyond the oiled silk in all directions, the outer layer being made somewhat larger than the rest, so that the margin of the mass of cloth may be thin. Cover the oily cloth with a piece of thin gutta-percha tissue, sufficiently large to overlap it on all sides by an inch or more, and retain it securely in position by a roller steeped in the antiseptic oil. Round this again wrap a still larger piece of folded cloth, say a folded towel also steeped in the oil, and cover the whole with a piece of oiled silk or gutta-percha. The time for changing the outer cloth or treating it with fresh oil must be regulated by the amount of discharge. During the first 24 hours the effusion of blood and serum is necessarily profuse, and fresh oil should be applied to the outer cloth within 12 hours of the first dressing, or even in 6 hours, if there should be unusual oozing. On the second day, also, in the case of a large wound, two dressings in the 24 hours are desirable. After this, if all go well, the discharge will diminish quickly, and a daily renewal of the oil will suffice; and after 5 or 6 days it may be applied once in 2 days. It should, however, be continued after the discharge has ceased entirely, till sufficient time has passed to insure that the wound has healed by scabbing, or at least has been converted into a superficial sore. The changing of the outer cloth requires care in order to avoid raising the edge of the gutta-percha along with it, and so admitting septic air towards the wound. It may be done with perfect security, by having the cloth consist of two parts, one covering each half of the gutta-percha, and as one-half is raised throwing a stream of watery solution (1 to 40) with a syringe upon the margin of the gutta-percha, a fresh oiled cloth being at once applied before the other portion of the former cloth is removed. If sufficient time cannot be spared for changing the outer cloth in this careful manner, it will be better to pour fresh oily solution upon the exterior of the cloth without disturbing it, taking care that the oil enter well beneath its margin. This plan is advisable where a large number of wounded have to be treated by one surgeon. The strong oily solution (1 to 5) would irritate the skin, if used continuously; after the first dressing, a weaker solution (1 to 10) suffices, and after a few days the strength may be reduced to 1 to 20 if excoriation should occur. The earlier the case comes under treatment,

[1] Lancet, Nov. 20, 1869. [2] Brit. Med. Journ., Sept. 3, 1870.

the greater will be the prospect of success, out even after the lapse of 36 hours it need not be altogether despaired of. In the case of *Compound Fractures*, the essential objects of the treatment may be attained by using splints constructed of stout iron wire bent into the form of the margin of a lateral splint, and strengthened by cross pieces here and there. Such splints can be readily extemporised by the surgeon himself, by help of two pairs of wire-forceps. The splints should be applied one at each side of the limb, without any padding opposite the seat of injury except the dressing above described, but padded elsewhere with any suitable soft material, an interval being left between such padding and the dressing. The outer layer of oiled-silk or gutta-percha should be applied outside the splints, so that all that will be requisite in order to apply oil to the outer cloth will be to take off the oiled silk with its retaining bandage, and pour on the oil through the ample intervals between the wires. Or the splints might be applied immediately external to the bandage that retains the deeper layer of gutta percha, leaving the outer cloth to be wrapped round external to the splints, cotton or charpie imbued with the antiseptic oil being tucked in under the splints to keep the margins of the gutta-percha in apposition with the limb, the cotton being changed as often as the cloth itself. For the sake of the general healthiness of the atmosphere of the crowded military hospitals, it is extremely desirable that even superficial granulating sores should be treated antiseptically. This may be done consistently with rapid healing by washing the sore with watery solution of carbolic acid (1 to 20), and covering it with two or three layers of oiled silk smeared with the oily solution (1 to 20), with well overlapping folded cloth steeped in similar oil, and over all a piece of gutta-percha tissue and bandage.

The application of large quantities of carbolic acid to an extensive surface is not unattended with danger. Three interesting cases of poisoning, two of them fatal, by the absorption of this acid, which had by mistake been used instead of "sulphur lotion," are recorded by Mr. E. S. Machin.[1] About oz. vj. of Calvert's Disinfecting Solution had been employed. Caution is therefore necessary in its use as an external application.

538. *Dose:*—Of the crystallized acid gr. j.–iij. largely diluted, or—which is a better form—one drop of crystallized acid liquefied by heat, in fl. oz. j. of mucilage thrice daily. Its internal administration, however, as pointed out by Dr. Sansom,[2] is not unattended with difficulty, for in addition to its nauseous odour and taste, rendering it very objectionable, especially for children, it is apt to act as a violent irritant of sentient surfaces, so that it can only be given in very small doses, and it has a peculiar caustic action on animal membranes, evidenced by its turning mucous surfaces of a dead white colour; it has also, he remarks, a toxic action, producing hyperæmia of the nervous centres. To obviate these effects, he advocates its use in the form of sulpho-carbolates. (See Sodii Sulpho-Carbolas.)

539. *Therapeutic Uses. In Scarlatina, Measles, and Small Pox*, Dr. A. Keith[3] has administered carbolic acid internally in several hundred cases with decided advantage. It was found more useful at an early stage of the disease, although given afterwards it much modified the symptoms and hastened the curative process. He employed the following mixture:— ℞ Acid Carbolic, Acid Acetic āā f℥j.–℥jss., T. Opii f℥j., Spt. Chloroformi f℥j., Aquæ ad ℥viij. Dose, a tablespoonful every four hours till the fever subsides. After the first dose this mixture was rather grateful to the patient than otherwise. *For Scarlatinal Sore Throat*, the gargle advised in diphtheria

[1] Brit. Med. Journ., March 7, 1868.

[2] Practitioner, July, 1869.

[3] Lancet, Jan. 23, 1869.

(*infra*) may be advantageously employed. Mr. Beardsley[1] has recorded some circumstances which seem to indicate that carbolic acid may exercise influence as a *prophylactic against Scarlet Fever*. The patient was systematically sponged with a solution of the acid (fl. drm. j., Aq. Oj.), and the rest of the household added the acid to their washing water. The disease did not spread. *As a means of preventing "pitting" in Small-pox*, Dr. H. Yates[2] has used with apparent success in one case an ointment of carbolic acid (fl. drms. ij.) and suet (oz. ij.) coloured with lamp-black, applied thickly spread on wadding. It was changed every second day, and the parts first washed with soap and warm water, and then with warm water impregnated with carbolic acid.

540. *In Diphtheria*, Mr. C. Sedgwick[3] speaks highly of the following formula, used as a gargle by adults, but applied by means of a sponge to the throat in children. ℞ Acid Carbol. ♏xx., Acid Acetic ♏xxx., Mellis ʒij., T. Myrrhæ fʒij., Aq. ad ℥vj., M. The acids should first be mixed together, and the other articles added gradually. He considers that this has a decided effect on the exudation. He has found it equally useful *in Ulcerated Tonsils*.

541. *In Phthisis*, the inhalation of an aqueous solution of crystallized carbolic acid (gr. ½–gr. j.½, Aq. fl. oz. j.) under the form of spray, has been tried by Dr. Marcet,[4] who comes to the conclusion that in the first stages of the disease it acts beneficially by improving the circulation in the lungs; hence relieving the dyspnœa, arresting the effusion of fluid into the smaller bronchi and air-cells, and favouring afterwards its absorption into the blood. Thus the first chronic stage with plastic effusion may apparently be prolonged, but in advanced stages where softening has commenced, and vomicæ formed with acute general symptoms, although it certainly relieves the dyspnœa, it produces no other benefit, and should be withheld. This plan of treatment was first advocated by Dr. Wolfe in 1865. Used as directed above it has been found serviceable in *Chronic Bronchitis*, and Mr. V. W. Blake states that he has seen great benefit in *Hooping Cough* from carbolic acid inhalations.

542. *In Pyrosis*, Dr. Podmore Jones[5] employed this acid in twelve cases, and in each with satisfactory results. He prescribes a solution of the crystallized acid (gr. j., Spt. Vin. Rect. fl. drm. j.) in doses of gutt. xv. in a wineglassful of water, an hour before each meal. He considers that it acts by destroying those vegetable organisms on which this affection appears to depend; be that as it may, it appears to be an effectual remedy.

[1] Practitioner, Feb. 1869.
[2] Lancet, Jan. 25, 1868.
[3] Med. Times, Feb. 27, 1867.
[4] Practitioner, Nov. 1868, p. 274.
[5] Ibid., p. 302.

In Flatulence and Foul Breath with Constipation, it has proved useful in the hands of Dr. Kempster, of Utica, U.S.[1] Mr. E. Garraway[2] places great reliance on it in the *Vomiting of Pregnancy*, and in other forms of *sympathetic vomiting:* he gives drop doses of the crystallized acid liquefied by heat, in mucilage thrice daily. *In Gastric Irritability*, especially when due to miasma or sewage exhalations, it proved most serviceable in the hands of Dr. Godfrey,[3] and in *Cholera* it is stated to have proved very successful.[4]

543. *In Chronic Cystitis*, when the urine is offensive, Sir H. Thompson (p. 150) advises an injection of carbolic acid, ♏j.–ij. to oz. iv. of warm water, to be used as directed in Art. Injections. *In Gonorrhœa*, Mr. Spencer Watson[5] employs the following injection:—℞ Solut. Acid Carbol. ♏xxx., Potass Bicarb. ℥j., Aq. Oj., M. This is to be used every two hours, if the disease has only just commenced and little or no thick pus be discharged, and if there be little or no swelling of the glans penis. If these exist they should be first subdued by antiphlogistics, and then the injection may be used every three or four hours.

544. *As a preventive of Puerperal Fever*, Dr. J. G. Wilson[6] speaks favourably of the practice of intra-uterine injections of a weak carbolic acid solution, which not only removes offensive coagula, &c., but probably acts in virtue of its antiseptic property.

545. *In Chronic Inflammation and Ulceration of the Os and Cervix Uteri*, it is highly spoken of by Dr. Lloyd Roberts[7] as a local application. He considers that as an escharotic in these cases it holds a mid-place between nitrate of silver and caustic potash. Care must be taken not to touch the vaginal mucous membrane with the acid, as it causes excoriation and much pain. In addition to its use as a caustic, he employs the following lotion as a healer and disinfectant:—℞ Acid Carbol. ℥j.–ij., Glycerini ℥j., Aq. Oj., M. *In Cancer of the Uterus*, Dr. W. Playfair[8] has found great benefit from a mixture of glycerine, tannin, and carbolic acid, in equal parts, applied on a pledget of cotton wool to the ulcerated surface. This was drawn out of the vagina with a string, and re-soaked twice a week, and the vagina was also washed out twice daily with a tablespoonful of the mixture in a pint of water. Great benefit, local and constitutional, followed this treatment.

546. *In Primary Syphilis*, the local application of the acid is

[1] Practitioner, Sept. 1868.
[2] Brit. Med. Journ., March 13, 1869.
[3] Med. Circular, Dec. 17, 1862.
[4] Med. Press, Jan. 22, 1868.
[5] Lancet, March 30, 1867.
[6] Glasgow Med. Journ., May 1869.
[7] The Practitioner, Oct. 1868.
[8] Ibid., Aug. 1868.

favourably noticed by Mr. Holmes Coote;[1] he employed it both pure and diluted with equal parts of water. *For Buboes*, Dr. J. Lamprey[2] advocates the plan of making a small vertical incision in the centre of the suppurating gland, just large enough to allow of the free escape of the pus, and then injecting with a common glass syringe, a solution of carbolic acid (1 part) and water (10 parts.) After remaining in a few seconds only it should be squeezed out of the sac by gentle pressure. The pain it causes soon passes off. The injection is repeated in three days, and in the meantime the bubo should be kept covered with lint soaked in a weak solution (1 to 40.) Care must be taken that the injection does not spread over the scrotum or surrounding skin, or it may give rise to excoriations.

547. *To Cancerous Ulcerations*, Dr. J. Barclay[3] employed in four cases the following lotion:—℞ Acid Carbol. ℥jss.-℥ij., Spt. Vini Rect. oz. j., Aquæ ad Oij., M. Compared with acetic and citric acid, which he employed in other cases, he draws the following conclusions:—1. That they have about an equal effect in removing pain in cancerous growths. 2. That carbolic acid has a powerful effect in removing the offensive fetor. 3. That they all have a solvent effect on cancerous tissue; citric acid the least, acetic acid next in degree, and carbolic acid most powerful. The above lotion may prove serviceable in *Gangrenous and other ill-conditioned Ulcers*, *Carbuncle*, &c., attended by copious or offensive discharges. Dr. P. Eadie[4] records a case of extensive *Carbuncle*, in which the application of lint, saturated with oil containing 1 part to 5 of carbolic acid, exercised the best effect. *To Poisoned Wounds*, Dr. Wolfe suggests the immediate application of the pure acid.

548. *To Burns*, the addition of carbolic acid to Lin. Calcis (1 part to 30) has been found most serviceable by Dr. Allan Wilson.[5] Prof. Pirrie,[6] of Aberdeen, used a stronger solution (1 of acid to 6 of olive oil), and he found it not only afford speedy relief to pain, but promoted the healing process without suppuration. It certainly seems worthy of further trial.

549. *In Toothache*, relief is stated often to follow the introduction into a carious tooth of a mixture of flexile collodion (1 part) and Calvert's carbolic acid (2 parts). It may be kept in the cavity by means of a bit of lint dipped in collodion.[7] Dr. McKendrick[8] enters a strong caveat as to its use, having seen instances in which the cheeks and lips were severely

[1] Brit. Med. Journ., March 14, 1868.
[2] Med. Press, July 28, 1869.
[3] Brit. Med. Journ., April 21, 1866.
[4] Lancet, Dec. 11, 1869.
[5] Ibid., Feb. 1, 1868.
[6] Ibid., Nov. 9, 1867.
[7] Ibid., Feb. 22, 1868.
[8] Practitioner, Dec. 1868.

blistered by it. Its application requires great care, and should only be used under medical supervision. *In Diseases of the Gums*, Mr. Hilditch[1] advises, after washing the teeth night and morning with a soft tooth-brush, the application to the affected part of a little of the following lotion:—℞ Acid Carbol. gr. xx., Spt. Vini Rect. fl. drms. ij., Aq. Dest. fl. oz. vj., M. Under its use the gums soon get firmer and less tender. *In Fœtor of the Breath arising from carious teeth, smoking, &c.*, washing the mouth out with a weak solution of carbolic acid, acts as a good deodorizer, though inferior perhaps to the permanganate of potash. *Obstinate Ulceration of the Throat, accompanied by fœtor of breath*, will sometimes yield to the application, in the form of spray, of the dilute acid (♏xv. ad Aq. fl. oz. j.), or it may be used simply as an inhalation (Dr. Beigel).[2] *In all Fetid Discharges from the Mouth, Throat, Nostrils, Ears*, and other parts, a weak aqueous solution or the glycerine of carbolic acid may be used with advantage.

550. *In Favus, Pityriasis, and other skin diseases of a vegetable origin*, Dr. Podmore Jones has found very effectual a lotion composed of 2 parts of the acid to 3 of glycerine and water, twice daily, and the daily use of carbolic acid soap. It sometimes proves very useful in allaying *pruritus in chronic Eczema and Erythema*. The same treatment will probably be of use in removing *Fetid Perspiration of the Feet and Axillæ*. It is stated to be effectual in *Scabies*, but as shown above, its application is not devoid of danger. It is an effectual destroyer of *Pediculi*. A case of *Nævus* was cured by Mr. Porter[3] by subcutaneous injection of carbolic acid. *In Psoriasis*, Dr. J. McNab[4] has found carbolic acid ointment (1 part of the acid to 4 of lard) very effectual; arsenic being given internally at the same time.

551. *In Scrofulous Ophthalmia*, Mr. Markey[5] recommends the following as an excellent collyrium:—℞ Acid Carbol. gutt. j., Glycerini gutt. v., Aq. Rosæ fl. oz. j., M.

552. *In Guinea Worm*, in order to expedite its extraction, Mr. J. Tufnell[6] advises that a silver probe, dipped in a mixture of carbolic acid and oil (1 to 3 parts) be passed up into the sinus as far as it will go, on each side of the worm. This will destroy the resisting power of the worm for a certain length, and by gentle traction it will come out freely. As soon as resistance is felt, the acid must be applied again, and a further portion extracted, and so on until the whole is removed. In this way a worm measuring 30 inches was extracted in about two hours.

[1] Lancet, March 14, 1868.
[2] Practitioner, Aug. 1868.
[3] Med. Press, Aug. 18, 1869.
[4] Lancet, March 19, 1870.
[5] Lancet, Sept. 19, 1868.
[6] Dublin Quarterly Journ., Aug. 1869.

553. Carbonic Acid. Acidum Carbonicum. $CO_2 = 22$. At ordinary temperatures it is gaseous, but by pressure it is condensed into a liquid, and by intense cold it is solidified. Sp. gr. 1·5245.

Med. Prop. and Action. The pure gas when inhaled acts as an irritant, causing spasmodic contraction of the glottis and consequent asphyxia. On mixing the gas with about twice its volume of air, Sir H. Davy found that he could breathe it, though it soon produced vertigo and somnolency. The first symptom usually experienced on breathing an atmosphere containing carbonic acid gas is throbbing headache, with a fulness and tightness across the temples, giddiness, loss of muscular power, a sensation of tightness at the chest, increased action of the heart, and often palpitations; the ideas become confused, and memory partially fails. Buzzing in the ears, impaired vision, and a strong tendency to sleep succeed, or syncope ensues. Convulsions, sometimes accompanied with delirium, foaming at the mouth, and vomiting, precede death. Dissection shows engorgements of the cerebral vessels, and sometimes serous or even sanguineous effusions. The treatment of poisoning by this gas is free exposure to the air; artificial respiration by the Marshall Hall or Sylvester methods; galvanism of the phrenic nerve; cold affusion; moderate blood-letting, especially by cupping at the nape of the neck; and the employment of stimulants, either given internally, or applied externally in the form of frictions. *As an anæsthetic*, its properties have been examined by M. Herpin.[1] He states that the gas, when diluted with 80 or 90 per cent. of air, causes none of the toxic effects of the pure gas, but produces gradual anæsthesia, without any signs of suffocation, without pain or any apparent disturbance of the system; its action, he considers, is chiefly directed on the brain and nervous system. He considers that it is particularly adapted for maintaining an anæsthesia previously induced by chloroform, as its action may be kept up for an almost indefinite period without danger to the patient. As a local anæsthetic, it will be considered more fully presently. When taken into the stomach in small quantities, in the form of an effervescing draught, this gas checks nausea and allays gastric irritability. Water charged with it is a good vehicle for the exhibition of many saline remedies. Locally applied to ulcerated surfaces, its primary action is that of a stimulant.

554. *Therapeutic Uses. In Gastric Irritability, Nausea and Vomiting*, carbonic acid given in the form of an effervescing draught has a most soothing and sedative effect. If acidity of the stomach exists, the draught may contain an excess of alkali. It is very useful in the *Gastric Irritability of Fever*.

555. *In Calculous Disease*, when the urine contains a phosphatic deposit, carbonic acid water (bottled soda water, or water aërated in a gazogene apparatus) may be given with advantage. *In Irritability of the Bladder*, Dr. Churchill[2] found the local application of this gas of great service. It may be used as advised in the next section.

556. *In Painful Affections of the Uterus*, the direct application of this gas, by its local anæsthetic action, sometimes exercises a beneficial effect. Its value in *Cancer of the Uterus* was first pointed out by Dr. Dewees (p. 269); and in 1840,

[1] Ann. de Thérap., 1859, p. 59. [2] Dublin Quart. Journ. of Med., Aug. 1857.

Dr. Clutterbuck[1] employed it with success in allaying *great irritability of that organ*. Prof. Simpson,[2] in 1856, brought the subject prominently forward, pronouncing it, in these cases, a good and powerful local anæsthetic. He directs a tablespoonful of crystallized tartaric acid, mixed with a tablespoonful of crystallized bicarbonate of soda, to be put into an ordinary wine-bottle, and three or four wine-glassfuls of water to be added: the gas which is evolved is to be carried through a caoutchouc tube, and applied to the womb by means of a gum elastic nozzle attached to the extremity of the tube. The first evolution of gas within the vagina is attended with a slight feeling of heat, but this is soon followed by a soothing effect. If the gas fail to afford relief, a teaspoonful of chloroform may be added to the contents of the bottle before introducing the cork. Dr. Tilt (p. 52) states that he has seen no good result from the use of this gas in cases of cancer; at any rate, not such as to compensate for the trouble it gives (p. 246). It has also been advised as a local application to *Cancerous and painful Ulcerations* in other parts of the body, but the relief it affords is only temporary. *As a means of inducing premature labour*, the use of the carbonic acid douche has proved effectual in the hands of Prof. Simpson (op. cit.), Scanzoni,[3] and others. *In Dysmenorrhœa*, Prof. Mojon[4] found carbonic acid vapour of the greatest service.

557. *In Dysentery and Ulceration of the Rectum*, Dr. Parkin[5] strongly advocates the introduction of carbonic acid gas per anum. It may be introduced in the manner advised in uterine affections (*ante*.) *In Cholera*, the value of this gas (obtained by a mixture of carbonate of soda and vegetable acids) has been strongly insisted upon by Dr. Parkin and others; but further facts are wanting to prove its efficacy. It has also been proposed as a prophylactic.

558. CARBONII BISULPHURETUM. Bisulphuret of Carbon. Bisulphide of Carbon. CS_2. A limpid, colourless fluid, extremely volatile, of a pungent taste, and peculiar fetid odour. Sp. gr. 1·272.

Med. Prop. and Action. In doses of gutt. ij.–iv., in mucilage, or on sugar, it is stated to be stimulant, diaphoretic, and emmenagogue, but great caution is required in its use, as in over-doses it is highly poisonous. Externally, in the form of embrocation (one part of the bisulphuret and two of oil), it is stimulant. The vapour, when inhaled, is anæsthetic. Prof. Simpson[6] exhibited it in about twenty cases, and states that it is certainly a very rapid and powerful anæsthetic. One or two of the patients stated that they found it more pleasant than chloroform; but, in the majority,

[1] Lancet, Oct. 10, 1840.
[2] Edin. Med. Journ., July, 1856.
[3] Brit. and For. Med. Chir. Rev., Oct. 1856.
[4] Med. Chir. Rev., No. lxvi. p. 554.
[5] Med. Gaz., vol. xiii. p. 777.
[6] Pharm. Journ., vol. vii. p. 517.

it produced distressing and disagreeable visions, and was followed for some hours by headache and giddiness, even when given only in small doses. Dr. Snow[1] also made some experiments with it, and considers that a single deep inspiration of air saturated with its vapour would produce instant death. On the whole it appears very inferior, in uniformity of action and safety, to chloroform. Its smell, that of decaying vegetable matter, is a great objection to its use. (Pereira.)

559. *Therapeutic Uses. In Nervous Headaches, including Neuralgic, Periodic, Hysterical, and some forms of Dyspeptic Headache*, Dr. Kennion[2] speaks highly of the local application of the bisulphide. About two drachms are poured into a small wide-mouthed, glass-stoppered bottle, half filled with cotton wool; this, of course, absorbs the fluid, and when the remedy has to be used, the mouth of the bottle is applied closely (so that the vapour may not escape) as near as possible to the seat of pain, and held there for from three to five or six minutes. After it has been applied for a minute or two, a sensation is felt as if leeches were biting the part, and this is followed by considerable smarting and pain, which subside, however, almost immediately after the removal of the bottle. Relief is generally immediate. It may be repeated three or four times daily, if necessary.

560. CARDAMOMUM. CARDAMOMS. The dried capsules of Elettaria Cardamomum, *Maton. Nat. Ord.* Scitamineæ. *Hab.* Mountains of Malabar and W. Coast of India. The seeds, which alone are employed in medicine, are best kept in their pericarps till required for use; they should then be separated, the pericarps being rejected.

Med. Prop. and Action. Aromatic and carminative, without acridity. They are seldom given alone, but are an excellent adjunct to other remedies. Their activity depends upon a volatile oil. The best form for internal use is the compound tincture. The seeds of Elettaria major, *Smith* and other allied species, have similar medicinal properties.

Dose:—Of the Powdered Seeds, gr. v.–xx. *Of the Compound Tincture* (Card. Seeds bruised oz. ¼, Caraway oz. ¼, Raisins oz. ij., Cinnamon oz. ½, Cochineal gr. lx., Proof Sp. Oj.), fl. drm. ½–ij.

561. *Therapeutic Uses. In the flatulent Colic of Children, in Dyspeptic Affections of old persons, in the low stages of Fever, and in Atonic states generally*, cardamoms in the form of compound tincture prove highly serviceable.

562. CARUI FRUCTUS. CARAWAY. The fruit of Carum Carui, *Linn. Nat. Ord.* Umbelliferæ. Cultivated in England and Germany.

Med. Prop. and Action.—Stomachic and carminative. The volatile oil which they contain, in doses of ℥ij.–v., is the best form for internal use.

[1] London Med. Journ., June 23, 1848.

[2] Brit. Med. Journ., June 17, 1868, p. 584.

They are chiefly used as an adjunct to other remedies. The distilled water (fl. oz. j.–iij.) is an ordinary vehicle for saline purgatives.

Dose:—Of Caraway, gr. x.–gr. lx.

563. *Therapeutic Uses. In Flatulence, Flatulent Colic, Atonic Dyspepsia, Spasmodic Affections of the Bowels*, the volatile oil, in doses of gutt. ij.–v., on sugar, is often productive of benefit. The distilled water is often given as a carminative in the flatulent colic of children.

564. CARYOPHYLLUM. CLOVES. The dried unexpanded flower-buds of Caryophyllus aromaticus, *Linn. Nat. Ord.* Myrtaceæ. *Hab.* Moluccas; cultivated in the East and West Indies, Mauritius, Penang, &c.

Med. Prop. and Action. Aromatic and stimulant. Their activity depends upon a volatile oil (Oleum Caryophylli), which is the best form for internal use. It is an excellent adjunct to other medicines, and enters into a great number of officinal preparations.

Dose:—Of powdered Cloves, gr. v.–xx. or more. *Of the Infusion* (Cloves bruised oz. ¼, Boiling Water fl. oz. x.), fl. oz. j.–ij. *Of the distilled Oil*, ℥ij.–v.

565. *Therapeutic Uses. In Atonic Dyspepsia*, with a languid state of the circulation, and a sense of coldness in the stomach, the infusion of cloves (fl. oz. j.½) or the volatile oil (gutt. iij.–v.), is occasionally given with benefit. When much flatulence is present, it is particularly useful.

566. *In the Vomiting of Pregnancy*, when the stomach rejects almost everything as soon as swallowed, Dr. Dewees (p. 211) found a tablespoonful of the infusion of cloves act most promptly and successfully.

567. *In Toothache*, a drop or two of oil of cloves, introduced into a carious tooth, is a popular remedy which occasionally affords relief.

568. CASCARILLÆ CORTEX. CASCARILLA. The Bark of Croton Eluteria, *Bennett. Nat. Ord.* Euphorbiaceæ. *Source*, the Bahama Islands.

Med. Prop. and Action. Aromatic bitter, and tonic. It is also a mild carminative, and has the advantage over other medicines of the same class of not causing constipation. It will often be retained when the stomach is unable to bear the stronger tonics. Its activity depends upon a volatile oil, and a peculiar crystalline principle, *Cascarilline*.

Dose:—Of powdered Cascarilla, gr. x.–xxx. *Of the Infusion* (Cascarilla oz. j., Boiling Water fl. oz. x.), fl. oz. j.–ij. *Of the Tincture* (Cascarilla oz. ij.½, Proof Spt. Oj.), fl. drm. j.–ij.

569. *Therapeutic Uses. In Atonic Dyspepsia* and in *Debility* from whatever cause, particularly in that occurring after fever, the infusion of cascarilla is often productive of much benefit.

570. *In the advanced stages of Diarrhœa and Dysentery*, it is highly thought of by the Germans; but its virtues in these cases are little known in England.

571. *In Intermittent and Remittent Fevers*, cascarilla was formerly held in high esteem, particularly in Germany. Stisser, Stahleaus, and others considered it a perfect substitute for cinchona. Its inferiority to that bark is now universally admitted, to which, however, it is an excellent adjunct, rendering it, by its aromatic qualities, more agreeable to the stomach, and increasing its febrifuge powers. (A. T. Thomson.)

572. *In Bronchial Affections, attended with excessive secretion of Mucus*, a combination of Infus. Cascarill. fl. oz. iv., Acet. Scillæ (Ph. Lond.) fl. drs. ij., Tinct. Camph. cum Opio fl. drs. ij., in doses of fl. oz. j. thrice daily, may be given with advantage.

573. Cassiæ Cortex. Cassia Bark. The bark of Cinnamomum aromaticum, *Nees. Nat. Ord.* Lauraceæ. *Source*, China *viâ* Singapore.

Med. Prop. and Action. Aromatic, stimulant, and carminative; closely resembling cinnamon, for which it may be used as a substitute, but it has a less delicate flavour, and acts more as an astringent. The distilled oil (gutt. j.–v.) is the best form of administration.

574. *Therapeutic Uses.* Similar to those of Cinnamon (*q.v.*)

575. Cassiæ Pulpa. Cassia Pulp. The pulp of the seed of the Purging Cassia, Cassia Fistula, *Linn. Nat. Ord.* Leguminosæ. *Source*, East and West Indies.

Med. Prop. and Action. Laxative, and in large doses cathartic. If given alone it creates much griping, nausea, and flatulence, to prevent which it should be combined with a carminative or a neutral salt. The confection (Ph. Lond.) is a convenient form for administration (Cassia Pulp ℔ss., Manna ʒij., Tamarind Pulp ʒj., Syrup of Roses f ʒviij.) Dose ʒij.–ʒj. The seeds and the leaves are also aperient. The pulp enters into the composition of confection of senna.

Dose:—Of Cassia pulp, as a laxative, gr. lx.–gr. cxx.; as a cathartic, gr. cxx.–oz. ss.

576. *Therapeutic Uses.* Very limited, similar to those of Senna.

577. Castoreum. Castor. The dried præputial follicles and their secretion, of the Common Beaver, Castor Fiber, *Linn*, an animal belonging to the order Rodentia. It is obtained from the Hudson's Bay Territory.

Med. Prop. and Action. Stimulant, and anti-spasmodic. The best form is the Ammoniated Tincture (Pharm. Edin.) (Castor ʒijss., Assafœtida ʒx, Spirit of Ammonia Oij., strain and filter) in doses of ʒj.–ʒij. From its frequent adulteration it has lost much of its standing as an anti-spasmodic; but, when pure, it appears to be a remedy of considerable power. When taken, even in moderate doses, it is absorbed into the system, and communicates its peculiar odour, slightly altered, to the urine. It contains a volatile oil and a crystalline principle, *Castorin*. It was formerly regarded as emmenagogue.

Dose:—Of Castor, gr. v.–x., in pill. *Of the Tincture* (Castor oz. j., Rect. Spt. Oj.), ℥xxx.–lx. or more.

578. *Therapeutic Uses. In Hysterical, Nervous, and Spasmodic*

Affections, castor, particularly in the form of the ammoniated tincture (*ut supra*), is a remedy of some value, especially when given in conjunction with other remedies of the same class. M. Trousseau speaks highly of its efficacy in this class of cases. *In Epilepsy*, its use is as old as Celsus, who recommends its employment. *Dysmenorrhœa*, attendant upon the expulsion of menstrual coagula, may often, according to M. Vannaire,[1] be relieved by large doses of castor.

579. *In Spasmodic Asthma*, Dr. Graves (ii. p. 87) states that he has often derived decided advantage from a combination of equal parts T. Castor and Vin. Ipecacuanhæ. During the paroxysm, he also found much benefit result from the application to the chest of a flannel steeped in water as hot as the patient can bear. It was formerly esteemed in *Hooping Cough*.

580. Catechu. Gum Catechu. Of this there are two kinds:—1. Catechu Nigrum, Black Catechu, an extract from the heart-wood of Acacia Catechu, *Willd.*, a Leguminous tree inhabiting the forests of India; 2. Catechu Pallidum, Pale Catechu, prepared at Singapore and elsewhere from the leaves and young shoots of Uncaria Gambir, *Roxb. Nat. Ord.* Rubiaceæ, inhabiting the Malayan Peninsula and Archipelago. Another kind of Catechu is prepared in some parts of India from the fruit of Areca Catechu, *Linn.* Pale Catechu alone is officinal in B. Ph.

Med. Prop. and Action. Powerful astringent. Of the two varieties chiefly met with in commerce, the pale and the dark, the latter is to be preferred, as it contains a larger proportion of mimotannic acid and catechin, upon the presence of which its astringent property depends. The dark kind averages 109 of tannin (mimotannic acid and catechin), the pale 97, in 200 parts. It is one of the most powerful and certain of the vegetable astringents, and may be advantageously combined with carminatives and chalk mixture. Alkaline salts are said to destroy its astringency.

Dose:—Of powdered Catechu, gr. x.–xxx. *Of the Infusion* (Catechu gr. clx., Cinnamon gr. xxx., Boiling Water fl. oz. x.), fl. oz. j.–ij. *Of the Tincture* (Catechu oz. ij.½, Cinnamon oz. j., Proof Spt. Oj.), fl. drm. ½–ij. *Of the Compound Powder* (Catechu oz. iv., Kino, Rhatany Root, āā oz. ij., Cinnamon, Nutmeg, āā oz. j.), grs. xx.–xl. *Of the Lozenges*, 1 to 6. Each lozenge contains gr. j. of Catechu.

581. *Therapeutic Uses. In Diarrhœa depending upon a relaxed state of the mucous membranes of the intestinal canal*, catechu, in doses of gr. x.–xv. of the compound powder, or fl. oz. j.–fl. oz. ij. of the infusion, may be given with the greatest benefit. It is best given in combination with opium and chalk mixture. Great care is necessary to ascertain clearly that the diarrhœa is not dependent upon, nor accompanied by inflammatory action; in which case this, as well as all other astringents, is not only

[1] Braithwaite's Retrospect, xlv. 1862, p. 278.

useless but injurious. The same remark applies to diarrhœa arising from deranged biliary action. *In the Diarrhœa of Children*, after acute symptoms have been subdued, or in any case when a considerable degree of looseness of the bowels persists after two or three days, one of the following mixtures of Dr. West (p. 604) may be used with advantage :—℞ T. Catechu ℥ij., Ext. Hæmatoxyli ℥j., Syr. ℥j., Aq. Carui ℥ix., M. : or, ℞ Pulv. Cretæ Co. cum Opio gr. xx., Infus. Catechu Co. fl. oz. j.½., M. Dose of either, fl. drm. j., twice or thrice daily, for a child æt. one year.

582. *To Sore and Chapped Nipples*, the local application of the tincture is recommended by Mr. Farr.[1] In most cases it is very efficacious. The nipple is to be washed in warm water, then dried, and the tincture applied with a camel-hair pencil.

583. *In Ptyalism*, and in *Ulceration and Sponginess of the Gums*, a piece of catechu, allowed slowly to dissolve in the mouth, is often of the greatest service. The infusion forms one of the best gargles in *Aphthæ occurring in the advanced stages of Phthisis and other chronic diseases.*

584. *In Toothache*, arising from relaxation of a portion of the gum, or when in the hollow of the tooth there is a piece of fungous flesh, a small piece of catechu inserted into the carious tooth is often productive of relief.

585. *Relaxation of the Uvula*, which gives rise to coughs and an uneasy sensation in the glottis, is frequently effectually removed by a piece of catechu, allowed slowly to dissolve in the mouth.

586. *In Hypertrophy of the Tonsils*, a very serviceable astringent gargle is composed of Infusion of Catechu fl. oz. vj., Tincture of Kino fl. drs. ij., M.

587. *In Leucorrhœa*, the infusion of catechu, used as a vaginal injection, once or twice daily, has been found useful in lessening the quantity of the discharge.

588. *To Indolent and ill-conditioned Ulcers*, where there is a copious discharge, the local application of catechu in the form of ointment (gr. lx., Adipis oz. ½–oz. j.) is occasionally attended with the greatest benefit.

589. Cera Flava. Yellow Wax. The prepared honey-comb of the Hive Bee. Apis Mellifera, *Linn.*

Cera Alba. White Wax. Yellow wax bleached by exposure to moisture, air, and light.

Med. Prop. and Uses. Demulcent, emollient; formerly employed internally in diarrhœa, &c., but now abandoned. It forms an ingredient in several ointments and plasters. An excellent application for *Indolent and other Ulcerations* is Ceromel (Ind. Ph. 1868), prepared by melting together

[1] Lancet, July 9, 1842.

Yellow Wax (1 part) and Clarified Honey (4 parts) at a gentle heat, and straining. It is a form well adapted for the tropics, where animal fats soon become rancid, and unfit for medicinal use.

590. CEREVISIÆ FERMENTUM. BEER YEAST. The ferment obtained in brewing beer. It is viscid, semi-fluid, frothy, exhibiting under the microscope numerous round or oval confervoid cells, which are known by the name of *Torula Cerevisiæ*, but which are really a peculiar condition of *Penicillia* and other moulds.

Med. Prop. and Action. Stimulant and antiseptic in doses of fl. oz. ½–j. It is chiefly used externally in the form of poultice, prepared by mixing yeast (fl. oz. vj.) with water at 100° (fl. oz. vj.), stirring in wheaten flour oz. xiv., and placing the mass near the fire till it rises.

591. *Therapeutic Uses. In Typhus and Typhoid Fevers*, yeast has been highly extolled by Dr. Stoker,[1] Dr. Lamprey,[2] and others; but it has never come into general use. The following is the formula employed by Dr. Lamprey:—℞ Cerevis. Ferm. f℥x., Camphor gr. xxx., Spt. Ether Nit. f℥iv., M. Dose, fl. oz. j. every 1, 2, or 3 hours, according to the severity of the symptoms. He states that he found a similar combination very serviceable in *Dysentery*, removing the fetor of the stools and diminishing their frequency. It has also been advised in malignant forms of *Scarlet Fever*, but in this, as well as in the preceding cases, it is a remedy of minor value.

592. *In Diabetes*, it was proposed as a remedy, on chemical grounds, by the late Dr. Herapath, and he mentions a case in which he employed it (a tablespoonful twice or thrice daily) with satisfactory results; but Dr. McGregor[3] gave it a trial in two cases, but had to discontinue it on account of the painful tympanitic distension it caused.

593. *To Fetid, Sloughing, Gangrenous*, and *Cancerous Ulcers*, the yeast poultice is a valuable application. It tends to destroy the fetor, arrests the sloughing, assists in the separation of the dead parts, and establishes a healthy granulating surface. It occasionally produces great pain.

594. *In Furunculus or Boils*, Mr. Mosse found that yeast, in doses of a tablespoonful twice daily for adults, exercised a most beneficial influence. By this means he often effected a rapid and complete cure.

595. CERII OXALAS. OXALATE OF CERIUM. $CeC_2O_4.3H_2O$. Obtained as a precipitate, by adding a solution of Oxalate of Ammonia to a soluble salt of Cerium.

Med. Prop. and Action. Sedative and tonic. This, and the salts of

[1] On Continued Fever, Dublin, 1829.

[2] Dub. Quar. Journ., Aug. 1849.

[3] Cited by Dr. Pavy.

cerium, were introduced in 1854 by Prof. Simpson, of Edinburgh, as efficient substitutes for bismuth, nitrate of silver, and hydrocyanic acid, to all of which they approximate nearly in their action on the system. The nitrate and oxide of cerium have been also employed in medicine, but the oxalate is the salt which has been found most generally useful.

Dose:—Of the Oxalate, gr. j.–ij. in the form of powder or pill.

596. *Therapeutic Uses. In Chronic Intestinal Eruption*, a peculiar and intractable form of disease for which arsenic and nitrate of silver are generally prescribed, Prof. Simpson employed the salts of cerium with marked advantage. *In Irritable Dyspepsia* attended with *Gastrodynia*, *Pyrosis*, and *Chronic Vomiting*, its exhibition was attended with satisfactory results. *In the Vomiting of Pregnancy*, it afforded prompt relief. Further testimony in favour of the oxalate, especially in the latter condition, is adduced by Dr. C. Lee [1] and Dr. Waring-Curran.[2] The latter administered it thus:—℞ Cerii Oxal., Ext. Lupuli āā gr. xxiv., M. ft. pil. xij. Cap. j. ter in die. At the same time he prescribes a mixture containing Potas. Bromid. gr. x., T. Cinchon. Flav. and Spt. Ammon. Arom. These pills and mixture he has found the most successful plan of treatment. Dr. Tilt (p. 326) speaks of it as an uncertain remedy, but adds that he has occasionally found it invaluable in checking *Sickness in Uterine Disease*. It seems well worthy of further trials.

597. *In Epilepsy, Chorea, and other allied Convulsive Diseases* in which the nitrate of silver is generally employed, it deserves a trial; for, as Prof. Simpson remarks, it is certainly attended with this advantage, that at the same time that it acts as a tonic and sedative, its use may be persevered in without any fear of discoloration of the skin.

598. Cetaceum. Spermaceti. A peculiar unctuous substance, obtained from the head of the Sperm or Spermaceti Whale, Physeter macrocephalus, *Linn.*, which inhabits the Pacific and Indian Oceans. It is composed almost entirely of pure cetin.

Med. Prop. and Action. Demulcent and emollient. It was formerly considered to have many virtues, but it is almost inert. Its chief, if not only use, is as an ingredient in Ung. Cetacei (Spermaceti oz. v., White Wax oz. ij., Almond Oil Oj.), a soothing application for blistered or abraded surfaces.

599. Cetraria Islandica. *Achar.* Iceland Moss. A lichen of the mountains of Northern Europe.

Med. Prop. and Action. Demulcent, nutritive, tonic, given in the form of decoction (oz. j., Aq. Oj.½, boiled to Oj.) in doses of fl. oz. iv. or more;

[1] Amer. Jour. of Med. Sci., Oct. 1860, p. 391.

[2] Med. Press, July 14, 1869.

or in that of jelly obtained by subjecting the decoction to further boiling. In addition to a large proportion of starch, it contains a bitter crystallizable principle, *Cetrarin* or *Cetraric Acid*, which gives a disagreeable taste to the above preparations; it is best extracted by washing the lichen in a weak solution of potash (1 part to 300 of water). Antiperiodic properties have been assigned to Cetrarin, but little certain is known of its powers; doubtless it is in this principle that much of the tonic property of the lichen resides: hence, though unpalatable, it is undesirable that it should be removed too thoroughly.

600. *Therapeutic Uses. In Scrofulous and Scorbutic cases, when accompanied by much debility; and also in convalescence from Diarrhœa, Dysentery, and other exhausting diseases*, Iceland moss, in the form of decoction or jelly, is regarded as a valuable tonic, and as a highly nutritive aliment.

601. *In Phthisis*, it has been much lauded, not only as a nutritive aliment, but as an expectorant. Sir A. Chrichton[1] speaks highly of its good effects in improving the expectoration, in diminishing the frequency of the cough, and rendering it more easy; in calming the irritability of the patient, and in preventing or moderating hectic fever. Many doubt its expectorant properties; they have doubtless been exaggerated.

602. *In Intermittent Fevers*, cetrarin has been proposed as a substitute for cinchona. Dr. Christison (p. 308) says that gr. xvj., in divided doses, have seemed sufficient to check the disease, but of its real value little is known.

CHAMOMILE. See ANTHEMIS NOBILIS.

603. CHIRATA. Chiretta. The herb and root of Ophelia Chiretta, *D.C. Nat. Ord.* Gentianaceæ. *Hab.* Temperate Himalaya east of Kumaon. Many varieties are met with in India. (See Indian Ph. p. 149.)

Med. Prop. and Action. Bitter tonic, and stomachic. It is closely allied in its medicinal properties to gentian; like it, it promotes digestion, improves the appetite, and gives a tone to the system, without producing much stimulant effect, or causing constipation. It contains a resin, and a yellow bitter matter, on which the activity of the plant depends.

Dose:—Of the Infusion (Chirata oz. ¼, Water at 120° fl. oz. x.), fl. oz. j.–ij. *Of the Tincture* (Chirata oz. ij ½, Proof Spirit Oj.), fl. drm. ½–ij. *Of the Compound Tincture*, Ind. Ph. (Chirata oz. j. ¼, Orange Peel oz. ¾, Cardamom Seeds oz. ¼, Proof Spirit Oj.), fl. drm. j.–ij.

604. *Therapeutic Uses*, the same as Gentian, *q. v.*

605. CHLORAL. A dense, oily, colourless, pungent-smelling liquid, $C_4HCl_3O_2$, or C_2Cl_3OH, obtained by the action of dry chlorine gas on anhydrous alcohol. Mixed with water it becomes the Hydrate of Chloral, and then exists in the form

[1] Lond. Med. Journ., vol. x. p. 299.

of a white solid substance, with a pungent peculiar odour resembling that of a ripe melon. It is in the latter form only, that of the hydrate, that it is employed in medicine.

Med. Prop. and Action. Hypnotic and anæsthetic. It was first brought to notice in these characters by Dr. Liebreich, of Berlin, and its claims have been carefully examined by Dr. B. W. Richardson,[1] who draws, amongst others, the following conclusions:—1. Deep and prolonged narcotism can be safely produced by the hydrate of chloral. 2. During a portion of the period of narcotism there may be complete anæsthesia, with absence of reflex actions, and a condition in which every kind of operation fails to call forth consciousness. 3. During the narcotism there are intervals of apparent exalted sensibility. 4. During the narcotism there is invariably reduction of temperature. 5. The hydrate produces muscular relaxation, which extends to the muscles of volition, and alike to the iris and the muscular arterial system. From the condition of the muscles after death, we may infer that this paralysis is, in part, due to change within the muscular structure itself. 6. The action on the nervous system is primarily on the sympathetic ganglia, afterwards on the cerebrum, and finally on the heart. 7. No bad results follow recovery. 8. In fatal cases, the functions destroyed are, *a*, the cerebral; *b*, the voluntary muscular; *c*, the respiratory; *d*, the heart. 9. In small proportions it arrests, in some degree, the coagulation of the blood, and in large quantities, stops the process of coagulation altogether. In large quantities, it also destroys the blood corpuscles, and produces general destruction of blood, but the dose required to produce extreme narcotism need not be so large as to lead to serious derangement of blood. The great practical fact with regard to the hydrate of chloral is, that by its agency, administered internally in proper doses (*infra*) we can induce a state of stupor or sleep which may be made to extend over five or even seven hours with comparative safety; and that in this state there is an interval of perfect insensibility to pain; but the interval is short, and for the greater part of the period, the sensibility is either natural or exalted. In the case of every animal, from the lowest to the highest, observes Dr. Richardson, the sleep is induced, not merely without pain, but with an expression of pleasure; the sleep is gentle, seems to be attended with no symptom of distress, and leaves no serious evil behind. Nausea is, however, occasionally felt after recovery. Mr. Spencer Wells,[2] in his trials with the hydrate, did not find its operation so uniform or beneficial. In one case it failed to produce sleep, in another it caused such burning pain in the throat and stomach that it had to be discontinued, and in another it induced considerable excitement, restlessness, and incoherent talking for a short period; yet, he adds, "I have seen enough to justify the hope that it will prove to be of valuable assistance in cases where we wish to obtain rapid relief to pain, and at the same time to lower the temperature of the body, while we are anxious to avoid the headache, sickness, or loss of appetite, and the rise of temperature which often counterbalance the good effects of opium." Dr. J. B. Tuke,[3] after extensive experience in its use in insanity, concludes that chloral possesses the following advantages over the hypnotics generally employed:—1. It is more uniformly certain in its action. 2. It has no depressing influence. 3. It does not cause constipation. 4. It does not produce nausea; and 5. Its effects are more lasting. Notwithstanding the strong testimonies in favour of the hydrate from many independent sources, it appears certain that it is not without its drawbacks; *e.g.*, in two cases reported by Dr. H. Maund,[4] it caused such frightful dreams, that it had to be discontinued; in another,[5] it induced insensibility with

[1] Med. Times and Gaz., Oct. 30, and Nov. 6, 1869.

[2] Ibid., September 18 and October 2, 1869.

[3] Lancet, March 26, 1870.

[4] Ibid., March 19, 1870.

[5] Edin. Med. Journ., Jan. 1870, p. 669.

coldness and rigidity of the extremities, such as is occasionally observed in chloroform narcosis; and in others, as that mentioned previously in Mr. Spencer Wells's practice, it induced mental excitement, restlessness, incoherence of speech, &c. These effects, however, in each case were transitory, and notwithstanding their existence, we are justified in regarding it as one of the most valuable hypnotics in the materia medica. One great drawback to its use is the difficulty of ascertaining the exact dose in each case, but Dr. Tuke considers that this may be obviated by commencing with half-drachm doses, and increasing them by ten grains till the limit is found. Its pungent taste is an objection to some. The theory of its *modus operandi* is, that the hydrate of chloral, taken into the stomach, is rapidly absorbed, and coming into contact with the alkaline constituents of the blood, is decomposed into chloroform and formic acid, and that it is to the former thus generated in the system, its effects on the organism are due; in the words of Dr. Richardson, "The phenomena observed correspond with those observed under chloroform, and the balance of evidence is that they are the result of the action of chloroform."

Dose.—The average dose for an adult, gr. xxx.–lx. As a general rule, gr. xxx. of the Hydrate is equal in effects to gr. j. of opium. For young children, Liebreich recommends gr. vij. as a dose. For adults, if short intervals of sleep are required, gr. xxv.–xxx. suffice, and may be repeated every two or three hours, by which a safe and continuous action may be maintained. In cases where more determinate effects are demanded at once, gr. lx.–cxx. may be given. Dr. Richardson prefers moderate and frequently-repeated doses to one large one. It should be given in solution freely diluted (gr. x. ad Aq. fl. oz. j.) for it is pungent if not well diluted, and a little tincture of orange peel is advised as an adjunct. Sir J. Y. Simpson used it in the form of enema. Syrup is a good vehicle. It has also been employed hypodermically and by inhalation, but experience is wanted to prove its utility when thus employed. Externally it has been advised as an anodyne; but in one case of neuralgia, in which it was thus employed by Dr. Richardson, it caused some irritation, with no relief to the pain. Mr. Lawson Tait [1] calls attention to it as a valuable adjunct to chloroform and opium.

In Poisoning by Chloral, strychnia, according to the experiments of Liebreich, acts as a speedy and complete antidote. The reverse does not hold good, because the action of strychnia is too rapid, fatal tetanus supervening before the chloral can be brought fairly into action.[2]

In Midwifery, chloral promises to be of considerable importance. Its effects have been observed in eleven cases by Mr. E. Lambert,[3] who draws the following conclusions:—"1. Chloral is an agent of great value in the relief of pain during parturition. 2. It may be administered under favourable circumstances during and at the close of the second stage, with the result of producing absolute unconsciousness, in the same sense in which we understand unconsciousness under chloroform. 3. When thus given successfully, it has this advantage over chloroform, that it requires no interference with the patient. 4. It is desirable to retain chloroform in the position which it at present occupies in midwifery, and to reserve for the agency of chloral the first stage of labour. If, however, chloral or some agent having analogous properties, be found successfully to relieve the pain of uterine contraction, the use of chloroform will be restricted to a lesser period of the duration of labour, or to the facilitation of manual or instrumental interference. 5. It is demonstrated that a labour can be conducted from its commencement to its termination, without any consciousness on the part of the patient, under the sole influence of chloral. 6. The exhibition of chloral in no wise interferes with the exhibition of chloroform. 7. The proper mode of exhibiting chloral is in fractional

[1] Med. Times, Feb. 12, 1870.
[2] Lancet, March 12, 1870, and Med. Times, Dec. 18, 1869.
[3] Edinburgh Med. Journ., Aug. 1870.

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doses of gr. xv. every quarter of an hour until some effect is produced; and according to the nature of that effect the further administration is to be regulated. Some patients will require doses of drm. j.; and it is better to produce an anæsthetic effect by drm. iij. given in the space of two hours, than by drm. j. given singly. 8. The effects of chloral are continued beyond the period of complete parturition; and the repose experienced by the patient after her labour is one of the favourable circumstances to be noted in considering its application to childbirth. 9. Any stimulating effects, in the form of general excitability, occasionally observed during the administration, have passed away very rapidly. 10. Chloral not only does not suspend, but rather promotes, uterine contraction, by suspending all reflex actions which tend to counteract the incitability of the centres of organic motion. 11. Labours under chloral will probably be found to be of shorter duration than when natural; for unconscious contractions appear to have more potent effects than those which are accompanied by sensations of pain. 12. Experiments are required in order to determine whether there exists the same antagonism between ergot and chloral as is known to exist between strychnia and chloral. 13. The general conditions under which chloral is to be administered are the same as those which regulate the administration of chloroform, and the rules laid down by Sir James Simpson in connection with this subject must be rigidly adhered to."

606. *Therapeutic Uses.* These are at present *sub judice*, at least in a great measure; but the following suggestive remarks of Dr. Richardson are worthy of the attention of every practical therapeutist:—

α. *As the Hydrate produces sleep*, it may be employed in cases of *Sleeplessness* and excitement where opium or other narcotics are objectionable. It may thus be used in *Acute Mania*, in *Delirium Tremens*, and possibly during *Hysterical Excitement*. (Cases of *Delirium Tremens* successfully treated by it, are recorded by Mr. H. T. Chapman[1] and Mr. J. H. Barnes.)[2]

β. *As it relieves pain*, it may be used as a substitute for opium, or independently, in cases of suffering from acute pain, as in *Neuralgia*, *Rheumatism*, and *Cancer*. It may also be used in surgical cases attended with much suffering, and may be carried in such cases, when required, to the extent of rendering a painful part sufficiently insensible to admit of its being altered in position or readjusted, *e. g.*, *Compound Fractures*. In *some Painful Diseases of the Joints*—as in *Scrofulous Disease of the Knee-joint*—it may thus also prove of the greatest service.

γ. *As it reduces the animal temperature*, it may be tested with every probability of advantage, in cases where there is a rapid increment of heat—fever—with restlessness and excitement, *e.g.*, *Surgical Fever*. Where an accident or surgical operation is succeeded by heat of body, with constant pain, sleeplessness, and tendency to delirium, Dr. Richardson remarks that he can imagine no treatment better than the administration of moderate and frequently-repeated doses (gr. xx.–xxx. every two hours) of the hydrate. "Under its influence, sleep would be

[1] Med. Times and Gaz., Oct. 2, 1869. [2] Lancet, Nov. 27, 1869.

induced, pain and excitement relieved, temperature brought down, and undue waste suspended. What is more, the tendency of the agent is to maintain the fluidity of the blood, and thus to prevent the most dangerous of all occurrences in acute disease, separation and deposition of fibrine in the circulatory system.

δ. *As it produces extreme muscular relaxation*, it may be reasonably employed in various cases, medical and surgical, where it is necessary to overcome muscular resistance or spasm. Thus it may be employed in *Tetanus*, *in the Passage of Gall-stones*, and specially in *Strangulated Hernia*. In the last named it would act, not only by rendering reduction by the taxis easy, to the avoidance of an operation, but should this prove unavoidable, it would tend to remove the attendant pain, and be of service to the operator by sustaining relaxation. Though not specified by Dr. Richardson, the hydrate is worthy of a trial in facilitating *Reduction of Dislocations*.

607. Amongst the diseases in which the hydrate has been subjected to the test of clinical observation, and in which more or less benefit has attended its use, are *Insanity*, especially *Melancholia*, *Puerperal Mania*, *Delirium Tremens*, *Chorea*, *Tetanus*, *Asthma*, *Convulsive Coughs*, *Neuralgia*, *Rheumatism*, and *Typhus Fever*. In none of these cases does chloral appear to exercise any marked control apart from its hypnotic effect, but in all cases where this was obtained in a kindly manner, the sound and refreshing slumber has been found to be followed by amelioration of the symptoms, and in many cases by eventual cure.

608. Chlorocodide, a bitter principle contained in opium, formed in the process of obtaining apomorphia from codeia.

Med. Prop. and Action. Similar to, if not identical with, those of codeia, salivation and dilatation of the pupils being the symptoms most easily produced; larger doses causing extreme restlessness; and very large doses proving fatal after a state of mixed paralysis and spasm, both tonic and clonic; consciousness being unaffected. Its only property which promises utility in medicine is its extreme bitterness, almost equal to that of strychnia, while the dose of chlorocodide which is required to produce tetanus must be enormous compared with the dose of strychnia required. Gr. ¼, taken by mouth, causes an uncommon sense of tonicity in the abdomen. Quinia, which is so often given as a stomachic, is a much less intense bitter than chlorocodide, and tends to produce fulness and aching of the head, which the latter does not. (Dr. S. J. Gee.)[1]

609. Chlorum. Chlorine. Chlorinium. Cl = 35·5. At ordinary temperature it is a pungent suffocating gas; but by a pressure of four atmospheres at 60°, it is converted into a yellow liquid. Sp. gr. 1·33.

[1] St. Bartholomew's Hosp. Rep., 1859, vol. v. p. 215.

Med. Prop. and Action. Powerful irritant of the bronchial mucous membrane, causing, when inhaled, a sense of suffocation, violent cough, and spasm of the glottis. Properly diluted, it has proved useful in some pulmonary affections. Its chief value, however, is as a deodoriser. It effectually destroys the odour of sulphuretted hydrogen and other noxious vapours arising from the decomposition of animal and vegetable matters. Prof. Faraday[1] recommends the following mode of application:—One part of common salt, and one part of the binoxide of manganese having been placed in a convenient vessel, there is to be added two parts of sulphuric acid, previously mixed with one part by weight of water. The salt should be bruised down, previous to being mixed with the manganese, and the acid and water should be mixed in a wooden bowl, and allowed to stand for some hours, that the heat produced by their combination may be dissipated before they are poured on the other ingredients. Common red vans of a flat form are best suited for the fumigation. An apparatus has been devised by Prof. Stone,[2] by which a supply of chlorine can be continuously supplied, and the amount of the gas exactly regulated. It appears to be well adapted for use in a sick room or hospital ward, and having many advantages over the plan advised above by Faraday, should have the preference where available. The great drawback of chlorine is its smell, which is very offensive to some persons. The disinfectant properties which have been claimed for it are less satisfactorily established than its powers as a deodoriser, but some strong evidence of its action as a *prophylactic against Scarlet Fever* and of localizing the scarlatinal poison, is adduced by Dr. Peter Hood.[3] It has been proposed as an antidote *in Poisoning by Sulphuretted Hydrogen* and *Hydrocyanic Acid*. For the purpose of inhalation the *Vapor Chlori*, B. Ph., is a convenient form. It is prepared by placing Chlorinated Lime (oz. ij.) in a suitable apparatus, and moistening with water; the generated vapour (chlorine) is then inhaled.

610. *Therapeutic Uses. In Bronchitis*, Dr. Toulmouche[4] has adduced strong evidence of the value of chlorine inhalations, but subsequent experience has not tended to sustain his favourable statements. Still, in some cases unattended with emphysema, it may be deserving of a trial. *In Phthisis*, it was also advocated by M. Gannal, but in the trial with it by Dr. Snow[5] in a few patients in various stages of phthisis, no benefit was observable, even when the inhalation was continued for some weeks. *In Gangrene of the Lungs*, it was found very beneficial by Albers. *In Aphonia following an ordinary cold without organic lesion*, Dr. Panacoast[6] found chlorine inhalation very serviceable in two instances. In all these cases the *Vapor Chlori*, B. Ph. (*ante*), may be employed, or from 10 to 50 drops of Liq. Chlori in hot water may be used, inhaled through an ordinary inhaler.

611. *In Chronic Diseases of the Liver*, chlorine vapour baths are advised by Mr. Wallace.[7] He found great benefit from them, and directs the patient to remain in the bath (at an average temperature of 150° F.) for about half an hour at a time. It is deserving of a trial in long-standing cases.

[1] Journal of Arts and Sciences, vol. xviii. p. 92.
[2] Lancet, Aug. 31, 1867.
[3] Brit. Med. Jour., Feb. 6, 1869.
[4] Gaz. Méd., June, 1838.
[5] Lond. Journ. of Med., Feb. 1851.
[6] Ranking's Abstract, 1851.
[7] Lancet, 1831–2, vol. i. p. 859.

612. CHLORI LIQUOR. Solution of Chlorine. Chlorine gas dissolved in water, and constituting 0·006 of the weight of the solution. Sp. gr. 1·003.

Med. Prop. and Action. The concentrated solution is an irritant poison, and caustic; slightly diluted, it is a powerful counter-irritant; when largely diluted, it is a tonic and stimulant. As a gargle or lotion, an average strength is 1 part of the solution to 8 of water. Salivation is said to have followed its prolonged use. Like the gas, it destroys vegetable colours, and is an excellent deodorising agent. It should be kept in a well-stoppered green glass bottle in a cool dark place.

Dose.—℥x.–℥xx., freely diluted.

613. *Therapeutic Uses. In Scarlatina*, the solution of Chlorine has been used with great advantage. Amongst others, Drs. Taynton and Williams[1] speak highly of it, and Dr. Tweedie[2] states that he has derived great benefit from the following mixture:—℞ Liq. Chlorin. f℥j., Syr. Limon. f℥ij., Aquæ f℥viij., M. Dose for a child, gutt. x.–xij., every six or eight hours. The solution should be fresh. A diluted solution also forms an excellent gargle for the sore throat which accompanies this disease.

614. *As a preventive to the infection of Puerperal Fever*, its efficacy has been established by Dr. Semelweiss,[3] of Vienna. At one period a large number of cases of puerperal fever occurred in Vienna, and they were supposed to arise from the want of proper precautions in the surgeons and students engaged in post-mortem examinations of puerperal subjects. Dr. Semelweiss therefore insisted on the necessity of their washing their hands in a solution of chlorine, prior to and after every such post-mortem; and the resultwas, that the rate of mortality was reduced from 30 to 7 per month, which was about the ordinary average. It is a precaution which should never be neglected.

615. *Gastro-enteric Irritation*, according to the experience of Mr. Mann,[4] is cured or greatly ameliorated by Liq. Chlori, in doses of f℥j. daily, in water.

616. *In Aphthæ, Stomatitis*, and *Cancrum Oris*, the solution of chlorine, incorporated with equal parts of honey, is an efficacious application. *In Ptyalism*, a weak solution of chlorine (1 Liq. Chlor. to 8 of water) proves very serviceable, correcting the fœtor and slightly diminishing the discharge. *In Cynanche Maligna*, its internal use has been attended with benefit. A solution (fl. oz. j., Aq. fl. oz. v.) is a serviceable gargle, not only in this affection, but in *Cynanche Tonsillaris*.

617. *To Cancerous and other Ulcers, with a fetid discharge*, a diluted solution (*ut supra*) is useful in correcting the offensive

[1] Med. Gazette, vol. iv.
[2] Cyclop. of Pract. Med., vol. iii. p. 655.
[3] Med. Chir. Transactions, vol. xxxii.
[4] Med. Gazette, May 24, 1850.

odour. The great value of chlorinated solutions to *Suppurating Wounds* has been clearly shown by Dr. Hervieux.[1] He advises the permanent application of a sponge steeped in the chlorinated solution, and under its use he states that severe suppurating wounds are soon changed into healthy sores. It is well worthy of a trial.

618. CHLOROFORMUM. CHLOROFORM. TERCHLORIDE OF FORMYLE. $CHCl_3$. A limpid, colourless, volatile liquid, of an agreeable ethereal odour and sweet taste. Sp. gr. 1·49. Dissolves in alcohol and ether in all proportions, and slightly in water, communicating to it a sweetish taste.

Med. Prop. and Action. Inhaled in the form of vapour, anæsthetic; taken internally, sedative and anti-spasmodic. Taken in small medicinal doses (♏iij.–vj.), suspended in mucilage, it produces little sensible effect beyond a sensation of warmth in the stomach, together with the relief, in many instances, of irritability or spasm of that viscus, should such exist. It has been thought that narcosis could not be induced by the introduction of chloroform into the stomach, but this is disproved by the following experiment by Dr. Anstie (p. 359) on himself:—On an empty stomach he swallowed ♏xlv. of chloroform suspended in oz. 1½ of mucilage. Great warmth of the epigastrium, and a feeling of flushing all over the body succeeded almost at once; five minutes after taking the dose, the pulse was throbbing 100 per minute, and the heart beating with uncomfortable violence, and there was decided confusion of mind. Five minutes later he experienced much nausea, and the pulse became slower, but at this point he fell into a state of unconsciousness. On recovering his senses he found that it was 46 minutes from the time of commencing the experiment. For nearly two hours after this, he remained in a state of great discomfort, shivering, nauseated, and with aching pains in the head and limbs, which sometimes assumed the sharpness of a twinge of neuralgia. It was some time also before he recovered the full use of his limbs. A case in which a drachm swallowed proved fatal to a child, is recorded by Taylor.[2] The addition of a small proportion of alcohol renders the operation of chloroform far more certain and manageable; and for internal use, therefore, the officinal spirit of chloroform, otherwise Chloric Ether, is far preferable to chloroform *per se*. Externally applied, undiluted, it acts as a rubefacient; diluted, as an anodyne.

Dose:—For internal administration, of Chloroform ♏iij.–x. *Of the Spirit (Chloric Ether)* (Chloroform fl. oz. j., Rect. Spirit fl. oz. xix.), ♏xx.–lx. *Of the Compound Tincture* (Chloroform fl. oz. ij., Rect. Spirit fl. oz. viij., Comp. Tinct. of Cardamoms fl. oz. x.), ♏xx.–lx. For external use only, *Liniment of Chloroform* (Chloroform and Camphor Liniment āā fl. oz. ij.) For doses suitable for anæsthetic purposes, see *infra*. "Gelatized Chloroform," prepared by incorporating 1 part of chloroform and 2 parts of white of egg, is a good form for external use.

Dr. W. Marshall[3] has shown that, as an anodyne, a combination of chloroform and opium is more prompt and certain in operation than either agent given singly, *e.g.*:—℞ Chloroformi ♏x.–xx., T. Camph. Co. ʒj.–ʒij., vel Liq. Opii Sed. ♏x.–xx.–xl., Mucilag. fl. oz. j., M., ft. haust.

From the researches of Dr. Waller[4] it appears that chloroform possesses

[1] Brit. and For. Med. Chir. Rev., Jan. 1861.

[2] On Poisons, p. 740.

[3] Glasgow Med. Journal, May, 1869.

[4] Practitioner, Dec. 1869.

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great advantage over alcohol or water, as a solvent of alkaloids and other substances intended for external application, as these chloroformic solutions applied to the skin are quickly absorbed, and produce local and general results according to the substances employed, whereas alcoholic and aqueous solutions were found to be either not at all, or very slowly absorbed.

Chloroform is one of the principal ingredients in the popular anodyne and narcotic medicine called Chlorodyne. According to Mr. Squire,[1] the following is the probable composition of chlorodyne:—Chloroform oz. iv.; Rectified Spirit oz. iv.; Treacle oz. iv.; Extract of Liquorice oz. iiss.; Muriate of Morphia grs. viij.; Oil of Peppermint ℥xvj.; Syrup xvij.½ oz.; Prussic Acid (2 per cent.) oz. ij. Dose, ℥v.–x.

619. *As an Anæsthetic*, Chloroform was first discovered and described by Soubeiran, in 1831, and by Liebig, in 1832; and its composition was first accurately ascertained by Dumas, in 1835. None of these chemists, however, appear to have been aware of its anæsthetic properties; the honour of this great discovery is due to Sir J. Y. Simpson, of Edinburgh, in 1847. It certainly deserves to rank as the most important improvement in modern medicine or surgery; a few drops inhaled producing such complete insensibility, that the most painful operations of surgery can be performed without consciousness or pain on the part of the patient. Sulphuric ether, originally discovered in America to be a powerful anæsthetic agent, was exciting the attention not only of the profession, but of the public, when chloroform was introduced by Dr. Simpson, and was almost immediately substituted in its place. The advantages of chloroform over ether were found to be as follows:—1. The effect was more complete and direct; 2. The quantity required was smaller; 3. The odour was more agreeable and less irritating; 4. The effect produced was more permanent; 5. Recovery took place decidedly quicker than when ether was employed. The relative advantages of ether and chloroform were carefully investigated by the Committee on chloroform appointed by the Medico-Chirurgical Society.[2] In their Report they state that ether is slow and uncertain in its action, though it is capable of producing the requisite insensibility, and is less dangerous in its operation than chloroform. In many respects its action is similar to that of dilute chloroform. The primary stimulating effect of ether on the heart's action is greater and of longer duration, and the subsequent depression of the heart's action is not so great as that produced, at the same degree of insensibility, by chloroform. On the whole, however, the Committee concur in the general opinion which, in Great Britain, has led to the disuse of ether as an inconvenient anæsthetic. They find a mixture of ether and chloroform to be as effective as pure chloroform, and a safer agent when deep and prolonged anæsthesia is to be induced; though slow in its action, it is sufficiently rapid in its operation to be convenient for general use. They suggest for use a mixture composed of ether three parts, chloroform two parts, alcohol one part (by measure), on the grounds that ether and chloroform blend uniformly when combined with alcohol, and the constituents escape equably in vapour. (See ANÆSTHETICS, part ii.)

620. Chloroform, when first inhaled, gives rise to exceedingly pleasant sensations, and a rapid flow of thoughts and images, resembling an agreeable dream, until, as the dose is increased, these become confused and incoherent. Dr. Snow has divided its operation into five degrees or stages.

The First Degree includes the slighter effects which are experienced by the patient, whilst he retains sufficient consciousness to appreciate his situation, and a knowledge of what is occurring around him.

The Second Degree is a dreaming or wandering state of mind, which is observed when the patient is silent, immediately preceding the loss of consciousness.

[1] Comp. to Brit. Pharm. p. 58. [2] Lancet, July 9, 1864.

The Third Degree. In this there are no voluntary movements, articulate sounds, nor anything indicating the presence of ideas ; but there may be involuntary muscular contractions or rigidity.

The Fourth Degree is a state of absolute relaxation of the voluntary muscles, in which no contraction can be excited in them. The breathing is sometimes stertorous in this stage.

The Fifth Degree is a state of impeded respiration observed previous to death in animals killed by chloroform.

These various degrees run gradually into each other, and cannot always be clearly distinguished ; it is seldom necessary, however, to carry the narcotism beyond the third degree, even in the most severe operations. The pulse is generally somewhat accelerated during the inhalation. The urine of persons subjected to chloroform and ether inhalation has been found to contain almost invariably a certain amount of sugar. For some interesting remarks on this point consult Dr. Pavy (p. 148, seq.) and Dr. Anstie (p. 367.)

621. *Observations on its Use. Preliminaries.* 1. Unless very feeble, the patient should fast for three hours before the inhalation.

2. Twenty minutes before the inhalation, a dose of brandy should be given in water—a teaspoonful to a child, one or two tablespoonfuls to an adult.

3. The patient should, whenever convenient, be wholly undressed, and, invariably, everything tight about the chest or neck should be removed.

4. If possible, let the patient be in the recumbent posture, and on his back. Let the chest and neck be well exposed. Whatever form of apparatus be used (a piece of lint, a handkerchief, and Skinner's inhaler, are perhaps among the best), there is little or no risk with the first inhalations ; and the patient may be instructed "to draw full breaths." So soon as any effect is manifest, you must be more cautious. Watch carefully the respiratory movements, and the colour of the cheeks, lips, and eyes. When convenient, keep your finger on the wrist-pulse ; but this is not essential. If the patient struggle much, proceed with increased caution.

Signs of Danger. Lividity of Face. Remove the chloroform, and let the patient have air. Open the mouth, and draw out the tongue.

Stertorous Respiration. Stop the chloroform, open the mouth, draw forward the tongue, and watch carefully.

Irregular Gasping Respiration. Stop the chloroform, splash cold water on the face, and flip with the towel.

Feeble Pulse.—Proceed with great caution. If the feebleness amount to almost complete failure, stop the administration.

Death-like Pallor. This, the most dangerous sign of all, must be met without a moment's loss of time. Flip with a wet towel on the cheeks, chest, abdomen, and limbs. Open the mouth, and if, as is usual, breathing has ceased, begin artificial respiration at once. With outspread palms, press the front of the chest forcibly down, whilst an assistant, at the same time, presses the abdomen. Make these movements not oftener than fifteen times in the minute. Air should be heard to enter the trachea. Whilst this is being done, let assistants continue most vigorously to flip the skin in all accessible positions—it cannot be done too much. If the collapse continue, let an ounce of brandy be injected into the rectum. Do not remit the artificial respiration until the patient is quite rallied. If the collapse persist, the efforts at rallying should be persevered with for an hour at least. If a large catheter be at hand it may be well to introduce it into the trachea, and inflate the lungs by the mouth. Remember that irregular inspiratory efforts may occur long after death in all other respects has apparently taken place. Do not be deceived by them, but continue your efforts.

Remarks. The plan of artificial respiration is, all things considered, the most convenient. The catheter in the trachea is, when practicable, the most effectual plan. Its introduction is not difficult. If the artificial inspirations be made too rapidly they defeat their own object; nor

should they be too forcibly made. If it be needful to continue them more than a few minutes, the operator will find it convenient to kneel astride the patient's trunk.

The administrator ought always to have with him brandy, an enema-syringe, and a large flexible catheter. He ought always, when convenient, to require his patient to be undressed, since it may be very desirable to have the surface accessible.

By "flipping with the towel," is meant twitching the corner of a damp towel in such a manner as to cause the sharpest pain possible. It is by far the most effectual method of awakening a chloroform patient, and should, in case of danger, be practised instanter, and at several parts at once. Its effect is to excite locally the capillary circulation, and indirectly to stimulate the respiratory muscles, and even the heart itself.[1]

On the appearance of any sign of danger, a measure often attended with the best effect, and which should never be neglected, is to place the patient on the left side.

622. *Cautions and Contra-indications.* 1. Do not be too anxious to obtain a rapid effect. 2. Be careful that a large proportion of atmospheric air be mixed with and inhaled at the same time as the chloroform. The proportion of chloroform to atmospheric air should not exceed 3½ per cent. For the purpose of insuring accuracy in the proportion, it is safer to administer the chloroform by an inhaler—*e.g.*, Snow's, Clover's, or Sansom's. 3. It should be given with great caution when extensive disease of the lungs or heart exists. 4. It should never be given when the pulse is weak and intermitting. 5. It is contra-indicated in poisoned conditions of the blood, as uræmia; and in acute cases of alcoholism, *e.g.*, delirium tremens. (Sansom.) 6. It should not be given in cases of advanced organic disease. 7. It is not advisable to induce profound insensibility during pregnancy. 8. It should never be employed without the presence of a medical man.

623. *Mode of administering Chloroform.* A plan commonly adopted is that which was first recommended by Prof. Simpson. A clean white handkerchief is to be folded funnel-shaped; into this the liquid is to be poured; it should at first be placed near the mouth of the patient; and, after a few respirations, over the mouth and nose. It is a good plan to allow the patient to hold the handkerchief, unless we desire to produce a deep state of narcotism, as it will fall from the hand when sleep commences. Another mode of administration proposed by Dr. Moir[2] and approved by Prof. Simpson, is to lay one single layer of a towel or handkerchief over the patient's nose and mouth, taking care not to cover the eyes, and to drop on this layer chloroform, drop by drop, until anæsthesia is sufficiently marked.

It may be doubted, however, whether, when complete anæsthesia is to be produced, these "simple" modes of administration are sufficiently safe for adoption. Dr. Snow proved that patients cannot breathe an atmosphere containing more than 5 per cent. of chloroform without danger. He objected strongly to the use of the handkerchief,[3] and the Committee of the Royal Medical and Chirurgical Society[4] state that 3½ per cent. should be the average amount, and 4½ per cent. the maximum proportion. It is true that the above-named committee state that an apparatus is not essential to safety, if due care be taken in giving the chloroform. Free admission of air with the anæsthetic is the one thing necessary, and guaranteeing this, any apparatus may be used. But Dr. Sansom[5] has shown that of eighty cases of death from chloroform, seventy-eight occurred after its administration on a towel, napkin, or sponge. There have been in all rather over 150 deaths from chloroform; in only about a dozen were precautions taken to insure the proper dilution of the

[1] Brit. Med. Journ. Jan. 1, 1870.
[2] Edin. Med. Journ., Dec. 1861.
[3] Med. Times, Nov. 20, 1847.
[4] Lancet, July 9, 1864.
[5] Med. Times, Oct. 17, 1863.

vapour. It is difficult to guarantee accurate dilution, except by using an inhaler, constructed expressly for that purpose.

624. *The advantages of chloroform in Surgery* have been ably enumerated by Professor Miller,[1] of Edinburgh. 1. It permits the performance of operations, which, either from mental agitation or extreme bodily pain, would otherwise be inexpedient. 2. It permits the performance of operations which would otherwise be impracticable, *e.g.*, deep-seated tumours of the neck, which require great nicety of manipulation, and much steadiness on the part of the patient. 3. It affords great relief to the operator as well as to the patient. 4. It affords the operator time for deliberate action—he has now no reason or excuse for hurrying over an operation. 5. It not only does not favour, but tends to save hæmorrhage, both during and after the operation. 6. It renders delicate dissections more simple and safe. Excepting the flow of blood, the anatomy is as plain as in a dissecting-room. 7. It lulls pain after operations, and may advantageously be employed, although inexpedient during the operation itself. 8. In operations on the skull and brain, anæsthesia is not contra-indicated. 9. Besides the above, there are other obvious advantages to the patient; viz., absence of alarm and of excitement and of shock, previous to the operation; freedom from pain during it, and during the arrangement and dressing of the wound; a greater readiness to undergo an operation, rendering this, therefore, because early, the more likely to prove successful; and the prospect, at all times, of a better recovery. 10. *In the examination of Injuries, in the operation of Sounding, in Irritable Stricture, in the reduction of Hernia and Dislocations*, and in many other cases, anæsthesia is of the greatest benefit, not only to the patient, but to the surgeon.

625. *Directions for its employment* are thus ably given by Dr. Snow:[2]—When voluntary motion is no longer apparent, in order to become informed respecting the state of the patient, the eyelid should be gently raised, touching its free border. If he look up, it is evident that narcotism has not exceeded the second stage. If no voluntary motion be excited, the third degree is probably attained; and, if the eye be turned up, this is pretty certain. But, notwithstanding this, if involuntary winking be occasioned by touching the edge of the eyelid, it is necessary to continue the vapour a little longer before the operation is commenced. In doing so, however, if the narcotism have already reached the third degree, and there is no particular rigidity or struggling, the vapour may be given in a more dilute form, or the inhalation may be intermitted for two or three inspirations at a time. In this way insensibility of the nerves is obtained, without increasing the narcotism of the nervous centres. As soon as the sensibility of the conjunctiva is abolished or so far blunted that the free edge of the eyelid, or the eye itself, can be touched without decided winking, the operation may be commenced, with confidence that there will be no pain, and no involuntary flinching to interfere with the operation. When there is struggling or great rigidity in the third stage, it is requisite to continue the vapour a little longer, till this state subside. If there be any approach to stertorous breathing, the inhalation should be at once suspended. Stertor, however, never commences till the patient is perfectly insensible. The time occupied in the inhalation is, usually, from two to three minutes. The operation having been commenced, the medical man having charge of the chloroform should carefully watch the patient's countenance, and if there be any sign of returning sensibility, a little more vapour should be given during the short time occupied in removing the limb. After the amputation is completed, the vapour need not be repeated until there is decided evidence of sensation. When the arteries to be tied are not numerous, it is sometimes unnecessary to repeat the inhalation. Generally, however, it is requisite to give a little chloroform at intervals, and if cold water have to be applied to stop the oozing of the blood, or the

[1] Surgical Experience of Chloroform, 8vo, 1848.

[2] Medical Gazette, Dec. 15, 1848.

flaps have to be united by sutures, it is advisable to keep the patient insensible until this is done.

The following are the rules for the use of chloroform in surgical operations laid down by the Committee of the Royal Medical and Chirurgical Society:—

With heart disease the anæsthetic may be given in any case which requires an operation, although when there is evidence of a fatty, weak, or dilated heart, great caution is demanded. Valvular disease is of less importance.

In phthisis, when an operation is unavoidable, the anæsthetic may be given with impunity.

For all operations upon the jaws and teeth, the lips, cheeks, and tongue, the anæsthetic may be inhaled with ordinary safety. By care and good management the patient may be kept under its influence to the completion of the operation. In these cases, blood, as it escapes, if not voided by the mouth, passes into the pharynx. If any small quantity find its way through the larynx it is readily expelled by coughing. In operations upon the soft palate, fauces, pharynx, and posterior nares, if sudden or severe hæmorrhage is likely to occur, it is not advisable to induce deep insensibility.

In cases requiring laryngotomy and tracheotomy, the anæsthetic may be employed with safety and advantage.

For operations upon the eye, involving the contents of the globe, the use of anæsthetics is open to objection on account of the damage which the eye may sustain from muscular straining or vomiting. If employed, profound insensibility should be induced.

In operations for hernia, and in the application of the taxis, the anæsthetic acts most beneficially. For most operations about the anus profound anæsthesia is positively demanded.

In the condition of shock or great depression, as after hæmorrhage, careful administration of the anæsthetic diminishes the risk of an operation.

In all cases other than those specially referred to, it is sufficient to state, so far as a mere surgical operation is concerned, that an anæsthetic may invariably be administered.

The continuous vomiting occasionally induced by, and following upon the inhalation of anæsthetics, may be injurious by consequent exhaustion, as well as by mechanically disturbing the repair of a wound. With this reservation, they do not appear to interfere with the recovery of patients from surgical operations.

626. *The injurious and fatal consequences which occasionally attend upon the Inhalation of Chloroform:*—1. *Vomiting.* This has been mostly observed when the inhalation has been practised at an early period after the patient has partaken of a full meal, but it sometimes occurs without any assignable cause. 2. *Convulsions.* Much difference of opinion appears to exist as to the frequency of convulsions after the inhalation of chloroform; those who are inimical to its general adoption representing convulsions as being a very frequent occurrence, while those who favour its use, and this class, it should be remembered, have employed it most extensively, declare them to be very rare. Dr. Nevins[1] considers the proportion to be one in every six or eight, much too high a ratio; probably one in fifteen or twenty would be nearer the average, but sufficient statistical data are wanting whereon to rest any positive statement. It is fortunate, observes Dr. Nevins, that these convulsions scarcely ever commence during an operation; they are generally manifested as soon as the agent begins to take effect, if they are present at all, and therefore a surgeon is not liable to be betrayed into commencing an operation during their absence, and being interrupted by their subsequent appearance. If they are so severe as to interfere with

[1] Translation of Lond. Pharm., 1851, p. 125.

the operation, he has nothing to do but to wait until the effects of the chloroform have gone off, and his patient is no worse than if chloroform had not been known. 3. *Depression or Prostration.* This occurs more or less in most cases. In the majority, this effect passes off speedily, and leaves no ulterior ill effects; whilst in others (a very small number compared with the number of subjects who have been brought under the influence of this agent) the depression has been alarming and even fatal. 4. *Headache* has been observed in many cases, but it passes off in most instances in the course of a few hours. 5. *Excoriation of the Lips and Nose.* This may be prevented by taking care to avoid direct contact. 6. *Death.* Dr. Sansom calculated that at the period at which he wrote (Sept. 1863), chloroform had been administered 2,000,000 times, whilst the deaths which were known to have occurred were rather over 150. This is a very small number indeed when we consider the powerful character of the agent, the necessarily imperfect knowledge which existed with respect to its laws and operation at the period immediately following its introduction, and the indiscriminate manner in which it has been employed. No remedy of the same power has been used so extensively and has been productive of less mischief. A strict attention to the rules already laid down is imperatively demanded, in order to avoid this or any other ill consequence.

627. *Directions for its Use in Midwifery.* No individual practitioner has employed this agent so extensively or so successfully as Prof. Simpson,[1] and any observations of his on this subject merit especial attention. He furnishes the following directions on the subject:—The two main difficulties, he observes, are to keep the patient in a state unconscious of pain, and yet not so deeply anæsthetised as to have the uterine action interrupted; for too deep a state of anæsthesia, in general, interferes with the force and frequency of the uterine contractions; while a lesser degree of the anæsthetic state leaves the contractions unaffected; and in a still smaller dose it often excites and increases them. The influence of the inhaled agent passes off in a few minutes; and if at any time the anæsthetic effect be too deep, and the uterine action in consequence impeded, all that is necessary is to abstain from exhibiting the chloroform for a short time, till the parturient contractions have been allowed to come back to their proper degree of strength and frequency; and then the chloroform may be given as before, by employing the vapour at every recurring pain, but in smaller doses, and for a shorter time than was previously practised.

The quantity of chloroform required varies both according to the duration of the labour, and the sensibility of the patient. Usually, when the handkerchief is used, about an ounce an hour is necessary; a small quantity being poured upon it from time to time. A less quantity will succeed in some, and others require more. The first quantity which Sir J. Y. Simpson poured on the handkerchief is from three to four drachms; but he adds, "I always judge by the *effects*, not by measuring the dose, and I pour on an additional quantity in a minute or so if it be required. In holding the handkerchief towards the patient, take care that plenty of atmospheric air is admitted, and never put it in contact with the face." He adds further, "I have usually begun the employment of chloroform when the os uteri was well dilated, or towards the termination of the first and the commencement of the second stage of labour; but when the pains were severe, I have commenced it earlier, and when the os uteri was still comparatively little dilated. There is, I believe, no limit to the date at which we may give it." To these valuable instructions of Simpson's we may add that the dose should be administered at the commencement of each pain, and increased when the head is passing over the perinæum. Although the quantity employed must be regulated by the effects produced, it is always advisable to measure it, in order that the practitioner may judge of the proportion between the effects and the dose, which may serve, in a degree, as a guide for its administration in

[1] Treatise on Anæsthetic Midwifery, p. 16, et seq.

other cases. It must be remembered that in using the handkerchief a large quantity of the chloroform is wasted. If an inhaler be employed, a very much smaller quantity will produce the desired effect.

From the observations of Prof. Simpson, it appears that he induces complete insensibility at first, and keeps up just so much of the effect as he deems advisable. Dr. Rigby, Dr. Snow, and others prefer commencing with small doses in natural labour, and increasing them if necessary; but when manual assistance is required, it is better to place the patient under the full influence at once. Dr. Beatty[1] observes that, in lingering labours with insufficient pains, the use of chloroform may be beneficially combined with that of the ergot.

The following are the rules for the use of chloroform in Midwifery laid down by the Committee of the Royal Medical and Chirurgical Society:[2]

(*a*) *In Natural Labour.*—The careful administration of chloroform during labour is not attended with special danger, there being, either in this country or abroad, so far as is known to this committee, no well-authenticated instance of sudden death where it has been given by a medical practitioner; but the occasional occurrence of unfavourable symptoms demands the exercise of caution during its employment. Administered in a moderate degree, it does not, as a rule, weaken the expulsive powers, and is decidedly beneficial in promoting dilatation of the maternal passages. It does not predispose to puerperal convulsions or other like complications. The balance of opinion is nearly equal as to whether it predisposes to imperfect contraction of the uterus after delivery. As a rule, it in no way retards the convalescence of the mother, nor has it any tendency to interfere injuriously with the function of lactation; nor has it any injurious influence on the child.

(*b*) *In Abnormal Labour.*—The anæsthetic may be employed with advantage in various obstetrical operations—as forceps, turning, craniotomy, and extraction of retained placenta—unless the patient is much enfeebled by hæmorrhage; when, if given, it ought to be accompanied by the use of stimulants. It may also be employed advantageously to check the paroxysms in puerperal convulsions.

(*c*) *As to the preference of Ether.*—There are no reasons for giving preference to ether over chloroform, the latter being much more desirable in obstetrical practice generally, the only exceptions being those in which chloroform notably disagrees.

In addition to the rules given for its administration in ordinary cases, it is generally desirable to observe the following rules during its administration in labour, subject to modifications at the discretion of the practitioner:—In natural labour, begin to give it generally at or after the termination of the first stage; but it may be given earlier if the first stage is unduly painful, or if the os uteri resists dilatation. Give it only during the pains, and withdraw it in the intervals. When the fœtal head bears on the perinæum, give it more freely to promote relaxation and relieve the increased pain. Withdraw the chloroform immediately after the child is expelled. If the patient is depressed or the pains are sluggish during its administration, an occasional stimulant may be administered. In cases where it seems to interfere with the progress of labour it may be necessary to suspend its use for a time, and re-apply it after an interval, or even to withdraw it altogether. In turning and in instrumental deliveries, deep anæsthesia must be induced, as in surgical operations, and the administration should then be entrusted to a competent person, whose sole duty should be to attend to it. In midwifery a special inhaler for its administration is not generally necessary or desirable, a handkerchief or towel, so folded as to prevent blistering the face, and to allow free admixture of atmospheric air, being sufficient for the purpose.

628. *As a means of Diagnosis in Spurious Pregnancy*, the importance of

[1] Dubl. Quart. Journ., Aug. 1850. [2] Med. Times, July 16, 1864.

chloroform was first pointed out by Simpson,[1] who remarks that, "generally speaking, chloroform will in any case of doubt solve the difficulty completely, if only given deep enough. When the patient is fairly put to sleep with chloroform, the tense abdominal muscles become perfectly relaxed, and on pressing on the abdomen you will find that the walls will give way before your hand, and sink backwards till you can feel the spinal column quite distinctly, and you will then find the uterus to be of the normal size." The examination should be made whilst the patient is fully under the influence of the anæsthetic; for when she comes out of her sleep again, in a case of spurious pregnancy, the muscles begin to contract and to become tense as before, so that by the time the patient is fully awake, the abdomen is as large and rounded as before. The value of anæsthesia as an adjuvant in aiding and establishing a correct diagnosis in such cases cannot be overrated.

629. *The Objections which have been urged against the use of Chloroform in Midwifery* by Dr. Gream[2] and others, are—1, that anæsthesia from these agents (chloroform, ether, &c.) is no more or less than drunkenness; 2, that it gives rise to indecent dreams, expressions, and actions; 3, that it induces convulsions; and 4, that it may cause death. The force of these propositions has, however, been weakened by the almost unanimous evidence of those who have employed these agents the most extensively.

630. *Post-mortem appearances.* In five deaths from chloroform, post-mortem examination showed no particular congestion of the head or brain; the lungs were greatly congested in two cases, and more or less so in the other three. The cavities of the heart were quite empty in two cases, but this might be attributed to other causes; and in both these air was found in the veins. For some interesting statistical data on deaths from chloroform, see Brit. Med. Journ., July 2, 1870.

631. *Therapeutic Uses. Spasmodic and Nervous Affections. In Spasmodic Asthma*, chloroform inhalation short of anæsthesia is often of value. With regard to its use in this class of cases, Dr. Hyde Salter (p. 230) draws the following conclusions:—1. It holds a high place amongst the remedies of asthma; there being probably no agent that relieves in so large a number of cases. 2. It operates with very various completeness in different cases. 3. Where it does not cure, it is of great value by affording a temporary respite. 4. No amount of asthmatic apnœa or dyspnœa is any bar to its use. 5. If given constantly, however, in large doses for a long period, a state of things arises which constitutes a bar to its continuance. 6. The sooner it is given in a paroxysm the better, for if the spasm has existed for some time it is apt to recur as soon as the influence of the chloroform passes off. A few drops at the first indication of an attack, as pointed out by Dr. Russell Reynolds,[3] may act as a preventive. He mentions the case of a young lady who, by inhaling a few drops on her handkerchief whenever an attack threatened, at once averted it, and she was thus virtually cured. (Dr. Salter.) It should always be administered under medical supervision, and never by the patient himself.

[1] Med. Times and Gaz., Sept. 10th, 1859.
[2] On the Misapplication of Anæsthesia in Childbirth, Lond., 1848.
[3] Lancet, Oct. 29, 1853.

632. *In Epilepsy*, chloroform inhalation has been employed both during a paroxysm and in the interval. Dr. George Johnson[1] speaks of its action in warding off a threatened fit, and in cutting short a violent and prolonged paroxysm, as uniform and certain. He considers that it probably acts in these cases by lessening the reflex excitability of the nervous system. Dr. Russell Reynolds (ii. p. 280), whilst admitting that it has delayed attacks while the patient is actually under its influence, remarks that it has failed to prevent their subsequent recurrence. This, however, is not in accordance with the experience of Dr. Brown-Séquard,[2] who speaks highly of its value in these cases, particularly when they partake of an hysterical character.

633. *In Chorea*, chloroform inhalation has been advised in order to control the convulsive movements; but Dr. Radcliffe (ii. p. 138) states that in three cases in which he tried it, it seemed to do more harm than good, and this he thinks is likely always to be the result, unless alcoholic stimulants are given in sufficient quantities before the inhalation, but when thus conjoined, benefit sometimes results. M. Gassier[3] successfully employed chloroform frictions in three cases. He used a liniment composed of equal parts of chloroform and oil of almonds, which was well rubbed night and morning along the course of the spine. In none of the cases in which it was used does there appear to have been any organic disease of the nerves or nervous centres.

634. *In Hysteria*, chloroform anæsthesia is rarely required unless the paroxysms are very severe and prolonged; when they are so, and especially if attended with delirium, sleeplessness, &c., Dr. Brown-Séquard (op. cit.) speaks highly of its value. A few minims (xx.–xxx.) of the compound tincture with ammonia or assafœtida given internally often affords relief. Chloroform liniment locally applied often speedily relieves *Hysterical or Neuralgic Pain of the Side*. *In Hysterical Convulsions*, chloroform inhalation is very effective. (Dr. Graily Hewitt, p. 385.)

635. *In Puerperal Convulsions*, Dr. R. B. Todd[4] employed chloroform in numerous cases with manifest benefit. Other cases successfully treated by it are recorded by Mr. Clifton.[5] Prof. Simpson states that in 200 women whom he delivered under chloroform, he had not met with a single instance of convulsions; from this it appears that it may in a degree act as a preventive to their occurrence. Testimony to its value in controlling the paroxysms of puerperal convulsions has also

[1] Brit. Med. Journ., March 21, 1868.
[2] Lancet, March 10, 1866.
[3] Med. Gaz., Nov. 15, 1850.
[4] Ibid., May 11 and 18, 1849.
[5] Ibid., vol. xvii. p. 335.

been borne by Dr. Murphy, Dr. Braxton Hicks, and others.[1] The administration of chloroform has been productive of benefit in eclampsia, even although a temporary albuminous condition of the urine was present. It would, however, be contra-indicated if serious disease of the kidneys were believed to exist.

636. *Infantile Convulsions* have been successfully treated with chloroform by Sir J. Y. Simpson and others, but it should only be resorted to where ordinary remedies have failed. "In cases," observes Dr. West (p. 193), "where depletion is inadmissible, where the convulsions are not obviously due to organic disease of the brain, while they are both severe in their character, and are returning with frequency, the inhalation of chloroform sometimes altogether arrests them." He has also found it of temporary service in convulsions of a more chronic kind. It should only be administered under medical supervision.

637. *In Tetanus, both Idiopathic and Traumatic*, chloroform has been employed, and in many instances has apparently contributed to the recovery of the patient. Dr. Todd[2] advises that it should be given in small and frequently repeated doses, with a large admixture of air, so as to produce a gradual and soothing effect. On this point, Dr. Anstie (p. 129) observes that whilst there is uncertainty as to the *lasting* benefit of chloroform in these cases, there can be no doubt whatever that the muscular spasms may be resolved in most cases, and that he is satisfied that a small dose, such as is quite insufficient to produce narcosis, is best suited for this purpose. Chloroform frictions proved effectual in the hands of Dr. Morrisseau.

638. *In Insanity*, chloroform inhalation has been used in some instances with benefit, but its applicability and safety as a general remedy have not been sufficiently proved. Where organic disease of the brain exists, it is at the best but a palliative. Its employment requires the greatest discrimination and caution. Van der Kolk (p. 157) states that in mania in hysterical patients he has seen quietude and sleep follow gutt. xv.–xx. taken internally in the evening, but he does not consider it suited for continuous administration, because the dose must be constantly increased.

639. *In Delirium Tremens*, the value of chloroform inhalation has been variously estimated, some writers speaking highly of the benefits to be derived from it, and others—the majority—agreeing in the main with the dictum of Dr. Wilks:[3] "you may quiet the patient by it for a time, but you do not in any way influence the disease." Dr. Anstie's (ii. p. 91) opinion of it is, on the whole, unfavourable; he mentions two cases in

[1] Med. Times and Gazette, July 4, 1863.

[2] Med. Gazette, Nov. 29, 1850.

[3] Med. Times and Gaz., Sept. 19, 1868.

which the patient died suddenly from cardiac palsy while the inhalation was proceeding; and he thinks it undesirable that it should come into general use in delirium tremens, as it is certain that the evil effects of a narcotic depression of the heart's action are much more serious in this than in many other affections. Though less dangerous, he has no high opinion of chloroform administered internally; great benefit, however, is said to have been derived from the following formula of Dr. Goodfellow's:[1]—℞ Chloroformi ♏xx., Quiniæ Sulph. gr. ij., T. Card. Co. ʒj., Aq. fʒx., M., ft. haust. 4tis vel 6tis horis sumend. If there be much febrile disturbance, calomel and opium āā gr. j. is prescribed.

640. *In Tic Douloureux and other Neuralgic Affections*, frictions with chloroform liniment are often serviceable, but where the pain is limited to a small space pure chloroform is best applied in the manner directed in sect. 618. *In Sciatica*, a strip of flannel soaked in chloroform, placed along the course of the nerve and covered with oiled silk to prevent evaporation, proves sometimes extremely serviceable. (Dr. Fuller, p. 472.) For the relief of *anomalous Cerebral symptoms of a Neuralgic character*, Dr. Tilt (p. 92) states that by means of chloroform inhalations, short of complete anæsthesia, he has often quelled cerebral symptoms and procured sleep, when opiates and other remedies had only made the patient worse. *Nervous and Hysterical Headaches* often vanish under the internal administration of ♏xv.–xxx. of spirit of chloroform. *In Toothache*, relief often follows the introduction into a carious tooth of a piece of cotton wool soaked in chloroform, or better still, of a solution of gum mastic in chloroform. This inserted into the hollow of a tooth on cotton wool not only affords present relief, but remaining in the tooth for a considerable time, prevents the irritating action of the air upon the sensitive nerve.

641. *In Chronic Rheumatism*, *Lumbago*, *Myalgia*, *Painful Sprains*, &c., frictions with chloroform liniment often afford great relief.

642. *In the Cough and Dyspnœa of Phthisis and of Bronchitis*, a few whiffs of chloroform (vj.–x.) are often signally useful, but the effect is only temporary. *In Asthma*, the same measure is sometimes of service; its use, however, requires much caution. It should never be carried to anything approaching to anæsthesia. *In Hooping Cough*, benefit is often derived from similar inhalations, and also from frictions with chloroform liniment to the chest and neck. *In Laryngismus Stridulus*, chloroform inhalation was successful in the hands of Mr. Image,[2] and is advocated by Dr. Reid;[3] and with regard to its use in *Croup*,

[1] Brit. Med. Journ., July 3, 1869.
[2] Ranking's Abstract, v. p. 380.
[3] On Infantile Laryngismus.

Dr. Eben. Watson[1] regards it as the most speedy and powerful relaxer of the glottis, and as such likely to be serviceable, but in this as well as in all this class of cases, it requires to be used with the greatest circumspection. *Obstinate and Spasmodic Hiccough* has been found to yield to chloroform inhalation.

643. *In Obstinate Vomiting*, a few drops of chloroform given internally is often useful; even in that of *Yellow Fever* it has been found serviceable in preparing the stomach for the reception and retention of food, but as its effects are transitory, it requires to be repeated each time before food is taken.[2] It might probably be advantageously combined with Liq. Calcis (*q.v.*) *In Obstinate Vomiting of Pregnancy*, Sir C. Locock[3] speaks of chloroformization almost to insensibility as very useful. *In Colica Pictonum*, M. Aran[4] successfully employed chloroform; he not only gave it internally by mouth and *per rectum* in enemas, but also externally, compresses moistened with it, diluted, being applied to the abdomen.

644. *In the passage of Gall Stones*, chloroform and ether given by the mouth, or in the form of inhalation, have been found most efficacious; and they possess this advantage, that while they relieve pain, diminish spasm, and are rapid in their action, they do not interfere with that muscular contraction which probably assists in the onward propulsion of the stone. (Dr. Murchison, p. 350.) The same remark applies equally to the *passage of Renal Calculi*. There is reason to suppose that chloroform taken internally, exercises some influence as a solvent of biliary concretions, and hence may be regarded as a curative agent in gall-stones. A very interesting illustrative case is recorded by Dr. J. Barclay,[5] in which gutt. ij.–iij. of chloroform three or four times a day afforded immediate relief, and there was, for eight subsequent years, no return of the attack. He states that he has found it give invariable and permanent relief in many other instances.

645. *In Cholera*, chloroform is a remedy of the greatest value, especially in the early stages. In doses of ♏ v.–viij. every hour or half-hour, it often arrests the vomiting more speedily than anything else, and in the same doses tends materially to relieve the spasms and cramps; for the latter purpose the diligent use of chloroform liniment, either alone or conjoined with turpentine, is very effectual. If the vomiting be excessive, a little chloroform sprinkled on lint, placed over the epigastrium, and covered with oiled silk or gutta-percha, often affords relief. The carbonated alkalies, soda or potash (grs. xl.–lx.) in solution, appear to aid the operation of chloroform when given internally; by some it has been found most useful

[1] Glasgow Med. Journ., Feb. 1867.
[2] Reynolds's Syst. of Med., i. 675.
[3] Brit. Med. Journ., Aug. 22, 1868.
[4] Brit. and For. Med. Chir. Rev., April, 1851.
[5] Brit. Med. Journ., Jan. 15, 1870.

when combined with oil of turpentine (♏xx.–xxx.) Being very volatile, it does not, like calomel or solid opium, accumulate in the stomach, and exert a deleterious influence when reaction sets in. Chloroform inhalation, stopping short of complete anæsthesia, has been resorted to with the effect in most instances of relieving the spasms, but whether it exercises any influence on the duration or mortality of the disease, evidence is still wanting. Its operation requires the most careful watching. Dr. T. M. Lowndes,[1] of the Bombay Army, has for some years used the following formula:—℞ Chloroformi ♏xv.–xx., T. Opii ♏x.–xv., Spt. Vin. f℥j., Aq. ℥j., M., in the treatment of *Choleraic Diarrhœa*, and with the best results.

646. *In Painful non-inflammatory Affections of the Uterus and Ovaries*, chloroform inhalation, short of complete anæsthesia, is often of great service. It may also be given internally, and proves a very useful adjunct to opium. It is chiefly indicated in hysterical cases. Locally applied, a few drops on a piece of lint, placed over the uterine and ovarian regions, occasionally afford relief. (Dr. Graily Hewitt, p. 379.) *In Dysmenorrhœa* it may likewise be employed with advantage. (Ibid. p. 443.) Inhalation, short of insensibility, in this class of cases is also favourably mentioned by Dr. Tilt (p. 92.) In uterine affections, when the local anodyne effects of chloroform are desired, it should be given in enemas *per rectum;* if employed in vaginal injections, as pointed out by Scanzoni, it is of little avail. *Inversions of the Uterus*, of months or even years' standing, have been reduced under chloroform or ether anæsthesia. Several such cases are cited by Dr. Graily Hewitt (p. 513.)

647. *In Prurigo*, one of the most effectual applications is that advised by Dr. Neligan, viz., ♏xxx. of chloroform incorporated with oz. j. of cold cream. It will often afford relief when all other remedies fail. Dr. Corfe,[2] in these cases, employed with great success, a chloroform lotion (℥ij.–℥iv., Aq. Oj.) The above ointment has been found useful in *Eczema* and other skin diseases attended with much irritation. *In Pruritus Pudendi*, Dr. Graily Hewitt found the greatest service from a mixture of chloroform and almond oil (1 part to 6) locally applied.

648. *In Irritable Ulcer of the Rectum*, the following ointment is highly spoken of by Mr. Curling:[3]—℞ Chloroform fl. ℥j.–f℥ij., Zinci Oxid. ℥ss., Ol. Olivæ f℥j., Cerat. Cetacii ℥iv., M. ft. Ung.

649. *In Intermittent Fever*, chloroform inhalation has been

[1] Brit. Med. Journ., August 29, 1868.
[2] Med. Times, xviii. p. 304.
[3] Brit. and For. Med. Chir. Rev., Oct. 1851.
[4] Med. Times, May 9, 1868.

practised in America. It seems capable of alleviating the severity of the symptoms in bad cases, if not of curing the disease.

650. *In Strangulated Hernia* and in *Dislocations*, whether recent or of long standing, the value of chloroformization is too well known to require further notice in this place. It ranks amongst the greatest improvements in modern surgery. *In Spasmodic and Irritable Stricture of the Urethra*, the extreme irritability of the parts, and the sudden and persistent spasm which so often prevents the introduction of a bougie, are often speedily removed by chloroformization, and the subsequent stages are rendered more manageable.

651. A case of *Poisoning by Strychnia* successfully treated by chloroform inhalation, is related by Mr. Macarthy.[1] From experiments, Dr. Anstie (p. 389) draws the following conclusions:—1. Chloroform has no direct antidotal action to strychnia. 2. In large doses it may indirectly prolong life by inducing paralysis rather than convulsion. 3. In small stimulant doses, chloroform has the power temporarily of arresting the convulsions of strychnia, without inflicting damage on the vitality of the nerves; its action in this case is, therefore, *pro tanto*, beneficial.

652. Chromic Acid. Acidum Chromicum. CrO_3. Occurs in the form of brilliant crimson-red prisms, very deliquescent and readily soluble in water.

Med. Prop. and Action. Powerful caustic; used in substance made into a paste with water, its action is exceedingly slow and gradual, but deeply penetrating. In saturated solution its action is less penetrating and less gradual. By using a solution more or less dilute, the action may be graduated according to the degree of effect desired. It is a powerful oxidizer, yielding its oxygen readily to organic matter, which is thereby dissolved. Smaller animals (mice, birds, &c.) were so completely dissolved by the acid in fifteen or twenty minutes that no trace of their bones, skin, hair, claws, or teeth could be discovered. (Heller.) It is not given internally.

653. *Therapeutic Uses. In Cancerous and other Ulcerations*, in which a deeply penetrating gradual caustic is desired, chromic acid appears to be specially indicated. The trials of Dr. Ure,[2] Sigmund, Heller,[3] and others have proved its efficacy and safety. The pain attendant on its use is stated to be much less than that caused by nitric acid or Vienna paste, not even disturbing the patient's sleep. Dr. Tilt (p. 158), however, tried it in several cases where the solid nitrate of silver was indicated, but did not find it possess superior attributes. From its deeply penetrating action much care is necessary in its use, and it should in no case be laid over a surface to be cauterized

[1] Med. Times and Gaz., May 9, 1868.
[2] Med. Gaz., March 20, 1845, p. 787.
[3] Dublin Quart. Journ. of Med., Feb. 1852, p. 250.

in a layer deeper than a line in thickness. The surrounding parts require to be carefully protected by folds of lint or strips of plaster. Its tendency to penetrate too deeply is the great objection to its use. Sigmund employed with advantage a concentrated solution for the destruction of *Syphilitic Condylomata*, and Mr. Marshall[1] found it effectual for removing *the Warts and other Morbid Growths from Genital Organs*. The solution employed was of the strength of 100 grains to fl. oz. j. of distilled water. It has also been employed for the removal of *External Hæmorrhoids*. Dr. Hairion[2] employed it with advantage in the treatment of *Obstinate Granular Ophthalmia*, but it possesses no advantage over nitrate of silver and other less potent remedies.

CIMICIFUGA RACEMOSA. See ACTÆA RACEMOSA.

654. CINCHONÆ CORTEX. The bark of the different species of Cinchona. *Nat. Ord.* Cinchonaceæ. *Hab.* S. America.

The Officinal Cinchona Barks are:—

1. CINCHONÆ FLAVÆ CORTEX. YELLOW CINCHONA BARK. The bark of Cinchona Calisaya, *Weddell*. Collected in Bolivia and Southern Peru. 100 grains should yield not less than 2 grains of quinia.
2. CINCHONÆ PALLIDÆ CORTEX. PALE CINCHONA BARK. The bark of Cinchona Condaminea. *D. C. vars.* chahuarguera, *Pavon*, and crispa, *Tafalla*. Collected about Loxa, in Ecuador. 200 grains should not yield less than 1 grain of alkaloids.
3. CINCHONÆ RUBRÆ CORTEX. RED CINCHONA BARK. The bark of Cinchona Succirubra, *Pavon*. Collected on the western slopes of Chimborazo. 100 grains should not yield less than 1·5 grains of alkaloids.

Although these are the three officinal barks, there are others, *e.g.*, Fibrous Carthagena Bark, from C. Condaminea, *var.* lancifolia, and the Silver grey, or Huanuco Bark from C. micrantha and C. nitida, which possess valuable medicinal properties. These and other species are being now successfully cultivated in India, Ceylon, Java, &c. The yield of alkaloids has been found to be much larger in the Indian-raised trees than in the barks imported from South America. See Indian Ph., p. 450, *seq.*

Med. Prop. and Action. All the varieties of cinchona are tonic, astringent, and anti-periodic, and are, of all medicines of their class, the most powerful and uniform in their action. They owe their astringency to the presence of kinovic, cincho-tannic, and red cinchonic acids. Their tonic and anti-periodic properties are due to the alkaloids, quinia, cinchonia, and cinchonidinia (*q.v.*) The active principles are not confined to the bark, but are contained in a minor degree in the leaves, the root-bark, and

[1] Cited in U. S. Disp., p. 1392. [2] Gaz. Hebd. de Méd., Jan. 7th, 1857.

the young shoots. The leaves especially demand notice, for though not comparable to quinia as an anti-periodic, they apparently deserve to rank high in the list of astringent tonics, and, like many other agents of this class, are quite capable of controlling *mild uncomplicated cases of malarious fevers*. This is probably due to the larger proportion of kinovic acid which they contain. They are well adapted for convalescence after fevers, and may be given in either of the following formulæ, advised by Dr. Chipperfield :[1] ℞ Cinchona Leaves, fl. oz. 1½, Acid. Sulph. dil. fl. drm. ij., Cold Water oz. xx. M. Boil for ten minutes and strain ; or ℞ Cinchona Leaves oz. j., Water oz. vj. ; boil for ten minutes and strain. Dose, fl. oz. iij.–fl. oz. iv. thrice daily. Dr. C. observed no difference between the leaves of C. succirubra and C. condaminea, which were the kinds employed by him. Peculiarity in the action of the different kinds of bark depends on the proportion in which the alkaloids are present in them. From the large quantity which is required to be taken to obtain the full effect, and from the extremely nauseous taste, there are many persons who are unable to take cinchona, without its causing derangement of the stomach, vomiting, headache, and in most cases, constipation. These ill effects may, in a great measure, be obviated by administering its alkaloids, quinia or cinchonia; from both of which, as a rule, all the benefit (with the exception of the astringent effect) which is to be expected from cinchona may be obtained, without its disadvantages. Occasionally, however, it happens that where the alkaloids fail to effect a cure, cinchona in substance is successful. In small doses bark improves the appetite, and the general tone of the muscular and circulating systems. It checks colliquative sweating in cases of extreme debility. Its action on the nervous system is shown by its extraordinary power in arresting diseases of a periodic character. In the treatment of *Intermittent Fevers*, it may either be given in a large dose shortly before the recurrence of the paroxysm, or in smaller repeated doses during the intervals. The efficacy of the infusion or decoction is greatly increased by the addition of a few drops of dilute sulphuric acid. (See also Quiniæ Sulphas.) Externally applied, bark is an astringent and antiseptic. It is sometimes sprinkled on the surface of *unhealthy ulcers*. The infusion or decoction, with the addition of a mineral acid, forms a valuable gargle in *Ulcerated Sore Throat*. Powdered bark is useful as a dentifrice in spongy conditions of the gums.

Dose:—Of either of the Cinchona barks in powder, gr. x.–lx. *Of the Decoction* (Yellow Cinchona Bark oz. 1½, Water Oj.; boil ten minutes and strain), fl. oz. j.–ij. *Of the Infusion* (Yellow Cinchona Bark oz. ½, Boiling Water fl. oz. x.), fl. oz. j.–ij. *Of the Tincture* (Yellow Cinchona Bark oz. iv., Proof Spirit Oj.), fl. drm. ½–ij. *Of the Liquid Extract of Yellow Cinchona*, ℥ x.–xxx. twice or thrice daily. *Of the Compound Tincture* (Pale Cinchona Bark oz. ij., Bitter Orange Peel oz. j., Serpentary Root oz. ½, Saffron gr. lx., Cochineal gr. xxx., Proof Spirit Oj.), fl. drm. ½–ij.

Therapeutic Uses are considered at length under Quiniæ Sulphas (*q. v.*)

655. Cinchonia, Cinchonine.

Cinchonidia, Cinchonidine.

Quinidia, Quinidine.

Three alkaloids contained in varying proportions in the different kinds of Cinchona Barks. C. micrantha is peculiarly rich in cinchonia, specimens of Indian growth yielding upwards of 6 per cent. of it.

Med. Prop. and Uses. Tonic and antiperiodic. Each of these alkaloids,

[1] Madras Quart. Med. Journ., 1866, vol. x. p. 85.

with their respective sulphates and the hydrochlorate of cinchonia, have been proposed as substitutes for quinia, but they have not hitherto been employed to the extent which they appear to merit. In 1866 a commission was appointed at Madras, to examine their real value, and supplies of them distributed to medical officers at "notoriously malarious stations," and were tested by them in 1,145 cases of paroxysmal fevers of all types ; 410 by sulphate of cinchonia, 359 by sulphate of cinchonidia, and 376 by sulphate of quinidia. Of the 1,145 cases treated there were 4 deaths and 27 failures, the latter presenting a percentage of just over 2 per cent.—a satisfactory result. The following abridged quotations from the report will serve to place the subject in a clearer light. The doses and mode of administration vary a good deal. Some medical officers used large doses (grs. xv. to xx.), others medium doses (grs. viij. to x.), and some small doses (grs. ij. to v.) As a general rule it appears that those experiments were most successful in which medium doses were administered in a single dose daily, the cases recovering more expeditiously than when larger or smaller quantities were employed. Large doses of either of these alkaloids produce effects very similar to those of quinine. Disagreeable noises in the head, singing in the ears, deafness, and giddiness, were the most noticeable symptoms. Vomiting, nausea, and purging were also occasionally noticed to follow their use. Small or moderate doses produced none of these effects, while they improved the appetite, strengthened the digestion, and in many cases appeared to have a marked effect in reducing the size of congested spleens. The evidence adduced does not show any particular superiority of one alkaloid over the other. The average dose of each is apparently about 10 grains. The sulphate of quinidine is perhaps the one regarding which there is the least difference of opinion as to its merits; all three are undoubtedly antiperiodic, and capable of controlling paroxysmal fevers. The sulphate of cinchonine in large doses, perhaps, causes more unpleasant symptoms than the others, but on this point further evidence is wanting. In some cases larger quantities were exhibited than were necessary to check the fever. "The main conclusion which the members of the commission have derived from the data before them is, that these alkaloids, hitherto little valued in medicine, are scarcely, if at all, inferior as therapeutical agents to quinine." [1]

656. CINNAMOMI CORTEX. CINNAMON BARK. The inner bark from the truncated stocks of Cinnamomum Zeylanicum, *Breyn. Nat. Ord.* Lauraceæ. Imported from Ceylon, &c.

Med. Prop. and Action. Aromatic-stimulant, carminative and astringent; supposed by the Germans to act specifically on the uterine muscular fibre. It is chiefly used as an adjunct to other remedies. Besides a volatile oil, in which its virtues principally reside, it contains tannin, a resin, and a peculiar acid, *Cinnamic Acid*.

Dose:—Of Cinnamon, in powder, gr. v.–xx. *Of the Distilled Oil*, ♏ij.–v. *Of the Distilled Water*, fl. oz. j.–ij. *Of the Tincture* (Cinnamon oz. ij.½. Proof Spirit Oj.), fl. drm. j.–ij. *Of the Compound Powder, Pulvis Aromaticus, Ed. Ph.* (Cinnamon, Cardamom Seeds, and Ginger āā in powder oz. j.), gr. iij.–x.

657. *Therapeutic Uses. In Flatulence, Colic, and Spasmodic Affections of the Bowels*, the compound tincture of Ph. L. (Cinnam. cont. ℥j.; Cardam. cont. ℥ss.; Piperis long. cont. ℥ijss.; Zingib. cont. ℥ijss. ; Spirit. Ten. Oij.), in doses of f℥ss. to f℥ij., proves a grateful and efficient carminative.

658. *In Atonic Diarrhœa*, the powder, in combination with chalk and opium, is often given with marked advantage.

[1] Pharm. of India, p. 453.

659. *In the low stages of Fever*, the essential oil is a valuable adjunct to other stimulants. The compound tincture is a good formula.

660. *In continued Nausea and Vomiting*, an aqueous infusion of cinnamon is often effectual in removing these states.

661. *In Uterine Hæmorrhage*, cinnamon has been employed, but with very doubtful advantage. Dr. Tanner[1] considers that its action is really due to some specific effect which it exercises upon the uterus, and not to any astringent property which it may possess. He advises the tincture in doses of fl. drm. j., given in cinnamon water every six hours. *In Tedious Labours depending upon atony of the Uterus and insufficiency of Uterine Contractions*, it was found effectual by Mursinna, and Dr. Tanner's experience tends to confirm the idea of its powers in these cases, but as Dr. Tilt (p. 229) justly observes, it would be wrong to rely entirely upon it.

662. A drop of the oil introduced into a carious tooth occasionally arrests *Toothache*.

663. Citric Acid. Acidum Citricum. $H_3C_6H_5O_7.H_2O$. A crystalline acid prepared from lemon-juice or the juice of the lime. It exists also in the juice of the orange; and is also found in smaller quantities in the grape, tamarind, gooseberry, currant, and other fruits.

Med. Prop. and Action. Refrigerant and anti-scorbutic. Citric acid, observes Dr. Thompson, as prepared by the hand of nature in the juice of the lemon, orange, &c., is more grateful than in its uncombined state—a fact which is quickly perceived by fever patients. When simply diluted with water, citric acid constitutes a most serviceable and agreeable beverage *in Fevers*. This is rendered more grateful and refreshing by using water impregnated with carbonic acid gas instead of common water. In the ordinary condition of the stomach, citric acid, either pure or combined, does not weaken the stomach; and in some irritable states of that organ characterized by a sensation of heat, painful digestion, an unpleasant taste in the mouth, and a disgust for food, it removes these symptoms, and proves decidedly beneficial; but, on the other hand, when the stomach is highly irritable, and its nervous susceptibility great, lemon-juice, or citric acid, even when largely diluted, causes heat, uneasiness, pain, and not unfrequently, obstinate vomiting. Nevertheless, as M. Broussais[2] has remarked, the citric is that acid which the stomach supports the best when suffering from inflammation. The citrates of potash and ammonia are refrigerant and slightly diuretic; those of soda and magnesia, purgative. The following table shows the equivalents required for making effervescing draughts:—

grs.		grs.		
20 of Carb. of Soda	=	9½ of Citric Acid,	or fl. drs. ijss. of	Lemon-juice.
,, Bicarb. of Soda	=	17 ,,	,, fl. oz. ss.	,,
,, Carb. of Potash	=	17 ,,	,, fl. oz. ss.	,,
,, Sesq. of Ammon.	=	24 ,,	,, fl. drs. vj.	,,

664. *Therapeutic Uses. In Fevers*, it proves a useful and grateful refrigerant. In some irritable states of the stomach

[1] Lancet, Oct. 15th, 1853. [2] Phlegmas. Chron. t. iii. p. 254.

it affords, in many instances, a great amount of relief; and in *Scurvy*, it has been used with great advantage, although inferior to lemon-juice. (See CITRUS LIMONUM.)

665. *In Cancerous Ulceration*, a solution of citric acid (drm. j.–j.½, Aq. fl. oz. viij.) proved signally useful in allaying the pain, in the hands of Dr. J. Barclay[1] and Mr. C. J. Denny.[2] It is well worthy of a trial; relief of pain in these cases is a great point. In other respects it is less effectual than acetic and carbolic acid (*q. v.*)

666. CITRUS LIMONUM, *D.C.* The Lemon Tree. *Nat. Ord.* Aurantiaceæ. *Hab.* Southern Europe, East and West Indies, &c.

CITRUS BERGAMIA, *Risso.* The Lime Tree, found in most tropical countries.

Med. Prop. and Action. The juice of the fruits of these trees, known respectively as lemon-juice and lime-juice (*Limonis Succus*), is refrigerant and anti-scorbutic. The outer part of the rind of the ripe fruit (*Limonis Cortex, Lemon Peel*) is an aromatic bitter, and forms an agreeable adjunct to other vegetable tonics, and the expressed or distilled oil from the rind (*Limonis Oleum*) is stimulant and carminative. That which is commonly sold as Essential Salts of Lemon is the binoxalate of potash, and does not exist in any of the Lime-tribe; it is a misnomer, which might lead to serious mistakes. Lemon-juice contains citric acid and malic acid in combination with potash and mucilage. The average quantity of citric acid is a fluid ounce in 32·5 grains. In the article Citric Acid, the refrigerant property of lemon-juice has been considered, but it has other qualities which deserve notice. Dr. Owen Rees found that lemon-juice, in doses of fl. oz. j. thrice daily, caused a great depression of the heart's action: in one case it fell from 120 to 75; in another from 110 to 74; the pulse, at the same time, being rendered smaller. These effects were observed in patients suffering from acute rheumatism, but the same effect was observed in the healthy body: thus, a clinical clerk took fl. oz. j. of lemon-juice thrice daily for three days, and carefully noted his pulse, which was naturally full, and about 75 in the minute. After five doses the pulse became much weaker, was more compressible, and numbered 70 in the minute. On the third day the pulse became as low as 66, and was very small and compressible. The urine was always acid, and also natural in quantity, till the third day, when it increased somewhat; the sp. gr. was then 1·017, and there was a deficiency of lithic acid. (See ACIDS, part ii.) *As an Antidote to Acro-Narcotic Poisons*, lime or lemon-juice is often very effectual. Its *modus operandi* is obscure, but its effects are often very remarkable. In over-doses of croton seeds (Croton Tiglium) I have witnessed almost immediate cessation of the vomiting, purging, and pain, from a single draught of lime-juice. It appears to be more or less useful in poisoning by all plants of *Nat. Ord.* Euphorbiaceæ.

Dose:—Of Lemon or Lime-juice, fl. drm. ij.–fl. oz. j., or more. *Of the Oil*, ♏ij.–iv. *Of the Syrup*, fl. drm. j.–ij. *Of the Tincture* (Fresh Lemon Peel oz. ij.½, Proof Spirit Oj.), fl. drm. j.–ij.

667. *Therapeutic Uses. In Scurvy*, lime-juice is of the utmost value, both as a preventive and as a curative agent. Its

[1] Brit. Med. Journ., April 21, 1866. [2] Lancet, March 24, 1866.

efficacy, according to Dr. Garrod, is due to the potash salts contained in it, and though this theory has been disputed, none other more plausible has been offered in its place. The following practical suggestions on its use have been issued by the Board of Trade :—"1. Every ship on a long voyage should be supplied with a proper quantity of lime or lemon-juice. 2. The juice having been received in bulk from the vendors should be examined and analysed by a competent medical officer. All measures adopted for its preservation are worthless unless it be clearly ascertained that a pure article has been supplied. 3. Ten per cent. of brandy (Sp. gr. ·930) or of rum (Sp. gr. ·890) should afterwards be added to it. 4. It should be packed in jars or bottles each containing one gallon or less, covered with a layer of oil, and closely packed and sealed. 5. Each man should have at least two ounces (four tablespoonfuls) twice a week, to be increased to an ounce daily if any symptoms of scurvy manifest themselves. 6. The giving out of lime or lemon-juice should not be delayed longer than a fortnight after the vessel has put to sea." *For Scorbutic Ulcers*, lint soaked in lime or lemon-juice, and covered with oil-silk, is an excellent application. Should the pure juice prove painful, it should be diluted.

668. *In Acute Dysentery and Diarrhœa*, lime-juice has occasionally been found serviceable, and the late Sir W. Fergusson,[1] in a very suggestive paper on the subject, adduced a large number of facts in support of its efficacy. It is only in *Scorbutic Dysentery*, however, that much benefit can be expected from it; and whenever in dysentery the state of the gums, or other circumstances, lead to the belief in a scorbutic taint, lemon-juice should form an essential part of the treatment. A mixture of equal parts of lime-juice, decoction of cinchona, and port wine, was found very effectual in the first Burmese war.

669. *In Acute Rheumatism*, lemon-juice in large doses (fl. oz. j.–ij. every 4 or 6 hours) has been advocated by Dr. Owen Rees[2] and others, who recorded cases successfully treated with it. We learn, however, from Dr. Fuller (p. 106) that, after an ample trial, this treatment has been discarded as uncertain in its action; but he adds that, though it has been abandoned as a mode of cure, lemon-juice, in the form of lemonade, taken as a beverage, seems to aid the action of other remedies, that it generally proves grateful to the patient, and is apparently serviceable in checking the disease. *In Rheumatic Gout*, lemon-juice is a valuable ally to other remedies, more especially when the patient is cachectic or scorbutic. It is of little or no service when the urine is clear, pale, and abundant, but when it is scanty, high-coloured, and loaded, it proves most useful. The

[1] Edin. Med. Surg. Journ., Oct. 1837. [2] Med. Gaz., Jan. 25, 1849

juice of one or two lemons, in the form of lemonade, may be taken daily. (Ibid. p. 350.)

670. *In Ammoniacal states of the Urine*, lemon-juice in large doses is advocated by Dr. Bence Jones.[1] It should not be taken in such quantity that it irritates the stomach and bowels, nor should it set uric acid free in the urine; so that the highest limit can be easily recognised by the bowel symptoms; the lowest is as much as will just make the urine acid.

671. *In the Vomiting of Pregnancy*, lemon-juice proved very effectual in the hands of Dr. Dewees (p. 210). It is also occasionally of service in *Heartburn*.

672. *In Pruritus Scroti and Pruritus Ani*, lemon-juice is often an effectual remedy. The parts should be first bathed in hot water, and afterwards the lemon-juice should be freely applied. When the pain and smarting caused by the application subsides, great relief will be experienced. Dr. Oppler[2] relates an obstinate case, which had resisted all external and internal remedies for ten weeks, but which yielded rapidly and completely to the application of diluted lemon-juice.

673. *In Febrile and Inflammatory Diseases*, an agreeable refrigerant beverage is formed by macerating two sliced limes or lemons and oz. ij. of sugar in Oj. of boiling water. When cool, it should be strained and drank *ad libitum*. For observations on its use, see Citric Acid.

674. Citrus Aurantium, *Risso*. The Common or Sweet Orange.
Hab. Azores, India, &c.

Citrus Bigaradia, *Risso*. The Seville, or Bitter Orange.
Hab. Southern Europe.

Med. Prop. and Action. The peel or outer rind of the fruit of the bitter orange is aromatic, bitter, and tonic, and forms an agreeable adjunct to other tonics. The oil distilled from the flowers, known as Oil of Neroli, is stimulant and anti-spasmodic. The water obtained from the flowers by distillation (*Aurantii Floris Aqua*, *Orange Flower Water*) has the same properties as the oil, only in a minor degree. The juice of the orange is refrigerant and anti-scorbutic, containing a large proportion of citric acid; but it is of less efficacy than lemon-juice. (See that article, and also Citric Acid.)

Dose:—Of the Infusion of Orange-peel (Bitter Orange-peel oz. ½, Boiling Water fl. oz. x.), fl. oz. j.–ij. *Of the Compound Infusion* (Bitter Orange-peel oz. ¼, Fresh Lemon-peel gr. lx., Cloves gr. xxx., Boiling Water fl. oz. x.), fl. oz. j.–ij. *Of the Tincture* (Bitter Orange-peel oz. ij., Proof Spirit Oj.), fl. drm. j.–ij. *Of the Syrup* (Tinct. of Orange-peel fl. oz. j., Syrup fl. oz. vij.), fl. drm. j. *Of Orange Flower-water* fl. oz. j.–ij. *Of the Syrup of Orange Flower* (Orange Flower-water fl. oz. viij., Refined Sugar lb. iij., Water fl. oz. xvj., or q. s. to make the product lb. ivss.), fl. drm. j.

[1] Med. Times and Gaz., March 17, 1866.

[2] Berlin Med. Zeitung, June 30, 1841.

675. *Therapeutic Uses. In Febrile and Inflammatory Diseases*, an agreeable refrigerant drink is made by diluting the juice of the common orange with water, and sweetening to the taste; or the pulp of the fruit sucked is not only refreshing, but beneficial. *In Scurvy*, oranges prove highly useful.

676. *In Hysteria and Nervous Affections*, orange flower water is highly esteemed in France, and is given in doses of fl. oz. j.–fl. oz. ij., to produce a stimulant and anti-spasmodic effect.

677. *In Dyspepsia*, the infusion or tincture is an elegant and efficacious tonic and mild stimulant. It will often be retained when the stomach rejects other medicines.

678. Cocculus Indicus. The fruit of Anamirta Cocculus, *W. et A. Nat. Ord.* Menispermaceæ. *Hab.* India and Ceylon.

Med. Prop. and Action. Not administered internally. The kernels contain a non-nitrogenous, crystalline, neutral poisonous principle, *Picrotoxin* ($C_{10}H_6O_4$), the properties of which have been examined by Dr. Glover.[1] From numerous experiments, he concludes that it acts on the spinal cord; that under its use the animal temperature is much increased; that the iris is contractile until the symptoms are very severe; and that, though a powerful acro-narcotic poison, it is less formidable than aconitia. In all animals killed by it, he observed congestion of the base of the brain. From its intoxicating properties, it is used for entrapping game and fish, but animals thus caught, are often very dangerous to eat. Dishonest brewers use the extract for adulterating porter. Externally, the powdered seeds are used in the form of ointment (gr. lxxx. ad Ung. oz. j.), or Picrotoxin (gr. x.) is occasionally substituted for them.

679. *Therapeutic Uses. In Porrigo and other Skin Diseases*, it was formerly in repute, but it has now been abandoned. It is an effectual destroyer of *Pediculi*, and as such, is much used in the East. *In Scabies*, in which it has been advised, it is very inferior in safety and efficacy to sulphur ointment. *In Ringworm of the Scalp*, Dr. Christison (p. 349) speaks of an ointment prepared by incorporating 1 part of the seeds, deprived of their shells, and 5 parts of lard, as one of the best applications; it should be applied night and morning, and washed away with soap and water at least once a day.

680. Coccus Cacti. Cochineal. The dried female insect. *Nat. Ord.* Hemiptera. Reared in Mexico and Teneriffe.

Med. Prop. and Uses. Supposed to be anti-spasmodic, and, as such, formerly esteemed in *Hooping Cough*; but it is of little value, and has now been almost wholly abandoned. In medicine it is principally employed as a colouring agent. The dose of the Tincture (oz. ij.-½, Proof Spirit Oj.) is fl. drm. ss. to jss.

Cochlearia Armoracia. Horse-radish. See Armoracia.

[1] Monthly Journal of Med. Sciences, April, 1851.

COD LIVER OIL. See OLEUM MORRHUÆ.

681. CODEIA. CODEINE. An alkaloid discovered in 1832, by Robiquet, in Opium, of which it constitutes $\frac{1}{4}$ to nearly 1 per cent. It occurs in fine rhombic colourless crystals; readily soluble in alcohol or chloroform, less so in ether and in water. It unites with acids, forming crystallized salts.

Med. Prop. and Action. These have been examined by Dr. Harley (p. 168), who comes to the conclusion that its action on man closely agrees with that of morphia; like it, possessing hypnotic and excitant properties. In those who are susceptible of the hypnotic action of opium, it induces somnolency when given by the areolar tissue in doses of gr. j.–ij. The effects, however, are much more transient than those of the other somniferous principles of opium. Its excitant properties are indicated by the stimulant action upon the heart and motor centres, resulting in acceleration of the pulse, contraction of the pupils, and derangement of the vagus. Given by the skin, two grains are equivalent at most to a quarter of a grain of morphia. By the stomach, larger doses are required, but it appears that these are often objectionable on account of their tendency to cause gastro-intestinal disturbance. From observations made by Dr. Harley (p. 297), it appears that atropia given with codeia, completely counteracts any nausea or other unpleasant effect of the latter. Excepting the effect on the pupil, all atropia symptoms are increased and prolonged by codeia. It is prescribed by the French Codex in the form of syrup, in doses varying from $\frac{1}{75}$ to $\frac{1}{6}$ gr. Dr. Harley considers that it possesses no advantage over morphia, but rather the contrary, and that it cannot be recommended as a useful or desirable addition to our materia medica. However, in *Diabetes*, Dr. Pavy [1] prefers codeia to opium and morphia, being equally effectual in controlling the disease without exerting the same narcotic effect. He considers gr. $\frac{1}{2}$ thrice daily, a proper commencing dose, and this may be gradually increased to gr. ij.–iij. He considers that codeia will prove a valuable agent in diabetes, exhibiting in some cases apparently a direct curative action. Dr. Aran [2] also speaks highly of the relief obtained from it in *Bronchitic Coughs* and *Phthisis*, in *Rheumatism*, *Gout*, *Cancer*, *&c.*,

682. COFFEA ARABICA. The Coffee Plant. *Nat. Ord.* Cinchonaceæ. *Hab.* Arabia, Persia, East and West Indies.

Med. Prop. and Action. The berry (*vulgo* Coffee), when dried and burnt, is tonic and stimulant. In small doses, a strong decoction of coffee is capable of arresting diarrhœa; whilst, in large doses, it acts as a cathartic. Dr. Pickford [3] attributes this partly to the condition of the motor nerves, which, being weakened, are, by its moderate stimulus, restored to their normal condition; and thereby diarrhœa, depending upon their deranged condition, is relieved. When large doses are taken, the motor nerves become over-stimulated; and on this increased action arises an increased amount of alvine secretion. He considers, also, that coffee undoubtedly possesses the property of promoting digestion, and of increasing the biliary secretion. This last opinion is in accordance with Liebig's [4] views, who points out the singular fact that caffeine, the peculiar principle of coffee, is identical with theine, the peculiar principle of tea; and that both these substances, with the addition of oxygen and the elements of water, can

[1] Guy's Hosp. Rep., 1870, xv., p. 420.
[2] Edin. Med. Journ., Sept. 1862.
[3] Medical Gazette, Nov. 24, 1848.
[4] Animal Chemistry, 2nd ed. p. 179.

yield taurine, the nitrogenized compound peculiar to bile. The experiments of Stuhlmann and Falek show that caffeine proves fatal to animals in comparatively small doses. It destroys by exhaustion of nervous power, and seems to act especially upon the heart and parietes of the vessels.[1] Caffeine, or a strong solution containing it, produces in man restlessness, palpitations, and other nervous symptoms. It also appears to check the metamorphoses of the animal body, as shown by the diminished formation of urea, which takes place under its use.[2] Hence it has been proposed to administer strong coffee in various febrile diseases in which there is excessive metamorphosis of the tissues. Coffee is of importance as a means of disguising the taste of nauseous medicines, particularly quinine, senna, and Epsom salts.

Coffee is contra-indicated in acute sthenic inflammations; and in persons suffering from piles it causes an increase of irritation and pain.

683. *Therapeutic Uses. In Asthma*, coffee is a remedy of considerable value. According to Dr. Hyde Salter (p. 202), it relieves about two-thirds of the cases in which it is tried. The relief is very unequal, often merely temporary, sometimes very slight, sometimes complete and permanent. He furnishes the following valuable hints on its administration:—1. It cannot be given too strong. Unless sufficiently strong to produce its characteristic physiological effects it does no good, but rather harm; moreover, if given very strong, it need not be given in much bulk, and quantity is a disadvantage, its effect is less rapid, and it oppressively disturbs the stomach. 2. It is best given without sugar and milk—pure *café noir*. 3. It should be given on an empty stomach; if given on a full stomach it often does great harm, by putting a stop to the process of digestion; indeed so much is this the case, that coffee accompanying a meal, especially late in the day, is so peculiarly apt to induce asthma, that it deserves to be classed amongst its special provocatives. 4. It seems to act better if given hot—very hot. To these hints it may be added that asthmatic patients should avoid using coffee as an ordinary beverage, lest the habit of taking it should impair its efficacy as a remedial agent. It is a simple and safe remedy which should never be neglected.

684. *In Infantile Cholera*, coffee has been extensively used by Dr. Pickford, on the recommendation of Dr. Dewees (p. 421), who states that in these cases he has often seen it act like a charm. Dr. Pickford[3] employs it in infusion (gr. xx. of coffee, fl. oz. ij. of water, and fl. drm. j. of syrup.) Of this he gives a large spoonful every hour. He states that it produces very marked effects, allaying the irritability of the stomach, and improving the colour and character of the motions. It was employed in nine children of different ages, from four weeks to two years and a half old. The dose varied from gr. x. to gr. xl. daily. In each case its success was unequivocal.

[1] See Ranking's Abstract, 1859, vol. xxix. p. 351.

[2] Garrod, p. 232.

[3] Med. Gaz. (op. cit.)

685. *Strangulated Hernia.* From a large number of cases collected by Dr. Marchant, and from the recorded experience of others,[1] it appears certain that coffee taken internally is capable of a remarkable influence in aiding or causing reduction. About half a pound of powdered roasted coffee is infused in twelve cupfuls of boiling water, and of this the dose is a cupful to be taken every quarter of an hour till six or eight cups have been taken, after which half an hour may elapse between each dose. In some cases after the fourth, in others after the sixth, and in another after the ninth cup, a spontaneous reduction of the hernia followed. With such evidence in its favour, this simple remedy seems well deserving of further trial.

686. *In the Vomiting of Pregnancy*, Prof. Meigs advises a cup of hot coffee and a piece of dried toast to be taken very early in the morning; after which the patient should be quiet until her usual time of rising; by this means the vomiting may often be prevented.

687. *In Tic Douloureux, Hemicrania, and other Neuralgic Head Affections*, coffee is much employed by the Belgian physicians. M. Hannon advises the internal use of the citrate of caffeine, in doses of gr. j. every hour, for some time before the expected paroxysm. Dr. Anstie[2] mentions two cases of *Neuralgia*, one of them a case of *Dorso-intercostal Neuralgia attending Shingles*, in which caffeine (gr. j. in solution) introduced hypodermically afforded great relief. He also states that in one instance he found it of great service in *Alcoholic Sleeplessness*. Thus used, he considers that it is likely to prove a valuable remedy in this class of affections. In two cases, however, in which it was thus employed by Dr. J. Barclay, of Banff,[3] it partially or altogether failed.

688. *In Intermittent and other Fevers*, Grindel and M. Dorpat regard coffee as a powerful febrifuge. In Dutch Batavia it is used in strong infusion, with lemon-juice, in the virulent fevers endemic in that island. The practice, passing from thence, has been introduced into Holland, where, M. Vanden-Corput states, it is now preferred to quinine. Pouqueville declares that it is infallible in the intermittents of the Morea, and Martin-Solon approves of its use in the adynamic form of *Typhoid Fever*. It has recently been proposed to administer a strong infusion of coffee in febrile diseases, with a view to limit the metamorphosis of tissues.

689. *In Hay Fever, or Hay Asthma*, a cup of strong coffee, without milk or sugar, repeated every two hours, is spoken of by Mr. Worthington,[4] as affording relief when various other

[1] Braithwaite's Retrosp., xxxvii. p. 199, and lix. p. 228.
[2] Practitioner, July, 1868.
[3] Med. Press, Dec. 29, 1869.
[4] Lancet, Aug. 1842.

remedies had proved unsuccessful. In *Hooping Cough*, it is strongly recommended by Dr. Guyot.

690. *In Poisoning by Opium, Aconitia, and other Narcotic Poisons*, a strong infusion of coffee, without milk or sugar, is an effectual stimulant. It is also advantageously given in the *Depression after Drunkenness.*

691. *In Nervous and Hysterical Headaches*, a cup of strong coffee is recommended by Percival and Baglivi.

692. COLCHICUM AUTUMNALE. Meadow Saffron. *Nat. Ord.* Melanthaceæ. *Hab.* Meadows throughout Europe.

Med. Prop. and Action. The corm or bulb, collected about the end of June, and the ripe seeds (*off.*) are acrid, purgative, diuretic, and sedative, in doses of gr. iij.–v. thrice daily or oftener. They contain a poisonous principle, *Colchicina* or *Colchicine;* and a peculiar acid, *Cevadic Acid.* In small doses, colchicum increases the secretions generally, particularly those of the liver and mucous membrane of the intestines. In a full dose it purges copiously, allays pain in a remarkable manner, and depresses the action of the heart and arteries; in some persons it gives rise to intermissions of the pulse; the motions produced by it are copious, frequent, and of a highly bilious character; the fæces, though solid, are surrounded with mucus, and its operation seems more analogous to that of the saline purgatives than of any other cathartic. Its sedative influence, though sensibly connected with its evacuant effects, is not, however, solely dependent upon them, and the number of motions may be very considerable without any proportionate depression of the strength ensuing. Colchicum has been asserted to exercise a twofold action on the urine. Chelius [1] believes, and the same fact has been stated by others, that, even in moderate doses, it has the effect of increasing the amount of lithates and lithic acid in the urine, when these are deficient; and Dr. Graves [2] has observed that, when the urine is loaded with lithates, colchicum has the effect of decreasing their quantity, or of removing them altogether. This subject, however, has been carefully examined by Dr. Garrod,[3] who draws the following conclusions:—1. That there is no evidence to prove that colchicum produces its effects upon the system by causing the kidneys to excrete an increased amount of uric acid, but that in fact the reverse would seem to hold good. 2. That colchicum is not always diuretic, but often diminishes the renal secretion, especially when its action is exerted upon the alimentary canal. 3. That it has no marked influence on the excretion of urea. These conclusions are drawn from careful analysis of seventy-two cases. From idiosyncrasy some persons are unable to take even the smallest dose of colchicum without its producing serious constitutional disturbance. Externally applied, it is anodyne.

Dose:—Of the dried corm in powder, gr. ij.–viij. *Of the Extract prepared from the juice of the fresh corm*, gr. ½–ij. *Of the Acetic Extract*, gr. ½–ij. *Of the Wine* (Colchicum corm dried oz. iv., Sherry Oj.), ℥x.–xxx. *Of the Tincture of the Seeds* (Colchicum seeds oz. ij.½, Proof Spt. Oj.), ℥x.–xxx.

693. *Therapeutic Uses. To Gout*, colchicum has been said to hold nearly the same relation as cinchona does to ague, and so far as individual attacks are concerned the similarity certainly holds good; but, unlike cinchona, colchicum has no power to prevent a return of the disease. So far from that, it is the

[1] London Med. Gazette, vol. vii.
[2] British and Foreign Med. Rev., April, 1849.
[3] Proceedings of Royal Medica Chir. Soc., June 8, 1858.

opinion of many that its use, especially if carried to an undue extent, rather predisposes to subsequent attacks. Its power of controlling gouty inflammation is often very remarkable. Occasionally, as Dr. Garrod (i. p. 856, *seq.*) observes, an almost magical change is produced by a single large dose, without the appearance of the least increase in the secretion from any organ, the effect being manifested in the rapid subsidence of the pain and other symptoms of the joint inflammation; and simple purging, even though copious, will often fail to produce any notable effect under such circumstances. In articular gout it may be advantageously administered during the time that the inflammatory symptoms are present, and ♏x.–xx., or even ♏xxv. of vinum colchici may be given every six hours. Thus given, it will be sufficient in most cases to cut short the gouty attack; and Dr. Garrod states, that though he has often trusted to it alone, yet in the majority of cases it is advantageous to combine it with other remedies, especially with alkalies, amongst which potash and lithia hold the foremost place. It is of importance at the same time to keep up an action of the bowels, and as saline purgatives are desirable, many of them acting remotely as antacids, and all of them tending to relieve portal congestion, recourse may be had to Sir C. Scudamore's "White Mixture," which was formerly a popular remedy:—℞ Magnes. Sulph. ʒi.–ʒij., Acet. Colchici (Lond. Ph.) ʒj., Magnes. Carb. gr. x.–xv., Aq. fʒjss. M. ft. haust., 6tis vel 8tis horis sumend. The state of the skin and kidneys require at the same time to be attended to. Colchicum, according to the same authority, is equally efficacious in subduing the exacerbations of *Chronic Gout* as in combating the early fits in the acute disease, due regard being paid to the strength of the patient, and the dose regulated accordingly. In these cases it may often be advantageously combined with guaiacum, iodide of potassium, quinia, &c. Doubts are entertained by some as to the use of colchicum in chronic cases, but Dr. Garrod considers that the permanent danger caused by allowing the inflammation to linger for a long period in the system is far greater than any injury which the proper use of colchicum can entail. This remark applies equally to the employment of this remedy in acute cases. *In Irregular Gout*, Sir H. Holland is of opinion that it may be employed with advantage, an opinion in which Dr. Garrod coincides. Its modus operandi is undetermined; it appears, like cinchona in intermittents, to exercise what we must at present be content to call a *specific action*. According to Dr. Laycock,[1] the local application of colchicum to the affected parts affords great relief in the majority of cases.

[1] Med. Chir. Rev., lxi. 190.

694. *In Acute Rheumatism*, the value of colchicum has been variously estimated; it may not have the power, as reported by some, of *curing* the disease, but it has the property of alleviating the symptoms and shortening their duration. It does so, Dr. Fuller believes, not by operating simply as a sedative, nor by acting specifically on the rheumatic virus, but by promoting its elimination by the kidneys, and by exercising some influence over the process of assimilation, whereby the formation of the poison is checked. Be this as it may, he adds, immediate benefit so repeatedly results from it when given combined with small doses of calomel, ipecacuanha, alkalies, and opium; and in *Chronic Rheumatism*, benefit is so frequently derived from it uncombined with other remedies, and in doses insufficient to produce any sensible effect upon particular organs, that no one can hesitate to assign the improvement to it. It is not equally beneficial in all cases; less so in the weak and nervous than in the robust; less so in purely fibrous rheumatism than in that complicated by synovial inflammation; less so in proportion as the fever exceeds the articular swelling, and as the urine is less highly charged with the lithates. Its operation in all cases must be watched most carefully. Throughout its use, the bowels must be carefully regulated, and if the lithates disappear from the urine, if the pulse become weak, if faintness, or nausea, or purging supervene, its use should be instantly discontinued; but until some one of these symptoms occurs, the acetous extract, or the inspissated juice (gr. j.–jss.,) or the wine (ɱxv.–xx.) may be advantageously given twice or thrice daily. (Dr. Fuller, p. 99.) *In Rheumatic Carditis*, colchicum, with alkalies, &c., is necessary to counteract and get rid of the materies morbi, without the removal of which it is difficult to conceive that a cure can be effected. (Ibid. p. 236.) *In Rheumatic Gout*, the same treatment is as necessary as in genuine rheumatism, but stronger remedies are at the same time required to restore a healthy condition of the intestinal secretions. Care must, however, be taken not unnecessarily to depress the system. (Ibid. p. 348.) *In Chronic Rheumatism*, its use should be restricted to those cases in which the liver is inactive, and the joints swollen, with effusion within the capsule, and where the pain is aggravated by heat. Here, with alkalies, diuretics, and opiates, it sometimes proves exceedingly beneficial. (Ibid. p. 418.) *In Rheumatic Iritis*, colchicum forms an excellent adjunct to other remedies.

695. *In the Lithic or Uric Acid Diathesis*, particularly if occurring in gouty subjects, or free livers, Sir B. Brodie (p. 205) found colchicum very useful. In the first instance, ɱxv. of vinum colchici may be administered twice or thrice daily;

afterwards a saline aperient, and from xl.–l. drops may be occasionally given in the morning with advantage.

696. *In Cystitis of Rheumatic and Gouty subjects*, colchicum is a valuable adjunct to pareira brava, or buchu. Given alone, it will, in many instances, afford great relief, if not effect a cure. Sir B. Brodie (p. 198) considers that it is indicated when the urine is alkaline. In the *Nephritis of Gouty subjects*, it is advised by Dr. Copland (ii. p. 641) conjoined with magnesia. *In Orchitis*, occurring in the same class of persons, it is sometimes productive of excellent effects. Mr. Saunders, R.N.,[1] relates a case which, after resisting all other treatment, speedily yielded to colchicum and fomentations. *In Senile Enlargement of the Prostate Gland*, it sometimes proves useful. This is, in a measure, accounted for by the fact that this affection frequently occurs in persons of a gouty diathesis.

697. *In Inflammation and in some Febrile Diseases*, colchicum, from its power of depressing the action of the heart and arterial system, as well as from its purgative and diuretic action, has been recommended by Mr. Haden,[2] Mr. Embling,[3] and others, but it has been superseded by remedies whose action is more direct and certain. This remark applies equally to *Dropsical Affections*, in which it formerly enjoyed some repute. Dr. Maclagan advises it in the advanced stages of *Bright's Disease*, as a means of depurating the blood.

698. *In Chronic Bronchitis*, the value of colchicum was pointed out in 1820 by Dr. Hastings. It is doubtless the active ingredient in the formula employed with great success by Dr. Greenhow[4] in *Gouty Bronchitis*:—℞ Potass. Iodid., Ammon. Carb. āā gr. iv., Vin. Colchici ♏x., T. Scillæ, T. Hyoscyam. āā ♏xx., Aq. Camph. q.s. ft. haust. ter die sumend. This is for the acute or early stage; in the more advanced, the mineral acids or iron are indicated.

699. *In obstinate Constipation*, Dr. Chapman[5] states that he found nothing so efficacious as the tincture of the root of colchicum, in doses of gutt. x. several times daily. He adds that he has seldom found it fail, and that the dose should be small, as the object is attained rather by gradual insinuation than by forcible impression.

700. *In Gonorrhœa*, colchicum has been extensively employed by Dr. Ticinus,[6] of Dresden; and he states that he has met with great success from its use. He gives ♏xxv.–♏xxx. of the vinum thrice daily, combined with Tinct. Opii, enjoining at the same time antiphlogistic remedies and the hot bath.

[1] Med. Times, vol. xv. 1847.
[2] Obs. on Colchicum, 8vo, 1820.
[3] Lancet, May, 1843.
[4] On Chronic Bronchitis, &c. 1869. London.
[5] On Diseases of the Abdominal Viscera, p. 299.
[6] Caspers Wochenschrift, Aug. 26, 1849.

In other inflammatory discharges from the Urethra in the male, and from the Vagina and Uterus in the female, he also found its use attended with signal benefit. Mr. S. Cooper[1] also found vinum colchici useful in relieving *Strangury, Ardor Urinæ, and irritable states of the Bladder*. Sir R. Brodie found that a full dose of vinum colchici (mxxx.-lx.), taken at bedtime, is often effectual in preventing the occurrence of *Chordee*.

701. *In Jaundice*, Dr. Copland (ii. p. 310) states that he has prescribed colchicum in several instances with marked benefit. He has generally combined it with mild mercurials, or soap, or alkalies, or with magnesia and the neutral salts, according to circumstances. It should be given in small doses, should be continued for a considerable time, and should be carefully watched. If there be much debility, or if it produce depression, it may be given with camphor. It often, he adds, increases the biliary secretion in cases depending upon *Chronic Inflammation or Enlargement of the Liver*, and promotes the resolution of the former, and a diminution of the latter morbid state.

702. *In Neuralgia*, colchicum has not, in the opinion of Dr. Copland (ii. p. 823), been so generally employed as it deserves. Its use should be preceded by cathartics; and, in order to be successful, it should be given in conjunction with stimulants and tonics, *e.g.*, the carbonate of ammonia and cinchona. He relates a case in which, thus prescribed, it produced unequivocal benefit.

703. *In Dysmenorrhœa*, connected with a tendency to gout or rheumatism, it will be proper to give colchicum internally, combined with blue pill every night or every other night, and active laxatives occasionally. Flannel should be worn, and cold and exposure avoided. (Dr. Graily Hewitt, p. 443.)

704. Collodium, Collodion, a solution of Pyroxylin (Gun-cotton), in Ether and Rectified Spirit.

Prep. Take of Pyroxylin oz. j., Ether fl. oz. xxxvj., Rectified Spirit fl. oz. xij. Mix the ether and the spirit, and add the pyroxylin. Set aside for a few days, and should there be any sediment, decant the clear solution. Keep it in a well-corked bottle. It is a colourless, highly inflammable liquid, with an ethereal odour; it dries rapidly on exposure to the air, leaving a thin transparent film, insoluble in water or rectified spirit.

Collodium Flexile. Flexible Collodion. Take of Collodion fl. oz. vj., Canada Balsam grs. cxx., Castor Oil fl. drm. j. Mix, and keep in a well-corked bottle.

Dr. Richardson's "Styptic Colloid" is prepared by digesting tannin, as

[1] Surg. Dict. 7th ed., art. Gonorrhœa.

pure as it can be, for several days in absolute alcohol, then adding absolute ether, until the whole of the thick alcoholic mixture is rendered quite fluid, and then adding xyloidine, or gun-cotton, until it ceases readily to dissolve. A little tinct. of benzoin is added, for the sake of its pleasant odour. The quantities are not mentioned. This solution is a powerful styptic, and may be applied to wounds, ulcers, &c., either with a brush or diluted with equal parts of ether, in the form of spray. As the ether volatilises, the tannin and cotton in intimate combination, are left on the surface, and the tannin coagulating with the albuminous portion of the blood or secretion, forms with it a kind of membrane almost like leather. The cotton meanwhile unites the whole, and gives substance and adhesive quality to the mass. It promises to be an agent of much value. Dr. Richardson suggests various combinations with this agent, which may be worthy of attention, *e.g.*, Creosote (℥j. ad fl. drm. ij.), Carbolic Acid (gr. v. ad fl. drm. ij.); this, he says, is very powerful, but produces some irritation; Iodine (gr. v.–vij. ad fl. drm. ij.), Morphia (gr. j. ad fl. drm. ij.), and Chloride of Zinc (gr. xxx. ad fl. oz. j.) For details the reader is referred to Dr. Richardson's paper.[1]

Med. Prop. and Action. Collodion was introduced in 1848, by Mr. Maynard, of Boston (U. S.), as a substitute for adhesive plaster in surgery. It acts on the twofold principle of drawing together and holding in apposition the edges of a wound, and of preserving it from contact with the air. Its action is purely mechanical; as the ether evaporates the subjacent surface is constringed, and a degree of pressure is thus established, which in many cases is very desirable and beneficial, by moderating vascular action, and promoting absorption. So long as the surface to which it is applied is of very limited extent, the sense of constriction and the preceding sensation of cold caused by the evaporation of the ether are insignificant, but when, in the words of Stillé (i. p. 138), it is applied over a large and sensitive surface, the sense of constriction becomes unpleasant, or may even be decidedly painful. One of the great objections to collodion was found to be its liability to crack, and consequently to peel off; this, however, may in a great degree, if not altogether, be obviated by using flexible collodion, which is generally preferable to the pure fluid. Although a useful agent in many respects, it has not answered the high expectations which were formed of it when it was first introduced.

705. *Therapeutic Uses.* *Wounds* of limited extent may be treated in the following manner by this agent:—the bleeding having been arrested and the skin dried, the edges are to be brought in careful apposition, and by means of a camel-hair brush, the collodion should be applied lengthwise over the wound, and about half an inch beyond the wound. In a few seconds, the ether having evaporated, the wound will be found covered with a film. When quite dry, in order to increase the firmness of the support, a second layer may be applied in the same manner as the first. In severe wounds additional support by goldbeaters' skin or adhesive plaster may be required. If there is no probability of the wound healing by first intention, it is better to apply the collodion transversely, like strips of plaster; room is thus left for the escape of pus. It is chiefly adapted for clean incised wounds, but it has been advantageously employed in lacerated ones; and even in a case of *Laceration of the Perinæum* it was used with success by Dr.

[1] Med. Times and Gaz., April 13 and 20, 1867.

Cormstock.[1] *Superficial Hæmorrhage from Leech-bites, Cupping*, &c., may often be speedily arrested by its application.

706. *In Skin Diseases*, much good was anticipated at the time of its introduction, from the local application of collodion, but it has not answered generally the expectations of its advocates; still in some it is useful, as in *Herpes Zoster*, the intolerable burning attending which is often notably relieved by painting the vesicated patches with it, and repeating the same as often as required. It is the cleanest and most effectual means of preventing the rupture of the vesicles, and its use is also warmly recommended in cases where superficial ulceration has taken place.[2]

707. *To prevent Pitting in Small-pox*, collodion has been advised by Dr. Ranking[3] and others; its value, however, is doubtful; probably the remark made by Mr. Marson (i. p. 461), with reference to Dr. Graves's analogous solution of gutta percha in chloroform, which acts on the same principle of pressure and exclusion of air, applies equally to collodion: "It does no good, and by confining the discharge under the coating produces a most offensive condition of the patient." If used, the flexible form should be preferred.

708. *In Erysipelas*, it has been recommended, but Dr. Russell Reynolds[4] states that it has appeared to him to be only of use when the erysipelas has been of very limited extent, and that its application over a large surface has not only failed to do good, but in consequence of its cracking and leaving rough edges, has done positive harm. This might be obviated, in a great measure, by using flexible collodion.

709. *Boils.* These often commence in the form of a small pimple, which soon maturates, and forms a pustule, around which the inflammation extends till a hard, red, painful swelling occurs; the centre of which dies, leaving a core. In such cases collodion applied in the earliest stage is often effectual in arresting its development. Should it fail in effecting this it should be still persevered with, as it allays pain and irritation, and apparently hastens the curative process. This treatment, proposed first by Dr. Hare, is favourably noticed by Dr. Ringer (p. 200). *Carbuncles.* Dr. Seiche, in twelve cases, tried the plan of surrounding the inflamed part with a zone of collodion, so as to exert pressure upon the base of the swelling, leaving the central portion exposed for the escape of the softened tissues. By this procedure it appeared that extension of inflammation was prevented, the pain alleviated, and the duration of the affection materially abridged (Stillé). *For preventing Bed Sores*, flexible collodion has been used with good effect in some cases.

[1] Amer. Journ. of Med. Science, April, 1849.
[2] Dublin Quart. Jour., 1869, p. 396.
[3] Lancet, Nov. 13, 1849.
[4] Syst. of Med., p. 691.

710. *In Entropium or Inversion of the Eyelids*, collodion has been successfully employed by Mr. Bowman.[1] He directs the lid to be restored to its natural position, while the collodion is being applied, by making gentle pressure outwards on the integument below the canthus. In this way the skin of the lower lid is horizontally grooved, while, at the same, it is left exposed so as to receive the collodion. It should be held in this position until the collodion has contracted, at least to such a degree as may be sufficient to maintain the right position of the lid during the further stages of the contraction. One application is generally sufficient; in some instances it requires to be repeated. To insure its success, the collodion should be concentrated; the surface of the lid should be perfectly dry; the patient's head should be inclined to one side, to allow the tears to run out at one corner of the eye, and not over the lid and cheek; and finally, the collodion should not be removed for some days. Two cases of *Chronic Entropium* thus successfully treated are related by Mr. W. Batten.[2] One of his cases was thus treated as far back as 1847.

711. *In Incontinence of Urine in Children*, Sir D. Corrigan[3] advocates the local application of collodion. The prepuce is to be slightly curved up, and over the little cup thus formed collodion is to be applied, by means of a camel-hair pencil or pen-holder. Almost as fast as applied the collodion solidifies. In contracting it draws closely together the edges of the prepuce, and thus the exit for the escaping urine is closed. When it is desired to pass water, the little wedge or cup of collodion is easily removed with the finger nail, and may be replaced as required. A fortnight's use sometimes suffices for a cure. This treatment is worthy of further trial.

712. *Painful Fissures of the Nipple* are often successfully treated by bringing the edges together, and keeping them in apposition, by means of collodion. *Fissures of the Lips*, *Hands*, or other parts may be treated in the same manner.

713. In addition to the above, collodion has been recommended in *Burns*, *Mammary Abscesses*, *Ulceration of the Os Uteri*, *Orchitis*, *Toothache*, *&c.*, but in none of these is its utility established by experience.

714. Colocynthidis Pulpa. Colocynth. The dried, decorticated fruit, freed from the seeds, of Citrullus Colocynthis, *Schrad. Nat. Ord.* Cucurbitaceæ. *Hab.* S. Europe, Africa, Egypt, and India. Imported chiefly from Smyrna, Trieste, France, and Spain.

Med. Prop. and Action. Powerful drastic cathartic, but from its extreme

[1] Lond. Journ. of Med., April, 1851.

[2] Lancet, Oct. 27, 1855.

[3] Dublin Quart. Journal, Feb., 1870.

acridity it is rarely given uncombined with carminatives, &c. The compound extract is the most eligible form for its administration. Combined with calomel or blue pill, it is one of the most generally useful purgatives we possess. Its activity depends upon a bitter principle, *Colocynthin*. It is said to act chiefly on the large intestines, and occasionally causes griping or tormina, nausea, and vomiting. To obviate these effects, it is advisable to combine it with camphor, which increases its purgative action, at the same time that its influence on the sentient nerves is greatly diminished. Henbane also modifies its action. When applied to an ulcerated or abraded surface, it acts as a brisk purgative; and Orfila states that gr. cxx. of the pulp, applied to the cellular tissue of the interior of the thigh of a man, caused death in twenty-four hours. In large doses it acts as an irritant poison, causing inflammation of the mucous membrane of the intestinal canal.

Dose:—Of Colocynth Pulp (a bad form of administration), gr. ij.–v. *Of the Compound Extract* (Colocynth Pulp oz. vj., Ext. of Socotrine Aloes oz. xij., Resin of Scammony oz. iv., Hard Soap oz. iij., Cardamom Seeds oz. j., Proof Spt. q.s.) gr. iij.–x. *Of the Compound Pill* (Colocynth Pulp oz. j., Barbadoes Aloes, Scammony, āā oz. ij., Sulphate of Potash oz. ½, Oil of Cloves fl. drm. ij., Water q. s.), gr. v.–x. *Of Pill Colocynth and Hyoscyamus* (Comp. Pill of Colocynth oz. ij., Ext. of Hyoscyamus oz. j.), gr. v.–x.

715. *Therapeutic Uses. In Constipation*, the compound extract or compound pill (gr. v.–x.) combined with small doses of blue pill, ipecacuanha, podophyllum, or nux vomica, as indicated in each case, is a safe and effectual remedy. Dr. Crichton[1] recommends the Prussian tincture (Colocynth Pulp oz. j., Star Aniseed drm. j., Spt. Rect. Oj.) in doses of ♏ x.–xx. *In Habitual Constipation*, he states that ♏ v.–x. in a little water, taken about an hour before breakfast, suffices to ensure a full evacuation.

716. *In some forms of Dyspepsia and Gastrodynia*, Pil. Coloc. et Hyoscyam. variously combined, as advised in the preceding section, is often productive of good, but it is inadmissible if inflammatory symptoms are present. The following pills, recommended by the late Dr. James Johnson, have been found useful: ℞ Ext. Coloc. Co. gr. xl., Pil. Rhei Co. gr. xx., Saponis gr. vj., Ol. Caryoph. gutt. iv. M. ft. pil. xvj., sumat j., vel ij., horâ somni.

717. *In Dropsical Affections*, particularly when connected with disease of the liver, colocynth proves useful as a hydragogue cathartic, but it is inferior in efficacy to elaterium. *In the Leucorrhœa of young Girls*, clysters of colocynth proved very successful in the hands of Claude.[2] He employed first a simple enema, followed by one prepared with colocynth. A single fruit he found enough for three doses. It produces a large number of stools, the latter ones being bloody. It is a doubtfully safe remedy.

718. *In Apoplexy, Mania, and some other Cerebral Affections*, colocynth is particularly useful as a powerful cathartic and

[1] Brit. Med. Journ., Nov. 28, 1868. [2] Journ. für Kind., 1859, p. 9.

derivative. It should be given in full doses, and repeated until it operates freely.

719. CONIUM MACULATUM. *Linn.* Spotted Hemlock. *Nat. Ord.* Umbelliferæ. *Hab.* Europe and Temperate Asia: common in England.

Med. Prop. and Action. The leaves and dried fruit (*off.*) are narcotic, anodyne, and antispasmodic, their activity residing in a peculiar volatile, oleaginous alkaloid, *Conia* or *Conein*. According to the experiments of Dr. Harley (p. 3, *seq.*), hemlock acts as a depressor of the muscular movements, but the effect is influenced by the state of the muscles, whether they are in action or at rest. If a vigorous adult man take five or six fluid drachms of the succus conii, and then start on a long walk, in half or three-quarters of an hour he experiences a feeling of tiredness, especially in the knees and hamstrings; he may still continue to walk, feeling powerless, with some giddiness and feeling of heaviness over his eyes; in an hour the sense of fatigue has gone off, and in another hour he is as active as ever. If the same quantity be taken, and he remain at rest, the eyes become first affected, the adjusting function is interfered with; then succeed drowsiness and dilatation of the pupil; then weakness of the legs; he becomes pale, cold, and tottering; the pulse is regular, and of undiminished force and volume; there is a diminution of muscular power in every part of the muscular system, and almost paralysis of the hamstrings and levator palpebræ. These symptoms reach their maximum in about two hours, and within three hours and a half quite disappear. The succus was administered to several persons in doses of fl. drm. iij. to oz. j., with similar symptoms, but in doses short of fl. drm. iij.–iv. there were no appreciable symptoms. The action is uniform and invariable in man and in all other animals. There is depression of the motor function of the third nerve, a lazy movement of the eyes, and sometimes strabismus, with imperfect adjustment of the refracting media of the eye. The full action of hemlock is a sleep: it is to the corpora striata, the smaller nervous centres, and the whole of the motor tract, just what opium is to the brain —it tranquillizes and renovates the whole muscular system. At first it appears to paralyse this, but it is really a tonic, its continued administration for months resulting in an improved condition of the body. Its action is influenced by muscular activity more than by muscular power. The sedentary, with abundance of strength, are more affected than the delicate but active. A delicate child will often take as much as would reduce some strong men to a tottering condition; hence, the dose must be proportioned to the degree of motor activity of the individual, whether child or adult. It produces no pure cerebral effects; the irritability of the spinal cord is diminished; there is no evidence of distinct interference with the sensory functions. It exercises no perceptible influence on the urine; it is not eliminated by the kidneys; neither, in the cases under observation, was it detected in the fæces or the breath. Locally applied, in the form of a poultice of fresh leaves (Cataplasma Conii), conium acts mildly as an anodyne; as a substitute for this poultice, Dr. Harley advises a piece of lint saturated with the succus; or, if heat and moisture be required, a bran poultice containing oz. j.–ij. of the succus may be used.

Dose:—Of the dried powdered Leaves (an ineligible form), gr. ij.–viij. *Of the Extract*, gr. ij.–vj. *Of the Juice* (*Succus Conii*), fl. drm. ½–j. *Of the Compound Pill* (Extract of Hemlock oz. ij.½, Powdered Ipecacuanha oz. ½, Treacle q.s.), gr. v.–x. *Of the Tincture of the Seeds* (Bruised Seeds oz. ij.½, Spt. Tenior Oj.), ℥xx.–lx. These are the officinal or ordinary doses, but it may be inferred, from Dr. Harley's observations, that they are far too small to be of any therapeutic value: his experiments, indeed, tend to show that, with the exception of the succus, the officinal preparations are almost or altogether inert.

720. *Observations on the Use of Conium*, drawn mainly from Dr. Harley:—

1. In order to influence any of the diseases to which it is antagonistic, hemlock must be given in such doses as will produce within about an hour its proper physiological effect.

2. The operation of hemlock in the same individual varies in degree, according to his motor activity: a dose which in the ordinary condition of the patient will be just sufficient to produce its peculiar effects in a mild degree, will, during exhaustion, operate much more decidedly and intensely.

3. Those leading a sedentary, inactive life are more readily affected by it than those of active habits.

4. An active, restless child will often take, with scarcely any appreciable effect, a dose sufficient to paralyse an adult of indolent habits. A dull, inactive child requires only half the quantity that a lively, active one does.

5. It is desirable in every case to watch the effects of the remedy for half an hour. A condition of quietude, with a fixed, sleepy appearance of the eye, may be taken as a general indication that the proper dose has been reached, and we must increase the dose till this is effected.

6. Those who use tobacco freely usually require a large dose of conium to produce its physiological effect. And the reverse, that those cannot tolerate tobacco who are readily influenced by comparatively small doses of conium, holds good. Great care therefore is required in their simultaneous use.

7. The effects of conium are neither increased nor diminished by the copious addition of alkalies, or of either of the mineral acids.

8. Large doses of conium should be carefully employed in conjunction with full doses of hydrocyanic acid.

9. The combination of conium and opium is of great value; what is wanting in the one drug is complemented by the other, and together they form a most perfect combination for bringing repose to any part of the body:—*e.g.*, *in Delirium Tremens*, instead of giving drm. j. of T. Opii, we may prescribe drm. iv.–drm. vj.–drm. viij. of hemlock juice, with ℥xx.–xxx. of laudanum. To a child with threatened convulsions, from one to two years old, we may give drm. j. of hemlock juice and ℥iij. of T. Opii.

10. Hemlock and henbane in combination prolong, and to some extent intensify, each other's action. The same may be said of belladonna. Dr. Harley states that he has frequently prescribed a mixture of tinctura or succus hyoscyami and succus conii in doses ranging from drm. ij.–drm. x.

11. Conia is not suitable for internal use, either by the stomach or the skin.

12. For the purpose of inhalation, the B. Ph. directs a Vapor Coniæ (Ext. of Hemlock gr. lx., Solution of Potash fl. drm. j., Water fl. drm. x., M. Put ℥xx. of this mixture on a sponge in a suitable apparatus, so that the vapour of hot water passing over it may be inhaled.) Dr. Harley, objecting to the use of the extract for this purpose, proposes the following as a substitute:—Conia gr. j., Alcohol fl. drm. 1½. Dissolve the conia in ℥xxx. of the alcohol, and add the remainder, mixed with fl. drm. ij. of water: ℥xx. contain gr. $\frac{1}{12}$ of conia. Protected from strong light, this solution may be kept unimpaired for a long time.

721. *Which part of Conium Maculatum is best for Medicinal Use?* Under this title Dr. W. Manlius Smith has published a pamphlet,[1] and the conclusion he has arrived at, from numerous trials, is that the immature fruit possesses the greatest amount of activity. A similar conclusion is arrived at by Dr. Harley, who states (page 92) that by far the most efficient preparations of hemlock may be obtained from the green and nearly ripe fruit.

722. *Therapeutic Uses. Chorea.* Dr. Harley, regarding this disease simply as a primary disorder of the nervous system,

[1] Albany (U.S.), 1867.

and acting on his conclusions with regard to the physiological action of this remedy (*ante*), has employed hemlock in several cases of chorea with excellent results. In one case (p. 41) especially, in a boy æt. 6, headed "*Chronic and obstinate Chorea, with Morbid Activity of the Nervous System from Birth*," he prescribed the succus in large and often-repeated doses for twelve weeks, and the patient completely recovered, not only from all traces of chorea, but from the excessive restlessness which had possessed him for many months previously. During the whole period of treatment his general health improved, he gained in strength and weight, and there was a notable improvement in the appetite. It had no effect upon the pupils, nor upon any of the secretions. The improvement was at first very slow, and it was not till carried to such doses as produced decided physiological effects, that the excitability of the motor centres was subdued. During the twelve weeks of treatment he took upwards of five pints (104 fl. oz.) of the succus conii, commencing with fl. drm. j.½ daily, gradually increased to fl. drm. vj. thrice daily. And fl. drm. v.–vj. of the same preparation invariably produced decided hemlock symptoms in several adults. This case, as Dr. Harley observes, proves—1. That apart from its effects on the motor centre, conium possesses no direct influence on the circulatory, nutritive, or secretory functions. 2. That its use may be prolonged with safety. Its effects are transient and powerful, and it is entirely destitute of what has been called cumulative action.

723. *In Epilepsy*, arising from sexual abuse, or from the irritation of dentition, Dr. Harley (p. 29) obtained decided and rapid improvement from hemlock. In that arising from peripheral disorder of sensation, from menstrual irregularity, or from emotion, it failed to exercise any beneficial influence.

724. *Undue Excitement of the motor centres occurring at or near the period of Dentition, and producing general irritability of the system with strong tendency to convulsions, and in many cases resulting in actual Convulsions.* Dr. Harley (p. 23) states that he has treated eleven such cases, presenting every variety and degree of irritation, and that all recovered under the use of hemlock; the slighter cases with great rapidity. He regards hemlock as essentially a children's medicine.

725. *In Tetanus*, the use of hemlock was suggested by Mr. De Morgan,[1] with the view of diminishing the irritability of that portion of the nervous centres which controls the reflex muscular action. A striking case, in which it was successfully employed, is recorded by Dr. Corry.[2] Five grains of the extract were given every third hour. To this disease,

[1] Brit. and For. Med. Chir. Rev., April, 1859.

[2] Dublin Quart. Journ. of Med. Nov. 1860.

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observes Dr. Harley (p. 48), whether arising from inflammatory irritation of the nerve centres, or from the tetanizing action of strychnia on the brain, conium is the natural antagonist; but to be effectual the full physiological effect of the drug must be obtained, and for this purpose the succus should be given in large doses. If the patient cannot swallow, from drm. vj. to oz. j.½ or oz. ij. of the succus, warmed to the temperature of the body, should be injected into the bowels, and repeated every two, three, or four hours, according to the condition of the muscles.

726. *In Sciatica and other Neuralgic Affections*, the extract, given to the extent of producing its constitutional effects, is occasionally serviceable, but is inferior in power to belladonna and opium; but when these are contra-indicated or fail in affording relief, it may be resorted to, both internally and locally. *In Chronic Rheumatism*, it proved very successful in the hands of Dr. Neligan;[1] and he attributes its failure in the practice of others to the fact of its not being carried sufficiently far to produce its physiological effect, which is the limit to which it should be carried. Dr. Home[2] successfully employed it in some cases of *Rheumatic Paralysis;* and in *Mercurial Tremor*, full doses were found by Mr. M'Whinnie more effectual than any other remedy. Dr. Harley (p. 45) cites some cases of *Paralysis Agitans* benefited by it; and in four cases of *Nocturnal Cramps of the Limbs*, two of them very severe, speedy alleviation followed its use in his practice. He likewise found it effectual in relieving other forms of *Muscular Convulsive Action*.

727. *In Spasmodic Contractions of the Stomach and Œsophagus*, associated with crampy pains of the stomach, flatulent eructations and globus hystericus, conium, in Dr. Harley's hands, has proved very serviceable.

728. *In Spasmodic Cough, Laryngismus Stridulus, and Pertussis*, conium will be found very serviceable. In the latter affection, Dr. Harley (p. 49) states that he has used it largely and with success. It requires to be given in full doses in order to produce a soothing effect. For a child a few weeks old he prescribes ♏xx.-xl. of the succus; and for one a year old, ♏lx. or more, repeated thrice daily. Its effect should be watched: see Rule 5, "Observations on its Use" (*ante*). *In Spasmodic Asthma*, the inhalation of vapor coniæ promises to prove serviceable.

729. *In Organic Disease or Functional Derangement of the Spinal Cord, attended by excessive Irritability of the Reflex Function*, conium will be a most suitable remedy. (Dr. Harley.)

730. *Sexual Excesses.* In those cases of exhaustion and irrita-

[1] Dublin Med. Journ., xxviii. p. 199. [2] Clinical Experiments.

bility which arise from early self-abuse, in those of troublesome irritation where the patient has been suddenly deprived of the legitimate means of gratifying his desires, and in those cases of erotic tendency that arise from some obscure irritation of the lumbar portion of the spinal cord, Dr. Harley (p. 51) states that he has never known conium fail to give relief. It is very remarkable, he adds, that while it possesses such decided influence over the morbid conditions of the sexual functions, conium should be incapable of depressing the natural function.

731. *In Cancer*, hemlock was formerly held in high repute, but it has fallen into disuse as a curative agent. Any relief which may follow its use is probably due, according to Dr. Harley, to the relaxation of the local muscular fibres, just as the division of neighbouring muscular fibres relieves irritable ulcers. This is the probable explanation of the benefit which has occasionally been found to follow its administration *in painful Scrofulous, Syphilitic, and Phagedenic Ulcerations;* but to obtain this benefit it is necessary that the full physiological effects of the drug should be observed. As a local application in these cases, hemlock poultices, or lint saturated with the succus, placed over the diseased surface, prove useful as an anodyne. It has long been thought to exercise specifically good effects in *Ulceration of the Tongue. In Cancer of the Stomach*, Dr. Walshe reports favourably of the extract in gr. x. doses in allaying pain and irritability; and Dr. Harley speaks of its utility for these purposes in *Cancer of the Pylorus*, and in a case of *Cancer of the Rectum*. As a palliative, it proved useful in *Cancer of the Uterus*, in the hands of Dr. Dewees (p. 274). For the relief of extreme pain, he sometimes used the extract in the form of injection (drm. iij.–iv., Aq. Oj.)

732. *In Scrofula*, it is highly spoken of by old writers as a resolvent; and Cullen especially states that he found it useful in discussing obstinate *Scrofulous Swellings*. Since the introduction of iodine, however, it has been abandoned, excepting as a local anodyne application in *painful Glandular Swellings and Ulcerations*. Here the hemlock poultice is serviceable. Dr. Harley's experience, however, is not in favour of its utility in these cases.

733. *In Inflammatory Diseases of the Eye*, conium, Dr. Harley (p. 52) believes, will prove a valuable remedy. In producing complete muscular relaxation it acts beneficially by relieving pain and tension, and thus removing that irritation which aggravates the primary disease and tends to make it chronic. He mentions six cases of *Scrofulous Conjunctivitis* successfully treated by it alone, unaided by external applications. The speedy relief from the photophobia, lachrymation, and spasm of the orbicularis was often surprising. *In Scrofulous Photophobia,*

Dr. Mauthner[1] has found great benefit from conia, thus:—℞ Coniæ gr. ½, Ol. Amygd. fl. drm. j., M. To be applied to the eyes twice or thrice daily. In these cases, relief might probably be obtained by subjecting the eyes for a few minutes to vapor coniæ.

734. *In Chronic Bronchitis, obstinate Coughs, and irritable state of the Air-passages*, the compound pill (gr. v.–x.) is a very useful formula. The addition of squill increases its efficacy in chronic cases. Benefit is also often derived from the inhalation of vapor coniæ (*ante*). The *Cough of Phthisis* is also sometimes greatly relieved by this inhalation.

735. Copaiba, Copaiva. An oleo-resin obtained by incisions made in the trunk of Copaifera multijuga, *Hayne*, and other species of Copaifera. *Nat. Ord.* Leguminosæ. *Hab.* Tropical America; one species in the West Indies.

Med. Prop. and Action. Stimulant of mucous surfaces generally, particularly that of the genito-urinary system. When continued in repeated doses for a few days, it causes a slight purging, which may be regarded as a sign that the system has become affected. The urine is generally greatly increased in quantity, and smells of the remedy, which may be separated from it by ether; it is stated to be of an intensely bitter taste, and has a copious froth or head, which remains more or less for several hours. Its *modus operandi* is obscure, but it appears probable that it operates by exciting a new action on irritated mucous surfaces. The odour may be detected in the breath. Its activity resides in a volatile oil, which is an eligible form for administration.

Remarks on its administration.—1. In some persons, copaiba, even in small doses, produces violent vomiting and purging. In these cases it should not be persevered with. 2. If it do not soon produce a purgative effect moderately, or an improvement in the symptoms, it should be discontinued. 3. A long course of copaiba is not unattended with danger. Mr. Thomas relates a case of renal dropsy, clearly traceable to the patient over-dosing himself with it; and Dr. Kinnier states that he has seen several cases of rheumatism fairly attributable to the same cause. Urticaria, he adds, is by no means an unusual sequence of too long a continued use of this remedy.

Dose:—Of Copaiba, fl. drm. ½–j. twice or thrice daily in milk or emulsion, or, in order to obviate its nauseous taste, in gelatinous capsules, or in the form of pill. Copaiba fl. oz. ij., and calcined magnesia gr. lx., thoroughly incorporated and set aside for eight hours, form a mass which gives 200 pills. *Of the Oil*, ♏v.–xx.

736. *Therapeutic Uses. Diseases of the Genito-Urinary System. In Gonorrhœa*, copaiba is a remedy of established value. The following formula is commonly employed, and with much success:—℞ Copaibæ, Spt. Ether. Nit. āā fl. drs. ij., Liq. Potas. fl. drm. j., T. Hyos. ♏xl., Aq. fl. oz. iv., Mucilage Acac. fl. oz. ij., M. sumat. coch. amp. ij. ter quaterve in die. Some practitioners prefer the oil, which may be advantageously given thus:—℞ Oil of Copaiba fl. oz. j., Oil of Cubebs fl. drm. j.,

[1] Journ. für Kinderker, 1854. Hf. 1, 2.

Sweet Spirits of Nitre fl. oz. j., M. Dose, gutt. xx.–xxx. To avoid its unpleasant taste, it may be given in capsules or in pills (*ante*). Dr. Dallas,[1] of Odessa, successfully employed it in the form of injection, thus:—℞ Copaiba ℥v., Ovi Vetell. ♏j., Ext. Opii gr. j., Aq. ℥vij., M. This injection used several times a day is said to have been employed with complete success without the aid of any other remedy. From a review of the treatment of gonorrhœa in the London Hospitals, in 1867,[2] it appears that copaiba is not nearly so generally employed as it was formerly, greater reliance being placed on injections, and the internal administration of sedatives, diluents, &c., with antiphlogistic diet, and rest. Still, in the advanced stages, when, after the subsidence of the inflammatory symptoms, the discharge continues profuse though thin, and is degenerating into *Gleet*, it is extensively resorted to, and is either prescribed alone or combined with T. Ferri Perchlor. The latter stage may, according to the compiler's experience, sometimes be found to yield to the introduction into the urethra of a bougie smeared with copaiba. According to M. Ribes,[3] copaiba proves useful in *Gonorrhœal Rheumatism*.

737. *In Leucorrhœa*, copaiba is sometimes eminently serviceable. Dr. Churchill[4] speaks highly of it, in doses of ♏xv. thrice daily. If the stomach is delicate, it may be made into pills with magnesia (*ut supra*); at the same time he advises a blister to the sacrum. Dr. Dewees (p. 80) also states that he has occasionally succeeded with copaiba, when other remedies had been fully tried without advantage.

738. *In Hæmorrhoids or Piles* of long standing, particularly when occurring in old persons, copaiba, in doses of gutt. xv.–xxv., thrice daily, is productive of great benefit. Cullen[5] states that he has often employed it with success. To old persons the taste of copaiba is not generally unpleasant.

739. *In Chronic Cystitis*, occurring in persons of a strumous diathesis, or in debilitated constitutions, Dr. Cumin[6] states that the best remedy is copaiba, combined with cubebs; and Mr. Liston[7] found it often speedily remove the most intense irritation when all other means had failed. The dose in these cases, according to Sir H. Thompson (p. 152), should not be more than ♏v. in mucilage three or four times daily.

740. *Diseases of the Lungs*, when attended with excessive secretion, are often benefited by copaiba, which exercises a powerful influence over the pulmonary mucous membrane. *In Chronic Bronchitis, Bronchorrhœa, and Chronic Coughs attended with profuse expectoration*, copaiba has been advised by Arm-

[1] Brit. and For. Med. Chir. Rev., July, 1856.
[2] Lancet, 1867, pp. 331, 362, 458.
[3] Med. Chir. Rev., No. lxi. p. 215.
[4] On Diseases of Females, p. 135.
[5] Mat. Med., part ii. p. 190.
[6] Cyc. Pract. Med., vol. i. p. 505.
[7] Elements of Surgery, p. 105.

strong[1] and others. Dr. C. J. B. Williams[2] states that he has often seen it restrain and modify the bronchial secretion. It is particularly useful in old persons. It is inadmissible when fever or much vascular irritability exists.

741. Coriandri Fructus. Coriander Fruit. The dried ripe fruit of Coriandrum sativum, *Linn.* *Nat. Ord.* Umbelliferæ. *Hab.* Europe; cultivated in India.

Med. Prop. and Action. Carminative and stomachic. Chiefly used as an adjunct to other medicines, or as a condiment. Their activity depends upon the presence of a volatile oil (Oleum Coriandri), which, in doses of ♏ij.–v., is a good form for administration. The bruised fruit, gr. x.–xxx., may be given in infusion.

Therapeutic Uses, similar to those of Carum Carui (*q.v.*)

Corrosive Sublimate. See Hydrargyri Perchloridum.

742. Creasotum. Creasote. A product of the distillation of Wood Tar. A colourless or slightly yellowish liquid, with a strong empyreumatic odour, in many respects closely resembling carbolic acid. Sp. gr. 1·071.

Med. Prop. and Action. Stimulant, sedative, rubefacient, and antiseptic. It possesses the property of immediately coagulating albumen; and to this may be ascribed many of its effects on the living system, and its power of preserving for months, meat which has been saturated with it. When added to blood, the latter thickens and becomes reddish brown, with small white spots, probably coagulated albumen; on further exposure to the air, the blood acquires a yellowish red colour. When applied to the tongue, creasote causes violent pain, but without redness or tumefaction; a strong taste of smoke extends to the throat, and there is a copious flow of saliva. Taken internally in small doses, it occasions a sensation of warmth in the stomach, expels flatus, with eructations smelling strongly of creasote, and appears to exercise a peculiarly sedative action on the stomach. It increases the flow of urine, to which it communicates its odour. In over-doses it produces the following symptoms, as observed by Mr. Macnamara:[3]—profound stupor, from which the patient could only be roused for a minute; the countenance flushed, and fuller than natural; the eyes fixed, but the pupils neither dilated nor contracted; the pulse slow and laboured; the heart's action remarkably slow and weak; the stomach irritable, and the ejecta bearing a strong smell of creasote. When aroused, vertigo and uneasiness in the head were complained of; and also a burning pain along the œsophageal tract, and in the stomach. Stimulants, the cold douche, and mustard emetics relieved the patient. Applied pure to a bleeding surface, creasote is styptic.

Post-mortem appearances of animals killed with Creasote. All the tissues of the body, except the liver, exhaled a strong odour of creasote; the mucous intestinal membrane was inflamed throughout. In the heart and great vessels the blood was coagulated, the lungs were greatly congested, the brain natural. Death is probably caused mechanically, the creasote coagulating the albumen of the blood, and preventing its circulation through the arterial system.

[1] Edin. Med. and Surg. Journ., 1818.

[2] Cyc. Pract. Med., vol. i. p. 322.

[3] Dublin Med. Press, March 7, 1850.

Dose:—Of Creasote, ♏j.–iij. in pill or following mixture. *Of the Mixture* (Creasote ♏xvj., Glacial Acetic Acid ♏xvj., Spt. of Juniper fl. drm. ½, Syrup fl. oz. j., Water fl. oz. xv.), fl. oz. j.–iij. *For External Use:—Ointment* (Creasote fl. drm. j., Simple Ointment oz. j.) *For Inhalation:—Vapor Creasoti* (Creasote ♏xij., Boiling Water, fl. oz. viij.) Mix and place in proper apparatus for inhalation.

743. *Therapeutic Uses. In Gastric Irritability and Vomiting*, creasote has been highly extolled, but general experience is to the effect that its value has been much overrated. In inflammatory conditions of the stomach it is calculated to aggravate rather than to relieve the symptoms. (Dr. Pavy, p. 98.) According to Dr. Ringer (p. 230), one principal cause of the failure of creasote in these cases arises from its being given in too large doses (♏j.–v.) He considers that the best effects are obtained if just sufficient creasote be added to water to make it taste distinctly but not strongly of the medicine, and of this a dessertspoonful may be taken frequently. Used thus, he states it will often prove effectual in allaying nausea and retching, though by some it is considered to have less power over actual vomiting. It occasionally proves useful in *Gastrodynia*, but in this and other affections of the stomach it should not be given in pill with oxide of silver, unless the latter be first mixed with liquorice powder, otherwise the mass will take fire.

744. *Fetid Eructations* will generally yield to creasote (♏ ¼–½ in pill) given with each meal. (Dr. Pavy, p. 109.) *The distressing Flatulence of Hypochondriasis* may be greatly relieved by creasote, gutt. j. in pill twice or thrice daily. (Drs. Gull and Anstie.)[1]

745. *In Diarrhœa*, creasote is occasionally effectual in arresting the discharge. Dr. Kesteven[2] found it so uniformly successful, that he rarely used any other than the following formula:—℞ Creasote ♏j.–iv., Spt. Ammon. Arom. ♏xv., Aq. f℥jss., M. When there was much pain, T. Camph. Co. was added. He attributes its influence to its coagulating properties. Mr. Richardson[3] also speaks highly of its efficacy.

746. *In Diabetes*, Dr. Elliotson[4] employed creasote in three instances with apparently good effects. Sir T. Watson (ii. p. 110) also speaks favourably of it. He relates two cases, in which it produced "the happiest effects," and he quotes the experience of Dr. Mac Intyre, also, in its favour. Its efficacy, however, has not been established by subsequent experience. In some cases it may prove useful as an adjunct to other remedies.

747. *In Glanders in the Human Subject*, creasote is one of the

[1] Reynolds's Syst. of Med., ii. p. 305.
[2] Medical Gazette, Feb. 7, 1851.
[3] Lancet, Oct. 25, 1851.
[4] Lectures, p. 219.

few medicines which make any impression; and the effect of this is often very transitory. Dr. Elliotson, in 1835, employed it successfully in three cases. The nasal cavities should several times a day be thoroughly syringed out with creasote, diluted with water; the abscesses should be opened as they form, and the patient's strength supported. These combined measures proved successful in the hands of Dr. Elliotson.

748. *In Chronic Bronchitis*, accompanied by excessive expectoration, the inhalation of the vapour of creasote (*ante*) is often very useful in checking the secretion. It also corrects the fœtor of the sputa in *Dilatation of the Bronchi* and *Pulmonary Abscess*. (Garrod, p. 140.)

749. *Mercurial Salivation* is stated by Dr. Faulcon[1] to be speedily improved and cured by a gargle composed of fl. drm. $\frac{1}{2}$ of creasote in Oj. of sage tea, or any other mild vehicle.

750. *In Toothache*, a single drop of pure creasote, applied to a carious tooth, occasionally affords immediate relief.

751. *In some Diseases of the Skin*, creasote ointment has been found useful; particularly in *Prurigo Senilis*, *Lepra*, *Psoriasis*, and *Impetigo*. *In Psoriasis*, Mr. B. Squire[2] testifies to the value of a combination of creasote (2 parts) and white wax (1 part). Should this cause much pain, as it is apt to do in persons of a lymphatic temperament, the proportion of creasote may be reduced one-half. He regards it as far superior to the ordinary pitch ointment. Dr. McCall Anderson[3] states that he has found this ointment very useful, but sometimes too irritating. *In Ringworm*, pure creasote rubbed into the surface is stated to be efficacious. *In Pruritus Pudendi*, a weak solution is sometimes useful.

752. *In Sloughing and Phagedenic Ulcerations*, the local application of pure creasote has, in many instances, been found beneficial. Dr. Elliotson states that, under its use, he has seen foul ulcers become clean, and long-standing ones heal rapidly. *To Indolent Ulcers*, a weak solution (gutt. vj.–xij., Aq. fl. oz. j.) may be applied.

753. *To Bed Sores*, Reichenbach's Lotion (1 part of creasote to 80 of water) is stated to be an efficacious application. It is also said to be a preventive.

754. *In superficial Hæmorrhage from Wounds, Leech Bites, or after Extraction of Teeth*, creasote is an efficient styptic. It may be applied on a piece of lint saturated with it, and applied with pressure to the bleeding point. It has been administered in *Hæmaturia*, *Hæmoptysis*, and other internal hæmorrhages, but without satisfactory results.

755. *In Constitutional Syphilis*, Mr. J. Morgan,[4] of Dublin, has obtained good results from creasote internally, conjoined

[1] Philadelphia Med. Exam., 1849.
[2] Practitioner, Nov. 1868.
[3] Lancet, Dec. 4, 1869.
[4] Med. Press, Jan 12, 1870.

with the use of carbolic acid baths. He uses the following:—℞ Creasot. fl. drm. j., Mucilag. fl. oz. j., Tere et adde, T. Opii fl. drm. j., Aq. Menth. Pip. fl. oz. vij., M. Dose, a tablespoonful four times daily. Every second night at least he directs a warm bath, containing fl. oz. ij. of carbolic acid, in which the patient is to remain half an hour or longer, so as thoroughly to influence the skin. The patient should remain in bed as far as possible, and a nourishing diet allowed. Usually, within ten days, improvement takes place, and gradually the signs fade. Should iritis or other acute symptoms appear requiring mercury, it may be given as well as the creasote.

756. *In Puerperal Fever*, Dr. Mackenzie[1] states that for several years he has used with great advantage creasote injections, in strength varying from ♏viij.–xij., in Oj. of thin mucilage. *In Phlegmasia Dolens*, he[2] also recommends the use of creasote injections daily.

757. *Warts* are said by Mr. Rainey[3] to be removable by creasote freely applied, and kept *in situ* for two days by strips of adhesive plaster. It requires subsequently to be applied daily till desquamation ensues. *Nævus* may be removed, according to Bujalsky,[4] by pencilling it twice daily for some weeks with creasote.

758. Creta Præparata. Prepared Chalk. Chalk freed from most of its impurities by elutriation. $CaCO_3$ nearly pure.

Med. Prop. and Action. Antacid, absorbent, and astringent. If continued for any length of time, an occasional aperient is advisable, as it is apt to accumulate in the bowels, and form intestinal concretions. Like liquor calcis, it appears to have the effect of diminishing the secretion of the mucous membrane of the intestines, besides correcting any existing acidity. Hence it is termed an astringent. Externally it is applied in fine powder to ulcers and excoriations.

Dose:—Of Prepared Chalk gr. x.–lx. *Of Chalk Mixture* (Prepared Chalk oz. ¼, Powdered Gum Acacia oz. ¼, Syrup fl. oz. ½, Cinnamon Water fl. oz. vij.½), fl. oz. j.–ij. This is a bad form for tropical countries, as it rapidly decomposes at high temperatures; if used, it should be prepared fresh at each period of administration. *Of Aromatic Chalk Powder* (Cinnamon oz. iv., Nutmeg, Saffron ää oz. iij., Clove oz. j.½, Cardamom Seeds oz. j., Refined Sugar oz. xxv., Prepared Chalk oz. xj. All these in fine powder to be thoroughly mixed and kept in a stoppered bottle), gr. x.–lx. *Of Aromatic Chalk Powder with Opium* (Aromatic Chalk Powder oz. ix.¾, Powdered Opium oz. ¼), gr. x.–xl. Forty grains contain gr. j. of opium.

759. *Therapeutic Uses. Diarrhœa arising from acidity of the primæ viæ, and some other forms of the disease*, often yield speedily to chalk mixture, either alone or in combination with other remedies (*infra.*) *In the Diarrhœa of Small Pox*, the following mixture is the one ordinarily in use in the Small

[1] Brit. Med. Journ., March 3, 1860.
[2] On Phlegmasia Dolens, 1862.
[3] Lancet, Dec. 8, 1855.
[4] Med. Times and Gaz., Jan. 7, 1860.

Pox Hospital, London:—℞ Cretæ Prep., Pulv. Acaciæ, Sacch. Alb. āā ℥jss., Aquæ ℥iv., T. Opii ℥j., Sp. Ammon. Arom., T. Catechu āā ℥ss., Aq. Menth. Pip. ℥iij., M., coch. amp. ij.–iij. 3tis horis. Whether the first dose seems to have answered the purpose or not, it should be repeated, as without the second dose the diarrhœa will often return. If after three or four doses the diarrhœa continues, recourse should be had to Infus. Rosæ Acidum, or should this fail, to Pulv. Kino Co. (gr. x. every 6 hours), or to Pulv. Creta c. Opio (grs. xx.–xxx.) (Mr. J. F. Marson, i. p. 456.)

760. *To Diseases of the Skin, Excoriations, Burns, and Ulcers, when accompanied by an acrid irritating discharge*, chalk finely powdered, and sprinkled over the surface, is highly useful, absorbing the discharge, and thus preventing the disease extending. An emollient poultice should be placed over the whole surface.

761. *In Chronic Bronchitis in the advanced stages, particularly when colliquative sweats and Diarrhœa are present*, Dr. Copland (i. p. 263) observes that the chalk mixture is often very serviceable. He states that he has derived the most essential benefit from the following mixture; even where the bowels were regular, he found it by no means productive of costiveness:—℞ Mist. Cretæ f℥vjss., Vin. Ipecac. f℥jss., Tinct. Opii f℥j. (vel Tinct. Camph. Co. f℥vj.), Syrup Tolut. f℥iij., M. cap. coch. amp. ij. ter quaterve in die. A similar formula proved very effectual in the hands of Sir C. Hastings.[1]

762. Crocus. Saffron. The dried stigma and part of the style of Crocus sativus, *Linn.* *Nat. Ord.* Irideæ. Imported from Spain, France, and Italy.

Med. Prop. and Action. Saffron was employed by Hippocrates and the ancients in uterine diseases; and to within a recent period, was regarded as stimulant and emmenagogue; but the observations of Cullen and Alexander brought it into disrepute; they having failed to obtain any benefit from its use, even in large doses. If taken for a long period it communicates a yellow colour to the urine, perspiration, and other secretions. Its chief use in medicine is as a colouring agent. 100 parts contain 65 of a yellow colouring matter, *Polychroite*, and 7 of a volatile oil.

Dose:—Of Saffron, gr. x.–lx. in infusion or powder. *Of the Tincture* (Saffron oz. j., Proof Spirit Oj.), fl. drm. ½–ij.

763. Croton Tiglium, *Linn.* Purging Croton. *Nat. Ord.* Euphorbiaceæ. *Hab.* India, the Moluccas, Ceylon.

Med. Prop. and Action. All parts of the tree possess medicinal properties; but the seeds only are employed in European practice, either prepared as below, or as the source of Croton Oil; in their native state they are powerfully poisonous; but when prepared in the following manner, they are a safe and efficacious purgative. Boil the seeds thrice in milk; and

[1] Midland Med. Repos., vol. ii. p. 376.

after each boiling, dry them well, and carefully remove the outer shell and the embryo. If the latter is allowed to remain, it causes violent tormina and vomiting. To gr. lx. of the seeds thus prepared, add gr. lxx. of catechu, and divide into two-grain pills; a few drops of Ol. Menth. Pip. may be advantageously added to the mass. This mode of preparation, first proposed by Dr White,[1] renders the seeds a valuable resource to the Indian practitioner; and Mr. Marshall justly observes, "To the field surgeon it is no unimportant recommendation that 500 doses may be contained in a small wafer-box, and purchased for half a rupee." I have used these pills in some hundreds of cases amongst the Burmese, and generally found their action uniform, producing five or six copious watery stools, and operating within two or three hours after being swallowed. Any excessive operation is almost immediately checked by a draught of lemon-juice. Mr. E. Wilson speaks highly of a tincture (bruised seeds oz. j., Spirit Rect. fl. oz. iv.), as a local stimulating application in various skin diseases.

764. *Therapeutic Uses.* *In Erythema, Eczema, Lichen, Prurigo, Ichthyosis, and other obstinate Skin diseases*, Mr. Erasmus Wilson (p. 177) states that he has derived great benefit from a liniment composed of fl. drm. j. of the Tincture of Croton (*ante*), Spirit of Rosemary fl. oz. j., and Rose Water fl. oz. iij.

Other Therapeutic Uses. See Crotonis Oleum.

765. Crotonis Oleum. Oleum Tiglii. Croton Oil. The oil expressed from the seeds of Croton Tiglium (*q.v.*)

Med. Prop. and Action. Drastic purgative, in doses of gutt. ½–ij.–iij. It may be given in the form of pill with bread crumbs; or, if the patient, from any cause, be unable to swallow, it may be placed at the root of the tongue, its full purgative action being equally attainable in this latter way. The smallness of the dose required, the rapidity of its action, and its powerful purgative effect, render it peculiarly valuable in apoplexy and other cerebral affections. In some persons it produces, even when given in small doses, severe hypercatharsis, which has occasionally proved fatal. It appears to possess a specific action on the intestinal mucous membrane, as, when injected into a vein, it has caused death, and the whole length of the intestines has been found in a state of inflammation. It is more speedy in its operation than any other cathartic, producing copious watery stools in one or two hours, and sometimes in even a shorter period, after its administration. Alkalies are said to modify the acrimony of the oil, without impairing its cathartic properties, and the addition of a small portion of opium diminishes the violence of its action. When its action is excessive, a draught of lime or lemon-juice affords almost immediate relief. Occasionally, it fails to purge. I have seen some cases in which three and even four drops have produced only one or two scanty stools, but in which fl. oz. j. of castor oil, subsequently given, has been followed by copious motions. Anthelmintic virtues have been also assigned to it. In very large doses it acts as an irritant poison. Externally applied, it is a powerful stimulant; diluted with four to eight parts of olive oil or soap liniment, it produces a vesicular eruption on the skin. As a counter-irritant it is superior to tartar emetic, on account of the rapidity with which it acts, and in the greater amount of irritation which it occasions. Its external application sometimes produces purging.

Dose:—Of Croton Oil, gutt. ½–gutt. ij.–iij. in pill or placed on the tongue; in combination with other purgatives, ℥ss upwards. For external use only, *Croton Oil Liniment* (Croton Oil fl. oz. j., Oil of Cajuput and Rect. Spirit āā fl. oz. iij.½).

[1] Ainslie's Mat. Med., p. 294.

766. *Therapeutic Uses. In the obstinate Constipation which accompanies Inflammation of the Brain, Mania, and other Cerebral Affections*, croton oil is especially valuable, acting not only as an aperient, but as a derivative and revulsive. *In Colica Pictonum*, it also proves effectual when other remedies fail. *In Apoplexy*, it is peculiarly adapted, from the ease with which it may be administered: placed at the back of the tongue, it operates freely.

767. *Tubercular Meningitis.* Dr. R. S. Turner[1] relates some cases of this affection in which croton oil liniment (1 part of croton oil to 3 of olive oil) to the shaven scalp was productive of the best results. Iodide of potassium was given internally at the same time, but the benefit is attributed by Dr. Turner to the croton oil counter-irritation. He quotes other authorities in favour of the practice.

768. *In Dropsical Affections*, when hydragogue cathartics are indicated, croton oil is sometimes preferable to elaterium, and other remedies of this class; but it is inadmissible when the patient is old and debilitated. Great caution is necessary in its use; it should be commenced in small doses, and gradually increased, according to the amount of purgation which it induces.

769. *In Albuminuria*, Dr. Heaton,[2] of Leeds, observes that, when it is advisable to administer a hydragogue cathartic, there is none so convenient as croton oil, which produces copious evacuations, with less sickness and discomfort than elaterium.

770. *In Neuralgia, Tic Douloureux, and Sciatica*, Mr. Newbigging[3] found all the distressing symptoms disappear after the internal administration of croton oil. He considers that it possesses a specific power in these nervous diseases, apart from its purgative action. Mr. Hunt,[4] also, states that in tic douloureux arising from dyspepsia, he has derived great benefit from its use. Other cases in which it proved successful are recorded by Dr. S. C. Sewell,[5] of Ottawa, Canada, who extended its use to *Chronic Rheumatism* with great advantage in many instances.

771. *Chronic Rheumatic and Neuralgic Affections, Paralysis, and Chronic Affections of the Joints*, are often benefited by frictions with croton oil liniment. Should it cause too much irritation, it may be diluted by the addition of soap liniment.

772. *In Phthisis*, croton oil liniment to the chest often affords relief, especially to the distressing *Dyspnœa*. It is also a very

[1] Edin. Med. Journ., Nov. 1868.
[2] Prov. Journ., April, 1849.
[3] Edin. Med. Surg. Journ., Jan. 1, 1841.
[4] On Tic Douloureux, 8vo, Lond 1844.
[5] Braithwaite's Retrosp., 1865, vol. ii. p. 67.

useful counter-irritant in *Chronic Bronchitis, Chronic Pneumonia, and other Chronic Lung Affections.*

773. Cryptopia. An alkaloid discovered in Opium by Messrs. T. and H. Smith, of Edinburgh, in 1867.[1] It is one of the least constituents of opium, a ton not yielding more than an ounce. It occurs in colourless six-sided prisms, soluble in chloroform, very slightly soluble in alcohol, still less soluble in ether, which, like water, only takes up a mere trace. It is readily soluble in water slightly acidulated with hydrochloric or acetic acid; separating therefrom in satiny tufts of hair-like crystals. The solutions are more bitter than those of morphia.

Med. Prop. and Action. These have been examined by Dr. Harley (p. 158), who for the purpose employed subcutaneous injections of an aqueous solution (gr. j., Aq. ℥xx.) acidulated with acetic or hydrochloric acid. The quantity in each injection varied from gr. ¼ to gr. j. The following are the conclusions he draws regarding it:—

1. That cryptopia, like morphia, has two distinct effects, a hypnotic and an excitant of a most remarkable and exceptional kind, dependent partly upon an illusion of vision, and partly upon a tendency to convulsive action.
2. The hypnotic effect is both considerable and protracted in those who are readily calmed by morphia. It is twice as active as meconine and narceine, and one-fourth as powerful as morphia.
3. Although no unpleasant effects have followed its use in man, further experience is required to show that as a hypnotic it possesses any advantage over morphia.
4. Its action upon the respiratory functions is first stimulant, but subsequently depressent, and death is the direct consequence of this depressent effect.
5. The effect on the action of the heart is regulated by that on the breathing, and is therefere indirect. When the breathing is greatly accelerated, as in the dog, the pulse is proportionately stimulated; and when it is depressed, the pulse is lowered. Independently of the breathing, the heart is unaffected by the action of the drug.
6. In large doses cryptopia causes dilatation of the pupils.

774. Cubeba. Cubebs. The dried unripe fruit of Cubeba officinalis, *Miquel. Nat. Ord.* Piperaceæ. *Source*, Java, and the Moluccas.

Med. Prop. and Action. Cubebs, in doses of gr. x.–gr. lx., is carminative and stimulant, and improves the tone of the digestive organs. In doses of gr. clxxx.–oz. j. it causes griping and purging, with much febrile action. Some constitutions are peculiarly intolerant of its action; in these it induces headache, a nettle-like eruption, and, in rare instances, partial paralysis. It acts specifically upon the genito-urinary organs, and increases the quantity of urine, to which it communicates a peculiar aromatic odour. Its operation is not confined to these organs; it being a stimulant of the mucous surfaces generally. The activity of cubebs has generally been regarded as residing in the volatile oil, of which it contains about 10 per cent., or in its crystallizable principle *Cubebin*, which is closely allied to piperine; but the recent researches of Bernatzik[2] tend to show that it is on

[1] Pharm. Journ., April 1867.
[2] Prager Vierteljahrs, lxxxi. 9, lxxxv. 81.

its peculiar acid, *Cubebic Acid*, its virtues depend. Dr. Reder,[1] agreeing in this latter view, strongly recommends the employment of the acid in practice. It, together with other matters, is deposited from the ethereal extract after it has stood for a time, and this sediment he prescribes in gr. xij. doses thrice daily, made into pill with soap, &c. Its properties seem worthy of further investigation.

Dose:—Of Cubebs gr. xxx.-cxx. *Of the Volatile Oil* ♏v.-xx. *Of the Tincture* (Cubebs oz. ij.½, Rect. Spirit Oj.), ♏xxx.-fl. drm. ij.

775. *Therapeutic Uses. In Gonorrhœa*, cubebs is a remedy of established value. Some constitutions, as stated above, are peculiarly susceptible of its action; and small doses, under such circumstances, produce great constitutional disturbance, and an aggravation of the symptoms. Its action is rendered more certain by the addition of gr. x. of carb. of soda to each dose. Alum is stated greatly to increase its efficacy,[2] thus :— ℞ Cubebæ oz. ij., Alum oz. ½, M., divide in pulv. ix., sumat. j. ter in die. The oil of cubebs (gutt. x.-xij.) may be substituted for the fruit, given alone or in conjunction with copaiba (*q.v.*) Orchitis occasionally occurs under the use of this remedy; but it is doubtful whether this can be fairly attributed to the medicine. Reder strongly advocates cubebic acid (*ante*). *In Gleet and Leucorrhœa*, Dr. Orr[3] employed cubebs in several cases, and reports favourably of its efficacy.

776. *In a case of Vaginitis*, which had resisted all other remedies for nine months, M. Piorry[4] employed an injection of the infusion of cubebs (oz. j., Aq. Oj.), and administered the powder internally. Under this treatment a speedy cure was effected. *In Infantile Enuresis*, Dr. Deiters[5] found cubebs very effectual. For infants a few grains are sufficient, but older children require half a teaspoonful twice or thrice daily. He likewise found it very effectual in checking nocturnal emissions in *Spermatorrhœa*.

777. *In Chronic Inflammation of the Bladder*, Sir B. Brodie[6] states that he has known the symptoms to be often much alleviated under the use of cubebs; but it must be given only in small doses (gr. x.-xv. thrice daily.) When administered largely, it proves injurious. Given with caution in small doses, it proves very useful, not only where the chronic inflammation is the primary disease, but where it occurs as a secondary affection, the result of a calculus in the bladder, &c. *In Cystirrhœa*, he also found small doses of cubebs very beneficial.

778. *In Chronic Inflammation of the Prostate Gland*, Sir B. Brodie[7] found much benefit from cubebs, in doses of gr. xx. thrice daily. It seems to act as a gentle stimulus to the parts.

[1] Practitioner, Jan. 1869.
[2] Med. Chir. Rev., vol. lxviii. p. 514.
[3] Edin. Med. Surg. Journ., vol. xviii.
[4] Gaz. des Hôpitaux, May 1842.
[5] Edin. Monthly Journ., Oct. 1854.
[6] Dis. of the Urinary Organs, p. 111.
[7] Op. cit., p. 149.

779. *In Hæmorrhoids or Piles*, the internal use of cubebs has been found useful in allaying the severity of the symptoms. It forms an efficacious substitute for pepper, and probably acts in the same manner. (See PIPER NIGRUM.)

780. *In Chronic Bronchitis and other Pulmonary Affections of Old Age*, attended with profuse secretion and much debility of constitution, cubebs, in small and often-repeated doses, has a very beneficial effect in checking the excessive secretion, and giving a gentle stimulus to the system.

781. CUPRUM. Copper. Cu = 63·5. A metal which, in its pure state, appears to exercise no sensible effects on the system, but which, in combination with acids, &c., acts as an irritant poison. Food cooked in copper vessels, by dissolving a portion of the metal, and converting it into salts, proves highly poisonous. Only one salt of copper (the sulphate) is officinal in B. Ph. for medicinal use, but solutions of the Ammonio-sulphate and Acetate are officinal as chemical tests. Pure copper foil is also employed as a test for arsenic, nitrate of silver, and mercury.

782. CUPRI SULPHAS. Sulphate of Copper. $CuSO_4$. $5H_2O$. Blue-stone. Blue Vitriol.

Med. Prop. and Action. Tonic and astringent. In small doses it produces no sensible effect on the system; but under its continued use, the secretions diminish, the appetite increases, the pulse becomes stronger and fuller, and it acts as a general tonic and astringent. It also acts as a stimulant and tonic on the nervous system. In doses of gr. iij.–iv.–xij. it proves emetic, and without causing much depression of the system. In larger doses it is a powerful irritant poison. Externally it is applied in substance, to destroy unhealthy and excessive granulations, and as a styptic to bleeding surfaces. In solution (gr. j.–x., Aq. fl. oz. j.) it is used as a collyrium, wash, &c. Valuable disinfectant properties, especially with reference to typhoid fever, have been ascribed to it, but further evidence is required to establish its virtues in this respect.

Dose:—As a tonic and astringent, gr. ¼–gr. ij.; as an emetic, gr. v.–x.

783. *Therapeutic Uses. In Chronic Dysentery and Diarrhœa*, a combination of sulphate of copper and opium proves highly serviceable. Amongst others, Dr. J. Brown[1] speaks favourably of it; and Mr. Raleigh[2] records many cases which recovered under the use of the following formula:—℞ Cupri Sulph. gr. ¼–½, Pulv. Opii gr. ½, M. ft. pulv. ter in die sumend. I have seen much benefit from this formula, substituting gr. v. of Dover's powder for the opium advised by Mr. Raleigh. *In the obstinate Diarrhœa of Phthisis*, Sir T. Watson (ii. p. 216) states that it is often effectual, in doses of gr. ¼, combined with gr. ¼ of opium. It occasionally causes

[1] Cyc. Pract. Medicine, vol. i. p. 661.

[2] Trans. of Med. Society of Calcutta, vol. vii. p. 66.

griping. *In the Chronic Diarrhœa of Infants*, Dr. Pereira (i. p. 874) states that he has often employed it with the most excellent effects, in doses of $\frac{1}{12}$ of a grain. *In the Diarrhœa of Typhoid Fever*, Dr. Harley (i. p. 631) regards sulphate of copper as the most efficacious of all medicines—gr. $\frac{1}{4}$ with Pil. Sapon. Co. gr. ij. every two, three, or four hours; increased, if necessary, to gr. j. For children $\frac{1}{8}$–$\frac{1}{6}$ will suffice. If too large a dose be given at first it may excite vomiting, but in small doses, even when there is considerable irritability of the stomach, it appears to act as a sedative.

784. *In Croup*, Hoffman first proposed the administration of the sulphate of copper, and his example has been extensively followed by the German physicians; in the majority of cases, it is stated, with the best results. He prescribed it in doses of gr. $\frac{1}{8}$–$\frac{1}{4}$, according to the age of the child, every two hours. If laryngitis were present, he gave gr. iij.–iv. (after depletion), to excite vomiting, and followed it up with small doses, every quarter or half hour. *In Diphtheria*, Dr. W. Squire (i. p. 409) ranks the sulphate of copper with alum, as one of the best and most effectual of emetics. He directs a solution (gr. v., Aq. fl. oz. j.) to be given in divided doses, a teaspoonful only for young children. The salts of copper have also been advised locally, to check the exudation, but their use is not free from danger (Dr. Squire.)

785. *In Cancrum Oris, Aphthous Ulceration, and Gangrenous Affections of the Mouth*, sulphate of copper (gr. v.) finely powdered, and thoroughly incorporated with oz. $\frac{1}{2}$ of honey, is an excellent application. *For Ulceration of the Gums in sickly, ill-fed children*, Dr. Symonds[1] speaks of the crystalline sulphate as an excellent local remedy; the chlorate of potash, either alone or with cinchona, being given freely internally at the same time.

786. *In Chronic Idiopathic Mania*, when tartar emetic has done its work, or is ill-borne, Professor Van der Kolk (p. 109) advises sulphate of copper. This, he remarks, has, like antimony, a calming action, though in a lower degree, on the brain and nervous system; but through its astringent properties it acts yet more definitively as a tonic. Under its use, he states that he has nearly always seen the appetite return, and the patients who during the antimonial treatment have become emaciated and cachectic, become again well-nourished, and the confusion of intellect disappear. Dose, gr. $\frac{1}{3}$, several times daily, in the form of a pill at first, and increased in the same manner as tartar emetic, *q.v.* In one case the dose was gradually increased up to gr. xiij. thrice daily for a month, and recovery ensued. *In Epilepsy*, Dr. Hawkins[2] found it highly service-

[1] Brit. Med. Journ., Mar. 14, 1868. [2] Med. Gaz., vol. iii. p. 183.

able, in doses of gr. $\frac{1}{4}$, conjoined with quinia. *In Chorea*, it has also been thought useful, but is probably inferior to conium and many other remedies. Sir B. Brodie[1] speaks favourably of a long-continued course of small doses of this salt in *Obstinate Hysteria*.

787. *In Gonorrhœa*, an injection of the following solution has been found useful:—℞ Cupri Sulph. gr. iv.–v., Liq. Plumb. Diacet. fl. drm. $\frac{1}{2}$, Aq. fl. oz. iv., M. *In Leucorrhœa*, a solution (gr. xx.–gr. xxx., Aq. Tepid. O$\frac{1}{2}$) has occasionally been found useful, when thoroughly injected into the vagina, thrice daily. The vagina should be previously washed out with soap and water. (Dewees, p. 75.)

788. *In Superficial Hæmorrhage from Leech-bites*, the local application of the sulphate is an effectual styptic. *In Passive and Copious Epistaxis*, a weak solution of the sulphate injected into the nostril, proves serviceable. It is, however, inferior to alum. *In the Intestinal Hæmorrhage of Typhoid Fever*, Dr. Harley[2] speaks of the sulphate with soap-pill, as a very valuable remedy, and one on which he is inclined to place most reliance. If the patient have been previously taking the copper salt, the dose may at once be increased to gr. j.–ij.

789. *In Purulent Ophthalmia in Infants*, a collyrium composed of Cupri Sulph. gr. j. in Aquæ Camph. fl. oz. j., is occasionally serviceable. *In Granular Conjunctivitis*, the application of the sulphate, in substance, to the inner part of the lids, is favourably spoken of by Sir W. Wilde.[3]

790. *Diseases of the Skin. In Tinea Capitis*, Dr. Graves (ii. p. 357) found a solution of the sulphate (gr. x., Aq. fl. oz. j.) a most useful local application. *In Ringworm*, a very effectual remedy is composed of Cupri Sulph. gr. xx., Pulv. Gallæ gr. lx., Aq. fl. oz. j., M. *In Scabies*, a solution of the sulphate (oz. j. ad Aq. Oj.) has been successfully employed by Mr. Lloyd[4] in a large number of instances. Previous to its use, he directs that the scabs should be rubbed off. *In Ichthyosis*, Mr. Erasmus Wilson (p. 383) speaks of the following as a useful application:—℞ Cupri Sulph. gr. xx., Ung. Sambuci oz. j., M. To be used twice or thrice daily. *In Molluscum*, Dr. Thompson (loc. cit.) applied with benefit the sulphate in substance. *To remove Warts*, M. Cazenave employs a strong solution of this salt.

791. *To weak, irritable, and indolent Ulcers*, the local application of a solution of sulphate of copper is attended with excellent effect. In the treatment of the ulcers of the Tenasserim Provinces, which are generally of a peculiarly obstinate

[1] On Local Nervous Aff., 1837.
[2] Reynolds's Syst. of Med., vol. i. p. 632.
[3] Dub. Quarterly Journ., No. x. p. 97.
[4] Lancet, April 4, 1846.

character, I have met with great success, by employing solutions of graduated strengths, from one grain to ten grains in the ounce of water. At the commencement, the weakest solution is applied twice daily; and when this ceases to occasion a feeling of heat in the ulcerated surface, the strength should be gradually increased by single grains, till the ten-grain solution is borne, by which time the ulcer is generally almost healed. In obstinate cases, these solutions may be alternated with others containing nitrate of silver or sulphate of iron. *To repress Exuberant Granulations*, the sulphate in substance should be employed.

792. CURCUMA. TURMERIC. The root-stock or tubers of Curcuma longa, *Linn. Nat. Ord.* Scitamineæ. Cultivated throughout the East.

Med. Prop. and Action. Stimulant and carminative; but it is not administered internally, except as a condiment. If taken in large quantities, it is stated to communicate a greenish hue to the stools. Its principal use in pharmacy is as a test for alkalies, which render it reddish or brown.

Offic. Prep. Tincture of Turmeric (Bruised Turmeric oz. j.; Proof Spirit fl. oz. vj. Macerate seven days, and strain.) Used to prepare the following:—*Turmeric Paper* (unsized paper steeped in tincture of turmeric, and dried by exposure to the air.)

793. *Therapeutic Uses. In Coryza*, inhaling the fumes of burning turmeric is a common Hindú remedy. I have seen it tried in numerous instances, and have rarely seen it fail to afford more or less immediate relief. The best mode of application is to place a small piece of burning turmeric under a small funnel, and to draw the vapour up the nostrils as it passes through the small aperture.

794. *To relieve the burning of the Eye in Ophthalmia*, a decoction of turmeric, applied cold to the eye, on a piece of linen, is often remarkably effectual. I have frequently used it with advantage.

795. CUSPARIÆ CORTEX. CUSPARIA OR ANGUSTURA BARK. The bark of Galipea Cusparia, *St. Hil. Nat. Ord.* Rutaceæ. *Hab.* Woods of South America.

Med. Prop. and Action. Tonic, stimulant, and aromatic. Taken internally it promotes digestion, increases the appetite, expels flatus, and does not cause constipation. By some it is believed to possess anti-periodic properties. In large doses it creates nausea. When chewed, it leaves for some time a sense of heat and pungency in the throat and fauces. Active principles—1, a crystalline principle, which has been named *Angusturine*, and *Cusparine*; 2, a volatile oil; 3, a resin.

Dose:—Of the Powdered Bark, gr. x.–xl. *Of the Infusion* (Cusparia Bark oz. ½, Water at 120° fl. oz. x.), fl. oz. j.–ij.

796. *Therapeutic Uses. In Malarious Fevers*, it was at the

time of its introduction (1788) regarded as equal, if not superior, to cinchona, such being the estimation in which it was and is still held by the people of South America. Mr. Brande[1] has spoken favourably of its febrifuge properties, and relates instances in which it proved successful. Alibert, however, gave it a fair trial, and found it of little value; and general experience has pronounced the same verdict.

797. *In Atonic Dyspepsia*, cusparia proves serviceable. It does not oppress the stomach like some other tonics; and under its use the tone of the digestion often rapidly improves. Cinnamon is a good adjunct; and it may be advantageously combined with rhubarb and alkalies.

798. *In the latter stages of Diarrhœa and Dysentery*, it may be given with advantage. *In the Diarrhœa of Children*, when the fæces are loaded with mucus, it proves useful. Dr. Lettsom[2] speaks highly of its efficacy.

799. *In Debility, Hysteria*, or whenever a light tonic is indicated, infusion of cusparia is an eligible preparation.

800. Cusso. Kousso. The dried flowers and tops of Brayera anthelmintica, *D.C. Nat. Ord.* Rosaceæ. *Source*, Abyssinia.

Med. Prop. and Therap. Uses. Anthelmintic. It exercises a poisonous influence on both kinds of *Tape Worm*, and hence is justly regarded as a true tæniacide; but, possessing no cathartic property, a subsequent aperient is required to cause the expulsion of the entozoa. Its disagreeable taste and the large quantity of the drug required, are the great objections to its use. It does not usually produce any physiological effects, but may be followed by some degree of gastric irritation. It contains a volatile oil, a bitter acrid resin, tannin, a crystalline principle, *Kwoseine*, and a bitter uncrystallizable substance, *Koussine*. In which of these principles the activity of the drug resides is not decided. It holds the foremost place amongst the anthelmintics of Abyssinia, where tape worm is the national disease, and from which country it was introduced by Aubert, in 1841.

Dose:—Of Cusso for an adult, oz. ½; for a child of 7 to 12 years, gr. cl.; from 3 to 7 years, gr. cxx.; for children not exceeding 3, gr. lx.–gr. xc.—*Of the Infusion* (Cusso, in coarse powder oz. ½, Boiling Water fl. oz. viij.), fl. oz. iv.–viij., including the infused flowers. It should be taken in the morning on an empty stomach, and followed in three or four hours by a dose of castor oil, or a mild saline aperient. In some cases in which it has failed to act when given singly, it has subsequently been found effectual when combined with Kamala (*q.v.*)

Daphne Mezereum. See Mezereum.

801. Daucus Carota, *Linn.* The Garden Carrot. *Nat. Ord.* Umbelliferæ. Cultivated in all parts of the world.

Med. Prop. and Action. The fruit (gr. xx.–xl.) was formerly employed as a carminative and diuretic, but is now obsolete. The only part now in

[1] On the Angustura Bark, Lond. 1791.

[2] Mem. of Med. Soc. of Lond., vol. i.

use is the root, which, when boiled and beaten into a paste with water, forms an excellent poultice. The raw root thus employed produces violent irritation.

802. *Therapeutic Uses. In Cancer of the Uterus*, Dr. Dewees (p. 276) states that a strong decoction of carrots, used as a vaginal injection, has "the happiest effects" as a palliative. *To Malignant Ulcers of the Tongue*, Mr. Earle[1] advises the pulp of boiled carrots to be retained on the ulcer, and frequently changed. At the same time, he advises henbane internally. *To fetid, ill-conditioned, and phagedenic Ulcerations*, the carrot poultice (*ut supra*) is an excellent application.

803. Delphinia. An alkaloid, $C_{27}H_{19}NO_2$, obtained from the seeds of Delphinium Staphisagria, *Linn.*

Med. Prop. and Action. Pure delphinia has little effect upon the mucous membrane of the stomach and bowels. It may be administered, in some cases, to the extent of gr. iij.–iv. daily, in doses of gr. ½, without exciting vomiting. In this quantity, however, it sometimes operates on the bowels, but causes very little irritation. In most instances it acts as a diuretic, occasioning a considerable flow of pale urine. When taken to the extent of gr. iv., it gives rise to sensations of heat and tingling in various parts of the body, similar to those which are produced by rubbing it on the skin; and its other effects are very similar to those of veratria. Its external application causes a sensation of burning, not unlike that after the application of a blister, but not to an unpleasant degree, unless the friction has been too long continued. It produces a slight redness of the skin, which lasts from a few minutes to one or two hours. (Turnbull.)[2] It may be applied in the form of solution (gr. xl., Spirit. Rect. fl. oz. xij.) or in ointment (gr. xxx., Olive Oil fl. drm. j., Lard oz. j.)

Dose, gr. ¼–gr. ½. Seldom administered.

804. *Therapeutic Uses. In Tic Douloureux, Rheumatism, and Paralysis*, its external application is stated by Dr. Turnbull to be very efficient. *In Neuralgia in the Tongue or at the point where the infra-orbital nerve escapes from its foramen*, it is to be preferred to the other alkaloids, because it can be applied to the tongue or gums without occasioning much irritation. *In Paralysis*, it appears, according to Dr. Turnbull, to be more useful than veratria, from its property of exciting the circulation in the affected part.

805. Delphinium Staphisagria, *Linn.* Stavesacre. Louse Wort. *Nat. Ord.* Ranunculaceæ. *Hab.* Southern Europe and Asia Minor.

Med. Prop. and Action. The seeds are cathartic, emetic, and anthelmintic in small doses, but are so violent in their operation that they are very seldom given internally. In large doses they are an acro-narcotic poison. When chewed, they cause a great flow of saliva, and have consequently been used as a masticatory. Externally, the bruised seeds have

[1] Med. Chir. Trans., vol. xii. p. 286.

[2] On the Med. Prop. of the Ranunculaceæ, pp. 114–118.

been used to destroy *Pediculi*, for which purpose they are very effectual, though their use is not devoid of danger. Active principle, *Delphinia* (*q.v.*)

Dose, gr. iij.–gr. x. in powder or decoction; rarely prescribed.

806. *Therapeutic Uses.* *In Scabies*, staphisagria seeds have obtained great repute as a certain remedy. M. Bourguignon,[1] who prefers it to all other remedies, directs 300 parts of finely-powdered staphisagria to be stirred into 500 parts of boiling lard, and the temperature to be kept up at 212° F. for twenty-four hours. After straining, a little essence may be added. Baths should be taken before and during the treatment, and the frictions should be made four times daily. Under this treatment the average duration of cure is four days. Dr. B. Squire[2] found the oil extracted from the seeds by ether, diluted with olive oil, was more efficient than even ung. hydrarg. in relieving *Prurigo*.

807. DEXTRINA. Dextrine. Gum Starch. $C_{12}H_9O_9,HO$. It is obtained from Starch in three ways: 1, by carefully heating it to about 300°; 2, by the action of diastase; and 3, by heating Starch paste with Water acidulated with Sulphuric or very dilute Nitric Acid (1,000 parts of Potato Starch are moistened with 300 parts of Water, to which 2 parts of Nitric Acid have been added, and dried in a stove heated to 240°.) In many of its properties it closely resembles gum.

Med. Prop. and Therap. Uses. To form an immoveable apparatus for fractures and diseases of the joints, moisten 100 parts of dextrine with spirit of camphor, and add 40 parts of water. It should be of the consistence of molasses. The bandages should be soaked in this mixture, and applied in the usual manner. It possesses no advantage over a mixture of white of egg and flour, or one of gum and chalk, both of which are more readily procurable and less expensive than dextrine. (Tufnell.)[3]

As a demulcent drink, it is much employed in France as a substitute for gum.

808. DIGITALINUM. DIGITALIN. A neutral, non-nitrogenised principle, obtained from Digitalis.

Med. Prop. and Action. In doses of $\frac{1}{60}$–$\frac{1}{30}$ of a grain, in pill, or dissolved in alcohol, it produces all the characteristic effects of digitalis. It is about 100 times as strong as the dried leaves; applied to the nose, it causes violent sneezing. Drs. Bouchardat and Sandras[4] found that, in doses of from $\frac{1}{32}$–$\frac{1}{12}$ of a grain, it produced diuresis, and a great diminution in the force and frequency of the pulse. Its powerfully sedative effect is not confined to the circulatory system alone, but extends to the nervous system, and to the generative organs particularly; hence its powers as an anaphrodisiac, which are considerable. When digitalin is introduced into the eye, it causes

[1] Brit. and For. Med. Chir. Rev., Jan. 1851.

[2] Med. Times and Gazette, June 6, 1868.

[3] Dublin Quart. Journ., February, 1865.

[4] Ann. de Thérapeutique, 1845, p. 60.

smarting and profuse lachrymation; and after four or five hours, when the local pain has subsided, on looking at a light there will be perceived that it is surrounded by a halo presenting the prismatic colours, not quite close to the light, but with a dark intervening space. This halo increases in diameter the farther the patient moves from the light, and becomes smaller and narrower the nearer he approaches. Homolle and Quevenne state that a slight opalescence is noticeable in the crystalline lens, and that the pupil is somewhat dilated and less contractile. (Dr. Brunton.)[1] The "Granules" of Homolle and Quevenne, much used on the Continent, are prepared as follows:—Digitalin grs. xv.½, Sugar ℥j.½, Water q.s. Mix well together, and divide into one thousand granules, like comfits. The dose is one granule, four or six times daily.

Dose, gr. $\frac{1}{60}$–gr. $\frac{1}{20}$. It must be prescribed with great caution, and the patient carefully watched.

809. *Therapeutic Uses. In Diseases of the Heart and Pulmonary Affections*, Dr. Hervieux[2] successfully employed digitalin. In doses of from gr. $\frac{1}{10}$–$\frac{1}{4}$, it did not cause nausea, purging, or any ill effects. In all the cases the pulse fell in a remarkable manner, the average diminution being from 22 to 36 pulsations in a minute. The action of the medicine began to evidence itself after two or three hours; but attained its maximum only after one, or even two weeks. The urinary secretion was not constantly increased in quantity; but in all cases much vesical tenesmus was present. *In Dropsy and Dropsical Affections, especially when connected with Heart disease*, digitalin has been used with satisfactory results by Homolle and Quevenne,[3] Bouchardat, Hervieux, Christison,[4] and others; but it does not seem to possess any marked superiority over digitalis itself. The following formula is advised by M. Falken:—℞ Digitalin, gr. $\frac{3}{4}$, Pulv. Scillæ, Pulv. Scammon. āā grs. lxxv., Mucilag. q. s., M. ft. pil. 100. Of these, two, then four, and lastly six, are to be given daily according to the effect produced.

810. *In Spermatorrhœa*, it proved effectual in the hands of Corvisart[5] and others. The dose employed was three of Homolle's granules (*ante*) daily. Its effects are said to be very marked.

811. In addition to the above, it has been used in *Mania*, *Epilepsy*, *Phthisis*, *Intermittents*, &c.; but the results appear to have been nothing remarkable. With regard to its local use in *Skin Diseases*, as advised by M. Dumont,[6] two strong objections exist: 1, the danger of its becoming absorbed into the system; and 2, the great local irritation it causes.

812. Digitalis Folia. Digitalis Leaves. The dried leaves of Digitalis purpurea, *Linn. Nat. Ord.* Scrophulariaceæ. *Hab.* Europe: collected when about two-thirds of the flowers are expanded.

[1] On Digitalis, &c., p. 47.
[2] Archives de Médecine, 1848.
[3] Répert. de Pharm., December, 1834.
[4] Monthly Journ. of Med. Sci., Jan. 1855.
[5] L'Union Méd., April, 1853.
[6] Ann. de Thérap., 1853, p. 128.

Med. Prop. and Action. Sedative and diuretic, these properties depending upon a peculiar bitter principle, *Digitalin* (*q.v.*) Its physiological effects have been carefully examined by Dr. Brunton,[1] whose statements, much abridged, we follow. In doses so small as to have no poisonous effect, its action is shown first on the urine, and secondly on the circulation. *On the Urine:* 1. In anasarca, especially from heart disease, digitalis acts as a diuretic. 2. It sometimes, but not always, acts as such in health. 3. When it acts upon the intestinal canal, so as to cause vomiting or purging, or when it affects the pulse so much as to cause intermittence, diuresis is much lessened, though a moderate degree of retardation may coexist with diuresis. 4. In large doses it causes suppression of urine, lasting for three days. 5. The acid reaction of the urine remains unaltered, but the urea, chloride of sodium, phosphates, and sulphates, are lessened, and the uric acid increased. *On the Pulse:* Given in small doses, digitalis first reduces the number of beats without rendering them irregular. If its influence be pushed further, the pulse remains slow, but now and then a quick beat is interpolated. These quick beats, as the influence increases, become more numerous, so that the slow beats become intermissions, and in a still further stage the slow beats entirely disappear, and the pulse becomes regular and extremely rapid. *On the Respiration:* In large doses, digitalis, as observed in horses, causes first acceleration of the respirations as well as of the pulse; and after this exciting action has passed away the number becomes remarkably diminished, deep, broken, and intermittent, the intermittence coinciding with that of the heart. *On the Digestion:* In small doses, digitalis is said to cause increased appetite; in large doses, it operates as an emetic and cathartic. Before these latter effects appear, however, there is loss of appetite, bad taste in the mouth, nausea, and other symptoms of digestive derangement. When vomiting occurs, it is violent and painful. *On the Nervous System:* In large doses, in animals, digitalis affects both the sensory and motor system, causing a comatose or semi-comatose state, and insensibility to external impressions, muscular weakness, which causes a stumbling, uncertain gait, and a kind of paralysis of the hind quarters, so that the animal with difficulty draws them after him. In small doses, in man, it produces giddiness, headache (sometimes very persistent), tinnitus aurium, disturbed vision, weariness, languor, and general prostration, and in some cases a kind of intoxication, weakening of the intellectual faculties, and hallucinations and delirium, or even symptoms of acute mania. In some few cases it acts as a soporific. It is apt to cause a remarkable derangement of sight. Dr. Brunton recognised two kinds—1. A general mistiness of sight, such as is seen before fainting; and, 2. A large bright spot, which sometimes resembled a ring showing the prismatic colours faintly, similar to, though less distinct, than that seen round a light after the local application of digitalin (*q.v.*) *On the Genital Organs:* Dr. Brunton agrees with Stadion, that digitalis and digitalin possess the power of temporarily arresting the activity of the sexual organs, and is, therefore, a true anaphrodisiac. For its influence on the uterus, see *infra*, Sect. 824. *On the Secretions:* Salivation has been noticed in some cases; in others there is occasionally a feeling of dryness of the mouth, along with some salivation, but it is not constantly observed. The secretion of the nasal mucous membrane is apt to be increased. Doses a little too large usually induce profuse sweating. In poisoning, hot sweats appear at first, which, as death approaches, dry up and become cold. *The Temperature of the Body* decreases under its use. The cause of death from digitalis seems to be stoppage of the heart's action and defective supply of blood to the nerve centres. (Brunton.)

813. *Remarks on the Use of Digitalis.* 1. Digitalis in small, long-continued doses is apt occasionally to accumulate in the system, and suddenly to induce poisonous, and even fatal effects.

2. Should, however, either its sedative or diuretic effects be obtained in a kindly manner, the patient, as a general rule, may be considered safe from

[1] On Digitalis, 1868.

its poisonous operation. If, on the other hand, neither of these effects be observed in a few days, danger from accumulation may be feared, and it should, therefore, be discontinued.

3. Perfect rest of mind and body and a recumbent posture favour the development of its action. Patients should be strictly prohibited from taking sudden or active exercise during its administration.

4. It is chiefly applicable to diseases of an asthenic character, and in persons of shattered and debilitated constitutions. In old age its action should be carefully watched.

5. Vomiting or purging interferes with its action both as a sedative and as a diuretic.

6. To obtain its sedative effect, the tincture is the best form of administration; but if its diuretic action be desired, the infusion is preferable, particularly if combined with squill or carbonate of ammonia, or both.

7. In many cases it produces benefit up to a certain point, and then seems to lose all power. In such cases it should be omitted for a few days, or discontinued altogether.

8. Its diuretic action is often induced by its external application.

Dose:—Of Digitalis Leaves powdered gr. ½–1½. *Of the Infusion* (Digitalis Leaves, gr. xxx., Boiling Water fl. oz. x.), fl. drm. ij.–iv. *Of the Tincture* (Digitalis Leaves oz. ij.½, Proof Spirit Oj.), ℥x.–xxx.

814. *Therapeutic Uses. Febrile and Inflammatory Affections. In Acute Inflammation*, the power of digitalis of depressing the action of the heart and capillary systems, and lowering the temperature of the body, has led to its use in some cases as an antiphlogistic; and though it may have proved useful in some inflammations—*e.g.*, pneumonia—it is generally inferior to antimony and other remedies of the same class. On this point Prof. Alison[1] remarks that the effect of digitalis in lowering the pulse is seldom to be obtained without its nauseating effect, and this can hardly be produced within so short a time as the progress of an acute disease demands, without danger of fatal syncope.

815. *Fevers. In Typhoid Fever*, digitalis is advocated by Wunderlich,[2] who found that it diminished the fever, lowered the pulse, and moderated the course of the disease; he gave gr. xv.–xx. of the leaves in infusion, in divided doses, in the course of the day. It has not, however, come into general use. *In Scarlet Fever*, Dr. Sidney Fennell[3] states that for years he has employed with the best results a combination of tinct. of digitalis, nitric ether, and nitrate of potash. For infants, one drop of the tincture every three or four hours suffices, though as much as five drops are tolerated. He thinks that it undoubetdly lessens, if it does not destroy, the infectious character of the disease. Cases of *Puerperal Fever* are recorded in which recovery followed the decidedly sedative operation of digitalis on the pulse (Stillé.) *In Intermittents*, it was proposed as an antiperiodic by Davy, and it has been employed successfully in

[1] Outlines of Pathology, p. 243.
[2] Med. Times and Gaz., 1862.
[3] Lancet, Jan. 23, 1869.

between forty and fifty cases by Graffeneuer, Gerard, and Bouillard;[1] but it is neither so safe nor so effectual as quinine or arsenic.

816. *In Diseases of the Heart*, digitalis is a potent remedy, but considerable difference of opinion has been expressed as to the class of cases in which its employment is indicated; some, regarding it as a direct cardiac sedative and depressant—in the words of M. Bouillard, as "the true opium of the heart"—would restrict its use to hypertrophy and other affections of the heart characterized by excess of action; whilst others regard it as a cardiac tonic and stimulant, and as adapted solely to a weakened and impaired condition of that organ. The only way of explaining this discrepancy of opinion, as observed in an excellent paper on the subject by Dr. A. Reith,[2] is by allowing to digitalis a double action on the vaso-motor system, such as recent researches render probable is possessed by medicines in general. The truth of the matter, he observes, is this, that in doses large enough to induce reaction digitalis will prove hurtful, if not dangerous, in hypertrophy; but in much less quantity, or in stimulating doses, it will be beneficial. The statements of the best observers are in favour of this view. It has been found that the beneficial effects of digitalis in hypertrophy are best obtained from small doses. Trousseau and Pidoux say, "These experiments are moreover confirmatory of a fact long since acknowledged, namely, that, to exercise its sedative action on the circulation, digitalis must be administered in small doses. Hypertrophy then requires only the primary action of digitalis for its relief, and will be aggravated by any approach to the secondary. But we can suppose a condition of the heart existing where a hypertrophic state would be required to effect a cure, and any drug which would physiologically create hypertrophy would be a proper remedy in the case. Such a condition is found in dilatation, and in enfeebled heart, and such a drug is digitalis when administered in physiological or tonic doses. The experience of every one must confirm this view." Notwithstanding these opinions, the best modern authorities—Drs. Gull, Wilks, Fuller, and Handfield Jones—regard digitalis as prejudicial, and even dangerous, in simple hypertrophy, and would restrict its use to cases of dilatation and enfeeblement of the heart. The conclusions drawn respecting it by Dr. W. Murray[3] are as follows: 1. That digitalis will stimulate and strengthen a weak heart, and that the weaker are the muscular tissues of the heart the safer will be the administration of the medicine. 2. That in hypertrophied heart it will fail to reduce the pulse either in frequency or strength,

[1] Cited by Brunton, p. 36.
[2] Edin. Med. Journ., Sept. 1868.
[3] Brit. For. Med. Chir. Rev., July, 1865.

and in such cases will prove dangerous. 3. That in a weak organ, acting, because of its weakness, with great rapidity, it will reduce the number of its contractions, and, as it were, strengthen or tone them down. To strengthen and quicken the action of a weak, slowly-acting heart, and to reduce the number of the rapid strokes of a feeble heart, is, according to Anstie, to do the work of a true stimulant; bringing action up to the normal standard on the one hand, and reducing it to that level on the other." (Dr. Murray.) Dr. E. Mackey,[1] who has evidently paid great attention to the subject, is of opinion that neither *Mitral Regurgitation* nor *Mitral Obstruction* contra-indicates the use of digitalis, and he details instances in which he prescribed it with advantage; but in *Aortic Regurgitation* and in *Fatty Degeneration*, he regards its employment as either contra-indicated or doubtfully safe. On this point Dr. Waters (p. 349) observes: "Of the value of digitalis in many cases of *Valvular Disease, especially when there is Hypertrophy of the Heart*, there can, I think, be no doubt; but it is not a remedy which should be employed in cases of *Fatty Heart*. If you are even disposed to give it as a diuretic from the failure of other remedies, I advise you to combine it with iron; but I think you ought to abstain from giving it altogether." With regard to the dose in this class of affections, Dr. Mackey considers that in any case where the heart's action is very feeble the commencing dose of the tincture should be ♏ v.–x. every four or six hours; in such cases he states that he has seen the dose rapidly increased to ♏ xv.–xx., or even ♏ xxx., with benefit; but, as a general rule, such a dose as ♏ xxx. is often enough repeated twice in the twenty-four hours. An equivalent dose is fl. oz. ½ of the fresh infusion, or gr. j. of the powdered leaves; but a patient taking such a dose should be kept recumbent at least half an hour before, and for two hours after. He states that he should hesitate before prescribing a larger dose than ♏xv. of the tincture to any patient following his occupation, and he adds that there is no doubt about the fact that half-drachm doses of the tincture, repeated several times at short intervals, especially in the upright position, may produce dangerous interference with the circulation, whether it be from over-stimulus or from a partial paresis. But given as above, no untoward results, as far as cumulative action is concerned, have followed.

817. *In Pericarditis*, after the acute symptoms have been subdued, Dr. Hope found benefit from a combination of T. Digitalis and T. Hyoscyami (āā ♏ xv.–xx.) More recently, Dr. Von Niemeyer[2] has strongly recommended digitalis in those cases in which the heart's action is very rapid and feeble, accompanied with cyanotic and dropsical symptoms.

[1] Brit. Med. Journ., May 30 and July 11, 1868.

[2] Practitioner, Sept. 1868.

818. *In Palpitations connected with Valvular Disease of the Heart*, Dr. Waters (p. 273) speaks favourably of a combination of digitalis and iron, except in very severe cases, when digitalis given alone appears to act best.

819. *Diseases of the Lungs. In Phthisis*, digitalis was formerly held in high repute, and more recently it has been favourably spoken of by Dr. Symonds;[1] but, as a general remedy, it will bear no comparison with cod-liver oil. For the relief, however, of certain symptoms, *e.g.*, *Hæmoptysis*, especially when attended with much vascular excitement, it proves serviceable as an adjunct to other means. Brunton,[2] indeed, regards it as the best remedy for hæmorrhage from cavities in the advanced stages of the disease. As a sedative, the tincture is occasionally of great service as an adjunct to expectorants in *Chronic Bronchitis* and *Spasmodic Coughs*. *In Pneumonia*, digitalis has of late years been much employed on the continent by Lissauer, Hirtz, Millet, Oppolzer, Traube, Schneider, and others.[3] Still more recently it has been employed in thirty-five cases by M. Rony-Saucerotte,[4] who regards it as one of the best means of relieving the febrile and other grave symptoms; less active as an antipyretic than veratrum, but more easily managed and less offensive; acting more slowly than leeches, but producing more durable results. *In Spasmodic Asthma*, it was employed by Ferriar and others, but it is inferior in safety and efficacy to many other remedies.

820. *In Insanity*, where the circulation is active, where there is a tendency to heat of head and congestion of the conjunctiva, and where the patient storms about in a noisy, turbulent manner, is prone to violence, and is sleepless for nights, the tincture in half drachm doses is more effectual than opium in diminishing excitement, according to Dr. Maudsley,[5] who speaks favourably of it also in mania dependent on organic diseases of the brain, and in that occurring in the course of general paralysis. Here it is often effectual in bringing down the pulse, lessening excitement, and procuring sleep. *In Acute Delirious Mania*, Dr. F. Blandford[6] prefers tinct. of digitalis in the above doses, or henbane, to opiates, which, indeed, in such cases prove prejudicial. It may sometimes be advantageously combined with hydrocyanic acid. Van der Kolk (pp. 106, 114, 157) speaks favourably of the action of digitalis, especially in the form of infusion, its use producing greater quietude and more marked depression of pulse-beat than could be obtained by any other means; but these good effects lasted only so long as the medicine was continued; on its discontinuance all the

[1] Brit. Med. Jour., June 13, 1868.
[2] Op. cit., p. 4.
[3] Ann. de Thérap., 1859, p. 82.
[4] Practitioner, March, 1869.
[5] Ibid., Jan. 1869.
[6] Ibid., Feb. 1869.

bad symptoms reappeared. He regards it then only as a palliative, though a valuable one.

821. *Delirium Tremens.* The efficacy of digitalis in very large doses in this disease has been proved by numerous cases in the practice of Dr. Jones, of Jersey,[1] Dr. Peacock,[2] Dr. M. Mackenzie,[3] Mr. Gascoigne,[4] and others. Dr. Peacock draws the following conclusions :—1. That digitalis, when exhibited in full doses, does not by any means produce the amount of depression which our previous experience of its action in small doses would lead us to expect; and, 2. That the remedy, in conjunction with other means, may probably be very usefully employed in certain cases of the disease, and especially when it occurs in young and robust persons whose strength has not been broken down by prolonged habits of intemperance. Dr. Laycock,[5] on the other hand, regards the evidence in favour of the calming effect of digitalis in this disease as of the vaguest kind, and states that there is no indication of the class of cases in which it may be safely prescribed. Mr. J. W. Robinson[6] recommends that digitalis be given in combination with opium. Dr. Anstie (ii. p. 90,) observing that in all the recorded cases the *tincture* had been employed, instituted some trials with an infusion, or powdered leaves in the form of pill, and arrives at the provisional conclusion that in all probability a large number of the reported successful cases have either been instances of a spontaneous favourable termination of the disease, or have been slightly helped towards their happy issue by the alcohol contained in the tincture. The dose of the tincture advised by Mr. Jones is fl. oz. $\frac{1}{2}$ till three doses have been taken, and then, if the excitement be not calmed, nor sleep induced, fl. drm. ij. repeated every three or four hours. The safety of this treatment is certainly questionable. Thus Dr. Ringer (p. 329), after stating that he has seen this treatment successful in several instances, adds that, on two occasions in which it was adopted, the patients suddenly fell back dead, although up to the moment of their death they had given no warning of such a termination. Whether, he adds, the death in these instances was to be ascribed to the digitalis or to the disease, it is impossible to say; but it is well known that delirium tremens, when treated by other remedies, sometimes ends in this suddenly fatal way.

822. *In Dropsy and Dropsical Affections*, digitalis has been in common use since its first introduction by Withering,[7] in 1775. Experience has proved it to be a powerful and efficacious remedy, particularly when given in combination with mercury,

[1] Med. Times and Gaz., Sept. 29, 1860.
[2] Ibid., August 3, 1861.
[3] Lancet, March 1, 1862.
[4] Brit. Med. Journ., Aug. 29, 1868.
[5] Edin. Med. Journ., Nov. 1862.
[6] Lancet, Oct. 17, 1863.
[7] On Digitalis, 1775.

squills, &c. Dr. Withering observes, "that it seldom succeeds in persons of great natural strength, or plethoric habit, or in those with a tight and cordy pulse. If the belly in ascites be tense, hard, and circumscribed, or the limbs in anasarca solid and resisting, we have but little hope. On the contrary, if the pulse be feeble and intermitting, the countenance pale, the lips livid, the skin cold, the swollen belly soft and fluctuating, the anasarcous limbs pitting under pressure of the finger, we may expect the diuretic effects to follow in a kindly manner." Experience has fully proved the general justice of Withering's remarks; at the same time, it must be observed that digitalis has failed more frequently than his eulogiums would lead us to expect. Its efficacy is much increased by combination; and if the infusion, which is the best form for administration in this class of cases, be employed, it may be advantageously combined with carb. of ammonia or tinct. of perchloride of iron. The following pill has long enjoyed a merited reputation in dropsy:—℞ Pulv. Digital. gr. ½, Pulv. Scillæ gr. 1½, Pil. Hydrarg. gr. ij., M., ft. pil. bis terve in die sumend. Dr. Murchison (p. 256) advises these pills to be conjoined with the use of a mixture containing acetate or bitartrate of potash, nitric ether, and decoction of broom tops. This advice of Dr. Murchison has reference to dropsy arising in connection with hepatic disease, but it is equally applicable to cardiac dropsy. *In Dropsy after Scarlet Fever*, Sir H. Holland[1] particularly advises a combination of digitalis and tinct. of perchloride of iron; and there is no doubt that in this and many other forms of dropsy attended with anæmia it is a very eligible formula. In prescribing digitalis in dropsy arising from heart disease, attention should be paid to the remarks in sect. 815. In these cases we should not lose sight of the fact now established by the observations of Dr. Christison and others, that diuresis may sometimes be induced by the external application of digitalis to the abdomen, either by fomentation with an infusion about four times the usual strength, or by frictions with an embrocation containing equal parts of tinct. of digitalis and soap liniment. Or it may be applied in the form of poultice, as advised in the next section.

823. *In Suppression of Urine*, the effects of digitalis applied in the form of poultice to the abdomen, according to the observations of Mr. J. D. Brown,[2] in six instances which he details, are often very remarkable. When procurable, he employs the fresh leaves; but in the winter or when not available, he adds fl. oz. j. of the tincture to a warm linseed-meal poultice. The dried leaves made into a poultice with oz. ½ of the tincture also succeeded. He considers that the leaves collected before

[1] Med. Notes and Reflect., p. 546. [2] Med. Times, Jan. 25, 1868.

seeding time have the most power, the winter leaves the least. Only two effects were observable—a marked reduction in the pulse-beats and great diuresis; the two are intimately connected, for Mr. Brown observes, "I have seen no good results till the pulse fell in number; it matters not from what figure; fall it must before any change occurs." This treatment seems worthy of further trial. *For re-establishing the Renal Secretion in Cholera*, Dr. E. Goodeve[1] recommends the following:—℞ T. Digitalis ♏v.–x., Sp. Ether. Nit. ♏xxx., Liq. Ammon. Acet. ♏lx., Aq. fl. oz. j., M., ft. haust. 3tis horis sumend. Plentiful diluents are also advisable.

824. *In Piles*, digitalis given internally proved highly serviceable in the hands of Dr. E. Mackey.[2] He relates some very severe cases of hæmorrhoids in which the tincture, ♏x.–xv. every three hours, exercised a marked influence in relieving the turgescence and all the more painful symptoms.

825. *In Uterine Affections characterised by undue excitement*, digitalis, from its sedative action on the generative organs, appears to be worthy of a trial. In *Menorrhagia* and other forms of *Uterine Hæmorrhage* unconnected with organic disease, digitalis appears to exercise a remarkable and decided sedative action. The evidences of its power adduced by Mr. W. H. Dickinson[3] are incontestable. He employed it in the form of infusion. When given in large doses (fl. oz. 1–1½,) the discharge never appeared after the second day; when smaller ones were used, it never appeared after the fourth day. Its *modus operandi* appears doubtful; the effect is evidently not due solely to its sedative qualities. Dr. Tilt (p. 225) confirms the statement of its efficacy in these cases. He prescribes the following:—℞ T. Digit. ʒij., Acid. Hydrocyan. dil. ♏xxx., Morphiæ Acet. gr. j., Aq. ad ℥vj. Dose, a dessert-spoonful every two or three hours. Dr. Graily Hewitt (p. 426), however, states that his trials with it in profuse menstruation have not been altogether encouraging.

826. *In Epilepsy*, digitalis in large doses (fl. drm. ij.–iv. of the tincture) has been strongly advocated by Dr. Sharkey[4] and others, but it is certainly less safe, and probably far less efficacious, than the bromide of potassium (*q.v.*) Amongst the more recent advocates of its use are Dr. Corneille[5] and Dr. J. Osborne;[6] the latter considered that its efficacy was greatly increased by combination with tinct. of cantharides.

827. *In Sciatica and other Neuralgic Affections*, Dr. Fuller (p. 426) speaks of digitalis (powdered leaves gr. j.–j.½, or tinc-

[1] Reynolds's Syst. of Med., i. p. 183.
[2] Op. cit.
[3] Med. Times and Gaz., Dec. 15, 1855.
[4] On the Efficacy of Digitalis in Epilepsy. Lond. 1841.
[5] Ann. de. Thérap. 1859, p. 88.
[6] Dub. Quart. Journ. of Med., Nov. 1855.

ture ℥x.-xx., 3 or 4 times a day) as a reliable remedy when the pain is intermittent, and of a purely neuralgic character; in other forms of the disease it is useless. Sedative and diuretic in its action, it calms the vascular system, excites an increased flow of urine, and thus, though not exercising a narcotic influence, it frequently allays pain and affords repose. (Dr. Fuller.) *In Hemicrania*, it proved successful in the hands of Debout and Serre;[1] but as they both employed it in combination with quinia, it is doubtful how far the benefit derived was due to the digitalis. *In Earache*, Dr. Lehman,[2] after the exhibition of a mild purgative, advises, as an effectualr emedy, the introduction into the meatus of a piece of cotton saturated with the tincture of digitalis.

Diosma crenata. See Buchu Folia.

828. Dulcamara. The dried young branches of Solanum Dulcamara, *Linn.* Bitter-sweet, or Woody Night-shade. *Nat. Ord.* Solanaceæ. *Hab.* Europe and temperate Asia. Collected when the plants have shed their leaves.

Med. Prop. and Action. Diaphoretic, diuretic, and alterative-tonic; in large doses said to be acro-narcotic, but its operation and effects are imperfectly ascertained. Whatever virtues it may possess probably reside in its alkaloid, *Solania*. It is best given in infusion (oz. j., Aq. fl. oz. x.) in doses of fl. oz. j.-ij. thrice daily, or oftener.

829. *Therapeutic Uses. In Chronic Skin Diseases, especially in Lepra, Psoriasis, and Eczema*, it has been long held in repute, and has been favourably reported of by Rayer, Wright,[3] and others. Dr. Elliotson,[4] who speaks well of it, advises a pint of the decoction to be taken daily, commencing with fl. oz. ij., and gradually increasing the dose. Little, if any, value is attached to it at the present day.

830. Dutch Oil. Dutch Liquid. The Chloride of Olefiant Gas of Fownes. C_2H_2Cl. Sp. gr. of the liquid, 1·247; of the vapour, 3·448.

Med. Prop. and Action. A powerful anæsthetic agent, first introduced by Mr. Nunneley,[5] of Leeds, who states that, in the cases in which he employed it, the results were most satisfactory. Drs. Simpson and Snow regard it as inferior to chloroform for the purposes of inhalation, as it gives rise to too much irritation. As a local anæsthetic, it is particularly recommended by Dr. Aran,[6] who states that it causes less pain and irritation of the skin than any other remedy of the same class. To obtain local anæsthesia by it, from 15 to 30 drops are applied to the painful part, and the whole covered with a wet compress, and a piece of waxed cloth or oiled silk. (See Anæsthetics.)

[1] Sydenham Soc. Year Book, 1861.
[2] Amer. Journ. of Med. Sci., v. p. 34.
[3] Med. Times, 1847, p. 387.
[4] Lectures, p. 381.
[5] Prov. Journal, March 4, 1849.
[6] London Journ. of Med., March, 1851.

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831. ELATERIUM. The sediment from the expressed juice of the fruit of Ecbalium officinarum, *Rich.* Squirting Cucumber. *Nat. Ord.* Cucurbitaceæ. *Hab.* Mediterranean region.

Med. Prop. and Action. Hydragogue cathartic. The best mode of administering it is in divided doses of gr. $\frac{1}{8}$ every four hours, until it begins to operate. It often occasions severe griping, vomiting, or hypercatharsis, but this may be partially obviated by combining it with a small portion of powdered capsicum or ginger. It gives rise to considerable dryness of the mouth and fauces, a desire for drinks, and, after its operation, to a great feeling of depression and debility, which soon passes off. The stools produced by elaterium resemble water in which meat has been partially boiled. It is only suited for dropsical or cerebral affections, where a powerful revulsive action is desired; in cases of ordinary constipation it should never be employed. It contains an active crystalline principle, *Elaterine*, which forms from 20 to 30 per cent. of good elaterium. This may be given in doses of gr. $\frac{1}{24}$–gr. $\frac{1}{6}$. Both elaterium and its active principle are irritant poisons in large doses, causing gastro-intestinal inflammation. One great objection to its use is the uncertainty of its operation. Not only is it largely adulterated, but it loses much of its efficacy by long keeping. When pure, it should be in light, friable, slightly incurved cakes, about one line thick, greenish-grey, acrid and bitter, with a finely granular fracture; not effervescing with acids, and yielding half its weight in boiling rectified spirit. In order to obviate the uncertainty of its operation, it has been advised to substitute the active principle, and Dr. Christison furnishes the following formula for its administration :—℞ Elaterin gr. j., Spt. Rect. fl. oz. j., Nitric Acid ♏iv., M. Dose, ♏xxx.–xl.

Dose of good Elaterium gr. $\frac{1}{16}$.–gr $\frac{1}{2}$. If impure, or deteriorated by long keeping, gr. $\frac{1}{2}$–gr. j.

832. *Therapeutic Uses. Dropsical Affections. In Dropsy, Anasarca, and Œdema, arising in connection with Disease of the Heart,* elaterium is one of the most efficacious remedies we possess. Dr. Hope (p. 409) observes that its effects are sometimes truly astonishing; and that he has seen an extreme, universal anasarca removed by it in three or four days. The remedy, however, is apt to be excessively violent in its operation, and it should therefore be given to strong subjects alone; in the weak and the aged, its effects should be carefully watched. As its effect varies in different individuals, it should be tried first in small doses, as from $\frac{1}{8}$ to $\frac{1}{4}$ of a grain. With caution, this may be carried to two grains. Dr. Hope gives it in the form of a pill, with capsicum to counteract the griping, and with a grain of calomel to prevent its emetic effects. A single pill should produce six or eight watery evacuations, and he advises that it should be repeated two or three mornings in succession, or every second or third morning, according to the strength of the patient. Dr. Darwell,[1] whose estimate of elaterium is very high, directs two grains to be combined with gr. xx. of ext. gentian, and divided into four pills, of which one is to be taken every hour, till it causes free evacuations. In order to be of much service, he adds, this should be repeated every two or three days for a fortnight; after which it may be

[1] Cyc. Pract. Med., vol. i. p. 179.

suspended for a short time. An eligible formula is proposed by Dr. Kilgour :[1]—℞ Elaterii gr. j., Ext. Coloc. Co. gr. xl., Ext. Hyoscyam. gr. xij., M. ft. pil. xij., sumat. j. nocte maneque. *In Bright's Disease, when there is much Dropsy*, elaterium is a favourite form of purgative ; but in cases of kidney disease, it is usually advisable to combine it with hyoscyamus, as it not unfrequently brings on an exhausting diarrhœa, especially if given after symptoms of uræmic poisoning have already set in. (Dr. G. Harley.)[2]

833. *In Cerebral Affections*, elaterium, as a powerful cathartic, occasionally proves highly serviceable, not only in removing the obstinate constipation so frequently attendant on these affections, but as a revulsive and derivative. It is, however, less applicable in the majority of cases than croton oil, or the stronger saline purgatives. It should be avoided in the aged, or in those much debilitated.

834. Elemi. A concrete resinous exudation from an undetermined tree, probably Canarium commune, *Linn. Nat. Ord.* Burseraceæ. Chiefly imported from Manilla.

Med. Prop. and Therapeutic Uses. Stimulant, only used externally in the form of ointment (oz. ½, Ung. oz. j.) *To indolent and ill-conditioned Ulcers*, this forms a good stimulant application; but it has no advantage over less expensive articles of the same class. The ointment is also used to promote suppuration from setons and issues.

835. Emetina. Emetia. Emetine. A feeble alkaloid. The active principle of Ipecacuanha. It occurs in two forms : 1, *Pure*, which is perfectly white ; and 2, *Impure*, which occurs in reddish brown, transparent, inodorous scales. The former is about four times as strong as the latter. Three grains of impure, and one grain of pure emetine, are equal to about gr. xviij. of ipecacuanha.

Med. Prop. and Action. Emetic and purgative. It exerts a specific action on the lungs and mucous membrane of the intestines, and has also narcotic properties. Stupor and death have resulted from large doses. Its operation is stated to be more certain, and more easily regulated, than that of ipecacuanha. Externally, it may be used in the form of ointment.

Dose, as an emetic and purgative, gr. ½ ; as an alterative, gr. $\frac{1}{16}$.

Therapeutic Uses, the same as those of Ipecacuanha.

836. Ergota. Ergot. The sclerotium (compact mycelium or spawn) of Claviceps purpurea, *Tulsane*, produced within the paleæ of the common Rye, Secale cereale, *Linn.* Hence its former name, Secale Cornutum, Spurred Rye. It is occasionally found in other grasses.

Med. Prop. and Action. In small or single doses (gr. xx.–xxx.), the effects of ergot on a healthy male adult are not very obvious beyond causing dry-

[1] Edin. Month. Journ., Sept. 1850. [2] Med. Times and Gaz., Dec. 30, 1865.

ness of the throat and fauces, thirst, and occasionally pain in the abdomen. Taken in large and long-continued doses, it induces two distinct states: 1, called gangrenous ergotism, attended by loss of muscular power, great debility, and gangrene of the extremities; and 2, convulsive ergotism, in which the cerebro-spinal system is prominently implicated. These states are described more in detail in sect. 839. Some light is thrown upon this double action of ergot by the chemical researches of M. Wenzell,[1] who has succeeded in isolating from it two alkaloids, which he terms respectively, *Ecbolina* and *Ergotina:* the former acting chiefly on the muscular system, half a grain producing the same effect as gr. xxx. of ergot in substance; the latter inducing some cerebral excitement, with such intense headache that its employment had to be discontinued.

The modus operandi of ergot has been much disputed, but it appears certain that it possesses the power of acting directly upon and of exciting contraction of involuntary or unstriped muscular fibre. The uterus, especially in the gravid state, is the principal example of this variety of muscular fibre, and it is on this that its effects are most marked and best known; but we have it also existing in the bladder, the gullet and stomach, the intestinal canal, the bronchial tubes, the ducts of many glands, the iris, and what is perhaps still more important, the middle coat of arteries: we have also in the heart a great involuntary muscle, though its fibres are not of the unstriped variety. Dr. A. Meadows considers it probable that ergot affects the muscular fibre found in every one of these structures in a greater or less degree, though it certainly does not affect them all equally, either in the same or in different persons.[2] It is to the action thus exercised on the muscular coat of the capillaries that is doubtless due the astringent power that ergot displays in cases of hæmorrhage, and the same fact explains in a measure its power as an emmenagogue.

Dose:—Of the powdered Ergot, gr. xx.–xxx. *Of the Infusion* (Ergot in coarse powder oz. ½, Boiling Water fl. oz. x., infuse for half an hour and strain), fl. oz. j.–ij. *Of the Tincture* (Ergot in coarse powder oz. v., Proof Spt. Oj.), ♏x.–lx. *Of the Liquid Extract*, ♏x.–xxx. These are the doses directed in B. Ph., and which are ordinarily employed; but from the researches of Dr. Dyce Brown,[3] it appears probable that the full effect of the drug as a parturifacient may be obtained by far smaller quantities. He found gr. v.–vj. of freshly powdered ergot in substance produce a safe, moderate, and natural amount of action. "Given in this manner, in the majority of cases, after a single dose," he states, "uterine action becomes increased in from five to twenty minutes, and the pains exactly resemble normal uterine pains in their strength, duration, and period of intermission; in fact, they are what may be called excellent, laudable pains, and no more." Should the first dose fail, it may be repeated in fifteen or twenty minutes. A third dose is rarely required. Should experience confirm these statements, it will be very important, as there can be no doubt that much of the ill effect of ergot on the fœtus (*infra*) is due to the large quantity of the drug administered. Care should always be taken to employ only *good* ergot, and the infusion, if it be given in that form, should always be freshly prepared as required. The B. Ph. directs the infusion to stand for half an hour, but according to Dr. Ramsbotham,[4] the infusion, if allowed to stand more than twenty minutes, is apt to nauseate. Villeneuve (loc. cit.) administered it in the form of enema, and considered this the most preferable mode when much irritability of the stomach is present. It is not advisable in any single labour to exceed gr. xxx. of powdered ergot, or its equivalent of the other preparation; for if in this quantity it does no good, more will be useless, and probably injurious. Occasionally, when ergot by itself has little or no effect, its powers are apparently increased by the

[1] Med. Times and Gaz., Sept. 2, 1865.

[2] Practitioner, Sept. 1868.

[3] Med. Times and Gaz., Nov. 4, 1865.

[4] Obstetric Medicine, p. 219.

addition of ℥xl.–lx. Sp. Ammon. Arom. In tropical practice, the Liquid Extract is far preferable to the crude drug, which at high temperatures, especially if exposed to the air, becomes almost inert.

837. *Historical Notice.* The first mention of the use of ergot as a parturifacient is in 1668 by Camerarius;[1] the next by Dr. Bautzmanni,[2] in 1699. It is represented by both these writers as being used in Germany to hasten labours. In 1774, on account of its reputed violence, its use was prohibited in France by legislative enactments. In 1777, Desgranges,[3] a physician of Lyons, brought its beneficial effects to the notice of the profession; and in 1787 we find its virtues extolled by Pawlisky.[4] It, however, fell into disuse until 1807, when its merits were again brought forward by Dr. Stearns,[5] of New York; and in 1813, Dr. Prescott,[6] of the same city, published an essay on its safety and efficacy. Since that date it has been in general use; but, as will be seen in the following sections, many opposite opinions have been expressed on its therapeutic power and value.

838. *The Opinions of Writers on the Value of Ergot* are very diversified. Le Mercier, Lysancourt, Beclard, Basset, Legonlais, Desmoreaux, Gardien, Capuron, Jackson, and Hall declare the ergot to be inefficacious; and Mme. La Chapelle affirms, after long experience, that "its innocence is its great virtue!" On the other hand, Drs. Houston, Hossack, Holcome, and others object to its use, on account of its extremely active and deleterious property; whilst a third class, including Michell, Church, Godwin, Desgranges, Dewees, Davies, Clarke, Mackenzie, Blundell, Jewell, Churchill, Wright, and the great body of practitioners, regard it, when properly administered, as a safe, efficacious, and useful remedy. These differences of opinion are explicable only in the following way: the first class either used too small a dose, or employed an inferior or damaged article; the second class administered it in too large or frequently repeated doses; whilst the third class hit upon the happy medium.

839. *As an Agent for producing Abortion*, it has been variously estimated. That it will induce premature labour is asserted by Gerardin, Hufeland, Rose, Guibert, Ingleby,[7] Ramsbotham,[8] and Merriman;[9] its power in this character is denied by Hall, Prescott, Michell, Villeneuve, Wright, and Lee; whilst Dr. De Gravina[10] came to the conclusion, from numerous experiments on animals, that, so far from shortening, it prolonged the period of gestation. There is a great weight of evidence in favour of the opinion that ergot does possess the power of inducing premature labour. Dr. Ramsbotham succeeded, in 26 cases, in inducing labour at the seventh and eighth month, by the administration of the ergot alone, without interfering with the membranes. All the mothers recovered; 12 of the children were born alive, 14 were still-born, and of the first class, only 4 survived any length of time. This ratio of deaths is much greater than when labour has been induced in any other manner, and, consequently, it should not be had recourse to except under extreme circumstances. The dose required to induce premature labour, when deformity of the pelvis, &c., demand such a step, is very variable. In two cases related by Dr. Patterson,[11] one woman took only drm. vj., whilst the other required drm. xxxiv. It was given in infusion (oz. ½, Aq. fl. oz. xxiv.) in doses of fl. oz. ij. every third hour.

840. *As a poisonous Agent*, ergot induces two states, which have been denominated gangrenous ergotism and convulsive ergotism. The former is characterised by formication (a feeling as if insects were creeping over the

[1] Actes des Curieux de la Nature, 1668, art. 6, obs. 82.
[2] Ephem. Curios. Germanic., dec. iii. art. 3, obs. 133.
[3] Gazette de Santé, 1777.
[4] Lancette Française, t. viii. p.164.
[5] New York Med. Repository, vol. xi. p. 308; and vol. xii. p. 344.
[6] Dissertation on the Secale Cornutum. New York, 1813.
[7] Obstetric Cases, p. 233.
[8] Lond. Med. Gaz., June 28, 1834.
[9] Synopsis, &c., 4th ed., p. 198.
[10] Annal. de Med., Oct. 1839.
[11] Edin. Med. Surg. Journ., Jan. 1, 1840.

skin), great depression of the vital powers, coldness of the extremities, followed by gangrene. The gangrene is probably produced by obstruction of the vessels. The convulsive form, induced by the use of ergotised bread, prevailed in Silesia in 1722, in the environs of Berlin in 1723, and at Wurtemburg in 1736. The symptoms observed were itching and tingling of the feet, followed by violent cardialgia and pains in the head and hands. These pains in a short time subsided, the head became heavy, swimming, and a mist before the eyes ensued. The fingers and hands became so spasmodically contracted that no force could straighten them, and the pain was described as equalling that of luxation. Some of the persons became totally blind, and others had double vision; the memory failed, the conversation was wild and unintelligible, the movements staggering and awkward. Some became maniacal, and others comatose. Opisthotonos usually occurred. Of 500 patients, 300 children under five years of age perished. Those who survived were a long time before they perfectly recovered. The peculiar circumstances under which ergot evidences its poisonous effects are undetermined; as Pentin, Froggart, Michell, Parmentier, Murray, and others have exhibited it in large and frequently repeated doses, without observing any ill effects to follow. (Wright.[1])

841. *Therapeutic Uses. As an expulsive agent in Labours.* Within a period varying from five minutes to half an hour, on an average in about fifteen minutes, after the ergot has been swallowed, the uterine contractions become stronger and more frequent, so that in fact they may be said to run into one another, there being no distinct interval between them; and these continue, in ordinary cases, until the child is expelled. In some rare cases it causes vomiting, headache, delirium, and great disturbance of the cerebro-spinal system. Dr. Churchill (p. 202) mentions five or six instances in his own practice; and the same effects have occasionally been observed by others. Dr. Hardy[2] observed, that in the majority of cases the administration of the ergot was followed by a marked diminution in the frequency of the mother's pulse, and a corresponding change in the action of the fœtal heart. In some, this depression of the pulse remained for many days. In most cases it produces no ill effects, either temporary or permanent, on the mother; but even here there are exceptions. Mr. Grantham[3] states that he has seen the uterus impaired as to its future contractile power after the use of large doses of ergot, and that he has had frequent occasion to apply the forceps, to assist the parturient efforts of those women whose previous labours had been hastened with this drug.

842. *The circumstances under which it proves useful, and those in which it is inadmissible,* have been judiciously set forth by Dr. Churchill. *Ergot may be safely given:*—1. When the pains are feeble and inefficient without especial cause. 2. If the os uteri be soft and dilatable. 3. If there be no obstacle to a natural delivery. 4. If the head or breech present, and be sufficiently advanced. 5. If there be no head symptoms, or

[1] Edin. Med. Surg. Journ., Jan. 1, 1840.
[2] Dub. Journ. of Med. Sciences, vol. xxvii. p. 224.
[3] Facts and Observations, p. 195.

excessive general debility. *Ergot should not be given*:—1. If the os uteri be hard and rigid. 2. If the presentation be beyond reach. 3. If there be mal-presentation. 4. If the pelvis be deformed. 5. If there be any serious obstacle to delivery in the soft parts. 6. If there be head symptoms or much general irritation.

843. The period at which it is generally the most advantageous to administer ergot, is when the head of the child has passed the brim of the pelvis; but its use is by no means confined to this period. Dr. Meigs advises that it should be given only at the moment, or just before the birth of the child, in order to secure, if possible, a permanent and good contraction of the womb after labour, in women who are known in their preceding labours to have been subject to alarming hæmorrhage. It is less applicable to first labours than to subsequent ones.

844. *Its effects on the Fœtus.* On this, as on every other point connected with the use of ergot, much difference of opinion prevails. Dr. Houston,[1] of New York, observes, "From what I have seen and heard, more children have perished by the injudicious use of ergot, during the few years which have followed its introduction into the practice of this country (America) than have been sacrificed by the unwarrantable use of the crotchet for a century past." A similar opinion has been expressed, in different words, by Drs. Hossack, Moore, Holcombe, Moreau, Patterson,[2] and more recently by Prof. Meigs.[3] On the other hand, Michell[4] considers that it has saved the lives of many children. Dr. Wright (op. cit.) expresses a similar opinion. There is, however, a great mass of evidence in favour of the view that ergot does act injuriously on the fœtus. I would refer particularly to a valuable paper by Dr. Hardy,[5] whose observations seem to have been conducted with great care and minuteness. Out of forty-seven infants, seven were expelled alive naturally, seven were born alive by the application of the forceps and vectis, and thirty-three were expelled dead. This, however, is a much larger ratio than occurs in ordinary practice, when ergot has been administered. Dr. Hardy observed the most common effect of ergot to be a diminution in the pulsations of the fœtal heart, succeeded, after a short time, by an irregularity of the beats, which continue more or less until the sounds intermit, and at length, after a variable period, become quite inaudible. He further observed, that in those cases where the number of pulsations has been steadily reduced

[1] American Med. Surg. Journal, Jan. 1829.
[2] Ed. Med. Surg. Journ., Jan. 1, 1840.
[3] Dub. Quart. Journ., Feb. 1851.
[4] On the Use of the Ergot, p. 78.
[5] Dub. Journ. of Med. Sciences, May, 1845.

below 110, accompanied at the same time by intermissions, the child will be rarely, if ever, saved, although its delivery should be effected with the greatest possible speed; he adds, however, that the mere depression of the fœtal heart below 100, without intermissions, is not in itself sufficient to cause this result, as instances have occurred where the number of pulsations have been reduced as low as 56, and yet by speedy delivery, and the adoption of the usual remedies, the children have been saved; but in none of these instances was there a steady, distinct, and well-marked intermission. These observations point out the necessity of the use of the stethoscope, in order to ascertain the condition of the fœtal circulation. These remarks coincide fully with those of Dr. Ely[1] and Dr. Beatty.[2] The latter fixes the limit beyond which the child will rarely be born alive, after ergot has been administered, at two hours. To this rule he met with but three exceptions. "It by no means follows from this," he observes, "that a child born within this period should always survive; in two instances the children were lost, although only twenty minutes in one, and five-and-twenty in another, elapsed between the administration of ergot and the birth of the child." Dr. Beatty[3] gives the following distinguishing characteristics of a fœtus expelled after the use of ergot: general lividity of the surface; universal rigidity of the muscular system, producing the stiffened limbs and clenched hands of those infants in whom life was extinguished; and a remarkable kind of alternating spasm and palsy which supervened in those who survived. Dr. Hardy further observes, that the depressing effects of ergot on the fœtus, in those cases in which the child is expelled alive, are so great, that frequently a considerable time elapses after birth before the child can be perfectly restored; and that infants born in a weak state, where no ergot has been used, are restored to animation with much less difficulty than in those cases in which this medicine has been employed during labour. Dr. Catlett[4] considers that its use gives rise to a predisposition to hydrocephalus in the early stage of infantile life. Different opinions have been advanced to account for the mortality of children after the use of ergot. Dr. Beatty, Dr. Hardy, and others attribute it to a poisonous effect indirectly exerted upon the fœtus; and others, and among them Prof. Meigs, to the vigorous contractions of the uterus, and its pressure on the cord. The first opinion is supported by Dr. Hardy, by the fact that the depression of the heart's action in the fœtus took place in numerous instances in which the ergot produced little

[1] Lond. Journ. of Med., Nov. 1851.
[2] Dub. Journ. of Med. Science, vol. xxi. p. 361.
[3] Op. cit., vol. xxv. p. 213.
[4] Edin. Med. Surg. Journ., Jan. 1, 1842.

or no effect upon the uterus, or on the pulse of the mother. In support of the second opinion, Dr. Patterson (op. cit.) mentions that, "in two cases of apparently strong healthy children, expelled dead after the use of ergot, the conjunctiva was found literally gorged with blood;" but this point requires further elucidation. In addition to the above physicians, Girardin, Burns, Moreau, Churchill, &c., have expressed their opinion that the child is more frequently still-born after the use of the ergot than when it has not been employed; although they differ as to the mode in which the fatal result is brought about. In conclusion, I would remark, that although the above observations point out the danger which sometimes, indeed frequently, attends the employment of ergot, yet that it is not of so serious a character, nor so constant in its recurrence, as to prevent the practitioner from employing it in proper cases, and with due caution, as laid down in the preceding sections.

845. *Its Action on the Placenta.* In most cases the placenta comes away favourably after the expulsion of the child, when ergot has been administered, but occasionally the contractions of the uterus, which were so favourable towards the expulsion of the fœtus, subsequently continue, and the placenta is in consequence retained. Dr. Churchill mentions a case of the kind, and Dr. Harvey relates one in which the placenta was detached, and lying in the cavity of the uterus, and yet the contractions were so vigorous that its removal could not be effected for an hour, until relaxation took place. It is inadmissible when the placenta is retained in consequence of morbid adhesion. Dr. Catlett considers that it causes hour-glass contraction. When, however, the placenta is retained in consequence of the feebleness or absence of uterine contractions, a dose of ergot (gr. xxx.) will often cause its speedy expulsion. Hæmorrhage after the birth of the child is comparatively rare, when ergot has been employed; and indeed it does not seem, in the great majority of cases, to interfere in any way with the speedy recovery of the mother, or with the subsequent uterine functions.

846. *In Hæmorrhage occurring during Labour*, ergot proves of great service, inducing contraction of the uterus, and arresting the discharge more rapidly than any other remedy. If, however, there be any great nervous exhaustion, opium should be first given; but if the hæmorrhage still continue after the exhaustion is removed, ergot may be had recourse to with evident advantage. Dr. Beatty observes that, to act beneficially, ergot should be employed early: "It will not do," he adds, "to wait until the system is exhausted, and the vital powers are reduced to the lowest ebb, for then the effect of the ergot may be more prejudicial than advantageous,

owing to the power it possesses of depressing the action of the heart." Dr. Beatty also considers that ergot will prevent the occurrence of hæmorrhage in certain cases, where, from previous experience, we have reason to know that it is likely to occur. This view is supported by the opinion of Prof. Meigs and other writers.

847. *In Partial Presentation of the Placenta*, Dr. Ely (op. cit.) strongly advises a full dose of ergot to be given immediately after the rupture of the membranes. "Here," he observes, "until the os uteri is considerably dilated, the bleeding can only be stayed by the plug; but when the os is open, thin, and yielding, if we rupture the membranes, the descent of the head will so compress the bleeding vessels as to place the patient in safety." To effect this more rapidly and certainly, ergot is advised.

848. *In Habitual Abortion, where this is dependent upon a weakened atonic condition of the uterus*, Dr. Meadows suggests the use of ergot, commencing in small doses (mv.–viij. Ext. Ergot. Liq., B. Ph.) as soon as pregnancy is known to exist, and continuing it in increasing doses (mxx.–xxx.) as long as may seem necessary, certainly till after the period of the accustomed abortion, but with the occasional omission of a week or two. Previous to resorting to this treatment, the practitioner will do well carefully to peruse Dr. Meadows' observations,[1] especially his remark, that the use of ergot in these cases is "a matter of extreme delicacy, requiring a very careful discrimination of the cause of previous abortions, and of the actual present condition of the uterus." This remark I cordially endorse, for it is certain that in unsuitable cases it may be productive of the greatest mischief.

849. *In Menorrhagia*, the power of ergot is often very marked, but it is not equally beneficial in all cases. According to Dr. Waring-Curran,[2] it proves most useful in that form of menorrhagia which occurs in women of a scrofulous habit, who have become very frequently impregnated, who suffer from constitutional debility, and in whom leucorrhœa exists as a consequence of previous hæmorrhage. Menorrhagia from obstructive cardiac disease, at either the mitral or aortic orifices, congesting the pelvic viscera; that associated with a diseased portal system; that consequent upon a scorbutic state of the system; and genuine menorrhagia—*i.e.*, an increase of the catamenia continuing for a lengthened period, and returning before the proper period without organic lesion—are the forms which he considers may be benefited by the freshly prepared infusion of ergot and borax. Ergot, according to the same authority, has little or no effect in menorrhagia dependent upon

[1] Practitioner, Sept. 1868, p. 167. [2] Med. Press, Nov. 17, 1869.

ulceration of the os, the presence of polypoid growths or other tumours, or in that arising from retroflexion of the uterus.

850. *In cases of Fibroid Tumours of the Uterus, and in Polypi*, Dr. Meadows states that he has been in the habit of prescribing ergot, with the view of exciting contraction of the uterus, and of forcing the tumour down towards the orifice. In suitable cases, and when the tumour is so placed as to be thus acted upon, he states that he has seen the uterus force it down not only to, but even beyond the os uteri into the vagina, and thus greatly facilitating any operation for its removal. Moreover, the hæmostatic action of the ergot is often of signal service in the attendant hæmorrhages and profuse discharges.

851. *In Sub-involution of the Uterus, in Chronic Sub-acute Metritis, and in Uterine Hypertrophy*, Dr. Meadows has employed ergot with good results. In all these cases it acts beneficially; first, by lessening the vascularity of the organ, which it effects by diminishing the calibre of the blood-vessels; and secondly, by inducing a state of tonic contraction of the uterus itself: it seems, indeed, to be essentially an uterine tonic, improving the general nutrition of the organ, and imparting a firmer and more healthy tone.

852. *In Leucorrhœa and Chlorosis*, it is sometimes very useful. Dr. Churchill employed it (gr. v., three or four times daily) with decided benefit; a blister to the sacrum appears to increase its efficacy. Dr. Graily Hewitt (p. 399) states that he has used it in cases of leucorrhœa, when the uterus was in a lax, congested condition, with the double effect of relieving profuse menstruation and the leucorrhœa sometimes associated with it. In these cases it may be advantageously combined with the salts of iron. *In the Constipation of Chlorotic Girls*, where this was apparently due to atony of muscular fibre, Dr. Meadows found a combination of ergot and steel very effectual.

853. *In Amenorrhœa*, ergot has proved successful in the hands of Drs. Neal, Wright and others, but its use is chiefly limited to those cases dependent upon atony, or a relaxed condition of the uterine muscular fibres. Dr. Tilt (p. 218) speaks favourably of its action (gr. v.–x. in powder, two or three times daily), but he does not generally rely on it alone, but gives it in conjunction with other remedies; thus:—℞ T. Ergotæ ℥xxx., Syr. Croci fl. oz. ½, Decoct. Aloes Co. fl. oz. j.½. M. Dose, a teaspoonful thrice daily.

854. *In Incontinence of Urine from simple want of power in the muscular coat of the bladder, from general atony, from chronic catarrhal inflammation, or in cases of reflex Paralysis of the Bladder*, Dr. Meadows obtained good results from small and often repeated doses of ergot and tincture of steel. *Retention of Urine*, under the same circumstances, is likely to be benefited by this combination. Dr. Meadows considers that in ergot,

combined with buchu, uva ursi, pareira brava, and triticum repens, we have a most valuable adjuvant in a variety of cases of *Bladder Disease*. He specially recommends a trial of it in those cases of *frequent Micturition accompanying Disease of the Uterus* in cases of antiflexion, or in fibroids of the anterior wall, in both of which pressure is made on the lower part of the bladder, with a resulting loss of power. He thinks that it should be extensively employed in such cases. *In the Nocturnal Enuresis so frequent in Dementia*, Van der Kolk (p. 149) states that he has used the extract with the best result. He likewise found it effectual in *Incontinence of Urine in Children*. *In Chronic Irritability of the Bladder*, Dr. Tilt (p. 312) states that he has seen great benefit from ergot in doses of gr. v. every three or four hours.

855. *In Gonorrhœa and Gleet*, the internal administration of ergot has been advocated by Drs. Ryan[1] and Negri,[2] and in their hands it proved successful, but it has never come into general use. Dr. Waring-Curran (op. cit.) speaks very favourably of injections of the officinal infusion in *Gleet*. He directs it to be used three or four times daily, the meatus being firmly pressed against the nozzle of the syringe, so that the fluid may be retained for five minutes in the urethra. *In Spermatorrhœa*, good effects from the use of ergot (gr. xxx.–lx. daily) have been obtained by Dr. C. L. Mitchell.[3]

856. *In Atonic Hæmorrhage*, ergot often proves serviceable, and its influence in these cases is probably due to the contractile action it exercises on the muscular coat of the arteries. Its value in *Hæmoptysis* is attested by Dr. Dobell,[4] especially when given in combination as follows: ℞ Ext. Ergotæ Liq. ʒij., Tinct. Digitalis ʒij., Acidi Gallici ʒj., Magnes. Sulph. ʒvj., Acid. Sulph. dil. ʒj., Infus. Rosæ Acid. ad ʒviij. M. A sixth part every three hours till hæmorrhage is arrested. The above ingredients require to be modified according to circumstances. Dr. Waring-Curran (op. cit.) states that by its means he has often arrested *hæmorrhage in the early stage of Phthisis*, but he is opposed to its use in the advanced stages from the fear of its inducing vomiting. *In Hæmaturia*, he speaks very favourably of its action, regarding it as superior to either turpentine or the vegetable acids. Dr. M'Gregor, of Glasgow,[5] records a case of *persistent periodical Hæmorrhage from the Bowels*, which yielded to it when all other remedies had failed. It has also been successfully employed in *Atonic Hæmatemesis and Epistaxis*.

857. *In Diarrhœa*, ergot has been successfully employed by

[1] Lond. Med. Journ., iv. p. 500.
[2] Lond. Med. Gaz., xiii. p. 369.
[3] American Med. Monthly Journ., April, 1861.
[4] British Med. Journ., June 27, 1868.
[5] Glasgow Med. Journ. June, 1867.

Dr. Wright (op. cit.) and others. In one case he found gr. v., thrice daily, effect a marked improvement when dysenteric symptoms were coming on. In an epidemic of *Dysentery* at Bielau, Dr. Gros[1] used ergotin with excellent results, gr. xij.–xv. in enema with some bland vehicle; or gr. vj. by the stomach in emulsion. One of the effects especially noted was that it quickly reduced the quantity of blood in the stools.

858. *Diseases of the Heart.* Dr. Meadows (op. cit.) considers it certain that ergot exercises an influence upon the heart, and that though its action may be somewhat uncertain, it seems likely to be of service in cases of enfeebled cardiac action, when there is either degeneration of tissue, or when the walls of the heart are thin and flabby. Dr. Waring-Curran mentions two cases of *Fatty Degeneration of the Heart*, in which occasional doses of ergot appear to have been of material use.

859. *In Chronic Congestion or Inflammation of the Spinal Cord and its Meninges*, Brown-Séquard obtained excellent results from ergot, and he recommends it in all cases where it is desired to diminish the amount of blood present in the spinal cord or its membranes. (Dr. Meadows.) In some forms of *Paralysis*, probably those arising from spinal congestion, it has also been found useful. Dr. Meadows mentions a case of *Paraplegia complicated with menstrual irregularity*, in which a cure was effected by its means. Dr. Waring-Curran has found occasional doses of ergot successful in the *Constipation of the Paralytic*, when the most powerful cathartics have failed.

860. *In Ptosis and Paralysis of the Eyelids*, an aqueous infusion, as a collyrium, is advised by M. Carron; and a case is related, in which paralysis of the eyelids from partial asphyxia following the respiration of charcoal fumes, was cured in eight days by fomentations with an aqueous infusion of ergot.[2] *In Abnormal Dilatation of the Pupil*, from any cause, its local application is suggested by Dr. Comperat,[3] he having observed that the powder of ergot, used as snuff, has the power of removing the dilatation of the pupil produced by belladonna. *In a disturbed state of the accommodation power of the Eye*, specially induced by overtaxing the organ on small objects with an insufficient amount of light, Prof. Willebrand[4] found ergot of especial advantage. He also found it of great use in several cases of *Acute and Chronic Inflammation of the Eye*, and especially in *Blepharitis* and *Pustular Conjunctivitis of Children*, the cure proving much more rapid, and relapse much rarer, than when local means alone are relied on. He prescribes gr. v. thrice daily, combining it with magnesia, or when chlorosis is present, with iron.

[1] Practitioner, Nov. 1868.
[2] Med. Chir. Rev., vol. lx. p. 613.
[3] Med. Times, vol. xviii. 1848.
[4] Brit. and For. Med. Chir. Rev., July, 1859.

861. *Neuralgia. In one case of severe Neuralgia following Shingles, in one of Sciatica of four months' duration, in one of Hemicrania*, and in *two of ordinary Tic Douloureux*, Dr. E. Woakes[1] effected a cure in the course of from four to six days by the administration of ergot. He employed it first on theoretical grounds. Further cases are required to establish its true value in this class of diseases.

862. *In Hooping Cough*, Dr. Hampel[2] states that he has derived great benefit from ergotin (extract of ergot.) He prescribes it in the form of lozenges, and finds that it diminishes the intensity of the attacks, increases the secretion of mucus from the bronchial tubes, reduces the sensibility of the bronchial mucous membrane, and arrests hæmorrhage when it occurs.

863. *In Enlargement of the Spleen connected with Intermittent Fever*, Willebrand (op. cit.) found ergot effectual, even when large doses of quinia had failed. *In Erysipelatous Affections*, he found it of good service applied externally as a cataplasm.

864. Ether. Æther. Æther Sulphuricus. Sulphuric Ether. A volatile inflammable liquid, prepared from alcohol, and containing not less than 92 per cent. of pure ether ($C_4H_{10}O$). Sp. gr. 0·735. Boiling point below 105° F.

Med. Prop. and Action. Diffusible stimulant and anti-spasmodic taken internally. The vapour is powerfully anæsthetic. The application of its anæsthetic properties to surgery was first made in 1846 by Dr. Morton, of Boston, U. S., and to him is due the honour of having introduced the practice of anæsthesia in surgical operations—the greatest improvement in modern surgery. The subject of ether narcosis has been ably investigated by Dr. Anstie (p. 315), who draws the following conclusions:—1. In the production of ether narcosis important differences may be noted in the order of the symptoms, according to the rapidity with which the blood receives the higher degrees of saturation. 2. In ether narcosis, induced by the inhalation of an atmosphere *weakly* impregnated with the vapour, the narcotic effects consist of a paralysis which spreads from periphery to centre, which involves the brain, the sensory, the motor, and the sympathetic system to nearly an equal extent; the sympathetic phenomena probably appearing slightly the earliest, and the sensory affection slightly preceding the motor. 3. The same results are produced by the injection of a moderate dose of liquid ether into the peritoneal cavity, or into the interior of the digestive canal, unless it should be eliminated by the lung so rapidly as not to reach the arterial system in any considerable quantity. 4. In either case, if the process do not extend over too long a period, it tends naturally to recovery. The too great prolongation, however, even of this, tends to produce death, by paralysing the respiratory movement through its effects on the medulla oblongata. 5. In very rapid saturation of the blood with a large dose of sulphuric ether, the course of narcosis is materially disturbed, and tends to the immediate production of dangerous and even fatal symptoms, which differ from those observed when an animal gradually sinks into death by apnœa, as the result of the protracted operation of smaller doses. 6. The statement of Dr. Snow and others, that ether is altogether incapable of causing sudden death by paralysis of the heart, is considerably invalidated by the result of several

[1] Brit. Med. Journ., Aug. 8, 1868. [2] Ibid., Sept. 5, 1868.

experiments with strong atmospheres. 7. The statement that circulation and respiration are affected in direct proportion to each other, and that both these functions are rendered more active in the earlier, and depressed in the later stages of etherisation is inaccurate, for it not unfrequently happens that the circulation is greatly quickened, while the respiration remains almost at its normal frequency, or slightly accelerated. It was frequently noted in the experiments, that great rapidity of circulation was not the uncertain harbinger of a rapid and shock-like fall of the pulse-rate, but in all these cases it was obvious that the rapidity as well as the subsequent slowness were the direct consequence of a paralysis of those portions of the nervous system which regulate the heart's action. 8. That this excessive rapidity of circulation is due to partial paralysis of the sympathetic system is supported by the occurrence of certain symptoms, particularly, α, flushing of the face, attended usually by perceptible perspiration. β, a more or less copious secretion of saliva. γ, the abnormal formation of sugar by the liver, leading to artificial diabetes. This last symptom is apparently far more readily produced when ether is introduced into the system by injection than by inhalation. For fuller details consult Dr. Anstie's work, "Stimulants and Narcotics," which will well repay perusal. It appears probable, from the experiments of Claude Bernard, that ether exercises a marked influence on the pancreatic secretion, which under its use may be augmented to almost any degree; he was accustomed to give ether to animals, in order to obtain a good flow of pancreatic juice. (Dr. Foster.)[1] From the power which ether possesses of dissolving cholesterine, as well as on account of its anti-spasmodic properties, it has been recommended as an internal remedy in *Jaundice depending on the presence of gall stones*. It may prove worthy of further notice. Attention has recently been called to the value of ether inhaled in minute quantities, as a stimulant-sedative in old age.[2] Applied externally, it evaporates rapidly, producing a marked sensation of cold and anæsthesia; if the vapour be confined, it acts as a rubefacient.

Dose, ℥xx.–xl., with mucilage.

Therapeutic Uses. See Chloroform and Anæsthetics.

ETHER METHYLIC and METHYL-ETHYLIC ETHER. See METHYLIC ETHER.

865. ÆTHERIS vel ETHERIS NITROSI SPIRITUS. Spirit of Nitrous Ether. Sweet Spirit of Nitre. Spiritus Ætheris Nitrici (Ph. L. E.) A spirituous solution, containing nitrous ether $C_2H_5NO_2$. Sp. gr. 0·845.

Med. Prop. and Action. Refrigerant, diuretic, and diaphoretic. It is chiefly used as an adjunct to other remedies of the same class. To obtain its diaphoretic and refrigerant effects, it is best combined with liquor ammoniæ acetatis; to obtain its diuretic action, with squills, &c.

Dose, ℥xxx.–fl. drs. ij.

866. *Therapeutic Uses. In mild Febrile Affections, Catarrhs, Coryza, and Influenza, to relieve Nausea and Flatulence*, and in some forms of *Dysuria*, sweet spirit of nitre, in doses of fl. drm. j.–fl. drs. jss. in a cupful of any convenient vehicle, is a popular and efficacious remedy. *In Dropsy*, it is a valuable adjunct to other diuretics, particularly to acetate of potash, squills, and digitalis. Dr. Copland (i. p. 625) speaks favourably of it when given uncombined.

[1] Brit. Med. Journ., Aug. 8, 1868. [2] Practitioner, Dec. 1869.

867. ÆTHERIS SPIRITUS. Spirit of Ether. Etheris Sulphurici Spiritus. Spirit of Sulphuric Ether. (Ph. Ed.) A combination of Sulphuric Ether fl. oz. x., and Rectified Spirit fl. oz. xx. Sp. gr. ·809.

ÆTHERIS SPIRITUS COMPOSITUS. Compound Spirit of Ether. (Ph. Lond. 1851.) Etheris Sulphurici Comp. Spiritus. The Compound Spirit of Sulphuric Ether. (Ph. Lond. 1836.) A combination of Ether fl. oz. viij., Rectified Spirit fl. oz. xvj., and Ethereal Oil fl. drm. iij. Hoffman's Anodyne.

Med. Prop. and Action. Diffusible stimulant, and anti-spasmodic. They are best given in combination with other remedies.

Dose:—Of Spirit of Ether, ℥xxx.–fl. drs. jss.; *of the compound Spirit*, ℥xxx.–fl. drs. jss.

868. *Therapeutic Uses. In Asthma*, spirit of ether is favourably mentioned as a palliative by many writers, but Dr. Hyde Salter (p. 242) stated that though he had repeatedly employed it, he had never met with but one case in which it proved of service; on the contrary, it seemed in some instances to produce a disagreeable oppression, and even increase the spasm.

869. *In Cardiac Neuralgia, including every variety of Angina Pectoris*, Dr. Anstie[1] speaks of ether in doses of ℥xl.–lx. as useful as a palliative, but inferior to arsenic or strychnia (*q.v.*) He recommends it also in *Uterine and Ovarian Neuralgia, and in Neuralgic Dysmenorrhœa.* For the relief of *Dysmenorrhœa*, Dr. Graily Hewitt (p. 443) considers the compound spirit as the best form of ether for the purpose, and he advises its use, combined with camphor, henbane, sal-volatile, &c., when the pain is not very severe.

870. *In Spasmodic Affections of the Bowels, Flatulence*, and *Flatulent Colic*, it may be administered with the best effects. It is particularly serviceable when these occur in hysterical females.

871. *In Cholera*, it has been extensively employed as a stimulant in the stage of collapse. In some cases, it seems to have roused the sinking vital powers. It requires to be given in large doses, with other stimulants.

872. *In Typhus and other low Fevers*, it is often productive of excellent effects, particularly when nausea, subsultus tendinum, and other spasmodic symptoms, are present.

873. *In Earache*, exposing the ear to the fumes of ether is often attended with great relief. It may be effected by mixing equal parts of the spirit and hot water in a phial, and applying its aperture to the external ear. *In Deafness*, gutt.

[1] Brit. Med. Journ., Aug. 22, 1868.

iv.–vj. of ether dropped into the meatus daily has been lauded as a cure, but Dr. Triquet[1] has proved its futility. In some instances it affords temporary relief, by acting as a solvent of accumulated cerumen in the meatus.

874. *Hiccough* is often immediately arrested by ♏xx.–♏xxx. of the spirit of ether in some aromatic water.

875. *In irreducible Hernia*, it has been applied externally to the hernial sac, as an evaporating lotion. The degree of cold which it induces has occasionally a good effect, the hernia returning immediately after its application. It frequently fails; anæsthesia by ether is far more successful. (See CHLOROFORM.)

876. EUCALYPTI GUMMI. BOTANY BAY KINO, RED GUM OF WESTERN AUSTRALIA. A gummy exudation from the stems of Eucalyptus resinifera, *Smith*, and other species. *Nat. Ord.* Leguminosæ. *Hab.* The Australian Continent, especially Western Australia.

Med. Prop. and Therap. Uses. Astringent, nearly allied to kino in physical characters and medical properties, but considered by Sir R. Martin, who introduced it into British practice, to possess, in addition to its astringency, demulcent properties which render it peculiarly valuable in *Chronic Dysentery and other Intestinal Affections occurring in invalids from India and the tropics.* *Dose*, gr. v.–x. in the form of powder or syrup. (Squire.)[2]

877. FARINA. Flour. The flour of the seed, ground and sifted, of Triticum vulgare, *Linn.*, Common Wheat. It contains Starch 71·49, Gluten 10·96, Sugar 4·72, Gum 3·32, Water 10, in 100 parts; but these quantities vary in almost every sample. It forms the most important article of food, when converted into bread. Wheat is the most nutritious of all grains of the same kind, containing a larger proportion of proteine matters than any other grain.

Med. Prop. and Therapeutic Uses. 1. In the form of fine powder, it forms a very cooling and pleasant application in *Erysipelas*, *Small-pox*, *and other External Inflammations.* 2. *To Burns and Scalds* it is applied in like manner. It should be put on sufficiently thick to exclude the air; it thus effectually protects the parts, and absorbs the discharge. The crust which forms may be removed by emollient poultices. 3. *In Poisoning by the Preparations of Mercury, Iodine, Silver, and Zinc*, flour, mixed with water, is employed as an antidote. 4. It is an ingredient in mustard, linseed, and other poultices.

878. FEL BOVINUM PURIFICATUM. PURIFIED OX BILE. The purified gall of the ox, Bos Taurus, *Linn.*

Med. Prop. and Action. Peptic? Taken internally, it produces no

[1] Ranking's Abstract, 1860, xxxii. [2] Comp. to British Ph., p. 64. p. 23.

marked physiological effect; it is not purgative, but it acts simply as a solvent of materials contained in the stomach and intestinal canal, producing no excitement to propel, but by liquefying the mass, facilitates its excretion (Dr. Clay.) Diuretic and anthelmintic virtues have also been ascribed to it, but these are doubtful.

Dose, grs. v.–x., in pill or in capsules.

879. *Therapeutic Uses. In Dyspepsia and Constipation*, attended by torpor of the liver, when the stools indicate deficiency of the biliary secretion, ox-gall, by supplying the deficiency, may prove useful as a palliative. It may be given as follows:—℞ Fel Bov. Purif. ʒij., Ol. Carui, ♏x., Magnes. Carb. q.s., M., ft. pil. xxxvj. cap. ij. bis in die. It may also be given in the form advised by Dr. Copland (ii. p. 268) for *Hypochondriasis*, attended with torpor of the intestines:—℞ Fel Bov. Purif., Pil. Assafœtid. Co. āā gr. xxx., Ext. Aloes gr. xx., Sapon. Dur. gr. x., Pulv. Ipecac. gr. viij., M., ft. pil. xxx. Dose, one or two daily before dinner. It is occasionally useful in *Diarrhœa, when the stools contain undigested food. In Functional Disorders of the Liver, Mesenteric Affections, &c.*, it is favourably spoken of by Dr. Copland, but in these, as well as in *Jaundice*, in which it has also been advised, little or no reliance is to be placed upon it. It is at the best a palliative.

880. *In certain forms of Hypertrophy*, ox-gall is praised by Dr. Bonorden. He cites cases of *Induration and Hypertrophy of the Mamma, Hypertrophy of the Tonsils*, and some affections of the eye, as *Hypertrophic Opacity of the Cornea, Pannus*, and *Staphyloma*, in which great benefit has followed the local application of ox-gall. He likewise suggests its use in *Hypertrophy of the Heart*. For external use he employs the following liniment:—℞ Fel Tauri Inspiss. ʒiij., Ext. Conii ʒj., Sapon. Natron. ʒij., Ol. Olivæ ʒj., M., to be rubbed in four times daily. For enlarged tonsils, it is triturated with water, and applied with a camel-hair pencil. In eye affections the fresh gall may be dropped into the eye several times a day, or it may be applied with a pencil.

881. FERRUM. (Fe. = 56.) Iron. A metal which, in its metallic state, is probably inert, or only acts mechanically; but it readily oxidizes in the alimentary canal, and thereby acquires medicinal power. It is one of the few metals which, by oxidization, is not rendered more or less poisonous. Its chief medicinal use is as the basis of the following preparations.

882. *The modus operandi of the Salts of Iron* is almost entirely through and upon the blood, which it improves by increasing the quantity and improving the quality of the blood-corpuscles—hence the term hæmatinic. Andral details a case of chlorosis in which the blood was examined, and the proportion of globules was only 49. Iron was administered for some

time, and the proportion rose to 64. In another case the proportion, under the use of iron, rose from 46 to 95. Simon also gives the case of a chlorotic girl, in whom the blood contained globulin 30·860, and hæmatin 1·431. Iron was administered for seven weeks; at the end of that period, the blood contained globulin 90·810, hæmatin 4·598. He observes that the changes in the condition of the patient kept pace with that of the blood. She was before pale, her lips and cheeks were colourless, but now she presented a really blooming appearance. To this property of enriching the blood may be ascribed its efficacy *in preventing the development of tubercular disease*. M. Coster's observations on this point are highly interesting. He placed a number of dogs and rabbits in the circumstances generally supposed to be the most favourable to the development of scrofula and tubercular disease, namely, cold damp cellars, without light; they were prevented from moving, and exposed to a most unwholesome atmosphere. Some of the animals were fed upon ordinary food; others upon bread, containing half an ounce of the sesquioxide of iron in each lb. j. of bread. The former, with one or two exceptions, became tuberculous; whilst not one fed upon the ferruginous bread presented even a trace of tubercles. Iron, however, as Dr. Symes Thompson[1] remarks, cannot be rapidly assimilated in large quantities by feeble persons, but must be taken, like food, hour by hour, day by day, and year by year, till the blood is no longer poor, the tissues no longer short-lived and unresistant, and until what is called the "tubercular dyscrasia" is overcome.

When taken internally, the salts of iron are absorbed into the system, and have been detected in the blood, the urine, and the milk; a portion of them passes off by the bowels, as is evidenced by the black fæces which are always observed after a few doses of any of the stronger salts of iron. Under their use the digestion is improved, the appetite becomes greater, the pulse increases in frequency and fulness, and the general health improves; the patient at the same time gains flesh and colour. These effects are often very marked. From some observations by Dr. Pokrowsky,[2] it appears that under the use of iron, the temperature of the body, whether previously normal or morbidly depressed, rises, and the daily amount of urea excreted in the urine is increased. The weight of the body also is augmented. These effects were produced alike by all the preparations of iron. In some persons, the salts of iron cause great gastric irritation. In excessive doses, they are irritant poisons.

883. *Remarks on the Use of the Salts of Iron.* 1. In excessive anæmia, whether from hæmorrhage or any other cause, the stronger salts of iron, the sulphate or perchloride, are chiefly indicated. In ordinary debility the milder ones, the ammonio-citrate, or the potassio-tartrate, are to be preferred. In scrofulous subjects, the iodide is an eligible form. The more readily soluble salts of iron should in most cases take the precedence of the oxide and other more insoluble preparations, unless some special superiority can be established for the latter.

2. No advantage is to be gained by giving any of them in very large doses. When the fæces become deeply discoloured under their use, it may be regarded as indicating that more is being taken than the system is in a state to absorb. Under such circumstances, the dose may be diminished.

3. Any gastric irritation which arises from their use, may be obviated by the addition of extracts of hyoscyamus, or conium. If one salt should disagree, a milder one may be substituted.

4. Acids and acidulous fruits should be avoided during their use, as, by combining with them in the stomach, other compounds may be formed, which may either give rise to irritation, or render the remedy less active.

5. From the researches of Dr. Woronichin[3] it appears that the administration of chloride of sodium, common salt, simultaneously with iron, enables a considerable proportion of the iron to be stored up in the

[1] Practitioner, Sept. 1868. [2] Year Book, Syd. Soc., 1862, p. 115.
[3] Practitioner, Dec. 1868.

organism; on the other hand, that a similar amount of chloride of potassium would cause nearly all the iron exhibited to be discharged in the secretions.

6. The fæces, under the use of iron, are black and offensive; this should be remembered, otherwise it might lead to the supposition that the biliary action was greatly vitiated. On discontinuing the medicine, the stools resume their natural colour. The tongue also, if iron has been taken in solution, becomes black.

7. During a prolonged course of iron, it should be intermitted for a short time, every ten or fifteen days, in order to ascertain the real state of the alvine secretions.

8. Purgatives greatly increase the efficacy of the salts of iron. Besides correcting the costiveness, which it is the tendency of ferruginous salts to induce, they act by removing the serosity of the blood in "watery stools;" and thus, the proportion of the serosity, and that of the organic elements, including the hæmatin, in the blood, are rendered more equal.

9. In anæmic states, the salts of iron are productive of the best effects, up to a certain point—that is, until the blood contains its normal amount of iron; if continued beyond this point, the blood becoming surcharged with hæmatin and globulin, a state of plethora is induced, and indigestion and general derangement result as a natural consequence.

10. In order to judge fairly of the effects of iron, it requires to be persevered in for several weeks, or longer.

Iron is contra-indicated—1, in all inflammatory affections; 2, in congestions; 3, in plethora or plethoric states of the system; 4, in the sanguine temperament generally.

Iron-wire sutures, as a radical cure for *Hydrocele*, have been proposed by Professor Simpson.[1] The practice is founded upon the fact that iron and other metallic wires, when placed in contact with living tissues, do not as a general law excite inflammation to a higher stage than that of adhesion or the effusion of coagulable lymph. Two cases successfully treated by this means are recorded by Dr. J. Young.[2] The number of fine metallic wires, or setons, passed through the sac, was four in one instance, and five in the other. Sutures of iron-wire have also of late years been much employed in various surgical operations.

884. FERRUM REDACTUM. Reduced Iron. Ferri Pulvis. (Ph. Dub.) Fer Reduit. Metallic iron with a variable amount of magnetic oxide of iron. Prepared by reducing peroxide of iron to the metallic state, by heating it in a gun-barrel in a furnace, and passing through it dry hydrogen gas.

Med. Prop. and Action. A powerful hæmatinic and tonic. It is usually easily borne on the stomach, but sometimes gives rise to disagreeable eructations of sulphuretted hydrogen gas. It does not possess the inky taste of other ferruginous preparations—a circumstance which enhances its value as a medicine for children. Like other preparations of iron, it blackens the stools, but it causes little, if any constipation. It may be given in the form of pill or powder, or in lozenges made with chocolate. (Draper.) It is taken advantageously with a meal.

Dose, gr. ij.-gr. vj.

885. *Therapeutic Uses. In Anæmia, Chlorosis*, and *Amenorrhœa*, it exerts the same beneficial influence as other ferruginous preparations. It has been given with advantage in *Chorea*.

[1] Edin. Med. Journ., Dec. 1858. [2] Med. Times, Feb. 26, 1859.

M. Coste states that he has used it with good effect in cases of *Enlarged Spleen following Ague*, in doses of gr. $\frac{3}{4}$ to gr. ij.

886. FERRI ACETATIS TINCTURA. TINCTURE OF ACETATE OF IRON. Prepared by mixing Solution of Persulphate of Iron, fl. oz. ij.$\frac{1}{2}$, and Acetate of Potash oz. ij. in Rectified Spirit Oj.

Med. Prop. and Action. An agreeable, mild chalybeate. An Ethereal Tincture of the Acetate has been recommended by Dr. Waters (pp. 175, 181) in the treatment of *Pulmonary Emphysema* of the degenerative form, especially when complicated with bronchitis. From its stimulating properties it acts as an expectorant. He gives it in acute attacks of *Bronchitis complicating Emphysema*, as soon as the urgent symptoms are ameliorated, and whilst the secretion from the bronchial tubes is still profuse.

Dose:—Of the Tincture, ℥x.–℥xxx.; *of the Ethereal Tincture*, ℥x.–℥xx. every four or six hours.

887. FERRI ET AMMONIÆ CITRAS. Citrate of Iron and Ammonia. Ferri Ammonio-Citras. Ammonio-Citrate of Iron. Prepared by acting on a mixture of Solution of Ammonia and Solution of Persulphate of Iron by Citric Acid in solution, and evaporating.

Med. Prop. and Action. A mild and valuable tonic and hæmatinic in doses of gr. v.–x. in solution. It is particularly adapted for children, and for those cases where the stomach is too irritable to bear the more powerful salts, as it is devoid of any unpleasant taste, possesses scarcely any astringency, and its properties are extremely mild and unirritating. It is one of the most preferable of all the mild salts of iron.

888. *Therapeutic Uses. In Debility after exhausting Diseases, and in the Anæmic states of Children*, the ammonio-citrate of iron is a valuable and efficacious remedy. It is particularly indicated in irritable states of the stomach, when it may be advantageously combined with infusion of calumba.

889. *In Scrofulous Affections of Children, Tabes Mesenterica, &c.*, the ammonio-citrate is eminently serviceable. Its mild taste, which may be further disguised by syrup, is no small recommendation for its use for children; and striking benefit often results from it, especially in mesenteric disease. To a child of three years old, gr. ij. may be given, twice or thrice daily.

890. *In Dyspepsia occurring in Scrofulous subjects*, it is often productive of excellent effects. *In the Cachexia which accompanies Ulcer of the Stomach*, especially in chlorotic females, this salt, or the ammonio-tartrate, as being the mildest, is the best form of iron to commence with, and is the best tonic which can be employed. Experience has fully confirmed the efficacy of the salts of iron in these cases, excepting when frequent vomiting, or excessive or continuous pain, is present; these states indeed contra-indicate their use. Dr. Brinton (p. 177) directs that they should be given in solution with or immediately

after food—a general rule in using them which the presence of an open ulcer makes doubly important. The insoluble oxide should be avoided.

891. FERRI AMMONIO-TARTRAS. Ammonio-Tartrate of Iron. A Tartrate of the Peroxide of Iron and Ammonia. ($Fe_2O_3\,NH_4O$, $C_8H_4O_{10}$ + HO.)

Med. Prop. and Action. Mild, unirritating tonic. It is an excellent substitute for the Citrate of Iron and Ammonia.

Dose, gr. ij.–viij. in solution or pills.

892. FERRI ARSENIAS. ARSENIATE OF IRON. Arseniate of Iron ($Fe_3\,As_2O_8$), partially oxidised.

Med. Prop. and Action. Alterative-tonic. It is believed to possess the combined properties of iron and arsenic. It is chiefly used in skin diseases associated with anæmia.

Dose, gr. $\frac{1}{20}$–$\frac{1}{10}$.

893. *Therapeutic Uses. In Elephantiasis, Eczema, Psoriasis, Lepra, Lupus, Lichen*, and in other obstinate cutaneous diseases, Biett employed the following formula with success:—℞ Ferri Arsen. gr. iij., Pulv. Altheæ vel Glycyrr. grs. xxx., Syr. Aurant. q. s.; mix very thoroughly, and divide into forty-eight pills, of which one is to be taken daily. It was also used externally, in the form of ointment (gr. xx.-xxx.–oz. j. of Cerate.) According to Duparc,[1] this salt, in doses of gr. $\frac{1}{3}$ daily, is competent in the adult to effect the cure of a *Herpetic* or *Squamous Affection*, however extensive or long-established.

894. *In Cancer*, it was employed externally by Mr. Carmichael; but from the danger attendant upon the application of arsenical preparations to ulcerated surfaces, it has been abandoned in these cases.

895. FERRI BROMIDUM. Bromide of Iron. (FeBr.) It becomes decomposed on exposure to the air; bromine is set free, and peroxide of iron formed. It is therefore best given in the form of syrup, by which its oxidation is prevented.

SYRUPUS FERRI BROMIDI. Syrup of Bromide of Iron. Prepared by heating together 200 grs. of bromine, 85 grs. of iron filings, and 2,000 grs. of water, until the solution becomes of a light green colour. It is then filtered, and 1,400 grs. of sugar dissolved in it by aid of a gentle heat. (Draper, p. 12.)

Med. Prop. and Action. Tonic and resolvent. In America it has been used with benefit in the treatment of *Scrofulous Tumours, Glandular Enlargements, Erysipelas*, and *Amenorrhœa*. On the Continent it has been successfully employed in the treatment of *Hypertrophy of the Uterus*. It appears to resemble the iodide in its therapeutical action. The syrup has

[1] Med. Times, Sept. 2, 1864.

been prescribed in *Phthisis*, *Tubercular Affections*, and *Bronchocele*. Externally, it has been used in the form of ointment, as an application to *Scrofulous Swellings*. (Bromide of Iron, 1 part; Glycerine, 1 part; Pure Lard, 14 parts.) (Draper.)

Dose:—Of the Bromide, gr. j.–gr. iij. in pill; *of the Syrup*, ℥xx., gradually increased.

896. Ferri Carbonas Saccharata. Saccharated Carbonate of Iron. Carbonate of iron ($FeCO_3$) mixed with peroxide of iron and sugar, and forming at least 57 per cent. of the mixture. Prepared by decomposing a solution of sulphate of iron by means of carbonate of ammonia, collecting the precipitated carbonate of iron on a filter, subjecting it to expression, and then rubbing it with sugar in a porcelain mortar, and drying the mixture at a temperature not exceeding 212°.

Med. Prop. and Action. Hæmatinic, tonic, and emmenagogue. It possesses no astringency. In its operation it closely resembles the other salts of iron.

Dose:—Of the Saccharated Carbonate gr. v.–xx.; *of the Pill* (Sacchar. Carb. of Iron oz. j.; Conf. of Roses oz. ½), gr. v.–xx.

Carbonate of Iron may also be given in aërated solution. 3,000 parts of a solution of carbonic acid prepared at the ordinary pressure of the atmosphere will hold in solution one part of carbonate of iron. If the solution be made with the aid of the apparatus employed in manufacturing aërated waters, it has the advantage of being less liable to change, and of containing an excess of carbonic acid. (Draper.) The Ferri Carbonas Effervescens of Dr. Skinner, of Liverpool,[1] is another convenient form of administering carbonate of iron. It is a granulated compound, containing carbonate of iron, tartrate and citrate of soda, sulphate of soda and sugar. 90 grs. contain 4 grains of carbonate of iron. Dose, gr. lx.–gr. xc. in Aq. fl. oz. v., two or three times a day.

Therapeutic Uses. Similar to those of Ferri Peroxidum.

897. *In Habitual Constipation*, Dr. Graves (i. p. 214) considers that the value of the carbonate of iron has not been duly appreciated, and adds that he has succeeded in curing with it alone, a patient who had long been subject to extreme constipation, and who had been reduced to the necessity of taking an immense dose of purgatives almost every week.

898. Ferri Citras. The Citrate of Iron. Two citrates are employed in medicine: 1, The Protocitrate, or the citrate of the protoxide of iron; 2, the Percitrate, or the citrate of the peroxide of iron. These salts have often been confounded with Ferri et Ammoniæ Citras, the three salts having been indiscriminately called the Citrate of Iron.

Med. Prop. and Action. Mild chalybeate.

Dose:—Of the Protocitrate, gr. ij.–viij. in pill; *of the Percitrate*, gr. ij.–x. in pill or solution with syrup.

[1] Dub. Med. Press, June, 1862.

899. *Therapeutic Uses.* *In Dyspepsia*, the citrate, especially the effervescent form, often proves signally useful. With regard to the salts of iron generally in dyspepsia, Dr. Brinton (p. 328) furnishes many valuable hints. He considers that they are generally useful not only in proportion to the anæmia and general derangement of nutrition present, but in proportion as the circumstances of the patient have deprived him of that due share of light, air, and exercise, the want of which aggravates, if not causes, so much of the dyspepsia of civilized life. Hence it is more useful in females than in males, more in the sedentary dyspeptic than in the florid and over-fed. That iron has other uses in this malady than those of a mere aliment and tonic can, however, scarcely be doubted; increasing, as it appears to do, both the gastric and intestinal secretions, by a specific determination to the mucous structure which furnish them. Where great nausea and irritability exist, it should generally be avoided. It should always be given immediately after a meal, excepting after tea. The effervescent citrate will generally be borne by the most delicate stomach. Neither this nor any other salts of iron should be given in doses sufficiently large to cause nausea or flatulence. The carbonate, phosphate, sulphate, and perchloride form a scale of increasing irritative preparations, and therefore demand not only a diminished dose, but an increased dilution. So, *e.g.*, while we may give gr. x. of the citrate as a common dose, gr. ij. of the sulphate, and ♏ vij.–viij. of the tincture of the perchloride, with fl. oz. j. of water, are as much as most dyspeptics will safely bear. The oxide and other comparatively insoluble preparations should be avoided. The efficacy of the salts of iron in these cases often appears to be increased by conjoining them with the sulphate or oxide of zinc.

900. FERRI IODIDUM. Iodide of Iron. FeI_2, with about 18 per cent. of water of crystallization and a little oxide of iron.

Med. Prop. and Action. Alterative-tonic, and emmenagogue. The syrup is the best form for administration. It is a very valuable salt, and is particularly adapted for persons of a scrofulous diathesis. Its effects as a tonic are soon evident, promoting digestion, increasing the appetite, and improving the general health. It is absorbed into the system and is eliminated by the kidneys, both the constituents having been detected in the urine after its administration. In large doses (gr. x.) it is apt to occasion gastric irritation, vomiting, and sometimes diuresis. The fæces are blackened by it, as by the other salts of iron.

Dose:—Of the Iodide of Iron, gr. j.–v. *Of the Pill*, gr. iij.–viij. *Of the Syrup*, fl. drm. ½–j. Each fl. drm. contains gr. 4·3 of the iodide.

901. *Therapeutic Uses.* *In Anæmia connected with Phthisis and Scrofula*, this is one of the best of tonics, where it does not prove too stimulating. It seems to promote the secretions more

than any of the other salts of iron, and it sometimes acts as a diuretic. It may also be given with advantage in all cases of *Anæmia* associated with glandular enlargements and other scrofulous manifestations. The syrup, in doses of ♏xx.–fl. drm. j. thrice daily, is the best form.

902. *In Scrofulous enlargement of the Lymphatic Glands, in Tabes Mesenterica, and other forms of Scrofula*, attended with debility and emaciation, the iodide of iron, in the form of syrup, is a powerful and efficacious remedy. It improves the general health, and, at the same time, causes a marked reduction of the size of enlarged glands.

903. *In Phthisis*, it was strongly advised by Dupasquier,[1] who states that, in some apparently hopeless cases, it effected a perfect cure; and that it always produced amelioration for a shorter or longer time. Dr. Cotton[2] thus sums up the result of his experience with it in phthisis:—1. Syrup of the iodide of iron, in doses of fl. drm. j. twice or thrice daily, occasionally produces headache, with some dyspeptic symptoms, but for the most part it agrees very well with consumptive patients. 2. Although very far from exhibiting a specific effect, it nevertheless seems to act very beneficially in a fair number of consumptive cases, especially when the disease is only in an early stage. 3. Under its influence the patient's weight is generally increased. It may be advantageously combined with cod-liver oil.

904. *In Chronic Hydrocephalus*, the iodide is favourably reported of by Dr. Ramskill (ii. p. 404). He states that it is usually very well borne by hydrocephalic children, unless there be a tendency to congestion or to inflammatory action. Amongst the children of the poor, he remarks, the combination of cod-liver oil and syrup of the iodide almost always gives satisfactory results.

905. *In Amenorrhœa and Dysmenorrhœa*, the iodide is of great value, particularly in women of a scrofulous habit. A return of the catamenia, in many instances, speedily follows the use of the iodide; it is best given in the form of the syrup, fl. drm. ½–fl. drm. j. thrice daily. *In Chlorosis*, accompanied by much torpor of the system, and where none of the symptoms referable to particular organs are very marked, the iodide is often speedily efficacious. Dr. Ashwell speaks highly of the following formula:—℞ Ferri Iod. gr. xvj., T. Calumb. f℥j., Aq. f℥vij., M., sumat. coch. mag. ij. bis terve quotidie. *In Leucorrhœa*, the iodide, internally and externally, has proved serviceable. *In Gonorrhœa*, an injection (gr. j.–Aq. fl. oz. j.) has been spoken of as efficacious.

906. *In Albuminuria*, the iodide of iron has occasionally

[1] Journ. de Pharm., March, 1841. [2] Med. Times, June 16, 1860.

proved highly serviceable; it is particularly indicated in old, broken-down constitutions.

907. *In Diabetes*, the iodide promises to be a remedy of great value, especially in persons of scrofulous diathesis. It should be commenced in small doses, and persevered in for a long period, associating with it a diet of light animal food and cruciferous vegetables. Opiates may be used at the same time.

908. *In Chronic Rheumatic Gout*, in anæmic patients, Dr. Fuller (p. 389) speaks highly of the syrup of the iodide (fl. drm. j.) given with fl. drm. iij. of cod-liver oil. The cutaneous and intestinal secretions should at the same time be attended to.

909. *In Secondary Syphilis*, when the constitution is much debilitated and cachectic, a course of the iodide, with the decoction of sarsaparilla, often proves essentially useful. Mercurials in every form should be carefully avoided.

910. *In Organic Disease of the Ovaries*, Dr. Copland (i. p. 656) states that the iodide has appeared to him to act most beneficially. *In Ovarian Dropsy*, he also reports favourably of its operation. To its internal use should be conjoined the external application of iodine to the inner sides of the thighs, or over the abdomen.

911. *In Chronic Diseases of the Liver*, the iodide is occasionally productive of great benefit. Dr. Venables[1] speaks highly of its efficacy, and advises it to be commenced in doses of gr. j. thrice daily, and gradually increased, when the symptoms warrant it, to gr. x.; but it is seldom that so large a dose can be required.

912. Ferri Mistura Aromatica. Aromatic Mixture of Iron. *Prep.* Macerate Pale Cinchona Bark powdered oz. j., Calumba Root in coarse powder oz. ½, Cloves bruised oz. ¼, Fine Iron Wire oz. ½, in Peppermint Water fl. oz. xij., for three days, agitating occasionally; filter, add Peppermint Water q.s. ad fl. oz. xij.½, then add Comp. Tinct. of Cardamoms fl. oz. iij., and Tinct. of Orange-peel fl. oz. ½, and preserve in a well-stoppered bottle.

Med. Prop. and Uses. An excellent chalybeate tonic in doses of fl. oz. i.–ij. Well adapted for *Anæmia and Debility after fevers.*

913. Ferri Mistura Composita. Compound Mixture of Iron. Griffith's Mixture. *Prep.* Triturate Myrrh reduced to powder gr. lx., Carbonate of Potash gr. xxx., and Sugar gr. lx., with q.s. of Rose Water, so as to form a thin paste, then gradually add Spirit of Nutmeg fl. drm. iv. and Rose

[1] Cyc. Pract. Med., vol. iv. p. 261.

Water ad fl. oz. viij., continuing the trituration till a milky fluid is formed; then add Sulphate of Iron gr. xxv. dissolved in Rose Water fl. oz. j.½. Mix thoroughly and preserve from contact with the air.

Med. Prop. and Action. A long-established and valuable hæmatinic, tonic, and emmenagogue.

Dose:—Fl. oz. j.–ij. twice or thrice daily.

914. *Therapeutic Uses. In Amenorrhœa, Chlorosis,* and *Leucorrhœa,* especially when associated with anæmia and general debility, few forms of iron are more generally useful than the compound mixture. Sometimes, however, it causes gastric irritation, when a milder form of iron should be substituted.

915. *In Hectic Fever and Phthisis,* this mixture has obtained great celebrity; it is often productive of marked benefit, particularly when much debility and anæmia exist. It occasionally causes headache, nausea, and heat of skin, in which case it should be discontinued.

916. *In Epilepsy arising from anæmia or debility,* Dr. Hope[1] particularly recommends this formula, above the other preparations of iron, in doses of fl. drm. x. with fl. drm. j.–iij. of decoction of aloes, thrice daily. It should be taken one or two hours after meals, as on an empty stomach it occasionally creates nausea; it should be persevered in for a month at least.

917. *In Granular Disease of the Kidneys,* Dr. Copland (ii. p. 657) states that he has derived great benefit from the salts of iron, particularly from the compound mixture.

918. *In Chronic Bronchitis,* Dr. Graves (ii. p. 17) prescribes this mixture with the view of improving the general system, and checking the superabundant secretion from the bronchial tubes. He prefers it to a simple chalybeate, because the other ingredients, namely, the myrrh and potash, have a tendency to produce the same effect. He orders fl. drm. j.–ij. to be taken thrice daily, and dilutes this quantity with fl. oz. ½–j. of almond emulsion or mint water. Given in these small doses, he considers the remedy to be safer and more effectual.

919. FERRI OXIDUM MAGNETICUM. Magnetic Oxide of Iron. Ferri Oxidum Nigrum. Fe_3O_4 combined with about 20 per cent. of water of hydration, and containing some peroxide of iron.

Med. Prop. and Action. The same as those of Reduced Iron (see FERRUM REDACTUM.)

Dose, gr. v.–x. or more.

920. FERRI PERCHLORIDI LIQUOR FORTIOR. STRONG SOLUTION OF PERCHLORIDE OF IRON. Liq. Ferri Perchloridi, B. Ph. 1864. *Prep.* To a mixture of Hydrochloric Acid fl. oz.

[1] Lib. of Med., vol. ii. p. 19.

viij. and Distilled Water fl. oz. viij., add Iron Wire oz. ij., and dissolve at a gentle heat. Filter, and add Hydrochloric Acid fl. oz. iv., and Nitric Acid fl. drm. ix.; heat the mixture briskly, until on the sudden evolution of red fumes, the liquid becomes of an orange-brown colour, then evaporate by heat of a water bath ad fl. oz. x. An orange-brown solution, with a strong styptic taste, miscible with water and rectified spirit, in all proportions. Sp. gr. 1·338.

FERRI PERCHLORIDI LIQUOR. SOLUTION OF PERCHLORIDE OF IRON. A mixture of the Strong Solution fl. oz. v., and Distilled Water fl. oz. xv. The same strength as Tincture of Perchloride of Iron.

Med. Prop. and Action. Powerful astringent and styptic, whether administered internally or applied externally. According to M. Deleau,[1] it is the most powerful hæmostatic known, acting as a modificator of living tissues generally, but especially of mucous membranes; hence its value as an anti-syphilitic and anti-scrofulous remedy. As a local or external agent, it is described at length in the following sections.

Dose:—Of Liq. Ferri Perchloridi ℥x.–xxx. in syrup or water. The Strong Solution is ill adapted for internal use.

921. *Therapeutic Uses. In Aneurisms*, injections of the perchloride were first advised by Dr. Pravaz,[2] of Lyons, in 1853; and cases of its successful application were recorded by Adams[3] and others; but according to M. Malgaigne,[4] the practice is fraught with so much danger, that no prudent man should have recourse to it. He states that of eleven cases treated by it there were four deaths, five serious complications, and only two cures. Hence it has fallen into disrepute. Injections of the perchloride have also been employed by Desgranges[5] and others for the cure of *Varicose Veins*, but both the safety and efficacy of the treatment are very doubtful.

922. *For the cure of Nævus*, injection of solution of the perchloride has proved effectual, and it has the recommendation, when successful, of leaving hardly any visible trace of its action. It acts by coagulating the blood in the vessels, and thus obliterating them. (Mr. T. Holmes.) It is difficult, however, first to be certain that the fluid will permeate the nævus, and, secondly, if it does so, to regulate the quantity. Moreover, its use is attended with positive danger when thus applied to nævi about the head, face, orbit and neck; cases of instant death having occurred in several instances when thus employed; one of these occurred in the practice of Mr. R. B. Carter.[6] It should never be employed to nævi of these

[1] Ann. de Thérap., 1858, p. 213.
[2] Ibid., 1853, p. 213.
[3] Med. Times, Aug. 1853.
[4] Jamin et Wahu, Ann. de Méd., 1854, p. 131.
[5] Mém. de la Soc. de Chir. de Paris, 1856, vol. iv., p. 7.
[6] Med. Times and Gazette, Sept. 5, 1863.

parts. Mr. T. Smith[1] speaks favourably of the use of setons of darning cotton soaked in solution of the perchloride.

923. *In Hospital Gangrene*, the value of the local application of the perchloride is attested by M. Maupin[2] and others. It is thought to be superior to the mineral acids. The pain it causes is at first excessive, but this soon subsides. To *Fungous Tumours*, *Hæmorrhoidal Tumours*, &c., it has been found a valuable application, not only for *arresting hæmorrhage*, but as a curative agent. A severe case of *Onychia*, cured by the application of an ointment composed of equal parts of the perchloride and lard, is recorded by Dr. Alcantara.[3] In *Zona*, at any period during its evolution, Dr. Gressey[4] recommends the application of a concentrated alcoholic solution of the perchloride. The vesicles should not be opened, in order to save the patient useless pain.

924. *In Post-partum Uterine Hæmorrhage*, Dr. R. Barnes[5] has for years employed with success injections of solution of the perchloride (half a pint of the strong solution to a pint and a half of water.) He employs Higginson's syringe fitted with a uterine tube about nine inches long. Care should be taken that air is not sucked up into the syringe; to avoid this, it is necessary to keep the entrance-tube of the syringe at the bottom of the fluid, and pump through back into the basin containing the solution, until the syringe is filled with the fluid. The apparatus being ready, the left hand should be passed into the uterus, to clear away all placenta and clots, and the uterine tube slipped along the palm of the hand, so as to carry the end of the tube up to the fundus of the uterus; the syringe should then be compressed gently and steadily, so that the fluid may trickle down over the whole inner surface of the uterus. The pumping may be repeated until the basin is *nearly* empty, not quite, lest air be taken up. As the iron acts by coagulating the blood in the mouths of the vessels—and mere contact is enough for this—it is unnecessary to pump with any force. One injection generally suffices. Employed thus, Dr. Barnes considers this injection perfectly safe, and he adds that he is certain not a few lives have been rescued by it from otherwise imminent death. This treatment he considers[6] also to exercise a marked influence in *preventing Puerperal Fever*. Dr. Remilly[7] succeeded in four instances in arresting *Hæmorrhage from Cancer of the Uterus* by injections of the perchloride, fl. drm. v. ad Aq. fl. drm. lxxx. The undiluted solution has also been applied to *Uterine Polypi* and

[1] Lancet, 1867.
[2] Mém. de Méd. Militaire, xx. p. 368.
[3] Ranking's Abstract, xxviii. p. 258.
[4] Med. Times, July 18, 1863.
[5] Lancet, Jan. 30, 1869.
[6] Obstetric Trans., vol. vii. 1866, p. 31.
[7] Med. Times, Feb. 25, 1854.

to Ulcers of the Os and Cervix Uteri. The objection to the perchloride as a topical application in diseases of the uterus and uterine passages is, that unless very much diluted, it corrodes the epithelium of the mucous membrane of the vagina. To prevent this, Dr. Braun adds crystallized carbonate of soda (gr. iv.) to the solution of the perchloride (fl. oz. j.); chloride of sodium is formed; but the hæmostatic properties of the perchloride are, according to Dr. Braun, intensified rather than diminished by the alteration. He speaks highly of this neutralized solution in various *Chronic Uterine Affections.* (Dr. Tilt, p. 157.)

925. *In Purulent Ophthalmia*, the perchloride, according to Dr. De Conde,[1] exercises an instantaneous hæmostatic effect upon the hæmorrhagic mucous membrane, and also a marked influence upon the secretion. *In Pannuform Keratitis*, it has been successfully employed by M. Foulin[2] and others. A large drop of the solution is dropped into the eye by means of a quill every second or third day.

926. *In Acute and Chronic Urethritis*, the perchloride internally, and locally in the form of injection, is favourably reported of by M. Barudel.[3] *As a means of destroying Syphilitic Infection*, M. Rodet[4] suggests the practice of thoroughly bathing the parts to which the virus has been applied, before it has time to become absorbed into the system, with the following lotion:—℞ Ferri Perchlorid. f℥j., Acid. Hydrochlor. f℥jss., Aquæ f℥j., M. Experiments on himself seem to attest its efficacy. Dr. M. Mackenzie[5] has recorded a case of *Syphilitic Stenosis of the Larynx* in which inhalation of a "pulverized solution" of perchloride of iron (gr. v., Aq. fl. oz. j.) was followed by most satisfactory results, all cough and stridor rapidly disappearing.

927. *In Dysentery*, M. Baudon[6] obtained excellent effects from this solution (gutt. xij.–xxx. in water and syrup in the twenty-four hours.) He also used it (gutt. xij.–xxv.) in enemas, combining it with opium if there was much pain. More recently, Mr. W. H. T. Power[7] has employed, with the best results, the tincture of the perchloride in dysentery. From 200 to 600 ♏ per day were given, the average dose being ♏x. in fl. oz. j. of water. Its effects, in arresting the liquid stools, were speedily evident.

928. Ferri Perchloridi Tinctura. Tincture of the Perchloride of Iron. Tinctura Ferri Sesquichloridi. Tincture

[1] Ann. d'Oculistique, 1858.
[2] Archiv. Gén. de Méd., June, 1856.
[3] Bull. Gén. de Thérap., May 15, 1858.
[4] Gaz. Heb. de Méd., Jan. 12, 1855.
[5] Med. Times, March 5, 1864.
[6] Bull. Gén. de Thérap., Nov. 30, 1861.
[7] The Practitioner, Aug. 1868.

of the Sesquichloride of Iron. Tinct. Ferri Muriatis. Muriated Tincture of Iron. A mixture of Strong Solution of Perchloride of Iron fl. oz. v., and Rectified Spirit fl. oz. xv. Sp. gr. 0·992. It is of the same strength as Liq. Ferri Perchloridi.

Med. Prop. and Action. Hæmatinic, tonic, astringent, and diuretic. It is one of the most powerful of the preparations of iron, and may be advantageously administered whenever these are indicated. Externally applied it is caustic, and is applied to *Warts*, &c., and as a styptic to superficial wounds. In large doses it is an irritant poison. Its continued use constipates the bowels.

Dose, ♏x.–♏xxx. or more.

929. *Therapeutic Uses. Diseases of the Genito-Urinary Organs. In Affections of the Bladder depending upon Disease of the Kidneys*, Sir B. Brodie (p. 141) states that he has employed this tincture with advantage, in doses of ♏viij.–xvj. twice daily, either in water or infusion of buchu. It requires to be persevered in. *In Irritability and Chronic Inflammation of the Bladder*, this tincture, combined with laudanum, is often of signal benefit.

930. *In Retention of Urine from Spasmodic Stricture of the Urethra*, the tincture in ten-minim doses, repeated every quarter or half hour, was first proposed by the late Mr. Cline. It has been extensively employed, in the majority of cases, with success. Occasionally it fails to afford relief. It should not be used to the exclusion of the hot-bath, opiate enemas, &c.

931. *In Incontinence of Urine in Children*, it is occasionally of great service. Dr. West (p. 658) states that he has found it more useful than any other remedy. It may be given in doses of from ♏iij. to x. thrice daily, either alone or combined with a few drops of tincture of henbane.

932. *In Atonic Hæmorrhage from the Kidneys, Uterus, and Bladder*, occurring in debilitated subjects, it may be given with much advantage, in doses of ♏x.–xx. several times daily. *In Hæmaturia*, Dr. Owen Rees[1] considers this the best form of iron for internal use. *In Hæmorrhage from the bowels in Typhoid Fever*, the tincture often proves effectual. If associated with much arterial action it may be combined with digitalis. ℞ T. Ferri Perchlor. ♏xxx., T. Digitalis ♏xv., Aq. Menth. Pip. fl. oz. j.½, repeated every four hours. If this fail, the solution may be tried in enema :—℞ Liq. Ferri Perchlor. ♏xv., Morphiæ Hydrochlor. gr. ½, Aq. Tepid. ℥iv., M. (Dr. Harley, i. p. 633.) Dr. Breslau, of Munich,[2] relates a case of obstinate *Menorrhagia* cured by injections of this tincture, fl. oz. j.½ diluted with fl. oz. j.½ of water.

933. *In Leucorrhœa, Chlorosis, and Dysmenorrhœa*, this tincture may be employed with every prospect of benefit. When, as is

[1] Med. Gaz., July 11, 1851. [2] Med. Chir. Rev., Jan. 1858.

often the case in these affections, dyspepsia co-exists, it may be advantageously conjoined with calumba, or it may be given in the form advised in sect. 942. 941

934. *In Gonorrhœa*, when the acute stage is past, and the discharge continues and is degenerating into gleet, few remedies prove more useful than this tincture in doses of ♏xv.–xx. thrice daily. It is much in use in the London hospitals at the present day. In old *Gleets* it proves also very useful. In cases of *Prostatorrhœa*, occurring in weak debilitated subjects, Prof. Gross speaks highly of a combination of this tincture and nux vomica.

935. *Other Diseases.* *In Albuminuria*, the red globules of the blood have been found much impoverished, and consequently the salts of iron are clearly indicated. Dr. Heaton[1] advises this tincture as the most generally active and beneficial, and one which combines diuretic and chalybeate properties. In the majority of cases in which he employed it the improvement was most marked and unequivocal. Mr. Dutt[2] relates a case of *Chylous Urine* cured by this tincture, ♏xv. in infusion of quassia thrice daily.

936. *In Beri-beri*, it was strongly advised by Mr. Ridley, who saw much of this disease in Ceylon. Mr. Malcolmson,[3] in quoting this, remarks that he is not aware of its having been employed to any extent; but it is to be observed that iron is one of the most approved remedies of the Telúgú doctors. They use it, mixed with the astringent juice of the mango and other trees; probably in the form of an oxide, united with gallic acid.

937. *In Phthisis*, the perchloride is a remedy of considerable power. Dr. Symes Thompson[4] bears strong testimony to its value, regarding it as far superior to other forms of iron. The improvement of appetite, diminution of flatulence, &c., he remarks, which occur under the perchloride are often remarkable; cod-liver oil, and other fats previously refused, being digested without discomfort. "It both checks *Diarrhœa* and relieves constipation by giving tone to the feeble muscular fibres of the bowels; it lessens *Night Sweats*, though these often call for oxide of zinc in addition, and is a valuable remedy in *Hæmoptysis*." *In the profuse perspirations of Phthisis*, Sir T. Watson (ii. p. 215) states that he has frequently succeeded with this tincture in doses of ♏xx. thrice daily, after other expedients had failed. Dr. Cotton[5] regards it as one of the most useful agents in the treatment of ordinary cases of *Phthisis*. Upwards of 66 per cent. of cases treated with it derived more or less advantage from its use. Very strong

[1] Provincial Journal, April 4, 1849.
[2] Lancet, July 26, 1862.
[3] On Beri-beri, p. 284.
[4] Practitioner, Sept. 1868.
[5] Lancet, Oct. 25, 1862.

evidence in favour of the perchloride in these cases is also adduced by Dr. J. Jones.[1] In every stage he regards it as more or less beneficial. *In Chronic Bronchitis with Emphysema*, a combination of this tincture and hydrochlorate of ammonia is favourably noticed by Dr. Thorowgood;[2] or, he adds, we may give the sulphate of iron with sulphate of magnesia in mint water.

938. *In Erysipelas*, the value of the tincture of the perchloride, first brought prominently to notice by Mr. G. H. Bell,[3] of Edinburgh, in 1851, is now generally recognised. Indeed, so marked is its action that it has been supposed by some to exercise a "specific" influence in erysipelas; but without admitting this, it is certain that no remedy is productive generally of better effects. In order to obtain its full influence, as pointed out by Dr. Russell Reynolds (i. p. 690), it is essential to give it in large and repeated doses, ℥xl. or more, every four hours. He advises the following formula:— ℞ T. Ferri Perchlor., Spt. Chloroformi, Glycerini āā ℥xl., Aq. ad fl. oz. 1½, M., 4tis horis sumend. The effect of this medicine, he remarks, may be seen sometimes after the first, often after the second dose: the local inflammation ceases to extend, the inflamed part becomes paler, less tender, less swollen; the feeling of exhaustion is diminished, and with it, such symptoms of exhaustion as exaggerated frequency of pulse, and dry brown tongue; the temperature falls, and sleep frequently ensues. As soon as such changes take place, the quantity of the tincture may be reduced. It is not, however, safe to trust to this medicine alone; alcoholic stimulants are often required at the same time. The only local applications necessary are hair-powder and cotton or wadding, to protect the parts from cold draughts of air, &c. Cooling lotions should be eschewed. Dr. Charles Bell, brother of the above gentleman, also bears testimony to the value of this remedy, particularly in *Infantile Erysipelas*, in which cases it may be given in doses of ℥ij.–iij. every two hours. He adds: "The beneficial effects of this medicine are so immediate and invariable in the common forms of erysipelas, that I feel convinced, were it given with boldness and perseverance in *Puerperal Fever*, which is now generally admitted to be analogous in its nature, and frequently accompanied by erysipelatous inflammation on the surface of the body, many valuable lives might be preserved."

939. *In Scarlet Fever*, in the advanced stages, attended by albuminuria and hæmaturia, the tincture of the perchloride is a remedy which often produces excellent results. In the words of Dr. Gee (i. p. 375), "Upon the whole, no remedy is equal in

[1] On the Perchloride of Iron, Lond., 1862.

[2] Lancet, Nov. 13, 1869.

[3] Monthly Journ. of Med. Sci., June, 1851.

value to the perchloride of iron." Its use should be associated with generous diet. Should it not succeed, gallic acid should be tried. Its efficacy is attested by Mr. H. Meade,[1] who prescribed it with signal benefit in doses of ♏ v.–xv., according to the age of the patient, every three or four hours.

940. *In Cardiac Affections*, this preparation, as well as other forms of iron, deserve more attention than is usually paid to them. *In Fatty Degeneration of the Heart*, Dr. Waters (p. 347) believes that if taken in small doses for a long time, it is capable of restoring to an enfeebled and fatty heart a good deal of its vigour, and possibly of its structure. But in order that it may do this, it must be continued not only for weeks but for many months, and even for years, being omitted from time to time as the state of the digestive organs may require. He considers that there is probably no better preparation than T. Ferri Perchlor., but if patients are unable to take this or other ordinary preparations of iron, recourse may with advantage be had to a chalybeate water. *In Chronic Valvular Disease*, it is, according to Dr. Waters (p. 374), no less valuable, given continuously as above directed. *In Palpitations*, and also in *Dropsy connected with Heart Disease*, he advises a combination of iron and digitalis, or, where the dropsical symptoms are slight, he considers iron alone sufficient.

941. *In Hysteria connected with Anæmia*, the tincture ♏ viij.–x. in combination with Spt. Ammon. Fetid. is often of the greatest service. Bathing, generous diet, and gentle exercise should be also enjoined. *In Pain of the left side so often associated with Hysteria*, it is advised by Dr. Peter Eade.[2] He states that in those cases where leucorrhœa co-exists, he has frequently found the following formula signally efficacious:— ℞. T. Ferri Perchlor., Acid. Nitric. dil., T. Aurant. āā ♏ xv., Magnes. Sulph. gr. xxx., Aq. ad fl. oz. j., M., ft. haust bis vel ter in die sumend.

942. *In Acute Rheumatism*, Dr. Russell Reynolds[3] has employed the tincture of the perchloride with marked success, in doses of about ♏ xxx. every six hours. He has found the relief of the joint affection definite, uniform, and speedy, whilst the duration of the disease has been shortened. Other cases successfully treated with it are recorded by Dr. Randle Buck,[4] but it proved a failure in the hands of Dr. Greene;[5] and Dr. Trestrail[6] objects to it from the fear of its increasing the tendency to the formation of coagula, which already exists in cases of rheumatic fever. To obviate this danger, he suggests

[1] Med. Times and Gaz., June 26, 1858.
[2] Ibid., July 20, 1867.
[3] Brit. Med. Journ., Dec. 18, 1869.
[4] Brit. Med. Journ., Mar. 12, 1870.
[5] Ibid., April 9, 1870.
[6] Ibid., May 7, 1870.

its combination with hydrochlorate of ammonia or other agents.

943. *In Diphtheria*, this tincture, as first pointed out by Dr. Ranking in 1859, is a remedy of great value. Amongst others who have testified to its utility is Dr. W. Squire,[1] who directs ♏xx.-xl. should be given with water (fl. oz. ½) and glycerine (fl. drm. ½) every three or four hours, or oftener, so that not less than half an ounce of the tincture be taken in the twenty-four hours; and this quantity, he adds, may be given even to children during severe attacks. It should be commenced on the first day of the illness, or as soon as the patient comes under notice, and continued till the tongue becomes red, and the throat improves; when deposit has already taken place, its good effects will be shown, not by any alteration in the dimensions of the patch, but by a diminution in the accompanying secretion, and by improvement of the general symptoms. It is not to be discontinued for some days, and may require energetic repetition if improvement is slow. (Dr. Squire.) Dr. Hillier (p. 146) states that from his own experience he cannot speak of it so highly as others have done. As a local application, the tincture alone, or diluted with equal parts of glycerine, sometimes appears to have a beneficial effect.

944. *In Purpura Hæmorrhagica*, it is regarded by M. Pize[2] as pre-eminently the agent for the cure of the disease. He states that it arrests the hæmorrhagic tendency in twenty-four or forty-eight hours, and that when continued for a few days it rapidly brings about convalescence.

945. *In Favus*, Mr. E. Wilson (p. 471) prescribes the salts of iron internally, but prefers the tincture of the perchloride in doses of ♏x. thrice daily, for a child of ten years old. If the disease is associated with scrofula, it may be combined with cod-liver oil.

946. *In Epistaxis*, the injection into the nostrils of the dilute tincture (fl. drm. j.½–fl. drms. ij. in Aq. fl. oz. vj.) is often effectual in arresting the hæmorrhage. *In Hæmorrhage from Leech-bites*, and in *that after the extraction of teeth*, the undiluted tincture acts as a good styptic.

947. *To Venereal Warts and spongy Granulations*, the undiluted tincture, locally applied, is a safe and efficient caustic. *Ulcers attended with profuse discharge*, are much benefited by the application of this tincture, either pure or diluted.

948. *For the removal of Thread-worms from the Rectum*, an enema containing the tincture (oz. ½, Aq. fl. oz. x.) is said to be very effectual.

949. Ferri Pernitratis Liquor. Solution of the Pernitrate of Iron. *Prep.* To a mixture of Nitric Acid fl. oz. iv½,

[1] Reynolds's Syst. of Med., i. p. 404. [2] Journ. of Pract. Med., Aug. 1860.

and Distilled Water fl. oz. xvj., add Iron Wire oz. j., and leave till dissolved, moderating the action should it become too violent, by the addition of a little more water. Filter and add water q. s. ad $O\frac{1}{2}$. Sp. gr. 1·107. Each fl. drm. contains nearly gr. viij. of the pernitrate of iron.

Med. Prop. and Action. Astringent and tonic in doses of ♏x.–xl. in water; diluted, it has also been used as an enema and injection.

950. *Therapeutic Uses. In Chronic Dysentery*, Dr. Maclean (i. p. 124) speaks in the highest terms of the benefit he has derived from this solution, particularly in men returning from tropical regions, anæmic from loss of blood and the depraving influence of malaria. Under such circumstances, it seems to hold a very high place in our list of remedies. After a time the citrate of iron and quinine may be substituted. *In the Diarrhœa of Children*, its efficacy has been established by Mr. Kerr,[1] Prof. Graves (ii. p. 227), and many others. It may be given in doses of a few drops according to the age of the child, and it may be employed in the form of enema (♏x.–xij.) It appears to be a safe and efficient remedy.

951. *In Exhausting Hæmorrhage, whether from the Lungs, Stomach, Kidneys, or Uterus*, this preparation is reported to be very efficacious. It requires to be given in large doses, from ♏xxx.–lx.

952. *In Chronic Bronchitis, Diarrhœa, Dysentery, Pyrosis, Gleet, Menorrhagia, and Leucorrhœa*, Mr. Postage[2] employed it with signal benefit. He states that, in all diseases attended with much debility, profuse discharges from the mucous surfaces, and where tonics and astringents are indicated, he has found this remedy, in doses of gutt. x.–xv. thrice daily, very advantageous.

953. Ferri Peroxidum Hydratum. Hydrated Peroxide of Iron. (Ferri Peroxidum, B. Ph. 1864). Ferri Sesquioxidum, Lond. Ph. Ferrugo, Red Oxide of ~~Mercury~~. Fe_2O_3. H_2O. Prepared by drying moist Peroxide of Iron at a temperature under 212°, until it ceases to lose weight, and then reducing it to a fine powder.

Iron

Med. Prop. and Action. Blood-restorative, tonic, and emmenagogue. It is also anthelmintic. The objections to its use are its disagreeable taste, and the quantity required to be taken before its specific effects are evident. It is an unirritating preparation of iron, although it occasionally causes dyspeptic symptoms; and during its use occasional aperients are necessary to prevent it accumulating in the intestines. It speedily blackens the fæces. It is best given in honey or treacle. Externally it is applied in the form of plaster (oz. j., Burgundy Pitch oz. ij., Litharge Plaster oz. viij.)

Dose, gr. v.–xxx. or more.

[1] Edin. Med. Surg. Journ., vol. xxxvii. p. 99.

[2] Med. Times, vol. xviii. p. 171.

954. *Therapeutic Uses. In Anæmia*, this, in common with the other preparations of iron, is of great value. Dr. Ashwell recommends the subjoined formula, which will often be borne where the other ferruginous compounds cause irritation:—℞ Ferri Sesquiox. gr. viij., Pulv. Ipecac. Rad. gr. j., Hydrarg. c. Cret. gr. ij., M., ft. pulv. bis in die sumend.

955. *In Atonic Amenorrhœa*, the peroxide, in combination with aloetic purgatives, is of signal benefit. *In Chlorosis*, it is also an excellent remedy, in doses of gr. lx. thrice daily, given in combination with fl. drm. ½ of aromatic spirit of ammonia or gr. v.–x. of carb. of soda.

956. *In Diabetes* attended with much debility, it is sometimes of great service. Dr. Prout (p. 48) regards it "as an excellent remedy."

957. *Nervous and Spasmodic Affections. In Tic Douloureux and other Neuralgic Affections*, the peroxide of iron has been successfully employed. Dr. Elliotson strongly advocated its use, and relates several cases successfully treated by it, in drachm doses every six hours, and gradually increased until much larger quantities are taken. Its use is limited to those cases in which the neuralgia is associated with anæmia; in others it usually fails. To prevent the iron accumulating in the intestines, purgatives are required.

958. *In Infantile Convulsions*, Sir C. Locock[1] speaks very favourably of this and other preparations of iron, particularly in those cases where there is any exhaustion or debility, and an absence of any decided determination of blood to the head. He relates, in illustration, the case of a child two months old, who for seventeen days had convulsions three or four times a day, or oftener; these resisted every treatment, until the carbonate of iron, in doses of gr. v. every two hours was given, when they at once yielded, and the child recovered. A case in which the peroxide of iron proved signally beneficial is recorded by Dr. S. Lawrence.[2] He considers that in these cases it acts as a nervine or nerve-tonic, lowering the sensibility of the nervous system when preternaturally exalted. He regards it as a mistake deferring the use of iron until the case becomes chronic or debility supervenes, and lays it down as a maxim, that if all offending matter has been got rid of from the bowels and stomach, and other existing causes of irritation removed —if the circulation be tranquil during the intervals of the paroxysms, and if no organic change is associated with the malady—the exhibition of the iron cannot be too soon begun.

959. *Laryngismus Stridulus.* In order to strengthen the system, and diminish the excessive nervous sensibility which

[1] Cyc. Practical Med., vol. i. p. 480.

[2] Edin. Med. Journ., June, 1858, p. 1112.

is so constantly a cause of this disease, Dr. Merei[1] thinks highly of this and the other preparations of iron; but he advises it to be preceded by cod-liver oil. If this disagrees, or produces no benefit, iron may be had recourse to, with every prospect of success. It should be carefully watched, lest the bowels become overloaded.

960. *In Chorea*, the employment of the peroxide in large doses, ʒ½–ʒj. increased to ʒiij.–ʒiv. every six hours, was introduced by Dr. Elliotson, and when conjoined with the use of active purgatives, is often productive of good effects. Dr. Wilks[2] speaks of it as one of the best of remedies; and Dr. Stone[3] considers that it acts both more certainly and more rapidly than zinc. Children, Dr. Wilks remarks, willingly take half-drachm doses in treacle. *In Hysteria associated with anæmia*, it may be used with advantage, combined with valerian and other antispasmodics.

961. *In Hooping Cough*, associated with anæmia, or occurring in weak delicate children, iron is indicated, and the peroxide has been highly recommended by Lombard and others. A better form probably is that recommended by Dr. West (p. 443). ℞ Mist. Ferri Co. ʒiv., T. Scilllæ ♏xvj., T. Conii ♏xl., Mist. Amygd. ʒij.½. M. Dose, fl. drm. iij. thrice daily for a child aged two years.

962. *In Paralysis Agitans* occurring in old debilitated subjects, or when it is associated with anæmia, the peroxide of iron, in full doses, will occasionally prove useful. *In Mercurial Tremor*, it is advised by Sir T. Watson (i. p. 682.)

963. *Other Diseases.* *In Cancer*, Mr. Carmichael[4] advised the peroxide in doses of ʒss.–ʒj. daily, in divided doses, combined with aloes (gr. ½–gr. j.) to prevent constipation. At the same time it was made into a thin paste with water, and applied externally. Although the salts of iron exercise no specific influence in cancer, it is one of the best general tonics which can be employed. Dr. Tilt (p. 245) advises a frequent change of ferruginous preparations and their combination with cod-liver oil. The syrup of the iodide is one of the best forms in these cases.

964. *In Gout* occurring in persons of debilitated constitution, and in many cases of *Irregular Gout*, the peroxide of iron will often be found of the highest service; the bowels having previously been well evacuated, and the urine restored to a healthy condition by alkaline medicines. *Lithic Acid Deposits*, which occasionally depend upon deficient oxygenation, as well as upon a superabundance of proteine articles of diet,

[1] Edin. Monthly Journal, Nov. 1850.
[2] Med. Times, Feb. 6, 1869.
[3] Med. Times, Sept. 17, 1859.
[4] On the Effects of the Carb. of Iron upon Cancer, Dublin, 1808.

have been found to yield to the preparations of iron. A case in which the peroxide thus acted is related by M. Cantilena.[1]

965. *In Palpitations accompanied by Debility*, the peroxide in drachm doses thrice daily, and a pill composed of Pil. Aloes Co. and Pil. Assafœtid. Co. āā gr. ij. at bedtime is often of great service.

966. *In purulent Discharges from the Aural, Nasal, and Vaginal passages, the sequelæ of Infantile Diseases*, Mr. W. Cooke[2] states that he has found the greatest benefit accrue from the use of this preparation, in doses as large as the stomach will bear without discomfort. The local treatment consists of injections of the sulphate of zinc (grs. iij.–v., Aq. fl. oz. j.) In every case, marked improvement followed this treatment.

967. FERRI PEROXIDUM HUMIDUM. MOIST PEROXIDE OF IRON. (FERRI PEROXIDUM HYDRATUM, B. Ph. 1864.) ~~Hydrated~~ Humid peroxide of iron, with about 86 per cent. of uncombined water. Prepared by precipitating Solution of Persulphate of Iron (fl. oz. iv.) with Solution of Soda (fl. oz. xxxiij.) It requires to be kept in a well-stoppered bottle, and when used should be recently prepared.

Med. Uses. As an antidote for poisoning by Arsenic, this preparation was first proposed by Bunsen and Berthold, in 1834. It converts arsenious acid into an arseniate of iron which is insoluble ($2\,Fe_2O_3 + AsO_3 = 4\,FeO + AsO_5$.) It has been extensively tried; and, although some instances are recorded in which it failed to produce any good effect, it is, without doubt, one of the best antidotes we possess. Of thirty-one cases quoted by Dr. Beck,[3] recovery took place in twenty-nine. It appears, however, that it is more a mechanical than a chemical antidote. It is stated that thirty-two parts of the peroxide are required for every part of the arsenic swallowed. It should be given in a moist state, in doses of a tablespoonful, every five or ten minutes, or oftener. Should the hydrated peroxide not be at hand, the common peroxide may be substituted.

Dose, oz. ¼–½ or more.

968. FERRI PHOSPHAS. Phosphate of Iron, $Fe_3P_2O_8$, partially oxidated. A slate-blue amorphous powder, insoluble in water, soluble in hydrochloric acid.

FERRI PERPHOSPHAS. Perphosphate of Iron. Ferrum Phosphoricum Album. White Phosphate of Iron. A white tasteless powder.

FERRI SUPERPHOSPHAS. Superphosphate of Iron. Acid Phosphate of Iron. A mass of soft consistence, without inky taste.

[1] Ranking's Abstract, 1856, vol. xxiv. p. 104.

[2] Lancet, July 13, 1850.

[3] See Med. Gaz., Oct. 15, 1841.

These salts have often been confounded, being called indifferently Phosphate of Iron. The first named is alone officinal.

The phosphates of iron are sometimes administered with other phosphates, in the form of syrups. Several new preparations of this kind have been introduced by different pharmaceutists, *e. g.*, Syrup of Phosphate of Iron and Ammonia; Syrup of Phosphate of Iron and Lime; Syrup of Phosphate of Iron and Manganese, &c. The Pyrophosphate of Iron with Soda or Citrate of Ammonia (known generally as *Soluble Pyrophosphate of Iron*, or simply as *Pyrophosphate of Iron*) is a scaled preparation, containing a variable proportion of the pyrophosphate of the peroxide of iron. (Draper.)

Med. Prop. and Action. Blood-restoratives, tonics, and alteratives. The phosphate is best administered in the form of syrup.

Dose:—Of Phosphate, Perphospate, Superphosphate, and Pyrophosphate of Iron, gr. iij.–gr. x. *Of the Syrup of the Phosphate*, fl. drm. j.–ij. Each fl. drm. contains gr. j. of the phosphate.

969. *Therapeutic Uses.* *In Cancer*, the phosphates of iron were highly esteemed by Mr. Carmichael (op. cit.) He administered the following pills:—℞ Ferri Phos. gr. xxx.–gr. xl., Potas. vel Sodæ Puræ gr. iij., Ext. Aloes gr. iv., Pulv. Glyc. gr. xx., Alb. Ovi q. s. ft. pil. xij. Dose, one every two, three, or four hours. At the same time, he applied locally the phosphate made into a thin paste with water, or an ointment (℥ij., Lard oz. j.) As a remedy for cancer, it is now abandoned.

970. *In Diabetes*, the phosphate has been favourably spoken of by Dr. Venables[1] and Dr. Prout (p. 48). The former directs it to be taken in doses of gr. j.–ij. gradually increased to gr. xx.–xxx. three or four times a day. It appears to exercise a decidedly favourable influence.

971. The phosphates of iron have been extensively used in the treatment of *Rickets*. The syrup of the phosphate of iron and lime is a preparation introduced for this purpose. It may be given in doses of fl. drm. j., or more, thrice daily.

972. Ferri et Quiniæ Citras. Citrate of Iron and Quinia. Citric acid combined with peroxide of iron, protoxide of iron and quinia. Prepared according to the formula of the Brit. Pharm., it contains 25 per cent. of citrate of quinia.

Med. Prop. and Action. Blood-restorative, tonic, and anti-periodic. It possesses the properties of both iron and quinia, and is admirably adapted for children and delicate females, being easily borne when the stronger salts of iron are inadmissible.

Dose, gr. v.–gr. x. or more.

[1] On Diabetes, 8vo, Lond. 1825, p. 48.

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973. *Therapeutic Uses.* Those of the salts of iron generally. *In Chlorosis*, Sir H. Marsh [1] advises the following formula:—℞ Liq. Ammon. Citrat. f℥iij., Ferri et Quin. Citrat. gr. j.–iij., Syrup f℥j., Aq. f℥vj., M., ft. haust. bis terve in die.

974. FERRI ET STRYCHNIÆ CITRAS. Citrate of Iron and Strychnia. *Prep.* Dissolve 980 grs. of Citrate of Iron in 9 oz. of Water, and 10 grs. of Strychnia and 10 grs. of Citric Acid in 1 oz. of Water: mix the solutions, evaporate to a syrupy consistence, and spread on plates to dry in scales. (Draper.)

Med. Prop. and Action. Blood-restorative, tonic, and nervine stimulant. It possesses the combined properties of iron and strychnia.

Dose, gr. ij. and upwards. Five grains contain one-twentieth of a grain of strychnia.

A Citrate of Iron, Quinine, and Strychnia is also manufactured, containing the same proportion of strychnia.

975. *Therapeutic Uses. In Atonic Dyspepsia, some forms of Paralysis, Chorea*, and *Amenorrhœa*, this preparation has been found serviceable. It is chiefly indicated where anæmia is associated with depression or derangement of nervous power.

976. *Essential Vertigo, i.e.*, vertigo unaccompanied with any other head symptoms, or with an appearance of depraved general nutrition, is most benefited, according to Dr. Ramskill (ii. p. 152), by a long course of citrate of iron and strychnia, in an effervescing form, alternating month by month with tincture of larch and small doses of digitalis.

977. FERRI SULPHAS. Sulphate of Iron. Sulphate of the Protoxide of Iron. Green Vitriol. $FeSO_4 . 7H_2O$.

FERRI SULPHAS EXSICCATA. Dried Sulphate of Iron. $FeSO_4 . H_2O$. Prepared by exposing sulphate of iron to a moderate heat, which is finally to be raised to 400° until watery vapour ceases to be given off.

FERRI SULPHAS GRANULATA. Granulated Sulphate of Iron. $FeSO_4 . 7H_2O$. Prepared by pouring a hot solution of sulphate of iron into rectified spirit, and stirring the mixture so that the salt shall separate in minute granular crystals.

Med. Prop. and Action. Blood-restorative, tonic, astringent, emmenagogue, anti-periodic, and anthelmintic. It is one of the stronger and most effective of the salts of iron. It is absorbed into the system, and has been detected in the blood and in the urine after a few doses; it also rapidly renders the fæces black. In large doses it gives rise to much gastric irritability, which may be partially obviated by combining it with ext. hyoscyami

[1] Med. Press, March 6, 1867.

vel conii. In excessive doses it is an irritant poison. Externally it is employed in lotions or washes (gr. j.-v.-x. ad Aq. ℥j.) The granulated sulphate is thought by some superior to the ordinary sulphate, inasmuch as it is less easily oxidized.

Dose:—Of the Sulphate or granulated Sulphate, gr. j.-gr. v. or more, in pill or solution, two or three times daily; *of the dried Sulphate*, gr. ½-gr. iij. or more.

978. *Therapeutic Uses. In Anæmia*, the sulphate is one of the most effective of the salts of iron. It may be given in the form of pill, with the extract of gentian; with a sedative, as conium; or with an aperient, as the compound rhubarb or aloes pill. It may also be given in solution with a little sulphuric acid, which adds to its efficacy, and assists to keep it in solution. Dr. Ashwell advises it in combination with hops, thus:—℞ Ferri Sulph. gr. j.-ij., Ext. Humuli gr. ij.-iij., ft. pil. ter in die sumend.

979. *In Palpitations in Anæmic states*, Dr. Abercrombie proposed the following pills, which Dr. Hope[1] says he has employed in a great number of cases, and that he has been seldom disappointed in their operation:—℞ Ferri Sulph., Aloes āā gr. ij., Pulv. Cinnam. gr. v., M. ft. pil. ij. These are to be taken at dinner-time, and repeated at night, if necessary.

980. *In Chlorosis*, the combination of sulphate of iron and aloes (as in last section) is often signally useful, the bowels being kept freely open at the same time by castor oil. *In Amenorrhœa and in Leucorrhœa*, it may be resorted to with every prospect of success.

981. *In Cancer of the Uterus*, Dr. Ashwell found a solution of the sulphate of iron (℥j.-℥jss., Aq. Oj.) beneficial in diminishing the quantity, odour, and acrimony of the discharge.

982. *In Piles attended with much Hæmorrhage*, and where the parts are not much inflamed, a solution (gr. ij., Aq. fl. oz. j.) of the sulphate daily injected is of great service. In hæmorrhoids, especially when ulcerated or when the constitution has become debilitated by the discharge, Dr. Cartwright[2] strongly recommends an ointment of the persulphate (gr. xxx.-lx., Ung. oz. j.) Injections containing the sulphate (gr. j.-ij., Aq. fl. oz. j.) prove very serviceable in *Prolapsus of the Rectum*. They should be used daily for a week or more.

983. *In Cardialgia, Gastrodynia, and in Ulceration of the Stomach*, the following formula of Dr. Abercrombie has been found very effectual:—℞ Ferri Sulph. gr. ij., Aloes gr. j.-ij., Pulv. Cinnam. gr. v., M., ft. pil. ij. ter in die sumend. The bowels should be carefully regulated at the same time. *In Convalescence from Gastric Ulcer*, Dr. Brinton (p. 177) advises a mixture containing the sulphate of iron and quinine kept in solution by a few drops of dilute sulphuric or hydrochloric

[1] Cyc. Pract. Med., vol. iii. p. 237. [2] Med. Times, Sept. 2, 1835.

acid ; should this disagree, he prescribes a pill of about gr. j. of each of these sulphates, with a small quantity of the extract of opium, or the compound styrax or soap pill. This will often be borne when the solution will not. *In Hypochondriasis*, Dr. Abercrombie's pills (*ante*) are an eligible form of administering iron when anæmia co-exists, or it may be combined with henbane or hop (sect. 978.) *In the Chronic Diarrhœa of Children*, Dr. West (p. 609) states that he has found the sulphate very useful. He prescribes it thus :—℞ Ferri Sulph. gr. iv., T. Opii ♏vj., Syr. Aurant ʒij., Aq. Carui ʒx., M. Dose, fl. drm. ij. every six hours for a child aged one year.

984. *In Enlargements of the Spleen*, the sulphate of iron is a remedy of great value. Cruveilhier[1] regards the salts of iron as a specific in *Hypertrophy of the Spleen*, or in *Chronic Splenitis*, and he states that, by their aid, he has obtained complete resolution of enlargements of the spleen, which have occupied half or even two-thirds of the abdomen. The sulphate may be given in doses of gr. vj.–x. daily, in combination with purgatives. It is the base of Shoolbred's Powder, which, for forty years, maintained a high character in India in these affections : —℞ Pulv. Jalapæ, P. Rhei, P. Calumbæ, Potas. Bitart. āā ʒj., Ferri Sulph. grs. xxx., M. ft. pulv. Dose, sufficient to open the bowels three or four times daily. I have seen the best effects follow a somewhat similar formula.

985. *In Intermittent Fevers*, the sulphate of iron was first employed by Dr. Marc,[2] in 1808 ; and so great was the success which attended its use, that M. Corvisart was appointed to inquire into the practice. His report was most favourable ; but, from some unexplained cause, it fell into disuse. I have employed it in between 100 and 200 cases of ordinary intermittents, quotidian, tertian, and quartan, such as occur in the Tenasserim provinces ; and, in upwards of two-thirds of the cases treated by it, a speedy and complete cure resulted. It also proved successful in some cases where quinine had previously failed. The dose employed varied from gr. viij. to x. daily, in divided doses, given during the intermissions. It was usually exhibited in the form of pill, with gr. j.–ij. of ext. hyoscyami ; or in solution, with infusion of quassia. It proved most successful in anæmic subjects, and in those with evident enlargement of the spleen. A low diet is necessary ; the bowels should be carefully regulated, and all acids and acidulous fruits avoided. The last point requires to be strictly attended to. It is a remedy of considerable power in these cases, and merits a further trial. It is inadmissible if much gastric irritability be present, or where the patient is stout

[1] Dict. de Méd. et de Chir., t. viii. 62.

[2] See Sedillot's Journ. Gén. de Medecine, t. xxxiv. and xxxxix., and Medico-Chir. Rev., Oct. 1833.

and plethoric, with a determination of blood to the head. In obstinate cases the quantity may be increased to gr. xx. daily, in divided doses.

986. *In Intermittent Hemicrania*, the internal use of the sulphate in doses of gr. viij.–x. daily, either alone or in combination with extract of hyoscyamus, is occasionally sufficient to effect a cure. In one very obstinate case, when quinine failed, it afforded immediate relief, in my practice.

987. *In Erysipelas*, Velpeau[1] employed the sulphate in solution (ʒj., Aq. Oj.) as an external application, in forty cases. In every instance, the active symptoms were subdued in from twenty-four to forty-eight hours. Erratic erysipelas, however, often resisted its action. He also employed an ointment (ʒij., Lard ʒj.) but it was not so efficacious as the solution.

988. *To Chancres, and Venereal Ulcers*, the sulphate very finely powdered, and sprinkled over the surface, has been employed, as a means of destroying the syphilitic character of the ulceration, and of establishing a healthy surface.

989. *In the Chronic stages of Hooping Cough*, or when the disease was of a purely nervous character, Dr. Stanger[2] found the sulphate very effectual.

990. Ferrum Tartaratum. Tartarated Iron. Ferri Potassio-Tartras. Potassio-Tartrate of Iron. Ferrum Tartarizatum. Tartarized Iron, a compound of peroxide of iron and potash with tartaric acid.

Med. Prop. and Action. Tonic and diuretic, anthelmintic in large doses. It is a mild and efficient salt with a very slight taste, and is well adapted for children. It may be prescribed with alkalies.

Dose, as a tonic and diuretic, gr. v.

991. *Therapeutic Uses. In Dropsy and Anasarca*, Dr. Darwell[3] states that he found this salt very efficacious, acting at the same time as a tonic and diuretic. It affords a great amount of relief, he adds, in those cases of anasarca which are connected with disturbed action of the heart, and in which it would be dangerous to give any stimulating tonic.

992. *In Chronic Diarrhœa attended with Anæmia*, Dr. E. Goodeve (i. p. 100) has found benefit from the following:—
℞ Ferri Tart. gr. v.–x., T. Opii ♏x.–xx., Aq. Cinnam. fʒx., M. ft. haust. ter in die.

993. *In Phagedenic Chancres*, Mr. Acton[4] relies on this salt, given internally in moderate and increasing doses. A solution is also applied to the sore. This treatment was first proposed by Ricord.

[1] Ann. de la Chirurg., February, 1842.
[2] Med. Chir. Trans., vol. i. p. 5.
[3] Cyc. Pract. Med., vol. i. p. 100.
[4] Dis. of the Urinary Organs, p. 410.

994. *In Phthisis*, it is recommended by Mr. J. K. Spender,[1] on the ground that it may be prescribed with alkalies, which are indicated by undue acidity of the stomach, the frequent concomitant of pulmonary consumption.

995. FERRI VINUM. Wine of Iron. Steel Wine. *Prep.* Macerate fine Iron Wire oz. j. in Sherry Oj., for thirty days, in a closed vessel, the iron being almost but not quite wholly immersed in the wine, agitate frequently, removing the stopper, and filter.

Med. Prop. and Action. A very useful, mild chalybeate, particularly adapted for children, and for those whose stomachs are irritable.

Dose, fl. drm. j.–fl. drs. iv.

996. *Therapeutic Uses. In Chlorosis, Anæmia, &c.*, occurring in young women of relaxed leucophlegmatic habits, steel wine is a popular remedy, and one which is occasionally productive of much benefit. Pil. aloes c. myrrh may advantageously be given at the same time, and generous living and outdoor exercise enjoined. *In Atonic Dysmenorrhœa*, the following formula, advised by Sir C. Locock,[2] is productive of great benefit; I have often employed it with manifest advantage:—℞ Vin. Ferri, Spt. Æther, Sulph. Co. āā f ʒj., Mist. Camph. fʒvj., sumat. ¼ part, 6tis horis.

997. *In Phthisis*, steel wine is favourably spoken of by Dr. Cotton;[3] he found it produce very good results, especially in children and young persons. He places much faith in its use, particularly when given with or immediately after meals.

998. *In Rickets*, it is, according to Sir W. Jenner the best form of administering iron. ℞ Vin. Ferri fʒj.–ʒij., Quiniæ Sulph. gr. j., Acid Sulph. dil. ♏j.–ij., M. This forms one of the best mixtures in such cases. It is especially useful when the skin is flabby, covered with perspiration, and when anæmia is well marked. (Dr. Aitken.)[4]

999. *In Eczema*, Mr. Milton[5] reports very highly of this and other preparations of iron, given in large and long-continued doses. It is chiefly adapted for cases occurring in adults, and when anæmia is present.

1000. FICUS. THE FIG. The dried fruit of Ficus Carica, *Linn. Nat. Ord.* Urticeæ. Imported from Smyrna.

Med. Prop. and Action. Gently laxative, but sometimes produces griping and flatulence. In the form of decoction (strained) it is demulcent. It is an ingredient in Confection of Senna (*q. v.*)

[1] Med. Times, Feb. 6, 1864.
[2] Cyc. Pract. Med., vol. i. p. 663.
[3] Lancet, Oct. 25, 1862.
[4] Reynolds's Syst. of Med., i. p. 808.
[5] On Dis. of the Skin, 1865.

1001. *Therapeutic Uses. In Pulmonary, Nephritic, and Calculous Affections*, a decoction of figs is a useful demulcent.

1002. *To Abscesses and Boils*, figs, boiled and split open, are occasionally used as cataplasms. The most ancient poultice on record is directed to be made of figs.[1]

1003. FILIX MAS. MALE FERN. The dried rhizome, with the bases of the foot stalks, and portions of the root fibres of Aspidium Filix mas, *Swartz* (Nephrodium Filix mas, *Richard*). Male Shield Fern. *Nat. Ord.* Filices. *Hab.* Europe, Asia, and N. Africa. Collected in the summer.

Med. Prop. and Action. Anthelmintic. It contains *a volatile oil*, *a resin*, and *a fixed oil*. The Ethereal Extract (Extractum Filicis Liquidum) is commonly known as the *Oil of Male Fern* (Oleum Filicis Maris.) It contains the volatile and fixed oil, and resin in solution. Male Fern appears to act specifically on tænia, or tape worms, as they are mostly discharged dead, after the medicine has been taken as directed below. Mr. Squire (p. 89) states that an extract of the unexpanded frond is equally effective with that of the rhizome.

Dose:—Of Powdered Rhizome, gr. lx.–gr. clxxx.; *of the Liquid Extract*, ℥xv.–xxx., in the form of electuary or emulsion.

1004. *Therapeutic Uses.* Against *Tape Worms*, the rhizome of the Aspidium was employed by the ancients; but it fell into disuse until about the middle of the eighteenth century, when Madame Nouffler obtained great celebrity by her nostrum, the base of which was found to be the rhizome of this fern. After the employment of an enema, she directed ʒiij. of the powdered root to be given, and two hours after, a bolus containing calomel gr. xij., scammony gr. xij., and gamboge gr. v. The practice was doubtless very efficacious. It is, at the present day, generally administered in the form of the liquid extract (Oil of Male Fern). Of this fl. drm. j. should be taken in the morning fasting, and should be followed by a dose of castor oil. It is one of the most effectual remedies we possess. The dry ethereal extract was employed by Brera and Ebers in doses of gr. xij.–gr. xxiv. at night, and repeated in the morning. In whatever form it is prescribed, it should be followed by a mild purgative. The worms are generally discharged dead, and it deservedly holds a high place in our list of tænicides. Dr. Fleming[2] considers that the oil should be given fasting, in a draught of milk, the favourite food of the parasite.

1005. *Hydatids.* Dr. Pavy[3] records an interesting case of *Hydatid Tumour of the Liver*, treated by injection into the cyst, after evacuating its contents, of a liquid containing ℥xxx. of the purified extract of male fern, ℥xxx. of liq. potassæ, and fl. drm. vj. of water, care being taken to prevent the entrance of

[1] 2 Kings, chap. xx. 7.
[2] Med. Times, Nov. 16, 1861.
[3] Lancet, Sept. 1, 1866.

air. Some febrile excitement, vomiting and purging followed, but no peritonitis. Recovery ensued. The inference drawn from this case is, "that the injection of the extract of male fern caused an immediate destruction of the life of the hydatid, without the production of suppuration, and that a rapid absorption of the fluid element of the cyst afterwards took place." It seems deserving of further trial.

1006. Fœniculi Fructus. Fennel Fruit. The fruit of Fœniculum dulce, *D. C. Nat. Ord.* Umbelliferæ. Imported chiefly from Malta.

Med. Prop. and Action. Stimulant, carminative. The distilled water (fl. oz. j.–ij.) and essential oil (mij.–v.) have been used in *Flatulence*, *Colic*, *Dyspepsia*, &c., but are now rarely employed. The ancients ascribed lactagogue properties to fennel seed, and that it really possesses this property is established by the researches of Dr. Routh;[1] he states that it is remarkable how materially it *increases the flow of milk*. In some respects it has advantages over castor oil leaves, to which Dr. Routh assigns the first place. Cazin[2] also bears testimony to its value, especially where the deficiency of milk is connected with atony of the stomach and gastralgia.

1007. Fraxini Folia. Ash Leaves. The Leaves of the Common Ash. Fraxinus excelsior, *Linn. Nat. Ord.* Oleaceæ. *Hab.* Europe.

Med. Prop. and Action. Astringent, tonic? Employed in this country chiefly in rheumatic and gouty affections, in the form of infusion (oz. j½.–oz. ij., ad Aq. O½.)

1008. *Therapeutic Uses. In Gout and Rheumatism*, attention was first called to the value of ash leaves by Dr. Delarue,[3] in 1852; and other French and German writers having testified to their value, they were tried in England, though with no very striking results. Dr. Garrod (i. p. 867) states that in *Chronic Gout* he has frequently used them with advantage; but he adds, "the amount of infusion taken each day has always been considerable, and the action of the diluent must not be forgotten." *In Chronic Rheumatic Gout*, its effects are very favourably spoken of by Dr. Fuller (p. 361). He employs an infusion of the leaves (oz. j½.–oz. ij., Aq. fl. oz. x.) variously combined. Its action is most manifest in persons already exhausted by the disease, when there is a disordered condition of the stomach, liver and bowels, profuse clammy perspiration, urine at one time scanty and turbid, at another abundant and pale. In such cases it appears to stimulate the whole secreting apparatus, and to give tone to the digestive organs; it invigorates the system, and checks the enfeebling sweats; and certainly, in some instances, is productive of effects which are sought in

[1] Med. Times, June 4, 1856, p. 575.
[2] Plant. Méd. Indig., p. 403.
[3] Journ. des Conn. Medico-Chir., Aug. 1852.

vain from quinine and other bitters. (Dr. Fuller.) Its modus operandi is very obscure.

1009. FUCUS VESICULOSUS, *Linn.* Sea Wrack. *Nat. Ord.* Algæ. When incinerated, it was formerly known as Vegetable Ethiops.

Med. Prop. and Action. Alterative-tonic, and deobstruent; particularly recommended externally and internally, in *Scrofulous Affections*, by Dr. R. Russell.[1] He states that he has substituted it for burnt sponge, and he thinks that "it far exceeds it in virtue." Any benefit which is derived from it is doubtless due to the small portion of iodine which forms one of its constituents. As a remedy for *Obesity*, the decoction, or, which is preferable, the extract of this seaweed (in doses of grs. xl.–lxxx. daily, in divided doses) has been highly praised by Dr. Duchesne-Duparc,[2] and its efficacy has been confirmed in his own person by Dr. Godefroy;[3] in a period of thirty-four days, under the use of the extract, in doses of grs. jvss., thrice daily, taken at the commencement of each meal, he lost nearly 3¼ lbs. in weight. Beyond its effect on the urine, which was rendered more abundant, high coloured, and odorous than before, he observed no physiological effect.

Dose, from gr. x.–gr. cxx. of the burnt Sea Wrack.

1010. GALBANUM. A gum-resin obtained from Ferula Galbaniflua, *Buhse. Nat. Ord.* Umbelliferæ. *Hab.* Persia. Imported from India and the Levant.

Med. Prop. and Action. Stimulant, anti-spasmodic, and expectorant. As an anti-spasmodic, it is inferior to assafœtida, and may be ranked between it and ammoniacum. It is regarded as emmenagogue, and may be advantageously combined with the salts of iron, in the treatment of *Amenorrhœa*. Externally applied in the form of plaster (Galbanum oz. j.; Ammoniac oz. j.; Yellow Wax oz. j.; Litharge Plaster oz. viij.) it is discutient and stimulant.

Dose:—Of Galbanum, gr. x.–gr. xx. in pill or emulsion. It forms an important ingredient in Pil. Assafœtidæ Co. (Pil. Galbani Co. L. Ph.), which is an eligible form of administration.

1011. *Therapeutic Uses. In Hysteria*, galbanum is often very beneficial. It is generally inferior in efficacy to assafœtida; but in some instances it agrees better, and produces an equal amount of benefit. A galbanum plaster applied over the sacrum is a measure which frequently affords relief. It is particularly useful in hysteria connected with disordered uterine action.

1012. *In Asthma*, galbanum is occasionally useful, in consequence of its expectorant properties; but it is inferior in efficacy to ammoniacum. It is also serviceable in *Chronic Catarrhs.*

1013. *Neuralgia dependent upon uterine derangement* has, according to the experience of Mr. Cussack,[4] often yielded to the following formula:—℞ Pil. Galb. Co. (L. Ph.) gr. iij.–vij., Pil. Hydrarg. gr. iij., M. ft. pil. alternis noct. sumend.

[1] On Sea Water, p. 133.
[2] Med. Times, April 10, 1862.
[3] Rev. de Thérap., Sep. 1862.
[4] Dublin Journ., vol. v. p. 22.

1014. *To Indolent Tumours of a non-malignant character*, galbanum plaster is sometimes applied, with the effect of diminishing their size, or altogether causing their absorption. This plaster proves useful to *Chronic Arthritic Enlargements*, when, in addition to support, it is desired to establish some degree of irritation.

1015. GALLA. Galls. Excrescences caused by the punctures and deposited ova of a hymenopterous insect (Diplolepis Gallæ tinctoriæ) on the twigs of the Gall Oak, Quercus infectoria, *Olivier*. *Source*, Asia Minor and Persia.

Med. Prop. and Action. Astringent. Their astringency depends upon the presence of tannic and gallic acids; of the former they contain 35, of the latter 5 per cent. They have, for many centuries, been held in high esteem in the East, in dysentery and ague. They are used as an antidote in *poisoning by Ipecacuanha, Emetine, the alkaloids generally*, and those vegetable productions whose activity depends upon an alkaloid, as *Opium, Aconite*, &c. They are also said to be an antidote in *poisoning by Tartar Emetic*, but this appears doubtful. They may be given in infusion (oz. j., Aq. Ferv. fl. oz. xij.) Externally they are used in the form of ointment.

Dose:—Of Powdered Galls, gr. x.–xx. *Of the Tincture* (Galls in coarse powder oz. ij½., Proof Spirit Oj.) fl. drm. ½–ij. Seldom used, except as a test. *Of the Decoction* (Galls bruised oz. j¼., water Oj.), fl. oz. j.–ij. Prep. for external use:—*Ung. Gallæ* (Galls in fine powder gr. lxxx., Benzoated Lard oz. j.) *Ung. Gallæ c. Opio* (Oint. of Galls oz. j., Powdered Opium gr. xxxij.)

1016. *Therapeutic Uses. In Chronic Diarrhœa*, galls may occasionally be given with advantage. Prof. Royle[1] states that he has frequently given powdered galls in doses of gr. x.–xx., several times a day, in the obstinate diarrhœas of the natives of India. *In the later stages of Dysentery*, Dr. Roots[2] employed the infusion of galls, in combination with opium, with marked benefit. Its nauseous taste is a great objection to its use.

1017. *In Leucorrhœa*, Mr. Walker, of the Lock Hospital, found great benefit from pulv. gallæ, in doses of gr. x.–xx., in decoction of tormentilla daily. *In Chronic Gonorrhœa and Gleet*, the internal use of galls (gr. xx.–gr. xxx. daily) has often a marked effect in checking the discharge. *In Atonic Menorrhagia*, decoction of galls, daily injected into the vagina, warm or cold, according to the feelings of the patient, is occasionally serviceable.

1018. *In Prolapsus Uteri vel Recti*, the daily use of an enema of decoction of galls proves serviceable in astringing the parts. *In Hæmorrhoids*, one of the most popular and efficacious external applications is Ung. Gallæ c. Opio. The Confect. Pip. Nig. may be advantageously given internally at the same time.

1019. *In Intermittent Fevers*, the employment of galls is of

[1] Mat. Med., p. 579. [2] Med.-Chir. Rev., July, 1846.

old date. Trials with this remedy in India, by Dr. C. Timins[1] and Dr. W. R. Cornish,[2] gave favourable results, but according to Dr. J. Macpherson,[3] an extensive trial with it in the Bengal dispensaries gave no good result generally, the reports conveying the impression that it was not equal to the common indigenous febrifuges. It appears to be only adapted to the mildest form of the disease, which generally yields to a purgative, followed by any mild astringent bitter, aided by a few days' residence in hospital. Dr. Timins prescribed gr. x.–xij., in infusion of chiretta. Dr. Cornish gave it either in powder, gr. xx.–xxx., three or four times daily; or in infusion (oz. ½, Aq. Oj.) in doses of fl. oz. j½.–iij.

1020. *In Relaxation of the Uvula, and Hypertrophy of the Tonsils*, an efficient astringent gargle is composed of gr. lx. of alum in fl. oz. vj. of infusion of galls.

1021. Gallic Acid. Acidum Gallicum. A crystalline acid prepared from galls. $H_3C_7H_3O_5.H_2O$.

Med. Prop. and Action. Powerful astringent, According to Dr. Bence Jones,[4] both gallic and tannic acids are strongly deoxidizing agents; so much so, that when in contact with alkalies, as in the blood, they are capable of taking oxygen even from the globules. This may serve, in a degree, to explain their action; they have probably no action on the nerves or muscles, exciting no contraction of the muscular structure. Gallic acid has a tendency to produce constipation, which may be obviated by an occasional aperient. It produces no sensible effect on the system, even in considerable doses. Its properties are very similar to those of tannic acid, but it is weaker, probably from its inferior solubility. Dr. Garrod, however, considers that, as a remote astringent, it is more effectual than an equal quantity of tannic acid, for the latter becomes converted in the blood into gallic acid and grape sugar, and hence, part only is available. It is said to be the active ingredient in Ruspini's styptic.

Dose, gr. ij.–gr. x. Prep. for external use:—*Glycerine of Gallic Acid* (Gallic Acid oz. j., Glycerine fl. oz. iv., mix thoroughly, place in a porcelain dish, and apply gentle heat, until complete solution is effected.)

1022. *Therapeutic Uses. In Hæmorrhagic Diseases*, gallic acid is a valuable remedy, but it is adapted only for chronic cases, or the advanced stage of acute cases, when inflammatory symptoms have been subdued. Its efficacy appears to be increased by combination with sulphuric acid, and it may often be advantageously conjoined with opium, digitalis, and other remedies of the same class. The following, advised by Dr. L. Earle, is a useful formula:—℞ Acid. Gallic. gr. xxx., Acid. Sulph. dil. f℥j., Liq. Opii Sed. ♏xxx., Infus. Rosæ Co. f℥vj., M. Cap. coch. mag. ij. 3 vel 4 quâque horâ. *In Hæmoptysis*, this mixture often acts beneficially; but in *Tubercular Hæmoptysis*, Dr. Symonds[5] considers larger doses necessary; thus, in severe cases,

[1] Madras Med. Reports, 1855.
[2] Indian Ann. of Med. Sci., 1857, p. 115.
[3] Ind. Ann. Med. Sci., 1856, p. 381.
[4] Med. Times, Sept., 1866.
[5] Brit. Med. Journ. June 13, 1868.

he prescribes gr. xx. every hour for twelve hours, and then at longer intervals. *In Hæmorrhage connected with Ulcer of the Stomach*, Dr. Brinton (p. 176) advises the following formula :— ℞ Acid. Gallic. gr. x., Acid. Sulph. dil. ♏x., Aq. f℥j., M. This is well adapted for other forms of *Chronic Hæmatemesis* and *Hæmaturia*. *In Atonic Menorrhagia*, its use is often attended with the best effects. Sir J. Y. Simpson gave it in doses of 10, 15, or 20 grains daily, and continued its use during the intervals as well as at the period of the discharge. Although doubtless a valuable astringent in these cases, it often, as Dr. Tilt observes, fails, especially when the hæmorrhage depends upon organic lesions. As a topical agent, it is inferior to tannic acid.

1023. *In Phthisis*, gallic acid with sulphuric acid (see last sect.) sometimes proves very effectual in checking the *Profuse Perspirations* and *Excessive Expectoration*. It likewise acts beneficially in checking *the Diarrhœa* of this disease.

1024. *Albuminuria*. Mr. Sampson[1] relates four cases in which the albuminous character of the urine was restored to a healthy standard by gallic acid, in doses of gr. x., thrice daily, or oftener. *In Scarlatinal Albuminuria*, it will sometimes succeed, when the perchloride of iron and other remedies have failed. When there is, at the same time, much hæmaturia, gallic acid, in sufficient doses, may be tried; but it should be discontinued if it does not bring about a decided improvement in four or five days (Dr. Gee.)[2]

1025. *In Dyspepsia* arising from a relaxed condition of the mucous membrane of the stomach, Mr. Sampson (op. cit.) derived great advantage from gallic acid. In *Pyrosis*, unaccompanied by organic disease of the stomach or by disease of the liver, the most marked benefit, according to Dr. Bayes,[3] will follow the use of gallic acid. *In Chronic Diarrhœa and Gastric Irritation in children*, Dr. Hillier (p. 386) furnishes the following excellent formula :—℞ Acid. Gallic. gr. xij., T. Cinnam. Co. ♏lxxx., T. Opii ♏viij., Aq. Carui ad ℥ij., M. Dose, two teaspoonfuls for a child aged two years. In these cases, Dr. West (p. 609) advises a very similar mixture, and states that he has used with good effect a combination of gallic acid and laudanum, in the form of enema.

1026. *In Gonorrhœa*, it was employed by Mr. Sampson, in a case of eight days' standing. The patient took a drachm in twenty-four hours, in doses of gr. xij. ; and in four days, the discharge changed from a thick consistence and yellow colour, to the smallest quantity of colourless gleet. We should expect much benefit from it in *Chronic cases and in Gleet*.

[1] Lancet, Dec. 1, 1849.
[2] Reynolds's Syst. Med., i. p. 357.
[3] Association Med. Journ., June 28, 1854.

GAMBOGE. See CAMBOGIA.

1027. GENTIANÆ RADIX. The root of Gentiana lutea, *Linn.* *Nat. Ord.* Gentianaceæ. *Source*, Mountainous districts of Southern and Central Europe.

Med. Prop. and Action. A pure bitter tonic. Its activity depends upon a bitter principle, *Gentianite*. It also contains a crystallizable principle, *Gentianin*. Gentian acts without causing astringency (indeed, it has occasionally a laxative effect); neither is it a stimulant; but, taken in moderate doses, it increases the tone of the digestion, improves the appetite, and strengthens the constitution. By long-continued use, it is said to communicate a bitter taste to the urine and cutaneous secretion. It has been asserted that it exercises a specific influence on the cerebro-spinal system, occasionally producing poisonous effects; but I have given it largely, in a great number of cases, for several years, and have never observed any ill effects result even from its long-continued use. It has been reputed vermifuge. Dr. Aveling[1] has proposed the use of gentian root in the manufacture of tents, in treating *partial occlusion of the cervix uteri*. He speaks of them as cheap, simple and efficacious.

Dose:—Of Gentian root in Powder, gr. x.–xxx.; an ineligible form of administration. *Of the Extract*, gr. ij.–x. *Of Gentian Mixture* (*Infus. Gentianæ Co.* B. Ph., 1864.) (Gentian root, oz. ¼, Bitter Orange-peel, Coriander fruit, āā gr. xxx., Proof Spirit fl. oz. ij., Cold Water fl. oz. viij.; macerate the solid ingredients in the spirit for two hours; add the water, macerate for another two hours and strain), fl. oz. j.–ij. *Of the Compound Infusion* (Gentian root, Bitter Orange-peel āā gr. lx., Fresh Lemon-peel oz. ½, Boiling Water fl. oz. viij.), fl. oz. j.–ij. *Of the Compound Tincture* (Gentian root oz. j½., Bitter Orange-peel oz. ¾, Cardamom seeds oz. ¼, Proof Spirit Oj.), fl. drm. ½–ij.

1028. *Therapeutic Uses. In Debility, and Diseases accompanied by Debility*, gentian is one of the most generally useful of the bitter tonics. It may be advantageously combined with the carbonate or aromatic spirit of ammonia.

1029. *In Atonic Dyspepsia, and in the Dyspepsia of Gouty subjects*, the tincture, given in some aromatic water, is very valuable as a stomachic and tonic. It may be advantageously combined with alkalies and sedatives.

1030. *In Intermittents*, it was favourably reported by Cullen.[2] He advises its being combined with equal parts of galls and tormentilla. It is now rarely employed. Dr. Chavasse,[3] of the French Navy, speaks highly of the powers of gentian as a *prophylactic in the Malarious Fevers of Guiana*. He considers that it neutralizes the miasmatic poison, if taken before any pathological manifestation of marsh fever is developed. For this purpose he gives the tincture in brandy twice daily. He remarks that the addition of the alcohol is important, for it excites the energies of the nervous system so as to make it accessible to the operation of the gentian.

[1] Med. Times, June 26, 1858.
[2] Mat. Med., vol. ii. p. 72.
[3] L'Union Méd., Jan. 21, 1860.

1031. GLONOIN. Nitro-Glycerin. A product obtained by treating Glycerin with equal parts of strong Nitric and Sulphuric Acids, successively added in small portions at a temperature kept below 32°. It is a yellowish oleaginous fluid, of a sweet, pungent taste, soluble in alcohol and ether, insoluble in water, slightly volatile and powerfully explosive. *Chem. Form.* $C_6H_6(2\ NO_4)O_6$.

Med. Prop. and Action. Attention was first called to this substance in 1858, by Mr. Field, who stated that in very small doses (one drop diluted with 100 of rectified spirit), he found it in his own person to produce very marked and peculiar effects. "As a direct sedative of the nervous system," he remarks, "without possessing any stimulating or permanently depressing qualities, without affecting secretion, together with its power of subduing muscular action, it appeared to become an invaluable agent in the treatment of a large class of nervous and spasmodic diseases." He adds, that he has not met with one well-defined case of *neuralgic or spasmodic disease* in which it has failed to afford relief; and he suggests that with such a remedy we may look forward hopefully to the treatment of *Tetanus*, *Hydrophobia*, and allied affections. The subsequent trials with it by Drs. Fuller and Harley, while they show that Mr. Field had certainly overrated the powers of glonoin, given in very small doses, leave little doubt that it is an agent of great power, capable in large doses of producing poisonous effects. Dr. J. B. Edwards[1] has shown that glonoin has two distinct physiological actions, which are modified by the dose and the duration of its action. The primary effect of a small dose is that of a stimulant, which passes off in the course of half an hour; whilst in large doses (20 drops, administered to a full-grown rabbit), it induces a set of symptoms resembling, in a marked degree, those produced by strychnia —tetanic convulsions, affecting violently the whole frame, contraction of the pupils, and exhaustion. It is evidently a remedy of great power, but its therapeutic applications remain to be determined.

1032. GLYCERINUM. Glycerine. A sweet principle, $C_3H_8O_3$, obtained from fats and fixed oils, and containing a small percentage of water. It is a colourless, thick, oily fluid, without odour; freely soluble in water or alcohol. Sp. gr. 1·25.

Med. Prop. and Action. Nutrient and emollient. It was originally discovered by Scheele, but was first introduced into practice by Mr. Startin,[2] of London, in 1845. He states that the addition of from ¼ to ½, or even to $\frac{1}{16}$ part of glycerine to any lotion, poultice, or external application, renders it particularly emollient and soothing; that it keeps the parts moistened and soft, and prevents the unpleasant odour of discharges. Its value as an external application depends chiefly on the fact that it does not evaporate or dry at an ordinary temperature. It possesses great powers as a solvent; hence its employment in the officinal glycerines of carbolic, gallic, and tannic acids, of borax, and starch (*q.v.*)

Dose, fl. drm. j.–ij.

1033. *Therapeutic Uses. Skin Diseases.* Mr. Startin[3] advises the annexed formulæ, in the following affections of the skin and other tissues:—For *Superficial Burns, Scalds, Excoriations,*

[1] Liverpool Med.-Chir. Journal, Jan. 1859.

[2] Med. Times, vol. xvi. p. 469.

[3] Op. cit., 1850.

Intertrigo, and Herpes Labiorum, ℞ Gum. Trag. Pur. ʒij.–ʒiv., Liq. Calcis fʒiv., Glycerini fʒj., Aq. Rosæ fʒiij., M., to form a soft jelly, to be used as ointment or embrocation. For *Chapped or Sore Nipples, Chapped Hands, Fissures of the Lips, and Pityriasis*, ℞ Sodæ Bibor. ʒ½–ʒj., Glycerini fʒ½, Aq. Rosæ fʒvij½., M. For *Prurigo, Lichen, Strophulus, Lepra, and Psoriasis*, ℞ Acid Nit. Dil. fʒ½–fʒj., Bismuth. Subnit. ʒ½, T. Digitalis fʒj., Glycerini fʒ½, Aq. Rosæ fʒvij½., M.; to be applied to the affected parts frequently. For *Alopecia, Baldness, Dryness of the Scalp, and the loss of Hair after debilitating diseases*, ℞ Spt. Ammon. Co. fʒj., Glycerini fʒ½, T. Cantharidis fʒj.–fʒij., Aq. Rosmar. fʒviij., M. Five parts of glycerine rubbed up in a mortar with four parts by weight of yolk of egg, forms a compound which has the consistence of honey, and is unctuous like fatty substances, but possessing the advantage of being easily removed by water. Applied to the skin, it forms a varnish which effectually prevents the action of air. These properties render it serviceable for *Broken Surfaces of all kinds, Erysipelas, and Sore Nipples, and for Cutaneous Affections*, the irritation of which it allays.[1]

1034. *In Small-pox, to prevent pitting and local disfigurement*, glycerine proves of great service by its emollient properties. After the pustules have discharged, and the discharge has begun to dry, a mixture of one part of glycerine and two parts of rose water, may be freely applied for a few days until the scabs begin to loosen. (Mr. Marson.)

1035. *In Chronic Uterine Affections*, Dr. Fürst,[2] of Franzenbad, recommends the local application of glycerine by means of the tampon. Cotton-wool boiled quite clean is tied up into a tampon with pack-thread, and is then moistened in hot water and wrung out, from fl. drm. ½–j. of glycerine is then placed upon it, and the tampon is introduced into the vagina at bed-time. Not only in *Hypertrophy of the Uterus*, but in *Endometritis* and *Vaginismus* he found it serviceable.

1036. *In Phthisis*, glycerine has been a good deal prescribed as a substitute for cod-liver oil, in cases where the latter nauseates. In some cases it has appeared to do good. It is frequently administered in combination with the syrup of the iodide of iron. Dr. Cotton,[3] however, states that he gave it a fair trial in twenty-three cases. He administered fl. drm. j.–ij., and even fl. drm. iij., twice daily, and from this experience he draws the following conclusions:—1. That it has generally little influence in phthisical cases; and 2. That it will bear no comparison with cod-liver oil.

1037. *In Croup*, Dr. Mayer[4] speaks favourably of the value

[1] Brit. Med. Journ., March 14, 1868.
[2] Practitioner, Nov. 1868.
[3] Med. Times, June 27, 1857.
[4] Amer. Journ. of Med. Science, April, 1858.

of glycerine locally applied to the glottis, as an adjunct to other treatment. Under its use there was manifest mitigation of the symptoms.

1038. *In Deafness*, the local use of glycerine has been strongly advocated by Dr. Turnbull[1] and Mr. T. Wakley.[2] It has no claims as a curative agent, but in certain cases where the auditory canal is dry and inelastic, and where the natural secretion is deficient, the introduction of a few drops of glycerine, either in a fluid form or on a piece of cotton, has the effect of improving the hearing. Its effects, however, are only temporary.

1039. GLYCYRRHIZÆ RADIX. LIQUORICE ROOT. The root or underground stem of Glycyrrhiza glabra, *Linn. Nat. Ord.* Leguminosæ. Cultivated in England.

Med. Prop. and Action. Demulcent, in the form of decoction (oz. jss. ad Aq. Oj.) or extract. It may be taken *ad libitum*. The extract (gr. x.–xxx.) is of considerable use in disguising the taste of hydrochlorate of ammonia, aloes, senna, and other nauseous medicines; and the powdered root is a common covering for pills. The root of the Abrus precatorius (*Goonch; Hab.* India) is an excellent substitute for it.

1040. *Therapeutic Uses. In Catarrhal Affections of the Throat, and in Coughs*, the extract, allowed slowly to dissolve in the mouth, allays the irritation, diminishes the cough, and protects inflamed surfaces.

1041. *In Strangury, Ardor Urinæ, and Diseases of the Bladder and Urinary Organs*, the decoction, combined with mucilage, forms an efficacious demulcent.

GRANATI RADIX. Pomegranate Root. See PUNICA GRANATUM.

1042. GUAIACI LIGNUM ET RESINA. The Wood and the Resin of Guaiacum officinale, *Linn. Nat. Ord.* Zygophylleæ. *Source*, West Indies and South America.

Med. Prop. and Action. Both the wood and resin are stimulant, diaphoretic, alterative, and tonic. The wood is best given in decoction (Guaiacum Wood oz. iij., Sassafras and Liquorice-root āā oz. j., Water Ox.) in doses of Oj–Oj. daily. The resin, the part most commonly employed, may be given in the form of mixture, but a better form is the Ammoniated Tincture. Guaiacum acts by augmenting the action of the cutaneous capillaries, thereby improving the state of the cuticular function. To obtain its diaphoretic effect, the surface of the body should be kept warm, tepid diluents should be drunk plentifully, care should be taken that the resin is in a state of minute division, and it should be combined with opium. If it fail to produce diaphoresis, it acts as a diuretic. In small medicinal doses, gr. x.–gr. xxx. of the resin, it causes a pleasant sensation of warmth in the stomach, and dryness of the mouth and fauces, and, by proper management, profuse diaphoresis. In larger doses it purges; the heat of the stomach and dryness of the mouth become intense, and, if

[1] Med. Gaz., June 1, 1849. [2] Lancet, Jan. 18, 1851.

continued, would produce gastro-intestinal inflammation. It appears to have great power in lessening excessive secretion from mucous surfaces.

Dose:—Of the Resin, gr. x.–xxx. in bolus or emulsion. *Of the Mixture* (Triturate Guaiacum Resin in powder oz. ½, Sugar oz. ½, Powder of Gum Acacia oz. ¼, and add Cinnamon Water Oj.), fl. oz. ½–ij. Each fluid ounce contains gr. xj. of the resin. *Of the Ammoniated Tincture* (Guaiacum resin powdered oz. iv., Aromat. Spirit of Ammonia Oj.), fl. drm. ½–j. in emulsion. The wood is an important ingredient in Decoct. Sarsæ Co.

1043. *Therapeutic Uses. In Amenorrhœa*, Dr. Dewees (pp. 122-125) placed more confidence in the ammoniated tincture than in any other remedy, and his testimony in its favour was very strong; but his statements of its value in these cases have not been confirmed by others who, like Dr. Meigs, have given it a fair trial. (Dr. Graily Hewitt, p. 457.) *In Dysmenorrhœa*, Dr. Dewees also strongly advocated the ammoniated tincture, and Dr. Rigby[1] states that where this affection partook of a rheumatic character, he derived great benefit from the use of guaiacum. In atonic cases, Dr. Graily Hewitt (p. 443) advises guaiacum to be given with magnesia (āā gr. x.) in powder every morning. He also states (p. 365) that he has found it useful in *Chronic Inflammation and Irritable States of the Uterus*, when there is an undue quantity of discharge present.

1044. *In Chronic Rheumatism*, guaiacum has, since the time of Dr. Dawson in 1781, maintained its character as a valuable remedy. Drs. Seymour, Graves, Elliotson, and others, have recorded strong opinions in its favour. The dose appears to have been a point of dispute, some, as Dr. Elliotson, prescribing the ammoniated tincture in ʒvj. doses three or four times daily, whilst others have not exceeded ʒj.–ʒj ½., or at the outside ʒij. for a dose. Dr. Fuller (p. 414), who speaks favourably of it, coincides with the latter class, and states that in these quantities it usually acts as a stimulating evacuant, increasing the action of the skin, kidneys, and bowels; should it produce diarrhœa, opium requires to be added to control its action. The mistura guaiaci is preferable, when the diffusible stimulant contained in the tincture is inadvisable. It may also be advantageously prescribed in the form of the "Chelsea Pensioner" (*v.* Sulphur). As a remedy *in Acute Rheumatism*, it is far less useful, being only applicable to sub-acute and lingering cases, in which the cutaneous action is sluggish; and even here discrimination is necessary in its use. In some forms of *Neuralgia*, when partaking of a rheumatic character, the ammoniated tincture (♏xx.–xl. every 4 hours) affords relief.

1045. *In Gout*, guaiacum has long enjoyed a high repute in Germany. Dr. Garrod (i. p. 862) states that he has used it extensively and with great advantage; he considers that it is

[1] On Dysmenorrhœa, Lond. 1844.

especially useful in the asthenic gout of old subjects, but that also to young patients it may be given with benefit. It may be administered for a long period without injury, some of Dr. Garrod's patients having taken it for a whole year.

1046. *In Cynanche Tonsillaris*, Mr. J. Bell[1] strongly recommends the internal use of guaiacum, in half drachm doses, suspended in mucilage, every six hours. He considers that, when timely administered, it will cut short the disease 99 times out of 100. Dr. F. P. Atkinson[2] has employed the following treatment with such success that he deems it a specific:— ℞ Potass. Bicarb. grs. xx., Pulv. Guaiaci gr. x. (vel T. Guaiaci ♏xxx.), Mucilag. q. s., Aq. fl. oz. j., M. To be taken in a state of effervescence with gr. xv. of citric acid, thrice daily. A gargle of T. Iodi, ♏xx. in oz. j. of water, to be used frequently, and three or four glasses of port wine and beef tea allowed freely. Dr. Walker,[3] who also regards guaiacum as "a specific" in ordinary sore throat, speaks highly of its efficacy in *Diphtheria*. He prescribes in all cases the following:— ℞ Tinct. Guaiaci Ammon. f℥½-f℥vj., Tinct. Cinchon. Co. f℥½, Potassæ Chlor. gr. lxxx., Mellis q. s., Aq. ad f℥viij., M. Dose, from a tea to a tablespoonful from one to four hours, or thrice daily, according to the severity of the case. In some cases a strong solution of nitrate of silver is applied locally at the same time.

1047. *In Syphilis*, guaiacum was formerly regarded as a specific. Dr. Pearson (p. 10) found that it possessed the power of arresting the progress of the disease, and of altogether removing some of the symptoms; but he adds that it has no power in eradicating the disease, which reappears in all its violence when the medicine is discontinued. In constitutional syphilis, its effects are much more marked than in the primary forms. *In Syphilitic Eruptions, and Nocturnal Pains in the Bones*, guaiacum, in the form of the ammoniated tincture, is often productive of unequivocal benefit.

1048. *In Granular Disease of the Kidneys*, Dr. Copland (ii. p. 656) regards the tincture, or decoction of guaiacum, as the best of all the class of diuretics, especially when the skin is cool as well as dry.

1049. *In Amaurosis*, it has been advised, but is only likely to prove serviceable when the disease is connected with rheumatism; or when it occurs in persons of a rheumatic diathesis.

1050. Hæmatoxyli Lignum. Logwood. The heart-wood of Hæmatoxylum campechianum, *Linn. Nat. Ord.* Leguminosæ. *Hab.* Central America and West Indies. Imported from Campeachy, Honduras, and Jamaica.

[1] Med. Gaz., vol. xxvii. p. 252.
[2] Practitioner, Feb. 1870.
[3] Brit. Med. Journ., Dec. 21, 1861.

Med. Prop. and Action. Astringent and tonic. It contains a crystalline substance, *Hæmatoxyline*, also *tannin*, and a resin. When given internally, it becomes absorbed into the system. The colouring principle has been detected in the urine twenty-five minutes after it has been swallowed. "The urine of patients taking logwood exhibits a pink colour when that fluid becomes alkaline from any cause; in strongly acid urine the colour may not be seen, but the addition of ammonia readily produces the coloration." (Garrod.)

Dose:—Of the Extract of Logwood, gr. x.–xxx. *Of the Decoction* (Logwood Chips oz. j., Cinnamon gr. lx., Water Oj.), fl. oz. j.–ij.

1051. *Therapeutic Uses. In Chronic Diarrhœa and Dysentery*, the decoction or the extract of logwood (the latter in doses of gr. x.–gr. xxx.) is productive of evident benefit. It not only acts as an astringent, but gives a tone to the digestive organs, and to the system generally. It is inadmissible as long as active inflammation exists. *In Chronic Diarrhœa, and in the Diarrhœa of Phthisis*, Dr. Pavy (p. 198) testifies to the value of the following:—℞ Mist. Cretæ ℥xij., Ext. Hæmatox. ʒij., Vin. Ipecac. ʒij., Vin. Opii ʒj., M., in doses of fl. oz. ½, twice or thrice daily, or oftener. It is a very useful formula. *In the Chronic Diarrhœa and Dysentery of Children*, it often answers well, and may be advantageously prescribed as advised by Dr. Hillier: ℞ Ext. Hæmatox. ʒij., T. Catechu ʒiij., Syrup ʒj., Aq. Cinnam. ad ℥iij., M. Dose, two teaspoonfuls for a child æt. three years.

1052. *In Leucorrhœa*, the decoction of logwood, given internally, and used as a vaginal injection, is occasionally of great service. Dr. Churchill[1] speaks favourably of it; in two or three cases in which he employed it, the discharge diminished, and the patients recovered. Previous to its use, he advises a blister over the sacrum.

1053. *In Cancer*, the extract has been advantageously employed by M. Desmartis;[2] he found an ointment of it (Ext. Hæm., Adipis, āā oz. ½) destroyed the offensive odour, and diminished the suppuration so long as it continued to be employed. In *Hospital Gangrene*, he found the same ointment act like a charm; and it also proved valuable in *Traumatic Erysipelas* of a severe character. It may be advantageously combined with the perchloride of iron and other styptics.

1054. Hemidesmi Radix. Hemidesmus Root. The dried root of Hemidesmus Indicus, *D.C. Nat. Ord.* Asclepiadeæ. *Hab.* Common throughout India.

Med. Prop. and Action. The root is alterative-tonic and diuretic, in doses of fl. oz. ij.–fl. oz. iv., of the infusion (oz. iv. ad Aq. Ferv Oij.) every four hours. Sir W. O'Shaughnessy states that his trials with it have been numerous and satisfactory. Its diuretic operation, he adds, is very remarkable; it acts also as a diaphoretic and tonic, and greatly increases the appetite. He considers its operation to be closely analogous to that of

[1] Diseases of Females, p. 135. [2] Med. Times, June 14, 1862.

sarsaparilla, but more decided; an opinion in which, after watching its operation in numerous instances, I fully concur. Its activity resides in a volatile oil and a crystalline principle, *Hemidesmine*.

Dose:—Of the Syrup (Hemidesmus Root bruised oz. iv., Sugar oz. xxviij., Water Oj.), fl. drm. j.–ij. This is the only formula given for its administration in B. Ph.; the Infusion (*ante*) is far preferable in every respect. The fresher the root, the greater is its efficacy. The old, odourless root is almost, if not wholly, inert.

1055. *Therapeutic Uses. In Chronic Rheumatic and Syphilitic Cases*, the infusion taken to the extent of from O½–Oj. daily, seems often to exercise a beneficial influence; it also forms an excellent vehicle for iodide of potassium. *In Chronic Skin Diseases*, the infusion taken warm, as in this state it acts more manifestly on the cutaneous secretion, is frequently of great service. *In the Cachexia of Children in India*, few medicines produce better results than a morning draught of a few ounces of a warm infusion of hemidesmus root, with the addition of milk and sugar, which renders it extremely like ordinary tea. In this way most children will take it readily. I have seen excellent results from it thus administered.

1056. HORDEUM DECORTICATUM. PEARL BARLEY. The husked seeds of common Barley, Hordeum distichon, *Linn.* Cultivated in Britain.

Med. Prop. and Action. Demulcent in the form of decoction (oz. ij., Water Ojss.) M. Themont[1] considers that this decoction acts powerfully on the kidneys, and that it may be advantageously employed when alkalies and stimulating diuretics are contra-indicated. Flavoured to the taste with sugar, lemon-juice, &c., it is an excellent refrigerant drink in *Febrile and Inflammatory attacks; in Gonorrhœa, to relieve the Ardor Urinæ;* and *in Calculous Affections.* It is gently laxative. As an article of diet, barley is of great importance, but it is less nutritious than many other grains.

1057. HYDRARGYRUM. Hg = 200. Mercury or Quicksilver. A metal which, in its pure (liquid) state, is apparently inert, large quantities of it having been taken without producing any physiological effects; but occasionally, when subjected to the action of the secretions of the stomach and intestines, it undergoes chemical changes, and acquires powerful medicinal properties. Workmen and others much exposed to the vapour of mercury, are subject to tremors and other affections of the nervous system, which not unfrequently prove fatal. When rubbed into the skin or administered internally, in a state of minute subdivision, it acts energetically on the system. It is of great importance in medicine, as the base of several valuable preparations.

1058. *Physiological Effects.* When taken in moderate doses, mercurial preparations increase the action of the various secreting glands and organs; stimulating some, the salivary glands for example, in an especial manner.

[1] Journ. de Pharm., Feb. 1845.

From their power of augmenting the secretions, they are variously denominated sialagogue, cholagogue, purgative, diuretic, &c. Some of these effects are probably due to their general action on the system removing morbid states which interfered with the due performance of the secreting functions of the organs, rather than to a direct effect on them. Mercury causes in the constitution, in some more than others, a great amount of irritability, making it more susceptible of all impressions. It quickens the pulse, increases its hardness, and occasions a kind of temporary fever, which, however, commonly diminishes when the patient has become habituated to the medicine. This irritation is chiefly observable when it is administered in small doses; in large ones it has been found to calm the system, and to act apparently as a direct sedative. If long continued, it produces a specific action on the salivary glands, commonly called salivation or ptyalism. For a long period it was a generally received opinion that mercury acted specifically on the liver, increasing in a marked degree the biliary secretion, and hence it ranked foremost in the list of cholagogues; but the recent researches of a committee appointed to examine into the subject, as expressed by Prof. Bennett,[1] are opposed to such a conclusion: indeed, the experiments made on dogs would tend to show that under the use of mercury the biliary secretion is considerably diminished. Its supposed *modus operandi* in affections of the liver is given below. Under its prolonged use the blood is impoverished, the patients become thin and pale, and Dr. Farre considers that it destroys the red blood-globules as effectually as they may be destroyed by venesection. Sir B. Brodie (p. 210) observes, that in many instances a course of mercury renders the urine alkaline; in some individuals, a single dose of calomel will produce the same effect. In numerous analyses of the urine of patients under the influence of mercury, Dr. Owen Rees[2] failed to detect a trace of albumen. The urine is generally increased in quantity. In the saliva of persons under the same circumstances, Simon found an increase of solid constituents; and, according to Dr. Bostock,[3] it is less viscid than in a healthy state, and contains a substance analogous to coagulated albumen. Mercurials produce the absorption of morbid fluids and materials of low organization, *e.g.*, the albuminous matters which are deposited in the tissues in syphilis. It is uncertain whether they produce this effect by directly stimulating the absorbents or by preventing fresh deposition. In large doses, some of the salts of mercury, particularly the bichloride, act as irritant poisons.

1059. *The occasional ill Effects of Mercury.* 1. *Griping and Purging.* This may be partially obviated by combining it with a sedative; or it may be necessary, if the stools become bloody and dysenteric, to discontinue it altogether. 2. *Sore Throat, Ulceration, or Mortification of the Tonsils,* accompanied with fever. In this case the medicine should be discontinued, and the ulcerated throat treated on general principles. 3. *Violent Salivation,* which not unfrequently terminates in mortification. 4. *A renewal of Salivation at a future period.* There are many cases of this on record. In one, related by Dr. Christison (p. 414), salivation reappeared at the end of four months, although no mercurial had been given in the interval. 5. *Eruptions of the Skin.* 6. *Erethismus Mercurialis,* which is characterized by a great depression of the vital powers, a sense of anxiety about the præcordia, irregular action of the heart, frequent sighing and faintness, which occasionally proves fatal. The medicine should be immediately discontinued, and the patient exposed to a healthy atmosphere, and tonics and liberal diet employed. 7. *Rheumatic Pains and Nodes,* resembling those produced by syphilis. 8. *Mercurial Palsy,* and other derangements of the nervous system. 9. A cachectic state of the constitution, known as *Cachexia Mercurialis.*

No certain rules can be laid down respecting the appearance of these ill effects: in some instances, they appear after a few moderate or small doses;

[1] Brit. Med. Journ., May 8, 1869.
[2] Med. Gaz., July, 1851.
[3] Med. Chir. Trans., vol. xiii.

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in others, it may be continued for months without any apparently ill effects. The appearance of any of them indicates the necessity of immediately relinquishing the use of the remedy. (See also next section.)

1060. *Remarks on the Use of Mercurial Preparations.* 1. From a peculiar idiosyncrasy, some persons are unable to take the smallest dose of mercury without its producing serious, and occasionally fatal consequences: for example, Dr. Christison (p. 408) quotes a case in which exfoliation of the jaw, and death, resulted from the external application of three drachms of mercurial ointment; and in another, the same effects were produced by two grains of calomel. Before commencing its use, therefore, the practitioner is bound to make strict inquiry whether, on any former occasion, it has disagreed. If such be the case, mercury in any form should be avoided.

2. The action of all mercurial preparations is promoted by a previous use of depletory measures.

3. The age, sex, temperament, and general health of the patient influence greatly the action of mercury. Children are salivated with great difficulty. Drs. Bennett, Clarke,[1] Evanson, and Maunsell,[2] state that they have never seen a child under two years of age, in whom unequivocal salivation was established. Aged persons are also extremely difficult to bring under the influence of mercury. Prof. Graves accounts for this circumstance in both cases (children and old persons) by the undeveloped state of the parotid glands in the former, and by their shrunken and atrophied state in the latter.

4. Persons in robust health are generally very slightly susceptible to the action of mercury; and the state of health in the same person at the time of taking the medicine greatly modifies its effects; thus, a woman who will resist its influence for a considerable period when in health, will be salivated by a single dose when suffering from anæmia.

5. Those who pursue their outdoor avocations, and at the same time live freely, are with great difficulty brought under its influence; and Dr. Macgregor states that it is almost impossible to salivate a person who smokes largely.

6. In some acute inflammations, particularly in that of the brain, and in suppurative inflammation of the liver, it is with great difficulty that ptyalism can be established.

7. The sanguine temperament is less susceptible to the action of mercury than the nervous and lymphatic.

8. An animal diet retards, and an antiphlogistic regimen assists, the development of mercurial action. Acids also interfere with it.

9. In order to insure the certain and rapid effects of mercury, the patient should carefully avoid exposure to great atmospherical changes. Exposure to wet should be particularly avoided.

10. The following valuable observations of Dr. Prout (p. 63) merit special attention. "The stimulating effects of mercury," he observes, "may be analogically illustrated by the stimulating effects of dram-drinking. As the stomach accustomed to ardent spirits will scarcely tolerate any weaker beverage, so the liver accustomed to the stimulus of mercury will hardly respond to any other influence. Those, therefore, who in early life have on all trivial occasions resorted to the powerful stimulus of mercury, are usually obliged, like early dram-drinkers, to persist in the baneful habit. The most superficial observer must have noticed that patients who habitually take calomel are more than ordinarily subject to biliary attacks, as they are termed, and that they will rarely yield to any other remedy. Nor is this its only fault; the habitual use of this remedy exerts positive mischief on the assimilating functions, and on the kidneys of some individuals." He adds: "I can truly say, that a large proportion of the most inveterate dyspeptic and urinary diseases which I have seen, have been distinctly referable to the abuse of mercury. It may be objected that many individuals begin the use of mercury early, and continue it with

[1] Lancet, 1843-44, p. 278. [2] On Diseases of Children, p. 108.

the same evident advantages to extreme old age. To this it is answered, that many persons commence the use of spirituous liquors at an early age, and continue to use them to extreme old age; but no one will say that such ought to become the rule. The same remark is strictly applicable to the abuse of mercury. *The object of these remarks is to impress on the reader the important fact, that when it has no real disease to combat, mercury is liable to give occasion to disease; and, consequently, to warn him against the indiscriminate use of this active remedy on trivial occasions, and in all diseases and constitutions.*

1061. *Mercury is either contra-indicated or injurious*—1, *in tubercular disease*, and in all diseases including syphilis, occurring in persons of a strongly marked scrofulous diathesis; 2. *in Phagedenic Ulceration;* 3, *in Gout and Arthritic Inflammation of the Eyes;* 4, *in Scurvy, and in persons of the Scorbutic diathesis:* Dr. Budd[1] asserts that even in syphilis occurring in persons of this habit, the employment of mercury is unsafe and injurious; 5, *in Inflammatory Dropsy*, Dr. Todd[2] cautions the practitioner against the use of mercury, regarding it not only as useless, but injurious; 6, *in Inflammation of the Bladder*, Sir B. Brodie (p. 108) says that mercury is certainly not beneficial, and is often injurious; 7, *in Diabetes*, Dr. Prout (p. 56) says that he has almost invariably seen it produce mischief; 8, *in Granular Disease of the Kidney*, it is condemned by Christison[3] and most subsequent writers. It should not be given in *Dropsy dependent on Granular Disease of the Kidneys*. As a rule it should not be administered when the urine is albuminous; 9, *in Ulceration of the Stomach*, its use is strongly condemned by Dr. Brinton (p. 179): he states that he has known even a single calomel purgative apparently undo all that months of sedulous treatment had been able to effect towards the relief of a gastric ulcer; 10, *in Enlargement of the Spleen;* and, 11, *in all Anæmic states from whatever cause arising*. On this subject the reader will do well to consult Dr. Habershon's work, "On the Injurious Effects of Mercury in the Treatment of Disease." (London, 8vo, 1860.)

1062. *Modes of Administration.* 1. *Internally.* The salt to be employed, and the particular dose, must be regulated by the severity or character of the disease to be treated: thus, in chronic or mild cases, the less active preparations of mercury, as hyd. c. cret., Plummer's pill, or small doses of blue pill, are indicated. Its alterative effect is also well obtained from minute doses of corrosive sublimate. In acute diseases, when its antiphlogistic powers are required, no salt is equal to calomel, in doses of gr. j.–ij. every three or four hours, combining it with opium to prevent its passing off by the bowels. Some practitioners, with a view of speedily affecting the system, have advised calomel in gr. xx. doses, repeated at long intervals; whilst others employ very minute doses, frequently repeated. Dr. Law,[4] of Dublin, states that gr. $\frac{1}{12}$ of calomel, repeated every hour, will produce salivation in from twenty-four to thirty-six hours, and the same effect may be produced by blue pill in equally minute doses; the whole quantity required never exceeding six grains. Mr. Clay,[5] of Manchester, advises this mode of administration; and in several instances I have in this manner induced soreness of the mouth in Hindoos, not more than two grains of calomel thus exhibited being requisite to establish soreness of the mouth and mercurial fetor of breath. When it is desired to induce speedy salivation, corrosive sublimate is neither the most manageable nor the most certain preparation. Mr. Clay states that for a period of twenty years he has pushed it to a great extent, both in adults and in children, and that he has never been able to produce decided ptyalism by its use. 2. *Inunction.* This is the most ancient mode of administering mercury; and when it is desired speedily to affect the constitution, it may be advantageously combined with the internal use of the same remedy. Sir B. Brodie (alluding to its use in syphilis) considers that it is the most certain and preferable mode; that it is less apt to gripe and

[1] Lib. of Med., vol. v.
[2] Med. Gaz., April 6, 1849.
[3] Lib. of Med., vol. iv. p. 292.
[4] Dublin Journ., Jan. 1839.
[5] Lancet, Aug. 21, 1841.

purge; and that it does not damage the constitution half as much as when taken by the mouth. To be effectual, it should be rubbed in before the fire, for three-quarters of an hour at first, and afterwards for a shorter time. The great objection to it is its uncleanliness. 3. *Fumigation.* "This," observes Sir B. Brodie, "is the least valuable mode of administering mercury. You may affect the system too much or too little, and you may be taken by surprise by the patient's gums becoming all at once excessively sore." Notwithstanding the unfavourable opinion expressed by so high an authority, fumigation with mercury has been much employed, and with the best effects, by recent writers on syphilis. Its value has been strongly advocated by Mr. Langston Parker, and the calomel vapour bath is considered by Mr. Lee one of the best methods of bringing the system, in cases of constitutional syphilis, under the influence of the metal. When it is desirable to employ fumigations, the patient should be placed in an apparatus like that used for sulphur baths, and instead of sulphur being thrown on a hot iron, the black oxide of mercury, gr. lx., or the sulphuret of mercury gr. xxx., or calomel gr. xx.–xxx., may be used. The patient may be very speedily affected, by allowing him to hold his head inside the bath for two or three minutes, so that he may inhale the mercurial vapour. Local mercurial fumigation is occasionally of great service. 4. *Subcutaneous Injection.* This mode in the treatment of syphilis originated with Dr. Lewin, of Berlin, and from trials with it, both on the Continent and in England, it is evident that mercury may be introduced into the system by this method with perfect safety; but with what degree of efficiency as a curative agent experience must decide. This question must at present be regarded as *sub judice.* Mr. T. J. Walker,[1] in cases of syphilis, employs a solution of gr. v. of the perchloride in 250 ℥ of water and 250 ℥ of glycerine: of this he injects ℥x. (gr. $\frac{1}{10}$ of the perchloride) every two or three days, in most cases, in various parts of the body, but most frequently over the abdomen; occasionally, in the cellular tissue of the arms or thighs. The injection always causes more or less pain, and usually, though not invariably, is followed by slight inflammation and exudation at the seat of puncture; the infiltration usually disappears in from three to six days. In one case it produced slight ulceration, but this was apparently accidental.

1063. *Therapeutic Uses. Syphilis.* For nearly three centuries, mercury has been regarded as a remedy of first-rate importance in the treatment of this disease; for a long period, indeed, it was regarded as a specific, and was consequently employed indiscriminately in every case which came under treatment. This injudicious practice was fully exposed by some of our military surgeons, including Hennen, Rose, Guthrie, &c., a few years since; and much has been written both for and against the mercurial treatment of syphilis. In France, for instance, M. Ricord has advocated the practice of giving a six months' course of a daily dose of mercury, followed by a three months' course of iodide of potassium, in cases of indurated chancre. On the other hand, so high an authority as Professor Syme states that the natural history of syphilis, where treated by hygiene and external applications without mercury, is that of a very slight disease; and the non-mercurial treatment has recently been strongly advocated by Dr. Hughes Bennett, Dr. Drysdale,[2] and others. Dr. Nevins (p. 426), writing in 1851, gave the following excellent summary

[1] Med. Journ., July 10, 1869. [2] Med. Times, March 26, 1864.

of the facts disclosed by the controversy, and no facts have been subsequently adduced to invalidate materially the correctness of his deductions :—

1. That every form of venereal disease *has been* and *may be* cured *without* the administration of mercury.

2. That, in some forms of syphilis, mercury is not only useless, but injurious, when given so as to affect the constitution.

3. That in those cases in which it is admissible, the good effects to be derived from it may be obtained from much smaller quantities than were formerly given.

4. That some of the symptoms and effects formerly attributed to this disease were due to the mercury itself.

5. That notwithstanding all the forms of syphilis *may* be cured without it, yet its judicious administration materially hastens the cure in many forms of the disease.

6. That the occurrence of secondary symptoms is much less liable to happen after the administration of this remedy, than if the disease has been cured without it.

7. That the liability to secondary symptoms is, in a great degree, dependent upon the length of time which the syphilitic virus has had for being absorbed into the system; and that therefore it becomes a point of primary importance to heal a venereal sore as quickly as possible; and as this can generally be sooner effected with mercury than without it, its employment on this ground is most advisable. (Tuckett.)

8. That in those venereal sores characterized by slowness of progress, and the deposition of albumen or lymph (commonly called hard chancres), the use of this remedy is most essential; whilst in those characterized by rapidity of progress, and the absence of any barrier by the effusion of lymph, or those in which there is a tendency to rapid ulceration, it is, on the contrary, less beneficial, if not positively injurious.

9. That in the venereal eruptions of a papular or scaly form, it is beneficial; whilst in those of an ulcerative character, as ecthyma or rupia, it is hurtful.

10. That its administration ought generally to be suspended when suppuration in a large bubo is taking place.

11. That the benefit derived from its use is not proportional to the amount of salivation induced; and that, except as an evidence of a constitutional effect, this result is undesirable.

In adopting the mercurial treatment of primary syphilis, two objects should be kept steadily in view. 1. To induce mercurial action gently; and 2, to continue its action sufficiently long. For the first purpose gr. v. of blue pill or gr. j. of calomel with gr. $\frac{1}{4}$–$\frac{1}{2}$ of opium may be given night and morning, and should the gums not give evidence of its action by the end of a week, the dose of the mercurial may be doubled. Should fumigation be employed, it may be used once daily.

Sponginess of the gums, with mercurial fetor of the breath, may be taken as an indication that the remedy has been carried to the required extent, and this condition it is desirable to maintain until the sore heals or the symptoms subside. This may occupy four or five weeks. No good, but rather injury, will result from carrying its use beyond this limit. Black-wash may be used at the same time as a local application. Inunction with mercurial ointment was at one time a favourite mode of treatment; it has the advantage of not deranging the bowels, but there is no evidence of its possessing any advantages to counterbalance its uncleanliness, which is a great objection to its use. If employed, ʒ½–ʒj. should be rubbed in daily into the inside of the thighs or axillas till it disappears. In certain cases great benefit may be expected from the hypodermic use of mercury (*ante*). For the *Syphilis of Infants*, Hyd. c. Cretâ is the most eligible form for internal use.

1064. *In Secondary Syphilis*, alterative doses of mercury, particularly of corrosive sublimate or of Plummer's pill, have been found highly serviceable; but it has been replaced in a great measure (especially where the osseous system is affected) by iodide of potassium, which produces all the good without the ill effects of mercury. The great value of both remedies appears to depend upon their property of promoting the absorption of the lowly organized albuminous material which is effused into the tissues in constitutional syphilis. Mr. Langston Parker[1] strongly advocates mercurial fumigation. The salts which he employs are the sulphuret, the oxide, and the black oxide, of which from ʒss.–ʒiv. may be used with safety. The fumigation should be continued for twenty or thirty minutes. The iodide of potassium or of iron, or corrosive sublimate, is given internally at the same time. He speaks highly of the efficacy of this treatment. Mr. H. Lee recommends calomel gr. xx. or more as the salt best adapted for the purpose (*ante*).

1065. *Cases of Syphilis in which Mercury is inadmissible.* 1. In old debilitated, broken-down constitutions. 2. In those strongly predisposed to scrofula or phthisis. 3. In persons labouring under scorbutic disease. 4. In those who drink much spirits, &c., habitually; in irregular livers, and in those whose avocations necessarily expose them to great atmospherical changes, particularly wet. 5. When there is considerable inflammation in the neighbourhood of a primary sore, the probability is that it will produce sloughing. (Brodie.)

The other Therapeutic Uses of Mercury will be more fully enumerated in the succeeding articles, particularly in the article Hydrargyri Subchloridum.

[1] On the Treatment of Secondary Syphilis, &c., London, 1850.

1066. HYDRARGYRUM AMMONIATUM. Ammoniated Mercury. NH_2Hg Cl. Hydrargyri Ammonio-Chloridum. Ammonio-Chloride of Mercury. Hydrargyri Precipitatum Album. White Precipitate. Prepared by the action of Solution of Ammonia on the Perchloride of Mercury in solution.

Med. Prop. and Action. It is said to be a powerful salt, death having resulted from its use; but it is never given internally. Externally, it is employed in the form of ointment (gr. lxij., ad Ung. oz. j.)

1067. *Therapeutic Uses. Skin Diseases. In Acne Indurata, Impetigo, Porrigo, Herpes, and in the dry stage of Eczema*, the white precipitate ointment is an efficacious application. *Ringworm*, when recent, occurring on the body or limbs, will sometimes yield to this ointment. It will rarely succeed on the hairy scalp. It is best used conjoined with sulphur, thus:—℞ Sulphur gr. xx., Hyd. Ammon. gr. xxx., Ung. Simpl. ℥j., M. To be applied twice daily for five or six days. This, in recent cases, will often effect a cure. (Dr. Hillier.) *In Sycosis or Mentagra*, its use is often attended with excellent effect; the parts should be bathed with black wash before each application. *In Herpes Zoster*, Dr. Corfe[1] states that this ointment subdues the pain and irritation in a remarkable manner. It should be applied two or three times a day. *In Lichen and Pityriasis Palmaris*, it is advised by Mr. E. Wilson (pp. 266, 295.) Ammoniated mercury dusted on the surface, or employed in the form of ointment, destroys *pediculi*.

1068. *In Ophthalmia Tarsi*, white precipitate ointment, applied to the margins of the eyelids at night, is sometimes of the greatest benefit.

1069. HYDRARGYRI BROMIDUM. BROMIDE OF MERCURY. SUB-BROMIDE OR PROTO-BROMIDE OF MERCURY.

HYDRARGYRI BI-BROMIDUM. BI-BROMIDE OF MERCURY, PER-BROMIDE OF MERCURY.

Med. Prop. and Action. These preparations have been brought prominently to the notice of the profession by Dr. Protheroe Smith,[2] who states that after five years' experience in their use he is impressed with their value as therapeutic agents. According to his experience the bromide acts more agreeably and effectually both as a cholagogue and purgative than calomel, without the depressing results so often observed to follow the exhibition of the latter salt. It seems to be useful in promoting the absorption of *Hypertrophied Glandular and other Morbid tissues* with less constitutional disturbance than the chlorides. It has been administered with apparent relief in cases of *Biliary Congestion of the Liver, in Chronic Hepatitis with Enlargement*, and in those *Skin Diseases* which yield best to mercury. He mentions also cases of large anomalous *Tumours of the Abdomen* which sensibly diminished, and in two instances wholly disappeared, under the use of these remedies, viz., the bromide in ½ gr. doses internally, and the

[1] Med. Times, vol. xviii. p. 304. [2] Brit. Med. Journ., Oct. 17, 1868.

bi-bromide in the form of ointment (grs. iv., Cold Cream oz. j.); also cases of *Uterine Tumefactions and Morbid Deposits around the Cervix Uteri* treated with pessaries of the bi-bromide, as well as with the ointment externally. These remedies appear well worthy of further trial.

Dose:—Of the Bromide grs. j.–ij. *Of the Bi-bromide* gr. $\frac{1}{16}$th–$\frac{1}{4}$th.

1070. HYDRARGYRI IODIDUM RUBRUM. Red Iodide of Mercury. HgI_2. Hydrargyri Biniodidum. Biniodide of Mercury. Obtained by the action of Perchloride of Mercury on Iodide of Potassium in solution.

Med. Prop. and Action. Alterative-tonic and stimulant, in doses of gr. $\frac{1}{16}$, gradually increased to $\frac{1}{4}$, in the form of pill or dissolved in alcohol. In its irritant properties it resembles corrosive sublimate. Its effects on the system are similar to those of the green iodide, but it is much more irritant in its action. In long-continued doses it produces salivation. It requires to be given with great caution, and to be discontinued if it cause much irritation. Left in contact with the skin, it causes inflammation; and when applied in the form of ointment (gr. xvj. ad Ung. oz. j.) to ulcerated surfaces, it occasions considerable pain.

Dose:—Gr. $\frac{1}{20}$–$\frac{1}{4}$, in the form of pill or in solution.

1071. *Therapeutic Uses. In Secondary and Constitutional Syphilis*, Dr. Octavius Royle[1] considers this the best form of mercury which can be used. He advises it in half-grain doses twice daily, with the extract of gentian, and administers at the same time fl. oz. j. of mist. guaiaci. He continues this till a decided impression is produced, and the gums become slightly sore. *In Syphilitic Eruptions of the Skin*, a weak ointment of this salt (gr. viij.–xij., Adipis oz. j.) is very efficacious; but the pain which it sometimes occasions is an objection to its use. *In Acne Syphilitica*, it is highly spoken of by Dr. Todd;[2] a cold douche vapour-bath being used at the same time.

1072. *In Bronchocele*, the red iodide is one of the best applications we possess. The great success which attended its use in India by Capt. Cunningham, of the 12th Cavalry, first attracted attention to it; and the evidence adduced by Dr. F. Mouat[3] established its claims beyond a doubt. It has since been used both in India and in Europe with great success. The strength originally proposed (℥ix., Ung. lb. iij.) has, however, been found far too powerful for ordinary use. It was directed to be rubbed in for ten minutes in the morning, and the patient to be exposed to the sun's rays as long as they could be endured. Dr. Frodsham[4] tried to substitute artificial heat for the sun's rays, but found it ineffectual. *In Elephantiasis Arabum*, it is favourably spoken of by Mr. F. Day,[5] of Cochin. He found the ointment (*ante*) far too strong, and substituted a weaker one (gr. j. ad Ung. ℥v.): even this

[1] Med. Times, vol. xviii. p. 169.
[2] Cyc. Pract. Med., vol. i. p. 23.
[3] Indian Ann. of Med. Sci., 1857, vol. iv. p. 436.
[4] Lancet, June 2, 1860.
[5] Madras Quart. Med. Journ., July 1860, p. 51.

causes at first slight irritative fever and augmentation of the size of the limb, but as these subside improvement soon becomes manifest. The strength of the ointment may be gradually increased. My own trials with Mr. Day's ointment in elephantiasis have been most satisfactory.

1073. *In other Cutaneous Diseases*, it also occasionally proves useful. Dr. Neligan found great benefit from it in *Pityriasis*. Rayer speaks highly of it in inveterate *Psoriasis*. In severe and obstinate cases of *Eczema*, when arsenic fails to effect a cure, Mr. Milton[1] speaks very favourably of the biniodide, and also of the bichloride, in doses of either salt gr. $\frac{1}{8}$-$\frac{1}{6}$ once, twice or thrice daily, according to the severity of the case, or the age of the patient. After a short course of these salts, arsenic may be resumed with the best prospect of success. It may be given combined with aromatics, sarsaparilla, &c. *In Lupus*, it is favourably spoken of as a local application by Mr. M'Whinnie.[2] The following is the formula he recommends: —℞ Hyd. Biniod. ʒj., Adipis ʒij., Emp. Opii ʒvj. The consequent swelling and pain are to be relieved by emollient poultices.

1074. *In Chronic Glandular Enlargements and other Tumours probably of strumous origin*, the ointment of the red iodide has been found of striking benefit by Dr. M. T. Sadler,[3] and others. Dr. Sadler has also found it useful in promoting the removal of *Gouty Deposits* in the neighbourhood of joints.

1075. *In Malarial Enlargements of the Liver and Spleen*, Dr. Maclean (i. p. 68) has obtained the best results from the application of the ointment employed in India for goître. (Sect. 1072). He strongly recommends its employment. He substitutes the heat of a fire for that of the sun. He never observed any mercurial symptoms follow its use. It seems well worthy of a fair trial.

1076. *In Chronic Rheumatic Gout* in syphilitic or gonorrhœal patients, Dr. Fuller (p. 367) states that he has found nothing more useful than this iodide in combination with bark, sarsaparilla, and a generous diet.

1077. *In Epilepsy*, Dr. Fuller[4] found the red iodide most serviceable, especially in cases where there was reason to suppose that the disease depended upon thickening of the dura mater. His formula is an extemporary one, formed by dissolving Potass. Iod. gr. v.–x. in Liq. Hydrargyri Bichloridi fʒj.-fʒij. Given thus in solution, it becomes readily absorbed, and speedily produces its specific effects. The exact dose of the above solution is not stated.

1078. *In obstinate cases of Ophthalmia Tarsi*, and in *Opacity of the Cornea*, a thin ointment (gr. ij., Cerate grs. xl., Oil gutt. xx.)

[1] On Skin Diseases, 1866.
[2] Med. Times, Oct. 20, 1855.
[3] Lancet, Dec. 12, 1863.
[4] Med. Times, Feb. 14, 1857.

is stated by Pereira to have been successfully employed. It should not be used until other remedies have failed.

1079. HYDRARGYRI IODIDUM VIRIDE. Green Iodide of Mercury. HgI. Called also the Iodide of Mercury. Obtained by triturating together Mercury and Iodine with the addition of a small portion of spirit.

Med. Prop. and Action. Alterative-tonic and stimulant. In long-continued doses it occasionally produces salivation, and, in large quantities, proves an irritant poison. Externally, it is applied in the form of ointment (oz. j., Wax oz. ij., Lard oz. vj.)

Dose, gr. j.–gr. iij., in the form of pill.

1080. *Therapeutic Uses. Syphilis.* In primary syphilitic sores occurring in strumous habits, and also in constitutional syphilis, the green iodide of mercury has been extensively and successfully employed. It is chiefly adapted for the tertiary forms of the disease, and for the removal of *Syphilitic Eruptions and Ulcerations.* It may be employed internally in the form of pill, and locally in ointment (gr. xx. ad Ung. oz. j.) Dr. Schedel[1] remarks, "Of its good effects too much cannot be said." It should be given internally and externally, but not to such an extent as to cause salivation; if this appear in the slightest degree, the medicine should be immediately discontinued. *In Syphilitic Ulcerations of the Throat*, Dr. Schedel recommends them to be slightly touched, two or three times a day, with a liniment composed of gr. xx. of the green iodide in oz. $\frac{1}{2}$ of honey.

1081. *Skin Diseases. In Lupus*, Dr. Houghton[2] states that he derived great benefit from this salt, the ulceration having, in some instances, healed with a rapidity quite foreign to its indolent nature. He administered it internally, in doses of gr. $\frac{1}{4}$–$\frac{1}{2}$, twice daily. *In Pityriasis, Eczema, Herpes, Impetigo, and other diseases of the Scalp*, occurring in children, Dr. Neligan derived great benefit from the following formula:—℞ Hyd. Iod. Vir. gr. $\frac{1}{2}$, Hyd. c. Cret. gr. ij., Pulv. Aromat. gr. ij., M. To a child of six years old this may be given every morning; or if not more than three years old, half the quantity may be given twice a week. It should not be given to infants. *In Rupia, Lepra, and Psoriasis*, it was successfully employed externally (gr. xij.–xx. ad Ung. ℥j.), by Biett; and in *Acne Rosacea, Mentagra, and Tuberculous diseases of the Skin*, by Rayer. Its internal administration greatly aids its external use. *In Bronchocele*, Porta[3] strongly advises an ointment composed of gr. v. of the green iodide in gr. xx. of lard. It is inferior to the red iodide.

[1] Lib. of Med., vol. i. p. 429.
[2] Cyc. Pract. Med., vol. iii. p. 180.
[3] Brit. and For. Med. Chir. Rev., Jan. 1851.

1082. *In Tic Douloureux and other Neuralgic Affections*, an ointment composed of gr. xl. of the green iodide and oz. j. of lard, is strongly recommended by Mr. J. Scott as a remedy of great efficacy.

1083. HYDRARGYRI NITRATIS LIQUOR ACIDUS. Acid Solution of Nitrate of Mercury. Nitrate of Mercury, HgO,NO_5, in solution in nitric acid. Prepared by dissolving Mercury oz. iv. in a mixture of Nitric Acid fl. oz. v., and of Distilled Water fl. oz. $1\frac{1}{2}$. The solution is to be boiled gently for fifteen minutes, cooled, and preserved in a stoppered bottle. Sp. gr. 2·246.

Med. Prop. and Action. Powerful caustic and escharotic; never employed internally. It should be applied to a space about 1 or $1\frac{1}{2}$ inch in diameter, by means of a brush; and lint, moistened with the solution, is then applied. An ulcerated surface thus dressed becomes immediately white; a kind of erysipelatous inflammation is set up in the surrounding parts; and in a few days a yellow scab gradually falls off. (Pereira.) The local application has been known to produce salivation.

1084. *Therapeutic Uses. In obstinate Skin Diseases*, it has been found a valuable escharotic. *In Lupus*, according to Mr. Milton,[1] it is a very valuable application. When its use is restricted to small surfaces, to tubercles, and to patches, in which the morbid action has been a good deal subdued, or which are healing too slowly, it is often of great service. The pain it causes, if properly used, is not great. It should first be brushed very lightly over the part, and the surface immediately after bathed with water. It requires to be repeated daily. Care should be taken to protect the surface from exposure to the air. *In Scrofulous and Syphilitic Sores, and in aggravated cases of Lepra and Psoriasis*, its local application has been attended with the best effects. It is too powerful an irritant for ordinary cases. Delpech employed it as a caustic to *primary Chancres*.

1085. *In Ulceration of the Cervix Uteri*, it has been employed as a caustic. Dr. J. Bennet[2] considers nitrate of silver preferable in mild cases, but in severe ones he speaks highly of the nitrate of mercury.

1086. HYDRARGYRI NITRATIS UNGUENTUM. Ointment of the Nitrate of Mercury. Citrine Ointment. A substitute for the Golden Eye Ointment. *Prep.* Dissolve 4 oz. by weight of Mercury in 8 fl. oz. of Nitric Acid with the aid of a gentle heat; add the solution to 15 oz. of Prepared Lard, and 32 fl. oz. of Olive Oil, previously melted together by a steam or water bath, and mix

[1] Journ. of Cutaneous Med., July, 1867.

[2] On Inflammation of the Neck of the Uterus, p. 145.

thoroughly. If the mixture do not froth up, the heat is to be increased until this occurs.

Med. Prop. and Action. A valuable stimulant application. It may be diluted to any degree.

1087. *Therapeutic Uses. Diseases of the Skin. In Lepra, Psoriasis, and other squamous skin diseases*, few local applications are more useful than this ointment. It has also been extensively employed in other affections of the skin, particularly in *Sycosis*, *Impetigo*, *Pemphigus*, and all *forms of Porrigo*, when unattended by inflammation. *In Eczema*, when it has reached the dry stage, Mr. Milton regards the dilute ointment as the most effectual remedy we possess. *In Ringworm*, the strong ointment, rubbed for some minutes over the affected surface, twice daily, is often effectual in removing the disease. *In Chloasma*, and also *in Favus*, it has been used with advantage. In these and other skin diseases, the use of the ointment should be preceded by emollient poultices, the strength of the ointment being regulated by the feelings of the patient, as it should never be employed so strong as to cause pain; alteratives should be administered, the bowels carefully regulated, and strict cleanliness enforced.

1088. *In Pruritus Scroti*, it is highly spoken of by Dr. Bowling (U.S.) He advised the parts to be sponged with vinegar previous to its application. By these simple means he states that for fifteen years he has not failed in a single case to effect a permanent cure. Dr. B. Squire[1] corroborates Dr. Bowling's statements regarding the dilute ointment as one of the very best remedies in cases of *Prurigo*.

1089. *To irritable Ulcers* the following ointment has been occasionally found useful:—℞ Ung. Hydrarg. Nit., Ung. Cetacei āā oz. ½, Pulv. Opii ʒj., M. ft. unguent. *To chapped Hands and Lips*, the dilute ointment is a valuable application.

1090. *In Ophthalmia Tarsi, Granular Conjunctivitis, &c.*, one of the most efficient applications is Ung. Hyd. Nit.; of which a small piece may be mixed with an equal weight of almond oil, and applied to the edges of the lids, at bedtime. The bowels and general health should be carefully attended to.

1091. Hydrargyri Oxidum Rubrum. Red Oxide of Mercury. HgO. Hydrargyri Nitrico-Oxidum. Nitric Oxide of Mercury (Pharm. Lond.), called also Red Precipitate; one of the most poisonous preparations of mercury.

Med. Prop. and Action. Stimulant and escharotic. It is never given internally, but is extensively used externally, in the form of ointment. This, well known as Red Precipitate Ointment, is prepared by melting together Yellow Wax oz. ¼ and Almond Oil oz. ¾, and when the mixture

[1] Med. Times, June 6, 1868.

is nearly cold, adding finely powdered Red Oxide of Mercury gr. lxij., and mixing thoroughly. It is a valuable application; but, applied to extensive ulcerated surfaces, occasionally causes ptyalism.

1092. *Therapeutic Uses. In Indolent Syphilitic Ulcerations*, the red precipitate ointment is an excellent dressing, stimulating the surface, improving the quality of the discharge, and apparently hastening the healing process. It should not be applied to too large a surface at once, or the salt may become absorbed into the system, and induce salivation. A case of this description happened in my practice. *To Flat Ulcers of the Rectum* which exist just within the anus, Mr. Coulson[1] advises the use of the following ointment:—℞ Hyd. Nit. Oxid. drm. j., Ung. oz. j., M. The bowels to be kept open.

1093. *In Pruritus Pudendi*, the late Dr. Rigby found an ointment composed of equal parts of this ointment and cod-liver oil very successful when other measures had failed. *In Eczema*, when it has reached the dry stage, Mr. E. Wilson places great faith in the red precipitate ointment. *In Favus*, he also speaks favourably of this ointment diluted with an equal weight of simple cerate. *Ringworm*, when occurring on the body or limbs, will sometimes yield to its local use when other remedies fail. The ointment has also been found occasionally useful as a dressing for the *Ulcerations of Rupia*, and of *Frambesia or Yaws*.

1094. *In Ophthalmia Tarsi, Chronic Conjunctivitis, and in some Chronic Affections of the Eye*, a small portion of the ointment smeared over the edges of the eyelids at bedtime is attended with great benefit. *In Purulent Ophthalmia*, according to Dr. De Condé,[2] it is often sufficient of itself to arrest the disease when employed early. He uses an ointment composed of four parts of red precipitate to fifteen of lard and fifteen of linseed oil. He regards it as the best remedy in the *Ophthalmia of New-born Infants*.

1095. *In Otorrhœa after Scarlet Fever*, M. Trousseau[3] strongly advises an application composed of twenty-five parts of the red oxide, five of almond oil, and five of lard. The external meatus is first washed out, and well dried, and the above introduced twice daily. Care should be taken to keep the tissues moist in the intervals with glycerine.

1096. Hydrargyri Perchloridum. Perchloride of Mercury. $HgCl_2$. Hydrargyri Corrosivum Sublimatum (B. Ph., 1864). Hydrargyri Bichloridum (Lond. Ph.) Corrosive Sublimate. Prepared by submitting to sublimation a mixture of sulphate of mercury, chloride of sodium, and black oxide of manganese.

[1] Lancet, Aug. 17, 1861.
[2] Ann. d'Oculistique, 1858, vol. xl.
[3] Journal de Méd. et de Chir., Oct. 1850.

Med. Prop. and Action. Alterative in doses of from gr. $\frac{1}{16}$ to $\frac{1}{8}$. In larger doses it causes much griping and purging; and, in large quantities, it is a powerful irritant poison. The smallest fatal dose is three grains, in the case of a child; the shortest period in which death followed is two hours. When swallowed, it produces corrosion of the stomach; and in whatever way it may obtain entrance into the body, it occasions irritation of that viscus, and of the rectum, inflammation of the lungs, and probably also of the heart, depressed arterial action, oppression of the functions of the brain, and inflammation of the salivary glands. (Christison.) In persons who have taken large quantities, it has been detected after death in the solids and fluids of the body. It appears to act powerfully upon the urinary organs, as in cases of poisoning by it, the urine is extremely scanty in quantity, and after death the urinary organs are generally highly inflamed, whilst the bladder is extremely contracted. It has been said to be more difficult to produce salivation by corrosive sublimate than by any other salt of mercury; indeed, Mr. Clay[1] states, that in an experience of twenty years, though he has pushed it to a great extent, both in adults and children, he has never been able to produce decided ptyalism by its use. Sir H. Holland,[2] however, speaks highly of its efficacy. He states that he has seen its influence in augmenting the secretions, procuring the absorption of morbid growths, altering the state of the skin in many cutaneous disorders, and changing the character of morbid actions generally, in cases where he believes no other medicine, or combination of medicines, would have equal effect. He considers that it is as safe as calomel. If it cause griping and purging, it should be combined with a small portion of opium.

Dose:—Of the Perchloride, gr. $\frac{1}{16}$–$\frac{1}{8}$. *Of the Solution* (Perchloride of Mercury, Chloride of Ammonium, āā gr. x., Dist. Water Oj.), fl. drm. ½–ij. Each fl. oz. j. contains gr. ½ of the salt. Prep. for external use only, *Yellow Mercurial Lotion*, *Yellow Wash* (Perchloride of Mercury gr. xviij., Solution of Lime, or Lime Water, fl. oz. x.)

It is contra-indicated—1, in persons labouring under or strongly predisposed to pulmonary disease, as it occasionally gives rise to great irritation of the lungs; 2, in inflammatory states of the kidneys and urinary organs.

1097. *Therapeutic Uses. In Secondary or Constitutional Syphilis*, corrosive sublimate was first recommended by Van Swieten; and was subsequently used on an extensive scale by Locher, of Vienna, who, in the course of eight years, cured 4,880 persons with this remedy. Prof. Graves speaks highly of it, and recommends gr. ⅛ to be taken twice daily, and about a scruple of mercurial ointment to be rubbed in every night. Under this treatment, he states that the disease was cured much more rapidly and effectually than if calomel, blue pill, or inunction alone, had been employed. A somewhat similar treatment has been successfully adopted by Biett, Dzondi, and others. One grain is divided into twenty-four pills; of these, one is given daily at first, and another is added every two or three days, until twenty-four or thirty-six are taken daily. In some apparently hopeless cases, this treatment effected a complete cure. The pills should not be given on an empty stomach, and their action should be carefully watched. *In Syphilitic Sore Throat*, when employed at an early stage, and in mild cases, Mr. Bacot found great benefit from the following

[1] Lancet, Aug. 21, 1841. [2] Medical Notes and Reflections.

gargle :—℞ Hyd. Perchlor. gr. j., Aq. f℥iv.–f℥vj., M. Its efficacy is increased by the addition of gutt. x.–xv. of diluted hydrochloric acid. *In Syphilitic Eruptions*, baths containing the perchloride (oz. ½, and hydrochlorate of ammonia oz. j. to each bath) are highly spoken of by Dr. Fricke.

1098. *In Gonorrhœa and Gleet*, injections of a solution of the perchloride (gr. ⅛–½, Aq. fl. oz. j.) often prove effectual. *In Leucorrhœa*, Dr. Dewees (p. 82) employed a solution of this salt (gr. ij., Aq. fl. oz.) as a vaginal injection, with great advantage. It should be used only once a day, for the first two or three days; and subsequently two or three times a day, until heat and irritation occur, when lotions containing acetate of lead will effect a cure. It is only applicable to chronic cases.

1099. *Diseases of the Eye. In Scrofulous Ophthalmia*, Dr. Hamilton,[1] of Dublin, found corrosive sublimate, in doses of from gr. $\frac{1}{16}$ to ⅛ in decoction of cinchona, twice daily, very beneficial. The regimen and the state of the digestive organs should, at the same time, be carefully attended to.

1100. *In Catarrhal Ophthalmia*, Dr. Mackenzie's collyrium is very efficacious :—℞ Hyd. Corros. Sub. gr. j., Ammon. Hydrochlor. gr. vj., Aq. f℥viij., M., to be applied tepid several times daily. This is preparatory to the use of a solution of the nitrate of silver (gr. iv., Aq. dest. fl. oz. j.,) which is dropped into the eye once a day, or oftener. *In the purulent Ophthalmia of Infants*, the former of these lotions is very serviceable.

1101. *Hemeralopia, or Night Blindness*, was successfully treated by Dr. Smith[2] with collyriums containing corrosive sublimate (gr. ij., Aq. fl. oz. j.) This was dropped into the eye twice daily; and, at the same time, a blister was kept open on each temple. The only other remedies employed were mild aperients.

1102. *Diseases of the Skin. In Obstinate Scabies*, a solution of this salt (gr. xx.–gr. xxx., Aq. Oj.) is an effectual application. The fear of its becoming absorbed into the system, and producing constitutional effects, is groundless. The same lotion is the best which can be employed to destroy pediculi, commonly called *Crab-lice*. *To allay the intense itching in Pruritus Pudendi, Pruritus Scroti, Urticaria, Prurigo, and other Skin Diseases*, Mr. Erasmus Wilson (p. 159) states that the lotion which he chiefly relies on is the following :—℞ Hydrarg. Corros. Sub. gr. v.–x., Spt. Rosmarini, Spt. Vini Rect. āā f℥j., Mist. Amygd. Amar. f℥vj., M. It is a very effectual formula. Mr. Milton's[3] formula is also highly spoken of :—℞ Hyd. Perchlor. gr. iv., Bismuthi Oxid. gr. xxx., Acid. Hydrocyan. dil. L. Ph. ♏xxx., Aq. Calcis.

[1] Dublin Journ., July, 1840.
[2] Edin. Med. Journ., lxxiv., p. 24.
[3] Med. Press, March 11, 1868.

ad fl. oz. viij., ft. lotio. To be applied warm twice or thrice daily. In *obstinate Eczema*, Mr. Wilson applies a saturated solution of the perchloride in proof spirit, by means of a camel-hair pencil, to the diseased part, with the view of setting up a new action on the surface. He has found a similar application useful *in Favus*. *In Acne Simplex*, *Acne Rosacea*, *Ephelis*, *and Porrigo*, the emulsion advised for pruritus (*ante*) is also recommended as a good local application. *In Psoriasis*, its internal exhibition in doses of $\frac{1}{16}$, combined with cinchona and sarsaparilla, is favourably spoken of by Sir Philip Crampton;[1] citrine ointment being applied locally at the same time. *To Onychia*, a strong solution has occasionally been locally applied with advantage, but it is inferior to liquor arsenicalis or tinct. iodi. *To Corns*, an alcoholic solution of this salt was recommended by Mr. Wardrop.[2] He directs the foot to be previously well soaked, and the corn pared down. One or two applications are said to be sufficient to complete the removal. *In Frambœsia*, *or Yaws*, the internal administration of corrosive sublimate, in doses of gr. $\frac{1}{10}$–$\frac{1}{2}$, is thought highly of by some West Indian practitioners; and, although it is occasionally productive of benefit, it appears to be very inferior to the iodide of potassium (Maxwell.) *To remove the Blueness of the Skin*, *occasioned by a prolonged use of the Nitrate of Silver*, Mr. Erasmus Wilson (p. 358) suggests the use of washes containing corrosive sublimate. It has been found useful also in removing the stains of *Chloasma*. *In Erysipelas*, Dr. Dewees states that a solution of this salt (gr. j., Aq. fl. oz. j.) is as effectual a local application as mercurial ointment. *In Erythema*, Dr. Bateman[3] prescribes a lotion composed of gr. x. of corrosive sublimate, in fl. oz. vj. of lime water.

1103. *In Hydrocephalus*, corrosive sublimate in doses of from gr. $\frac{1}{30}$ to $\frac{1}{16}$, has proved successful in the hands of Dr. Merriman and some others. It has the effect of producing copious olive-green stools, and an increase of the urinary secretion. Dr. Weisse relates one almost hopeless case, which yielded to $\frac{1}{12}$ of a grain every two hours. It appears to have no advantage over calomel (*q. v.*) *In the Threatenings of Apoplexy in old age*, comprising vertigo, confusion of ideas, and general embarrassment of the mental faculties, Dr. Headland[4] has found that half-drachm doses of the solution (Lond. Ph.) thrice daily, for three or four weeks, has a useful influence in removing these sensations.

1104. *In Dropsical Affections*, *arising from Disease of the Heart*, *Liver*, *or Lungs*, corrosive sublimate is occasionally very efficacious. Dr. Pereira (i. p. 963) states that, under its use,

[1] Med. Times, vol. xx. p. 234.
[2] Medico-Chir. Trans. vol. v. p. 140.
[3] Synopsis, op. cit., p. 167.
[4] Lancet, Jan. 6, 1866.

he has repeatedly seen dropsical symptoms disappear. He advises from ♏xxx.–lx. of the solution every six hours; and adds, that he has given it many days, and even weeks, without affecting the mouth.

1105. *In Hypertrophy of the Uterus*, Dr. Oldham[1] strongly advises the internal use of corrosive sublimate, in doses of ♏lx.–cxx. of the solution, two or three times daily, in combination with a vegetable tonic or chalybeate. It rarely salivates. The reduction of an indurated womb is generally slow, but under the persevering use of this remedy, he states that six or eight weeks will suffice to absorb and soften a considerable hypertrophy. Blistering the sacrum or inguinal regions greatly promotes the reduction. Dr. Graily Hewitt (p. 366) has employed this remedy with advantage in *Chronic Inflammation of the Uterus, attended with enlargement of the organ.* It should not be given in doses so as to salivate, and requires to be persevered in. He states (p. 557) that in small, long-continued doses, it also proves undoubtedly useful in the treatment of *Fibrous Tumours of the Uterus.* It need not exclude the employment of other means. For restraining *the Hæmorrhage dependent on the presence of fibrous or polypoid growths of the uterus*, the perchloride (gr. $\frac{1}{16}$ every six hours) sometimes succeeds, when other remedies fail. Dr. Tanner[2] relates such a case: it was the only remedy which had the effect of restraining the hæmorrhage, and the patient was more than once saved from death by its use.

1106. Hydrargyri Pilula. Mercurial Pill. Blue Pill. Prepared by rubbing together 2 oz. of Mercury and 3 oz. of Confection of Roses until metallic globules are no longer visible, then adding 1 oz. of Liquorice Root in fine powder, and mixing the whole well together.

Med. Prop. and Action. Alterative, in doses of gr. j.–ij.; purgative, in doses of gr. v.–x. It is one of the best forms for inducing salivation when it is not an object rapidly to affect the system; for this purpose gr. v. may be given every night and morning, combined with a small portion of opium, to prevent its passing off by the bowels. Combined with calomel, it is stated greatly to increase the activity of the latter. On the whole, it may be considered as one of the most generally useful forms of mercury for internal use.

Dose, gr. j.–gr. x.

1107. *Therapeutic Uses. In Bilious derangements, and Disorders of the Chylopoietic Viscera*, the practice of giving, almost indiscriminately, a blue pill (gr. v.) at night, and following it up in the morning by a senna draught, was adopted by the late Mr. Abernethy; and, however beneficial may be the results

[1] Guy's Hosp. Reports, Oct. 1843. [2] Obstet. Trans. iii. p. 13.

when judiciously administered, its indiscriminate and often-repeated use cannot be too strongly condemned.

1108. *In Dyspepsia*, attended with hepatic derangement, or where there is reason to suspect the duodenum to be the seat of disease, blue pill (gr. ij.–iv.) is occasionally productive of great benefit. It should not be given in such doses, or in such a manner, as to produce ptyalism; and it may be advantageously combined with ipecacuanha (gr. j.–ij.) and with a sedative.

For other Diseases, see Hydrargyri Subchloridum, for which it may be substituted when speedy salivation is not desired.

1109. HYDRARGYRI SUBCHLORIDUM. SUBCHLORIDE OF MERCURY. Hg. Cl. Hydrargyri Chloridum (Lond. Ph.) Calomelas (B. Ph., 1864.) Calomel.

Med. Prop. and Action. *Alterative*, in doses of gr. ½–j., either alone, or as it occurs in Plummer's Pill. *Purgative*, gr. ij.–vj., in combination with jalap, scammony, and other purgatives. When it is wished to bring the system under the specific influence of mercury, the dose is gr. j.–gr. ij. or more, frequently repeated, with a small portion of opium to prevent its passing off by the bowels. It is said to have a sedative action in doses of gr. xx.–gr. lx. It is best given in the form of pill, with some inert confection. Externally it is applied in the form of ointment, or as a lotion, with lime water (*vulgo* black wash), or in the form of powder. It is likewise used in the form of fumigation (*ante*). Calomel is the best salt of mercury for rapidly and certainly bringing the system under the influence of the metal, and is consequently preferable in all acute inflammations. Its *modus operandi* is imperfectly understood; a small dose evidently increases the activity of the liver and biliary organs, as is shown by the character of the stools which are produced by it: in doses of gr. xx. in acute dysentery its sedative action is often very evident, and the benefit which arises from it in croup and other affections of the throat, has led to the belief that it acts specifically upon the lining membrane of the trachea and larynx; no less certain and evident is its action on the salivary glands. In some idiosyncrasies it produces most serious effects.

Dose of Calomel:—As a purgative, gr. ij.–gr. x.; to produce mercurial specific effects, gr. j.–ij., or more, frequently repeated. *Of the Compound Pill—Plummer's Pill*, (Subchloride of Mercury, Sulphurated Antimony, āā oz. j., Guaiacum Resin in powder oz. ij. Castor Oil fl. oz. j. or q.s.), gr. v.–x. —Prep. for external use only: *Ointment* (Subchloride of Mercury gr. lxxx., Lard oz. j.); *Black Mercurial Lotion—Black Wash* (Subchloride of Mercury gr. xxx., Sol. of Lime or Lime Water fl. oz. x.)

1110. *Therapeutic Uses. Acute Inflammation.* Amongst the revolutions in modern medical opinion, few, if any, are more conspicuous than that which relates to calomel, not only as a cholagogue, which is noticed elsewhere, but as an antiphlogistic possessed of special powers in controlling and subduing inflammation, especially of serous membranes. For upwards of half a century after its claims, in combination with opium, were prominently set forth by Dr. Hamilton, of Lynn Regis, in 1783, it maintained the highest repute, which is the more extraordinary from the circumstance that it was employed

almost indiscriminately in almost all diseases of an inflammatory type. With the change which has come over our views as to the nature of inflammation, mentioned in considering tartar emetic, has ensued a change in practice, and calomel has fallen from its high estate, and there is now a danger of this remedy, possessed beyond a doubt, of powerful virtues, falling into undeserved neglect. Its *modus operandi* in inflammation was always confessedly obscure. By some it was considered to act solely on the blood, in which it effected such a change as to incapacitate it from effusing lymph, and thus virtually put an end to the inflammatory process; by others, it was considered to operate by its power of increasing the secretions, and thus to act as a derivative; by others, to induce a direct constringing action on the capillary circulation. By each or all of these methods it was considered to control inflammatory action, and the occurrence of salivation was looked upon as the criterion that the system had become properly and thoroughly affected, that the inflammation for which it had been prescribed was subdued, and that recovery might be confidently anticipated. At the present day, these views have well-nigh been abandoned; the power of calomel to control simple inflammatory action is doubted or denied by many, and recovery following as a sequence of salivation is regarded as a fallacy; the explanation offered of the frequent co-occurrence of salivation and amendment of symptoms or recovery in inflammatory cases being that the inflammation, which is confessedly a morbid state, yielding either to the power of *vis medicatrix naturæ*, or to remedial measures, the obstacles offered to the development of mercurial action being removed, salivation follows as a matter of course. Although calomel has ceased, and very properly so, to be resorted to in all cases of inflammation, even in that of serous membranes, there are forms of inflammatory disease—*e.g.*, iritis and retinitis—in which it is productive of the best effects, even in the acute stages, and there can be little doubt that it possesses the power of promoting the absorption of the products of inflammatory action.

1111. *Fevers. In Typhus and Typhoid Fever*, mercury was at one time much employed, but has fallen into disuse. With reference to the former fever, Dr. Murchison (p. 264) states that he has seen many cases treated with it, but never with the slightest benefit. It has, he adds, been shown by Graves, that ptyalism not only fails to relieve the symptoms or shorten the progress of typhus, but that it does not protect the system from being attacked. *In Typhoid (Enteric) Fever*, Dr. Murchison (p. 569) also states that, though mercury has been strongly recommended, he, in his own experience, has found it both useless and injurious. In the early stages of these fevers, and also in *Relapsing Fever*, if jaundice or other hepatic complication

exist, a calomel purgative may be admissible, but in all cases the greatest caution in its use is requisite, and in the enteric form it is apt to act too powerfully as an irritant.

1112. *In Intermittent Fevers*, mercury is wholly uncalled for, except as a purgative to remove fæcal accumulations or hepatic congestion, when these conditions exist. It has sometimes been observed, when quinia fails to make any impression on the fever, that after the operation of a brisk mercurial purgative, such as is advised in the following section, its effects are speedily manifested. When splenic enlargement co-exists, mercury even as a purgative is inadmissible. *In the obstinate Intermittents of Childhood*, in tropical regions, I have used with the best effects a combination of hydrargyrum c. cretâ, quinia, and rhubarb.

1113. *In Remittents*, the calomel treatment introduced by Dr. James Johnson, and advocated by Annesley, Twining, &c., has fallen into almost total disuse as a cure, having been superseded by the safer and more effectual agent quinia (*q.v.*) In these cases, however, it is advisable that the bowels should be cleared out as soon as possible; for this purpose, gr. iij.–v. of calomel, extract of colocynth, and scammony, should be given with a few drops of any aromatic oil. Dr. Maclean, who advises this combination, states that he has found it very effectual, rarely, if ever, causing griping or nausea; and as it apparently acts upon the whole tract of the intestine, it seldom requires a nauseous draught to aid its operation. Amongst those whose testimony is most condemnatory of the mercurial treatment of these fevers is Dr. Morehead, whose remarks are well deserving of careful consideration. (See also QUINLÆ SULPHAS.)

1114. *In Bilious Remittent or Yellow Fever*, mercury has had many advocates, whilst others regard it as useless, if not injurious. It cannot be denied that mercury, like all other remedial agents, often fails to produce any impression on the disease, which, in spite of the establishment of salivation (which, however, it is extremely difficult to induce), too frequently progresses to a fatal termination. Still we have no reliable data to prove the greater success of the non-mercurial process of treatment. Amidst the doubts which surround the subject, there is much force in the advice of Stillé (ii. p. 702): "The part of prudence is probably to abstain from mercurialization in yellow fever as a general rule." Quinia, chloroform, or chlorodyne (advocated by Dr. Aitken), lime-water, and chlorate of potash, seem more promising medicines.

1115. *In Puerperal Fever*, the treatment by mercurialization, formerly in vogue, has been partially or altogether abandoned for a more rational mode of cure. The objects to be attained are—1, by neutralizing or removing the noxious fluids from the

interior of the uterus, by means of free tepid injections of solutions of permanganate of potash, iodine, or other antiseptics; 2, by counteracting or neutralizing the *materies morbi* in the system by the exhibition of sulphites, *e.g.*, gr. xx.-xxx. of the sulphite of magnesia or lime every two or three hours; and 3, by supporting the system by nutritious food and the judicious use of stimulants. It appears certain, that of all preventive measures none is more effectual than promoting contraction of the uterus, and the early use of intra-uterine injections for the removal of coagula, &c. For further remarks, consult Dr. Snow Beck's paper on this subject.[1] *In Pelvic Peritonitis*, Dr. L. Aitken[2] states that he has never seen any benefit accrue from mercury in any shape or form; "but to those," he adds, "who are wedded to the notion that its action is necessary for the resolution of a serous inflammation, it has been suggested that the best form in which it could be given would be that of medicated pessary or suppository."

1116. *Diseases of the Heart.* The heroic treatment of *Cardiac Inflammation*, advocated by Drs. Latham, Hope, and others, consisting of venesection and rapid and full mercurialization, has been superseded by milder, and it is believed more effectual means. With regard to mercury, Dr. Waters (p. 325) expresses his belief that *in Pericarditis* it is rarely, if ever, desirable to employ it, except occasionally as a purgative; that it has no special power of controlling inflammation; and that by giving it to the extent of producing salivation the patient's strength is reduced, and the danger of a fatal issue increased. There may be, he adds, exceptional cases in which it should be used, but not in such cases as are generally met with. The measures he relies on, in the place of the mercurial treatment, are opium, bicarbonate of potash, the moderate and cautious use of stimulants, large linseed poultices to the chest, and blisters in the advanced stages. Throughout the disease, he allows nourishment, beef-tea, milk, &c., and solid food as soon as the state of the appetite enables the patient to take it. He states that in none of his cases has he taken blood by venesection, and rarely found it necessary either to cup or leech; the relief afforded by local depletion being obtainable by the administration of opium. *In Rheumatic Inflammation of the Heart, occurring in young, robust subjects*, Dr. Fuller (p. 228), however, lays great stress on the value of mercury carried to the extent of slight salivation; but he directs it to be given combined with opium, and it is an open question whether the benefit he observed in his cases was not due to the latter drug, and whether they would not equally have recovered had the mercurial been omitted. He does not advo-

[1] Proceed. of Obstet. Soc., Feb. 1, 1855. [2] Ed. Med. Jour. April, 1870.

cate its use in persons of a weakly, irritable, and unhealthy constitution.

1117. *Diseases of the Lungs. In Pleuritis*, mercury is still employed by some, but Dr. Waters (pp. 217, 226), in common with the majority of modern practitioners, has abandoned all confidence in it as a remedial agent, or in its powers to produce absorption of pleuritic effusions; indeed, he considers that, if given to any extent, it produces in most cases positive harm. Given occasionally as a purgative, it proves serviceable, and this is about the limit of its utility. Its use, even in this way, is contra-indicated, if the pleurisy is connected with Bright's disease, or other organic disease of the kidneys.

1118. *In Pneumonia*, calomel, either with antimony or opium, was formerly regarded as indispensable, but it has of late years fallen into comparative disuse. Dr. Waters (p. 49) considers that too high a value was placed on mercury as a remedy in the stage of hepatization, for which it was considered peculiarly applicable, and that in these cases it possesses no special properties for promoting absorption of the effused matters. As a purgative, he remarks, mercury is very useful, as it tends to relieve the portal system, often overloaded in pneumonic inflammation; but if given in frequent doses, or with the view of producing salivation, he believes that its effects, except in a few exceptional cases, will generally be more or less prejudicial. In his own 44 cases, of which only 1 proved fatal, it was given once only, and he adds his belief that the progress of recovery was in nowise hastened by its administration. For Dr. Waters' treatment of these cases, see sect. 195. *In the Pneumonia of Children*, Dr. Hillier (p. 32) considers that calomel is not to be recommended except as an occasional aperient.

1119. *Diseases of the Throat. In Croup*, mercury is a remedy of great value. Some mild cases may yield to antimony (sect. 196) without its aid, but in the severer forms it should be had recourse to without delay, and persevered in till amendment occurs. On this point Dr. W. Squire (i. p. 263) observes, "Calomel should be given from the first, and repeated frequently in small doses, interrupted occasionally for the administration of an emetic. Gr. $\frac{1}{2}$–gr. j. of calomel, with gr. $\frac{1}{8}$–$\frac{1}{4}$ of ipecacuanha, according to the age of the patient, is to be prescribed every two hours; if the bowels become disturbed, it can be persisted with in diminished doses until its characteristic effect on their secretions is obvious, nor is it then to be entirely discontinued." It is not to be used to the exclusion of local and other general measures, especially the use of a hot (70°–75°) moist atmosphere.

1120. *In Diphtheria*, calomel, according to Dr. Hillier, has a decided effect in checking plastic exudation. By many it is

discarded as useless or injurious; but in 13 of the worst cases in which it was exhibited by Dr. Hillier (p. 146), recovery took place in 7. It is not advisable in all cases indiscriminately, its use being limited to children of moderately good constitutions, and in cases in which the exudation is firm and thick, or causing laryngeal obstruction, with sthenic symptoms. He prescribes it in doses of gr. ½–gr. j., every two or three hours, with or without Dover's powder (gr. j.) or ipecacuanha (gr. j.), until the bowels become relaxed with greenish stools. At the same time he gives abundant fluid nourishment and sometimes wine; and he adds, he has been surprised at finding that patients thus treated have made as good, if not a better recovery, than those who had been treated with tonics, or salines, and chlorate of potash. In a few cases, when calomel caused diarrhœa, and the false membrane was very tenacious, and the pulse good, he used a flannel belt, smeared with mercurial ointment, round the abdomen; not that, he adds, he has much confidence in the benefits to be obtained from it.

1121. *Diseases of the Head. In Simple Meningitis*, mercury, apart from its purgative effects, is a most valuable remedy. It should be administered in small and frequently repeated doses, so as to bring the system under its influence quickly, and this is best effected by combining with its internal administration the use of mercurial inunctions in the groin and axilla. (Dr. Ramskill, ii. p. 367.) Dr. Russell Reynolds (ii. p. 433), however, states that in *Cerebritis* he has never seen any good results from mercury given by the mouth or by inunction.

1122. *In Insanity*, mercury, once so highly thought of, is now abandoned. "If mercury be ever useful, and not mischievous, in the treatment of insanity," observes Dr. Maudsley (ii. p. 61), "it is when given in small doses of the bichloride in cases that are becoming chronic, or where there is a suspicion of syphilis. To administer mercury systematically in *general paralysis*, as has been done, is as unaccountable in theory as it undoubtedly is pernicious in practice." *In Acute Mania*, Van der Kolk (p. 105) states that he has not employed calomel as a rule, and that he has sometimes seen salivation attended by an increase of cerebral congestion. "The less favourable action of this medicine induces besides a cachectic condition, and a sinking of the patient."

1123. *In Acute Hydrocephalus or Tubercular Meningitis*, the mercurial treatment, once so much in vogue, is now deemed useless, or injurious; but in *Chronic Hydrocephalus*, it still holds a high place in the opinion of many. The plan recommended by Prof. Gölis, of Vienna, is regarded by Dr. Ramskill as one of the best. He advises the head to be shaved, and mercurial ointment (gr. xx.–xl.) mixed with ointment of juniper berries,

to be rubbed on the scalp twice daily. The child should wear a woollen cap, to prevent the risk of the perspiration being checked by the cold air. Calomel gr. $\frac{1}{4}$–$\frac{1}{2}$ should be given twice daily; if this purges too much, the mercurial inunction should be alone employed. This treatment is to be persevered in for thirty or forty days, when, if there be some improvement, the remedies may be gradually diminished, but the cap is to be worn after the inunction has been discontinued. If there be no marked improvement after six or eight weeks, some diuretic, as acetate of potash or squill, may be added, and a couple of issues may be inserted in the occiput. Blisters to the nape of the neck may be advantageously substituted for these. Whenever there is heat of head, and the child grows fretful, restless, and irritable, a couple of leeches behind the ears will be found of service. When convalescence has begun, it may be accelerated by small doses of quinine. (Dr. Ramskill, ii. p. 403.) Mercurialization, *per se*, is condemned by Dr. West (p. 104); whatever good, he remarks, he has seen in cases when calomel has been employed, has been effected when it was given in combination with purgatives, or when it produced a purgative effect. In the *Convulsions of Childhood*, a single purgative dose of calomel often has a beneficial effect.

1124. *In Delirium Tremens*, when there is, as is often the case, hepatic congestion or abdominal plethora, a full dose of calomel, repeated if necessary, so as to unload the stomach and intestines, is often of great service. Dr. Corfe[1] relates three cases in which calomel thus given, was followed by sleep, which opium had previously failed to induce.

1125. *In Apoplexy*, calomel (gr. x.–xv.) mixed with a few grains of gamboge, rubbed up with butter and placed at the root of the tongue, is advised by Dr. Copland, as a speedy and effectual purge. It is not, however, unattended with danger, alarming ptyalism having followed its administration.[2] When the attack has passed off, a mild mercurial course has been found useful in promoting the absorption of any effused fluid, and in restoring the normal character of the secretions.

1126. *In Headaches arising from biliary derangement, or a torpid state of the Bowels*, a few grains of calomel, regulated by the age, strength, &c., of the patient, and by the severity of the symptoms, and followed at a short interval by a saline or other purgative, are often sufficient to effect a cure. The remedy should not be too often resorted to.

1127. *Diseases of the Eye. In Ophthalmia Neonatorum*, the introduction of finely-powdered calomel into the eye has been employed with marked success by Dupuytren, Kluge, of Berlin, Van Siebold, of Göttingen, and others. It is introduced into

[1] Med. Times, June 16, 1849.
[2] See Dr. Bright's Case, Guy's Hospital Reports, Part ii. p. 337.

the eye by means of a camel-hair pencil, loaded with the powder, which is shaken from it into the eye, while an assistant separates the lids. It may be employed at the earliest period of the disease, once a day in mild, twice a day in severe cases. From one to two hours after the application, the eyes may be washed with warm water; iodine and its salts should be avoided during its use. Dr. Wells[1] speaks of having used with great advantage the insufflation of calomel in *Scrofulous Ophthalmia*, in *Opacities of the Cornea, and other Eye affections of a scrofulous nature*. This treatment is also favourably spoken of by Mr. Brudenell Carter,[2] in *Photophobia*.

1128. *In Purulent Ophthalmia*, the treatment by mercurials and antiphlogistics, formerly in vogue, has been found by experience to be less effectual than that by tonics, as described in sect. 232, and has consequently been abandoned. Mr. A. Poland[3] has published some excellent remarks on the abuse of mercury in this and other eye diseases.

1129. *In Syphilitic Iritis*, mercury is admitted on all hands to be highly valuable; indeed, by some it is regarded as a specific. It is certain, however, that some mild cases will recover without mercury in any form, and that the local use of atropia in the earliest stages sometimes suffices to arrest the attack. Should this fail, should the congestion and local pain remain unabated, the pupil continue undilatable, and if the vision does not manifestly improve, mercury should at once be resorted to. In these cases, observes Mr. Brudenell Carter,[4] it is found, as a mere matter of fact, that mercury, given rapidly but discreetly, until the gums show some slight signs of its constitutional effect, will at once break the chain of morbid action. From the very day on which the mercurial line becomes apparent, the sensations of the patient are relieved and the symptoms of inflammation decline. He considers that its effect is quite as declared in *the Traumatic, or in the Rheumatic, as in the Syphilitic forms of Iritis*, and that the indication of its use is to be sought entirely in the severity or obstinacy of the attack, and not at all in the cause by which it is excited. *In Syphilitic Retinitis*, it is of equal value as in iritis. In these cases calomel (gr. j.–ij.) with opium (gr. $\frac{1}{4}$–$\frac{1}{2}$) may be given every four or six hours, and its operation aided by mercurial inunction, continued till the gums are affected, or the disease yields.

1130. *Diseases of the Abdominal Viscera. In Diseases of the Liver*, no remedy has been employed so generally and indiscriminately as mercury; and up to a very recent period its cholagogue virtues were firmly believed in by the majority of

[1] Opthal. Hosp. Reports, Jan. 1862.
[2] Practitioner, Jan. 1869.
[3] Lancet, May 15, 1858.
[4] Practitioner, July, 1869.

the profession. The belief in its powers in this respect has been upset by the experiments of Dr. Bennett and others (*ante*); and apart from this, it has been superseded in the practice of many by podophyllum, which is thought to possess all the virtues without the disadvantages of mercury. Under these circumstances, there is a great chance of mercury, in hepatic affections, falling, as other remedies have done, into undeserved neglect. There are cases, *e.g.*, *Congestion of the Liver*, in which a full mercurial (calomel) purgative is of undoubted utility. Under its administration the local weight, pain, fulness, and other symptoms subside simultaneously with the occurrence of copious bilious stools, and it is impossible to disabuse the minds of those who have repeatedly witnessed these simultaneous effects, of the idea that they bear an intimate relation one to another. The most plausible, and probably the true explanation, is that given by Dr. Murchison (pp. 126, 404), namely, that mercury in these cases acts by irritating the upper part of the small intestines, propelling onwards the bile as fast as it flows into the duodenum, thus preventing its reabsorption, and that the biliary accumulations thus excreted, constitute "the bilious stools" which have generally hitherto been regarded as the result of increased biliary secretion from the liver itself. But, as Dr. Murchison observes, if the calomel acted by stimulating the liver to increased secretion, it would be injurious in cases of hepatic congestion. In addition to the above explanation, Dr. Murchison considers that mercury may perhaps also act by stimulating the gall bladder and bile ducts to contract through reflex action. By adopting Dr. Murchison's hypothesis, it is easy to understand how it is that *Jaundice* sometimes yields rapidly to a calomel purgative (gr. v.) followed by a saline draught, and also how it will prove useless and probably injurious when the affection is connected with obstruction by gall-stones, or organic disease of the liver. The best authorities agree in condemning the use of mercury, especially if carried to salivation, in the treatment of *Gall-stones*, and in jaundice connected therewith. The treatment of *Acute Hepatitis* by mercurialization is now well-nigh abandoned, and is replaced by local depletion by leeches (especially round the anus, so as to unload the portal system), sinapisms followed by fomentations and large linseed-meal poultices over the hepatic region, purgatives, especially salines, as sulphate of soda and magnesia, seidlitz powders, &c., which increase the watery exhalation from the mucous membranes of the bowels; alkalies, together with colchicum, when there is reason to suspect that the affection is of a gouty nature. Perfect rest with a mild nutritious diet (milk, beef-tea, and farinaceous articles) should be enjoined, and alcoholic stimulants and fermented liquors interdicted. *In Chronic Hepatic*

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Affections, all the benefit which could be expected from mercury, is obtained more effectually and with less damage to the constitution from nitro-hydrochloric acid and iodide of potassium (*q.v.*)

1131. *In Acute Gastritis*, mercurial purgatives are amongst the best remedies. In the case of an adult and vigorous patient, calomel (grs. iij.–v.) followed by castor-oil, or saline or senna draught, may be given with advantage. When such active effects are undesirable, blue pill with pil. coloc. co. and ipecacuanha often prove serviceable, and may be followed by a seidlitz draught or other mild purgative. *In the acute Indigestion of Children* beyond the period of infancy, when there is fever and griping, or even when the latter is absent, a dose of calomel and scammony or of hyd. c. cretâ with rhubarb, followed by castor oil, sometimes proves beneficial. Mercurial purgatives are also in use in *Congestion of the Stomach arising from disorder of the Liver;* and they have favourable effects also in some cases of this class when pain is present associated with the vomiting of ropy mucus, but astringents are necessary to complete the cure. (Dr. Wilson Fox, ii. p. 865.) In those forms of *Dyspepsia* characterized by marked hepatic derangement, mercury sometimes is productive of marked benefit; but as Dr. Brinton (p. 334) justly observes, its habitual use even as a purgative is not without detriment, and its more marked constitutional effects are generally most mischievous.

1132. *In Acute Dysentery*, mercury was formerly regarded as indispensable, and was employed and recommended by the highest authorities in large (gr. xx.) and repeated doses. Experience, however, has shown that even the worst forms of the disease are curable without its aid, and that certain ill consequences follow its employment; hence it has fallen into comparative disuse, except as an occasional aperient, its place being now filled by ipecacuanha (*q.v.*) Dr. Maclean (i. p. 125) condemns the use of mercury on the following grounds:—1. Because soldiers (and others), fearing ptyalism, refrain from applying for treatment till the disease is far advanced, much precious time being thus lost. 2. Because we have in ipecacuanha a remedy that effects all that mercury can do as an evacuant without its irritating effects. 3. Because men "cured" by mercurial treatment are, as a rule, cachectic, ex-sanguine, prematurely old-looking, extremely sensitive to atmospheric changes, and to relapses from trivial causes. 4. Because chronic dysentery is more frequent after the mercurial than after the ipecacuanha treatment; and 5. Because men actually under the influence of mercury are very disposed to the disease. These are valid reasons; still, in exceptional cases, should mercury be deemed advisable, recourse might be had to Annesley's pills (see Ipecacuanha) or to the

following, which were found very effectual by Dr. Stewart:[1]— ℞ Calomelas gr. ½, Morphiæ gr. ¼, Quiniæ Sulph. gr. ij., M., ft. pil. 2tis vel 3tis horis sumend. It should be held as an axiom that in the asthenic and scorbutic forms of dysentery, mercury in every form should be avoided. *In Chronic Dysentery*, mercury is wholly uncalled for, excepting as a purgative when congestion of the liver is present, and even then it should not be repeated too frequently. *Obstinate Diarrhœa of Children*, which resists all other remedies, will sometimes speedily yield to small doses of calomel (gr. ½-gr. j.), given for two or three nights in succession at bedtime.

1133. *In Cholera*, calomel has for upwards of half a century been given in every variety and stage of the disease, in every gradation of dose, from one grain to sixty, in almost every possible form of combination, with the view, by turns, of obtaining its purgative, or its cholagogue, or its stimulant, or its sedative action, and the reported results have been of the most diversified and unsatisfactory character. The inutility, to say the least of it, of excessive doses is proved by Dr. Stilson's account of the epidemic at Malta in 1837, when the average mortality under scruple doses every half-hour or hour was 52 per cent. There is this further objection to large doses of calomel, in common with other powerful medicines, especially during the stage of collapse, that the stomach for the time being loses its power of absorption, and that during that stage, the drug, particularly an insoluble powder like calomel, remains wholly inactive; but when the stage of reaction sets in, and the stomach resumes its normal functions, the medicine becomes absorbed, and in the place of acting beneficially, is likely to produce the most serious and even fatal effects, the enfeebled system being unable to withstand the influence of the accumulated drug. This applies with greater or less force to all powerful drugs, especially when given in a solid form. Of the benefit derivable from medium or occasional doses (grs. v.-x.) we have no direct evidence. There is a vague impression in many minds that such a dose, or even two or three such doses, at the outset of the attack, exercise a favourable influence on the course of the disease, and so long as it is not carried beyond this, it may do no harm, if it do no good; but experience has shown that it is not, even in these doses, to be depended upon as a remedy of any value, and if persisted in, is open to the same objections as have been adduced against large doses. If the mercurial plan of treatment be determined upon, there can be no question but that preference should be given to Dr. Ayre's plan, which consists in prescribing grs. j.-ij. of calomel with ℥j.-v. of laudanum

[1] Indian Ann. of Med. Sci., No. 2, p. 432.

every 5, 10, or 15 minutes, omitting the latter when the dose has reached 60 or 80 drops. Dr. Ayre's success with this treatment was great, and it has been corroborated by others, but a great portion of the success may have depended upon his allowing the patient to drink freely of cold water (the colder the better), a practice that seems not only safe, but in the highest degree beneficial and grateful.

1134. *In the Vomiting of Pregnancy*, Sir C. Locock[1] states that ten grains of calomel will often arrest the most violent sickness. Dr. Tilt (p. 326) also states that in *Obstinate Vomiting connected with Uterine Disease*, he has had recourse to calomel in doses of grs. x.–xv., and that in two instances he found it invariably check the vomiting which had continued for hours.

1135. *In Obstinate Constipation*, *Ileus*, and *Colica Pictonum*, a full dose of calomel, with or without opium, followed in a few hours by castor oil and a turpentine enema, often affords speedy and marked relief.

1136. *Against Worms* (*Lumbrici*), calomel was highly esteemed by Rush and others, who considered that it acted specifically on the entozoa independent of its purgative effect. Though not administered alone at the present day, it forms a valuable adjunct to scammony and other purgative anthelmintics in common use in childhood.

1137. *Diseases of the Genito-Urinary System. In Renal and Bladder Affections* generally, mercurials, especially if carried to the extent of affecting the gums, are not only not beneficial, but decidedly injurious. Every good effect which could be expected from them is obtainable, with greater speed and certainty, from opium. Although contra-indicated in idiopathic albuminuria, Mr. H. Lee[2] states that in *Syphilitic Albuminuria* he has found great benefit from the calomel vapour-bath.

1138. *In Amenorrhœa*, mercury is spoken of by Dr. D. Davis[3] as the most powerful emmenagogue existing; and Dr. Ashwell (p. 77) remarks that in obstinate amenorrhœa, where there are chronic inflammation and permanent congestion, and any evidence of incipient structural change, there is no remedy equal to mercury. "If salivation," he adds, "be produced and maintained, mercury often ensures decided and permanent benefit." Dr. Graily Hewitt (p. 414) likewise states that it has appeared to him to do good in several cases in which he employed it. He directs that on two successive nights at the time of the next expected period, a dose be given of calomel (gr. v.) and aloes (gr. vj.), followed by a seidlitz powder in the morning. It is inapplicable if the patient be very feeble. The cases of amenorrhœa requiring mercurializa-

[1] Brit. Med. Journal, Aug. 22, 1868.

[2] Lancet, July 25, 1868.

[3] Obstetric Medicine, p. 237.

tion are very rare; it should ever be borne in mind that, given in unsuitable cases, mercury is capable of doing serious mischief.

1139. *Other Diseases.* *In Acute Rheumatism*, mercury, combined with opium, carried to the extent of producing salivation, was a mode of treatment formerly much in vogue, but has now fallen into comparative disuse. Dr. Fuller (p. 96) is of opinion that this practice is not only unnecessary but decidedly prejudicial. When given so as to affect the mouth, mercury proves exceedingly depressing, and is sometimes productive of evil consequences which may be felt for months or even years. Moreover, it exerts no perceptible influence over the rheumatic poison, nor does it prevent the access of cardiac inflammation; on the contrary, as observed by Dr. Macleod,[1] "the rheumatism has continued although the mouth was affected, whilst it has speedily subsided on continuing the narcotic and purgatives without the mercurial." Moreover, pericarditis and endocarditis supervene as readily whilst the patient is under the influence of mercury as when that drug has not been administered; and when such is the case we lose the most valuable property of mercury, namely, that of limiting the effusion of lymph on the inflamed surfaces of the heart. Such being the case, mercurial action should never be induced as a cure for an uncomplicated attack of acute rheumatism. (Dr. Fuller.) As a purgative, calomel (grs. iij.–v.) combined with opium (grs. j.–ij.) at night, and followed by a saline aperient in the morning, is often of the greatest service. *In Rheumatic Gout*, even when the liver is sluggish, and the intestinal secretions unhealthy, calomel, and indeed every form of mercury, is apt to prove exceedingly depressing, and should therefore be avoided. Ox gall with taraxacum, aloes, &c., are preferable. *When connected with a Syphilitic taint*, benefit will be derived from Hydrarg. Iod. Rubrum (*q.v.*), and under the same condition it proves most serviceable in *Chronic Rheumatism;* but in ordinary cases mercurialization is needless if not hurtful. *In Joint Affections connected with Rheumatic Gout*, Dr. Fuller (p. 371) recommends an ointment containing Calomel (℥j.) or Corrosive Sublimate (gr. iv.–vj.), Iodide of Potassium (℥ij.), and Lard (℥j.) *In Gout*, when the bowels are constipated, and there is co-existing congestion of the portal system, an occasional mild mercurial purgative may be given with advantage; but as Dr. Garrod observes, "It should be borne in mind that in gouty habits mercurials must be used with great caution, as in many cases there is a considerable susceptibility to their action, and very unpleasant consequences may follow their administration in repeated doses."

[1] On Rheumatism, p. 360.

1140. *In active intractable Hæmorrhage*, mercury, carried to slight salivation, has been highly spoken of. Dr. Latham mentions a case of *Epistaxis*, which resisted all ordinary remedies, but yielded immediately the mouth became sore. Dr. Southey also states that he has been taught by experience to rely upon mercury almost as a specific for obstinate hæmorrhage, whether attended by inflammation or not. Sir T. Watson (i. p. 253) adds: "Whatever may be the *modus operandi* of mercury, the fact is certain, that hæmorrhage which has resisted all other modes of treatment, has, in very numerous instances, ceased at once, upon the occurrence of a moderate degree of salivation."

1141. *In Dropsical Affections*, mercury should be given with much caution. "When," observes Sir T. Watson, "Ascites is passive, when the distention of the peritoneum has crept on without pain, fever, or other marks of inflammatory action, our first and best hope of evacuating the fluid will rest upon diuretics. Drastic purges may also be employed. If these remedies fail, and we suspect hepatic disease, it will be proper to give the patient the chance of the remedial influence of mercury." It is best given in combination with digitalis and squill as advised in sect. 822. *In Dropsy*, depending upon granular disease of the kidneys, it is injurious, and it should be administered with great caution to the aged, the cachectic, or the scorbutic. *In Ovarian Dropsy* it is of little value, and small dependence is to be placed upon its powers in *Hydrothorax* or *Hydropericardium*.

1142. *In Diseases of the Skin*, partaking of an inflammatory type or of syphilitic origin, mercurial preparations are indicated. Of these, calomel ointment (℥j. ad Ung. ℥j.) is one of the best. Pereira (i. p. 929), speaking of this ointment, remarks that if he were required to name a local agent pre-eminently useful in skin disease generally, he should fix upon this. It has been found especially useful in *Lepra*, *Psoriasis*, *Acne*, *Herpes*, *Impetigo*, and *Eczema*. *In dry Eczema* (*Eczema siccum*), *Psoriasis*, and *in Syphilitic Eruptions*, Dr. McCall Anderson[1] advises the following:—℞ Hyd. Subchlor. ℥j., Ung. Hyd. Ammon. ℥ij., Glycerini ℥j., Ung. Simpl. ad ℥j., M. To be rubbed firmly on the eruption twice daily. In the use of all mercurial preparations in skin diseases it should be remembered that to a certain extent they are absorbed, and that salivation is a contingency to be expected, if applied to too large a surface, or if too long continued.

1143. *In Pruritus Pudendi and Pruritus Ani*, Dr. Tournie[2] states that he has adopted the following treatment with great success:—First, if the parts are covered with scales or dry

[1] Lancet, Dec. 4, 1869.

[2] Provincial Journ., April 1851.

crusts, emollient cataplasms and baths are employed until these are removed. An ointment composed of 4 to 6 parts of calomel and 30 of lard is applied twice daily; and after each application, the parts are sprinkled with a powder composed of 1 part of camphor and 5 of starch. The proportions may be varied according to circumstances. "Experience," he says, "shows that the ointment alone is inefficacious; and the camphorated starch, singly, allays the itching, but does not effect the cure." He found it in the highest degree efficacious in the above affections, in *Intertrigo*, *Chronic Eczema of the Scrotum*, and in several *Lichenoid Affections*.

1144. *In Lupus* which resists other remedies, or which has improved up to a certain point under the use of arsenic, and there is a threatening of relapse, Mr. Milton[1] advises that mercury should at once be resorted to. He states that he knows of no remedy which so quickly checks the spread of lupus as calomel; gr. j.–ij. will, as a rule, be enough to begin with, gradually increased to gr. ij.–iij.–iv., which may in general be considered the outside limit, the object being to procure two or three loose stools after each dose; when this effect does not ensue, a mild saline aperient should be given. Should the gums become affected, which with proper care they should not, then the aperient should be continued alone till this symptom has passed off. *In Lupus Erythematodes* and allied affections, Dr. McCall Anderson (op. cit.) states that he can confirm the opinion of Dr. Moriz Kohn, of Vienna, as to the value of emp. hydrargyri. A piece of lint, the size of the part, is spread with the melted plaster and applied and changed once daily.

1145. *To Chancres and Syphilitic Ulcers of all kinds*, the black wash is a most serviceable application. It should be applied fresh on linen or lint several times a day, and the mixture should be well shaken before each application. A very effectual mode of treating *Syphilitic Condylomata of the Anus* consists in washing the parts twice daily with solution of chlorate of soda, drying them, dusting them with calomel, and separating them with a piece of clear dry lint. (Dr. McCall Anderson.)[2]

1146. *In Cancrum Oris*, the black wash, locally applied, is occasionally signally beneficial. It should be used chiefly in the earlier stage of the disease, and the ulcer should be frequently cleansed with the lotion.

1147. In addition to the above, calomel or other mercurial preparations, carried to the extent of salivation, have been employed with alleged success in *Tetanus*, *Hydrophobia*, *Dissection Wounds*, *Inflammatory and Scrofulous Affections of the Joints*,

[1] Journ. of Cutaneous Med., July 1867.

[2] Lancet, Dec. 4, 1869.

Phlegmasia Dolens, Ununited Fractures, the Plague, and Amaurosis; but in these as well as in numerous other affections, its use has been superseded by other agents of greater efficacy, and less harmful to the constitution. In some, as in hydrophobia, it is utterly powerless, and may prove highly prejudicial.

1148. HYDRARGYRI UNGUENTUM. Ointment of Mercury or Mercurial Ointment. Called also Blue Ointment. Prepared by thoroughly incorporating Mercury lb. j. with Prepared Lard lb. j. and Prepared Suet oz. j.

Med. Prop. and Action. Chiefly used externally, either as a local or as a constitutional remedy. In Germany, it is given internally in the form of pill, from the idea that it induces salivation more speedily than any other form of mercury. It may be applied externally in the form of *Compound Ointment* (Oint. of Mercury oz. vj., Yellow Wax, Olive Oil āā oz. iij., Camphor oz. j½.), and *Liniment* (Oint. of Mercury oz. j., Sol. of Ammonia, Lin. of Camphor āā fl. oz. j.) It is also occasionally used in the form of *Suppositories* (Oint. of Mercury gr. lx., Benzoated Lard, White Wax āā gr. xx., Oil of Theobroma gr. lxxx., divided into twelve equal parts). Inunction with Ung. Hydrarg. is a valuable adjunct to the internal use of mercury when rapid salivation is desirable.

1149. *Therapeutic Uses. In Syphilis*, the introduction of mercury into the system by inunction is strongly advised by Sir B. Brodie; but it has not been generally adopted, on account of its uncleanliness and other inconveniences. (See secs. 1062, 1063.)

1150. *In Erysipelas*, the local application of mercurial ointment was first advocated by Dr. McDowell,[1] of Dublin. He directs the inflamed parts to be smeared over with the ointment, and states that three or four applications generally suffice to arrest the progress of the disease. In most cases, it causes salivation. *In Pruritus Ani and Pudendi*, Dr. Ringer (p. 165) speaks highly of the value of this ointment locally applied.

1151. *In Small-pox*, to prevent pitting, inunction of mercurial ointment has been advised by several writers, amongst others by Prof. Bennett,[2] but the practice is not devoid of danger; in a case related by Dr. G. Paterson,[3] excessive salivation followed its application. The following, which is a modification of Emp. Vigo cum Mercurio, is in use at the Children's Hospital in Paris:—℞ Ung. Hyd. ʒxxv., Ceræ Flav. ʒx., Picis Nigræ ʒvj., M. This application, observes Mr. Marson (i. p. 460), has good effect; but is most suitable in semi-confluent cases, or in those barely confluent. In severely confluent cases where the patient is very restless, it would soon be rubbed off.

1152. *In sub-acute Synovitis*, especially of the knee-joint,

[1] Dublin Journal of Med. vol. vi.
[2] Mon. Journal of Med. Science, Jan. 1850.
[3] Ranking's Abstract, vol. xv., p. 536.

where there is much fluid, the treatment which has proved most successful in the hands of Mr. W. Adams[1] is inunction of strong mercurial ointment to the locally blistered surface; the dressing to be continued so long as the blistered surface remains unhealed. Occasionally, healing takes place very rapidly; in such cases a dressing of equal parts of mercurial and savine ointment is preferable. *In purely chronic cases* with much thickening, he prefers Scott's dressing (Cerat. Hydrarg. Co. L. Ph.) This cerate, with pressure and complete rest, formed the treatment which obtained so high a name for the late Mr. Scott, of Bromley. Dr. Fuller (p. 369) speaks favourably of mercurial inunction to a locally blistered surface in *obstinate Affections of the Joints consequent on Rheumatic Gout.*

1153. *In Subacute Ovaritis*, Dr. Tilt[2] speaks highly of frictions of mercurial ointment, combined with camphor and belladonna, over the seat of disease. In some instances, improvement occurs in a few days, in others in six or eight weeks. He speaks highly of its efficacy. He recommends the following formula:—℞ Ung. Hydrarg. ℥ij., Ext. Belladon. ℥j., Ceræ ℥ij., Adipis ℥j., M. Warm-water enemas and gentle aperients (castor oil) should accompany the treatment.

1154. *In Indurations and Enlargements of the Testicles, and in Orchitis*, inunction of this ointment is a local measure often attended with the best effects.

1155. *In Phlegmasia Dolens*, much benefit accrues from the local application of this ointment, either alone or conjoined with extract of belladonna.

1156. HYDRARGYRUM CUM CRETÂ. Mercury with Chalk. Grey Powder. Prepared by rubbing Mercury (oz. j.) with Prepared Chalk (oz. ij.) until metallic globules are no longer visible to the eye, and the powder assumes a uniform grey colour. Grs. iij. contain gr. j. of mercury.

Med. Prop. and Action. Alterative in doses of gr. j.–iij.; aperient, gr. v.–xv. for adults, gr. j.–v. for children. It is rendered slightly antacid by the presence of the chalk. It may be combined with rhubarb and cinnamon, and also with alkalies: it is a mild, unirritating preparation, and particularly adapted for children. It should be given in sugar, syrup, or some viscid fluid.

Dose, gr. j–iij.; as an aperient, gr. v. upwards.

1157. *Therapeutic Uses. In the Diarrhœa and Dysentery of Children*, when the stools are clay-coloured, or mucous and sanguineous, the following formula is particularly useful:—℞ Hyd. c. Cret. gr. ij.–iij., Pulv. Aromat. vel P. Cretæ Aromat. gr. iij., M. ft. pulv. bis in die sumend. Sir T. Watson (i. p.

[1] Lancet, Jan. 6, 1866. [2] Lancet, March and April, 1849.

802) prescribes the following:—℞ Hyd. c. Cret. ʒ½, Pulv. Cretæ Co. (Pharm. Lond.), Sodæ Carb. Exsic. āā ʒj., M. Dose, gr. iij.–v. thrice daily. He advises its use particularly when *Aphthæ* exist in the mouth, borax being used as a local application. *In the Diarrhœa of Phthisis*, half-grain doses of grey powder are occasionally effectual in checking the discharge.

1158. *In Gastric Remittent Fevers of Children*, grey powder given every night, or every other night, in combination with ipecacuanha, and followed in the morning by a dose of castor oil, has been found very useful. (Locock.)[1] This treatment is also well adapted for the *Jaundice of Infancy and Childhood*.

1159. *In Syphilis Infantum*, grey powder is the best form of mercury for internal use. It may be continued for a considerable period, without giving rise to gastric irritation. *In the Syphilitic Eruptions of Children*, Dr. Hillier (p. 366) states that the treatment he prefers is to give hyd. c. cretâ gr. j., twice or thrice daily, with syrup of iodide of iron. Chlorate of potash, he adds, without mercury, will sometimes do good, but it is not so effectual as mercury. *In Syphilis in the Adult*, Mr. Acton, Mr. C. Smith, and others, prefer grey powder to the stronger forms of mercury.

1160. Hydrochloric Acid. Acidum Hydrochloricum. Hydrochloric acid gas, HCl, dissolved in water, and forming 31·8 per cent. by weight of the solution. Muriatic Acid. Spirit of Salt. Sp. gr. 1·16.

Acidum Hydrochloricum Dilutum. Diluted Hydrochloric Acid. Prepared by diluting Hydrochloric Acid fl. oz. viij. with Distilled Water fl. oz. xvj., and then adding more water, so that at a temperature of 60° it shall measure fl. oz. xxvj½. Sp. gr. 1·052.

Med. Prop. and Action. The strong acid is a powerful caustic and escharotic. For internal use, the dilute acid, in doses of ♏x.–xx. in any bland fluid, acts as an antalkaline, stimulant, tonic, and mild laxative. In long-continued doses it is alterative and tonic, and improves the tone of the digestive organs. If continued too long, it produces effects similar to those of the other mineral acids. (See Acids, part ii.) From its injurious action on the teeth, it is advisable to wash the mouth out with an alkaline solution immediately after its employment, either internally, or locally to the fauces. As a disinfectant and fumigant, hydrochloric acid was first recommended by Guyton Morveau in 1773, to disinfect the cathedral of Dijon; the air of which had become intolerable from the stench emanating from the bodies buried beneath the building. He employed a mixture of 6 lbs. of common salt and 2 lbs. of sulphuric acid. The hydrochloric acid fumes set free deprived the air of all unpleasant odour, and in four days afterwards public worship was held in the building as usual. He recommends the following proportions: 15 parts of common salt and 12 of sulphuric acid. The salt is to be placed on flat earthen dishes on a sand-bath, and the whole acid added at once. In an inhabited house, the acid

[1] Lib. of Medicine, vol i. p. 385.

should be added gradually, and the sand-bath dispensed with. Its disinfecting properties are, however, inferior to those of chlorine.

Dose of Acid. Hydrochlor. Dil., ♏x.–♏xxx. freely diluted.

1161. *Therapeutic Uses. Calculous Affections. In the Oxalic Acid Diathesis*, the use of the mineral acids was introduced by Dr. Prout (p. 73), and he placed chief reliance on hydrochloric and nitro-hydrochloric acid (*q.v.*); and subsequent experience has justified the recommendation. Hydrochloric acid is especially indicated when the digestive powers are impaired. It should be given before each meal, and may be prescribed alone or combined with tonics, and should be persevered in for a month, or until the lithate of ammonia or lithic acid begins to appear in the urine, when its use should be suspended. The same remarks apply to the *Cystic Oxide Diathesis. In the Phosphatic Diathesis*, the alkaline or alkalescent condition of the urine requires to be corrected by acids; and of these, hydrochloric has been found the most generally beneficial. Its effects require to be carefully watched. In many instances, however, too much irritation exists to allow the administration of this remedy, in which cases opiates are clearly indicated. Of the acid, ♏v.–x. thrice daily will generally be sufficient. Mr. Balman[1] relates a case of phosphatic calculus, which was cured by injecting into the bladder a mixture of gutt. ij. of the acid in f℥iv. of water, always taking care to wash out the bladder previously with warm water. It gave rise to no unpleasant symptoms.

1162. *In Gout*, Dr. J. F. Duncan[2] describes the treatment by hydrochloric acid as pre-eminently safe and beneficial; he considers that it acts more directly upon the primary cause of the disease—the presence of lithic acid in the blood—and that it holds out a greater prospect of effecting a real cure than any antacids. He employs the following mixture:—℞ Acid Hydrochlor. Dil. fl. drm. j½., Spt. Chloroformi fl. drm. ij., T. Colchici fl. drm. j., Infus. Cascarill. ad fl. oz. vj., M. Dose, oz. j. every three hours.

1163. *In Atonic Dyspepsia*, Dr. Wilson Fox (ii. p. 820, 839) speaks highly of the value of hydrochloric acid, and its utility is easily comprehensible from its being probably the most active agent in the normal process of digestion; ♏xv.–xx. of the dilute acid properly diluted should be given immediately before, or during or directly after a meal. It may be advantageously combined with vegetable bitters. In milder cases of *Acid Vomiting or troublesome Heartburn of Pregnancy*, and also in *Nervous Disorder of Digestion associated with Diarrhœa*, he has found benefit from a combination of this acid and tinct. of NUX vomica. It should be given before meals.

[1] Med. Gaz., Dec. 1, 1848. [2] Med. Press, May 2, 1866.

1164. *In Typhus and Typhoid Fevers*, hydrochloric, in common with other mineral acids, is often productive of excellent effects. See Acids, Part ii. To allay the thirst in mild cases of typhus, Dr. Buchanan (i. p. 554) is of opinion that there is no better medicine than dilute hydrochloric acid (♏xx.) and water (fl. oz. j.)

1165. *In the continued Fevers of Childhood*, it appears to have a beneficial influence. In the advanced stages, after the second week, when the vital powers are much depressed, Dr. West (p. 694) recommends the following:—℞ Acid. Hydrochlor. Dil. ♏xxxij., Spt. Æther. Co. (L. Ph.) ♏lxxx., Syr. Rhœad. ℥iv., Mist. Camph. ℥iijss., M. Dose, fl. drm. iv. every 6 hours for a child æt. 5 years. It is inadmissible if there be severe abdominal symptoms, in which case he substitutes Dover's powder gr. j.–j½. at bed-time, which has the double advantage of checking a tendency to diarrhœa and of procuring sleep. Nutritives and stimulants (wine) should be employed as required. *In Scarlet Fever*, hydrochloric acid largely diluted has the recommendation of several American physicians.

1166. *In Syphilis*, this acid was introduced as a remedy by Zeller, of Vienna, in 1797, after an experience of nine years successful employment of it. From that date to the present, it has occasionally found advocates, but its use has never been general. Mr. Pearson (p. 117) observed that it could radically cure the disease, and ascribed the benefit derived from it to its salutary action upon the stomach and constitution, and also to its agency on the ulcers of the throat and tongue, as a local application. Dr. Rust[1] states, that in the journals of the syphilitic ward of the Vienna Hospital, he found recorded several hundred cases entirely cured by this acid, without the aid of a single grain of mercury. The formula employed was fl. drm. j. of the acid in Oij. of barley water daily. It is *essential*, he remarks, to the success of the remedy, that abstinence be enforced; he found it fail in every case when a full diet was allowed.

1167. *In the chronic stage of Hooping Cough*, hydrochloric acid in large doses, fl. drm. ij.–vj. daily, has been recommended as a specific, but it is better to give it in moderate doses as advised by Dr. West (p. 443):—℞ Acid. Hydrochlor. Dil. ♏xxxij., T. Opii ♏iv., Syr. Mori fl. drm. iv., Aq. fl. oz. ij½., M. Dose, fl. drm. iij. thrice daily for a child æt. two years.

1168. *In Diphtheria*, when the whole of the false membrane is visible, and its margins within reach, it is useful to paint the part and the surrounding mucous membrane, on to which the disease is spreading, with a mixture of equal parts of strong hydrochloric acid and honey. It sometimes arrests the

[1] Med. Quart. Rev., 1835, pp. 113–180.

local spread of the disease. Dr. Hillier (p. 144) prefers this caustic to nitrate of silver. Where there is much redness and pain, Dr. Squire (i. p. 404) recommends the acid diluted with five parts of water should be pencilled over the whole surface. This, he states, tends to prevent further exudation, and affords relief to the local discomfort.

1169. *In the Ulcerated Sore-throat of Scarlet Fever*, Dr. Hillier (p. 318) advises the acid and honey (*ante*) to be applied every third day, a concentrated solution of the chlorate of potash (*q.v.*) being used as a gargle in the intervals. As an internal remedy in *Scarlatina*, it has been successfully employed by some American physicians.

1170. *In Cynanche Maligna or Putrid Sore-throat*, also in *Gangrenous Stomatitis and Cancrum Oris*, the local application of the pure acid has been employed successfully in arresting the ulcerative process, but on account of its powerful action the greatest caution is necessary, in order to limit its application to the diseased parts. In mild cases it should be diluted with an equal weight of honey. *In Aphthous Ulceration of the Mouth in Children*, 1 part to 8 is sufficiently strong, and often produces excellent effects.

1171. *In Phthisis*, the use of hydrochloric acid has been favourably spoken of. The results of the experience of Dr. Cotton[1] on this point are as follow:—1. The mineral acids are well suited to a large number of phthisical cases. 2. The dilute hydrochloric acid, especially in doses of ♏x.–xv. twice or thrice daily, is an important auxiliary to other treatment, and may oftentimes be usefully employed, either alone or with other mineral or vegetable tonics.

1172. *In Phlegmasia Dolens*, Dr. Mackenzie[2] directs fl. oz. j. of the diluted acid in Oij. of barley water, with fl. oz. ½ of chlorate of potash, to be taken daily.

1173. Hydrocyanic Acid. Acidum Hydrocyanicum, HCN, Prussic Acid. Is chiefly obtained by decomposing some of the compounds of cyanogen, but is found also in the distilled water and oil of the bitter almond, and the cherry laurel. It is likewise produced when amygdaline (a principle contained in bitter almonds, and the kernels of peaches, plums, and other fruits) is acted on by emulsine. (See Amygdalæ.)

Diluted Hydrocyanic Acid. Acidum Hydrocyanicum Dilutum. Hydrocyanic Acid, HCN, dissolved in water, and constituting 2 per cent. by weight of the solution. Sp. gr. 0·997. It is prepared by distilling sulphuric acid with yellow prussiate of potash and water.

[1] Med. Times, Nov. 17, 1860. [2] On Phlegmasia Dolens, 1862.

Med. Prop. and Action. The pure acid is so powerful a sedative poison, that small animals made to breathe air saturated with its vapour died at periods varying from one to ten seconds. A single drop placed on the tongue of a rabbit killed it in eighty-three seconds; and three drops applied to the eye of a cat, caused death in twenty seconds. (Christison.) So powerful a poison is evidently entirely unsuited for ordinary medicinal purposes. The diluted acid is a powerful and direct sedative in doses of gutt. ij.–iv.–vj., but the smaller dose should be always given at the commencement. Its action is principally directed on the brain and spinal cord. Dr. Lonsdale,[1] from a large number of well-conducted experiments, concludes that the immediate effects of the strong acid are exerted upon the brain and spinal cord; and that it also indirectly enfeebles, to a greater or less extent, the contractility of the heart. Dr. Meyer[2] and others, however, consider that it may prove fatal, independently of the brain and nerves; and that its fatal effect is owing to a paralysis of the heart, induced by the topical action of the blood, mixed with the acid, on that organ. In small medicinal doses it acts as a direct sedative, reducing the force and frequency of the heart and arterial system, allaying vascular excitement and irritability, relieving spasm, and inducing a general sensation of tranquillity in the system. Its sedative action in irritable states of the stomach is well known. Externally applied (fl. drm. j.–fl. drs. ij. of the diluted acid, in fl. oz. x. of water), it is sedative and anodyne. Care should be taken not to apply it to an ulcerated or denuded surface, as it becomes, when thus applied, absorbed into the system, and may produce serious and even fatal effects. "Scheele's Acid" is about twice as strong as that of the Pharmacopœia, containing 4 per cent. of the anhydrous acid; but different specimens of Scheele's Acid are found to vary in strength. For this reason it should not be prescribed.

1174. *In poisoning by Hydrocyanic Acid*, according to M. Preyer,[3] artificial respiration, immediately applied, is very frequently a perfect remedy; and further, that in atropia, in very small doses ($\frac{1}{75}$ gr. ?) subcutaneously injected, as soon as possible after the ingestion of the acid, we have an unfailing antidote. Further experiments are required to demonstrate the correctness of these statements. In the treatment of poisoning by this acid, the first object should be to support life by all means in our power, for, as Dr. Ringer (p. 364) observes, "hydrocyanic acid passes very speedily into the blood, and is as speedily eliminated; hence if life can be supported for half an hour, the patient is generally safe."

Dose:—Of the diluted Acid (B. Ph.), ♏ij.–viij. *Of Scheele's Acid*, half the quantity. It is rarely, if ever, advisable or safe to carry the dose to the full extent directed in the B. Ph.

1175. *Therapeutic Uses. Simple Nervous Cough*, apparently independent of pulmonary disease, is sometimes of great urgency and violence, and, while it seems to be kept up by an irritable state of the system, appears to be aggravated by opiates, and the usual expectorant remedies. For this affection, there is no more certain palliative than hydrocyanic acid (Stillé, ii. p. 223.) *In the Cough of Phthisis*, it often forms a valuable adjunct to ordinary cough mixtures, especially when the system is irritable, and any spasmodic symptoms are present. Under the same circumstances, it seems to possess some power in controlling *Hæmoptysis*. There is much evidence, especially adduced by Dr. H. Roe,[4] to prove that it is a powerful remedy

[1] Edin. Med. Surg. Journ., No. lxi. p. 39.
[2] Lancet, June 13, 1846.
[3] Practitioner, Aug. 1868.
[4] On Hooping Cough, chap. vii.

in *Hooping Cough;* there are, however, other remedies quite as effectual, and far more safe, *e.g.*, belladonna. If employed, Dr. West's formula (p. 443) may be tried:—℞ Acid. Hydrocyan. dil. ♏ viij., Liq. Cinchonæ (Battley's) fl. drm. j½., Syr. Aurantii fl. drm. j½., Aq. Flor. Aurant. fl. drm. iij., Aq. fl. drm. vj., M. Dose, fl. drm. iij., thrice daily, for a child æt. two years.

1176. *In Dyspepsia, attended with gastric irritation*, hydrocyanic acid, in doses of ♏ ij.–iv., combined with infusion of calumba, is often signally useful, allaying irritability of the stomach, and thereby inducing a slower and consequently a more healthy secretion of gastric juice. *In the Irritative Dyspepsia of Phthisis*, Dr. Wilson Fox (ii. p. 887) states that he has found no remedy so efficacious as this acid, given with carb. of potash or soda, in infusion of calumba, twice or thrice daily, in the intervals of meals. *In Sub-acute Gastritis*, it often proves useful, given in an ordinary effervescing draught. Speaking of its use in *Gastrodynia*, Sir T. Watson (ii. p. 446) states that he has seen more rapid and decided relief afforded by hydrocyanic acid than by anything else, and that the cure so wrought is often permanent. *In Gastralgia and Enteralgia*, it is often productive of good results, given in conjunction with bismuth.

1177. *Vomiting*, arising from many morbid conditions, is often speedily relieved by hydrocyanic acid, given in an effervescing draught. Even in that attendant on *Ulcer of the Stomach*, according to Dr. Brinton (p. 171), it sometimes is effectual, either alone, or with the effervescing mixture of the citrate of potash. *In Enteric Fever, for simple Vomiting* of sour bilious fluid, a mixture containing carb. of soda gr. xxx., and diluted hydrocyanic acid ♏ v., is very serviceable. If there be sickness and diarrhœa, we may prescribe the following draught:—℞ Mist. Cretæ fl. oz. j., Bismuthi Subnit. gr. x., T. Opii, Acid. Hydrocyan. dil. āā ♏ v., M. To be repeated every two or three hours. This usually succeeds in allaying the vomiting (Dr. Harley, p. 630.)

1178. *In Acute Mania, and other forms of Insanity*, for allaying excitement, Dr. K. McLeod[1] reports very favourably of hydrocyanic acid, in doses of ♏ ij.–vj., repeated at such intervals as are required to sustain its specific action. He not only thus administered it by mouth, but also hypodermically. The practice does not seem to be devoid of danger. Dr. Maudsley considers that it may be sometimes usefully conjoined with digitalis (*q. v.*)

1179. *In Skin Diseases*, to allay distressing pruritus, lotions containing hydrocyanic acid are often very effectual; either of the following may be used:—℞ Acid. Hydrocyan. dil. f℥iv.,

[1] Med. Times, March 1863.

Aq. Dest. f℥viij., Alcohol f℥iv., Plumbi Acet. gr. xvij., M.; or, ℞ Acid. Hydrocyan. dil. ♏ x.–xl., Glycerini f℥j., M. It proves especially useful in *Urticaria*, *Lichen Tropicus* ("*Prickly Heat*"), *Eczema*, and *Impetigo*. *In Pruritus Pudendi*, Dr. West speaks of the acid, largely diluted, as a valuable application. Some caution is necessary in its use; the stronger formula (*ante*) should not be applied over a large surface, and the patient must be warned not to use it too freely, as there is danger of its becoming absorbed. It should never be applied to abraded surfaces.

1180. *In Neuralgia*, Dr. Fuller (p. 480) has often found the following application useful:—℞ Acid. Hydrocyan. dil. fl. oz. ½, Glycerini, Aq. Rosæ āā fl. drm. ij., M. This should be painted over the seat of pain with a camel-hair brush.

1181. Hydrogenii Peroxidum. Peroxide of Hydrogen. Is best obtained for medicinal purposes by the process originally proposed in 1818 by Thénard, its discoverer, in which peroxide of barium is used as the agent for supplying the oxygen, with hydrochloric acid as the displacing body. A solution charged with ten volumes of oxygen is the best and most applicable for general use, according to Dr. B. W. Richardson,[1] who was the first to apply it to therapeutic uses.

Med. Prop. and Action. The peroxide in weak solution acts as a stimulant. It probably acts by oxidizing the blood, but this effect can be arrested by the action of alkaloids and narcotics. In some cases, when employed freely, it has been observed to produce a profuse salivation. Of a solution charged with ten volumes of oxygen, the dose for an adult is fl. drm. j.–fl. drs. iv. in a liberal quantity of water. As a general rule, it should be given separately, or if conjoined with another remedy, it should be added at the period of administration. Dr. S. B. Birch[2] speaks disparagingly of this remedy, "disagreeing and causing intestinal irritation in some cases, exercising no perceptible action in others, and rarely productive of good." Its disagreeable taste is a great objection to it. He considers that we can do very well without it, except in bad cases of diabetes, when he thinks it should be fairly tried.

1182. *Therapeutic Uses.* Dr. Richardson employed the peroxide in 223 instances, from which he draws the following conclusions:—In the treatment of *Diabetes* the peroxide, while it reduces the specific gravity of the urine, increases the quantity, so that its value in the disease is inappreciable. [Cases of diabetes successfully treated with it are recorded by Dr. Day,[3] of Geelong, and Mr. Bayfield;[4] but Dr. Pavy (p. 268) states that he tried it in a few cases without being able to trace the slightest effect, one way or another; he believes it to be

[1] Lancet, Oct. 20, 1860, p. 390; and Brit. Med. Journ., March 22, 1862.
[2] Brit. Med. Journ., Apr. 11, 1868.
[3] Lancet, Jan. 11, 1868.
[4] Ibid., Oct. 17, 1868.

perfectly devoid of the power of influencing the disease; and the later researches of Dr. Richardson[1] tend to show that it is devoid of any specific value in diabetes.] *In Chronic and Sub-acute Rheumatism*, it is of great value. *In Valvular Disease of the Heart, attended with Pulmonary Congestion*, it largely relieves the attendant apnœa. *In Struma*, it removes *glandular swellings*, like iodine. *In Mesenteric Disease*, it improves the digestion, and favours the tolerance of cod-liver oil and iron. *In Jaundice*, it exercises an excellent effect in improving the digestion and causing a free secretion (of bile?) *In Cancer*, it seems to exert no influence. *In Pertussis*, its value is very remarkable; it cuts short the paroxysms, and removes the disorder altogether more quickly than any other remedy except change of air. *In Chronic Bronchitis*, during the attacks of suffocative dyspnœa, it affords rapid relief. *In Chronic Laryngitis*, its caustic character renders its administration painful. *In Anæmia*, while it exerts no specific influence *per se*, yet, combined with iron, it increases the activity of that drug. *In Phthisis*, in the first stage, it greatly improves digestion, and aids the action of iron; while, in the last stage, it affords unquestionable relief to the breathlessness and oppression, acting, in fact, like an opiate without producing narcotism. It was also used in a few cases of *Dyspepsia*, but with what result is not stated. (Ranking.)

1183. Hyoscyami Folia. Hyoscyamus or Henbane Leaves. The leaves of Hyoscyamus niger, *Linn. Nat. Ord.* Solanaceæ, collected when about two-thirds of the flowers are expanded. *Hab.* Waste places throughout Europe and Western Asia.

Med. Prop. and Action. Narcotic, anodyne, and anti-spasmodic, its activity residing principally in an alkaloid, *Hyoscyamia*. According to the researches of Dr. Harley,[2] hyoscyamus or its alkaloid given in small doses, and such as are insufficient to produce positive dryness of the mouth, rapidly subdues ordinary excitement of the pulse, and reduces it within an hour or two to its slowest state, namely, to that condition in which it may occasionally be found after a long period of complete rest of mind and body, *e.g.*, to 50 or 45. It was never observed lower than 42. After doses ($\frac{1}{10}$–$\frac{1}{12}$ gr. of Hyoscyamia introduced hypodermically) sufficient to produce complete dryness of the tongue and hard and soft palates, the pulse will generally experience an acceleration of 10 or 20 beats, and be increased slightly in force and volume. This acceleration rarely lasts an hour; the pulse then slowly declines, and usually decreases about five beats for every interval of 20 or 30 minutes, until at the end of from an hour and a half to two hours, it attains its minimum rate. Apart from these effects on the pulse, the following symptoms will be observed, after moderate doses (grs. $\frac{1}{30}$–$\frac{1}{24}$ of the alkaloid). In 10 or 20 minutes from the time of injection, the tongue becomes more or less completely dry, rough and brown; the hard and soft palates dry and glazed; excessive giddiness, and a weight across the forehead, somnolency, the cheeks a little flushed, and the membranes of the

[1] Med. Times and Gaz., Dec. 12, 1868.

[2] Brit. Med. Journ., Apr. 11, 1868, p. 343.

eye sometimes slightly injected. After continuing for about an hour, these symptoms pass off, and the tongue and palate become covered with a sticky and offensive secretion, agreeing in all respects with that observed after the action of belladonna. The pupils slowly dilate during the latter part of the action of the medicine, and at its close, attain their maximum degree of dilatation. If larger doses than $\frac{1}{12}$ gr. be given, the above symptoms will be increased in degree, and prolonged for two or three hours; and they will be accompanied either by wakeful, quiet, and usually pleasing delirium, with illusions of the sight, or with such excessive somnolency that the patient cannot keep the eyelids raised for a few seconds, but when aroused, lapses again into a dreamy sleep, broken by occasional mutterings and slight jerking of the limbs. In either case, the power of maintaining the erect posture will be lost, and at best the patient reels like a drunken man. Like atropia, hyoscyamia is eliminated by the kidneys, and has been detected in the urine twenty-two minutes after the hypodermic injection of gr. $\frac{1}{12}$ of the alkaloid. The urinary constituents themselves do not appear to undergo any diminution or increase during the operation of henbane, but at the end of its operation many individuals altogether fail to pass a single drop of urine, and this retention may be prolonged for several hours, but never, when the bladder is in a healthy condition, causing any inconvenience. When taken by the mouth, hyoscyamus, or its active principle, produces exactly the same effects as when the latter is introduced into the system hypodermically; they are fully developed about an hour after the ingestion of the medicine. In its action upon the system, hyoscyamus appears to be intermediate between opium and belladonna, possessing as it does, on the one hand, powerful somniferous properties second only to opium itself, and on the other, an influence on the sympathetic nervous system, as indicated by the pulse, secondary only, when given in large doses, to that possessed by belladonna itself. Compared with belladonna, it is distinguished by a preponderance of deliriant or somniferous properties. Compared with opium, it agrees, on the one hand, very closely with that drug in its cerebral effects, provided we take a wide view of both medicines upon the system; whilst, on the other, its influence upon the pulse, upon the mucous membrane of the mouth, and the pupil, place it in strong contrast with that drug. In addition to its cerebral and sympathetic effects, henbane has a powerful depressant influence upon the motor function, and thus comes into relation with conium.

Dose:—Of the Extract, gr. v.–x. *Of the Tincture* (Hyoscyamus Leaves in coarse powder oz. ij$\frac{1}{2}$., Proof Spirit, Oj.), ℥xx.–lx. According to Dr. Harley, fl. oz. j. of the tincture, or gr. xv. of the extract, is about equivalent to gr. $\frac{1}{40}$ of sulphate of hyoscyamia introduced subcutaneously. According to his experience, it requires fl. oz. j. of the tincture, and fl. oz. j$\frac{1}{2}$. of the succus, to procure sleep; smaller doses he considers are insufficient for this purpose.

The combined action of hyoscyamus and opium has been carefully examined by Dr. Harley, who draws the following conclusions:—1. Opium prolongs and intensifies the effects of hyoscyamus, even to producing an acceleration of pulse some 15 or 20 beats for an hour or more. 2. Hyoscyamus increases the hypnotic action of opium, and, to a certain extent, is able to prevent the derangement of the vagus nerve, which is frequently the first effect of opium. 3. Opium given in combination with hyoscyamus does not prevent the elimination of hyoscyamia by the kidneys. The influence of the caustic alkalies on hyoscyamus is probably identical with that observed in belladonna (*q.v.*) Children will usually bear a very large quantity of henbane. Dr. Harley mentions having frequently given a fluid ounce of the succus or tincture to children under twelve years of age, with no other effect than an acceleration of the pulse 30 or 40 beats, continuing for an hour and then gradually declining, and, towards the end of the action, a moderate dilatation of the pupil. The mouth, in these cases, remained clean and wet throughout, and there was no trace of giddiness or sleepiness. Hyoscyamus, or its alkaloid, applied locally to the eye, produces dilatation of the pupil.

1184. *Therapeutic Uses. In functional disturbance of the Heart*, arising from emotion, henbane is specially indicated, but, to be effectual, it requires to be given in large doses. Dr. Harley (p. 340) states that in these cases, the subcutaneous injection of gr. $\frac{1}{48}$ of sulphate of hyoscyamia exercises a most speedy and beneficial influence. He also states that in *Cardiac and Pulmonary Asthma* it is the appropriate remedy, and when used subcutaneously will often bring immediate relief.

1185. *In Insanity of a sthenic type*, and in *Acute Delirious Mania*, under the conditions enumerated in sect. 820, henbane is indicated, and, equally with digitalis, is far preferable to opium. Dr. Maudsley advises the tincture in drachm doses; if this has no effect, then fl. drm. ij., or even more, may be given safely. Dr. F. Blandford prefers the extract, gr. x.–xv., given in the fluid form. (See DIGITALIS.) As a sedative, it is favourably spoken of by Van der Kolk (p. 157), especially if chest complications co-exist. *In Delirium Tremens*, it is favourably spoken of by Dr. Barlow,[1] especially when given after the action of an aperient, combined as follows:—℞ Camphor gr. ij., Ammon. Carb. gr. iv., T. Hyoscyam., T. Lupuli, Syr. Aurant., Mucilag. Acaciæ, āā ℥j., Mist. Camph. fl. oz. j., M., ft. haust. horâ somni sumend. This formula he also advises in *Mania*, omitting the ammonia when there is much vascular excitement. *In Puerperal Insanity*, Gooch speaks highly of a combination of extract of hyoscyamus (gr. v.) and camphor (gr. v.) repeated every six hours.

1186. *In all irritable conditions of the Kidneys, especially in the Oxalic and Uric Acid (gouty) Diathesis*, henbane, according to Dr. Harley (op. cit.), is an invaluable remedy. *In Nephritis*, both recent and chronic, it may sometimes be substituted with advantage for belladonna. *In Spasmodic Affections of the Uterus, the Bladder, and the Urethra*, the antispasmodic and anodyne effects of henbane are very decided. *Enuresis of the young* is very speedily ameliorated and ultimately cured by its judicious use. (Dr. Harley.)

1187. *In Hypochondriasis and in Epilepsy* arising from emotional disturbances, Dr. Harley states that he has found henbane very serviceable; it must be given in occasional and full doses (fl. drm. iv.–oz. j$\frac{1}{2}$. of the succus, or fl. drm. iv.–v.–viij. of the tincture). In other varieties of this disease, and in *Convulsive Affections generally*, it proved useless in his hands.

1188. *In Neuralgia*, it is a powerful anodyne, but in affections of the nerves of common sensation it possesses no advantage over atropia. *In Neuralgic Affections of the Internal Viscera*, it is more efficacious than belladonna. (Dr. Harley.)

[1] Pract. of Med., p. 543.

1189. *In Cancer of the Uterus*, Dr. J. Clarke advises a vaginal injection, composed of drm. iij. of the extract, dissolved in Oj. of warm water. Of this fl. oz. iij. may be used, three or four times daily. It affords much temporary relief.

1190. *In Diseases of the Eye*, henbane is a valuable means of dilating the pupil. It is less powerful than belladonna, but may be substituted for it in *Cataract*, *deep-seated Ulcers of the Cornea*, *Iritis*, *&c.* (See BELLADONNA.)

1191. *In the Cough and Dyspnœa of Phthisis*, great relief is often obtained by inhaling the vapour of henbane (gr. iv.–vj. of the extract in Oj. of boiling water).

1192. *In Rheumatism*, *painful Glandular Swellings*, *irritable Ulcers and Hæmorrhoids*, fomentations or cataplasms of henbane leaves afford great relief. An ointment composed of equal parts of the extract and lard is also very serviceable in these cases.

HYPOPHOSPHITES, ALKALINE. See Sodæ Hypophosphis.

1193. IODOFORM. Iodoformum. Sesqui-iodide of Carbon, Yellow Iodide, or Ter-iodide of Formyle. C_2HI_3. Formed by the mixture of concentrated alcoholic solutions of Iodine and Potassa. Introduced into practice in 1848 by Dr. Glover.[1] It occurs in the form of small pearly crystals of the colour and odour of saffron, and of a sweet taste. It is volatile, soft to the touch, insoluble in water, soluble in alcohol, and in ether.

Med. Prop. and Action. In small medicinal doses iodoform, according to Dr. Glover, appears to possess a union of tonic, stimulant, and alterative properties, exercising, at the same time, a remarkable influence on the nervous system, producing occasionally a kind of intoxication, followed by convulsions and tetanic spasms. In large doses it may prove fatal; fifty grains, in Dr. Cogswell's[2] experiments, having destroyed a strong dog. The odour of the iodine was detected in the blood, brain, and muscles. The dose is gr. j.–iij. twice daily, in the form of pill. Externally, it may be applied in the form of ointment (gr. xxx.–gr. lx. ad Ung. oz. j.) *As an anæsthetic*, it has been supposed to exercise effects similar to chloroform; but the experiments of Righini and Bouchardat[3] show that though its influence on leeches, fishes, &c., is very marked, yet that on mammalia it will bear no comparison to chloroform, except indeed in its local operation. Introduced in the form of suppository into the rectum, M. Moretin found its local anæsthetic influence was so marked that defecation could be accomplished without consciousness on the part of the patient; and this was further shown by the anodyne influence it exercises when applied to cancerous and other ulcers. *As a disinfectant*, its powers have been asserted by M. Righini.[4]

1194. *Therapeutic Uses. To painful Cancerous and Phagedenic Ulcerations*, iodoform locally applied has been found effectual

[1] On Iodoform, Edin. 1848.
[2] Essay on Iodine, p. 122.
[3] Ann. de Thérap., 1857, p. 205.
[4] Journ. de Chim. Med. 1853.

in relieving the pain and improving the character of the ulceration. It may be applied in the form of ointment (*ante*), or it may be dusted over the part, and the surface covered with some bland preparation, as glycerine, spread on lint. It is inapplicable so long as inflammation is present. Dr. Eastlake employed it internally in *Cancer of the Uterus*, in doses of grs. ij.–iij., in the form of pill with bread crumbs; and it seemed to diminish the pain when locally applied to the cervix uteri, in an advanced case of disorganization. Dr. Greenhalgh considers that it has the advantage of never producing that malaise so frequently attendant on the use of opium, and that it is a valuable addition to the materia medica. (Dr. Tilt, p. 245.) *In Cancer of the Rectum, and in some painful Affections of the Bladder*, iodoform suppositories have been found serviceable in relieving the pain. Dr. Morétin found them also very useful in *Chronic Enlargement of the Prostate*.

1195. *In obstinate Skin Diseases*, especially in *Lepra*, *Psoriasis*, *and Chronic Eczema*, Dr. Glover found great benefit from it. *In Bubo*, *Scrofulous Glandular Enlargements*, *Bronchocele*, *Bed Sores*, *and Chancres*, it has also been found useful, in some instances, when locally applied.

1196. *In Phthisis*, iodoform mixed with starch, spread on paper, and allowed to volatilize, so that the patient may inhale the vapour in a very diluted form, has been thought to exercise a beneficial influence.

1197. The pain of *Gout* and *Neuralgia* is said to have yielded to the local employment of this substance; in the hands of some practitioners, however, it has not succeeded. It has been advised to use in neuralgia a saturated solution of iodoform in chloroform. (Ringer, p. 262.)

1198. Iodo-Tannin. A preparation formed by triturating together Iodine, Tannic Acid, and Water.

Med. Prop. and Action. It is considered to conjoin the alterative properties of iodine with the astringency of tannin. For internal use it is given in the form of syrup (Iodine grs. xxx., Ext. of Rhatany grs. cxx., Water and Sugar of each enough to form Oijss. of Syrup), in doses of fl. drs. ij.–fl. oz. ss., gradually increased. Each ounce contains about a grain of iodine. For external or local use, the following solution is advised:—Iodine grs. lxxv., Tannin oz. jss., Water fl. oz. xxx.; filter and concentrate to fl. oz. iij. Its action is that of a stimulant and astringent.

1199. *Therapeutic Uses.* As an internal remedy, the syrup is applicable to the same class of cases generally as iodine, but is preferable where there is profuse discharge or marked relaxation of the mucous membranes or other tissues. The solution (*ante*) has been found serviceable as an injection in *Leucorrhœa*, *Gonorrhœa*, *Vaginitis*, and allied affections; also as an application to *Ulcerations of the Os Uteri*, *Hydarthrosis*, &c. As an

injection in the cure of *Varices*, it has been employed by M. Desgranges:[1] out of seven cases in which he employed it, six proved successful. He found it, however, nearly one-third as weak as the perchloride of iron (*q.v.*) He advises a trial of its powers in *Aneurism*.

1200. Iodum. Iodine. I = 127. A non-metallic element, obtained principally from the ashes of sea-weeds. It exists largely in many marine plants. It was discovered by M. Curtois, in 1812. It is very sparingly soluble in water, but freely so in alcohol, in ether, and in a solution of iodide of potassium or of chloride of sodium.

Med. Prop. and Action. Iodine, given internally in small or medicinal doses, is alterative-tonic. One of the first and most important effects of this remedy observed by Lugol,[2] is a great increase of appetite. This is certainly one of its best effects; for not only does it indicate an improved state of the digestive organs, but it enables us with ease to invigorate the constitution by wholesome and sufficient nourishment. Together with increased appetite, the general health improves, and the body gains strength and plumpness. There is also increased activity of most of the excreting and secreting organs. The urine is generally much increased in quantity. Some experience this effect so instantaneously, that iodine has been detected in the urine almost immediately after the dose has been taken; indeed, Prof. Porta[3] observes, that after inhaling the vapour of iodine for one minute, not so much as a grain of the metal having been lost, his urine gave forth the odour of iodine for four or five days. It occasionally causes purging, in which case it should be discontinued. In large doses, it produces irritation of the gastro-intestinal mucous membrane, causing pain and heat of the epigastrium and vomiting. When combined with potassium, it does not produce the same amount of local irritation. Some persons, from idiosyncrasy, are unable to take iodine, even in small doses, without its causing headache, vertigo, coryza, derangement of the digestive organs, &c. This state is designated *Iodism;* it only remains as long as the patient is taking the remedy; on its being discontinued, the whole of the symptoms disappear. The subject of Iodism has been examined by M. Rilliet,[4] whose observations, though highly interesting, are too lengthy for insertion in this place. *Externally* applied, it produces intense local action, and often causes a prolonged sensation of pricking and smarting. The skin, when rubbed with it, becomes of a reddish yellow colour, from the absorption of the remedy, its presence in the cutaneous tissue, and its injection into the capillary vessels. The epidermis soon becomes detached in layers of various sizes. When applied to ulcerated surfaces, it at first causes much pain; but as the healing process progresses, the iodine causes less and less irritation. This diminution of pain is not uniformly observable. When the vapour is inhaled, it excites cough and irritation of the air-passages. Whether inhaled, or applied endermically, it becomes absorbed into the system, and evidences its presence in the urine, on the addition of starch. It has been deemed emmenagogue. Iodine has been proposed as a deodorizer and disinfectant by Dr. B. W. Richardson. Air charged with

[1] Braithwaite's Ret., xxxiv. p. 178.
[2] On Iodine, trans. by O'Shaughnessy, 1831; and on Scrofulous Diseases, trans. by Ranking, 1844.
[3] Brit. and For. Med. Rev., June, 1851.
[4] Gaz. Méd. de Paris, 1860.

organic impurities is rendered entirely inodorous by the volatilization of iodine in the apartment; in this character it is very efficient.

Dose:—Of Iodine, gr. $\frac{1}{8}$-$\frac{1}{4}$-$\frac{1}{2}$ in pill; a bad form of administration, apt to induce gastric irritation. *Of the Tincture* (Iodine oz. $\frac{1}{2}$, Iod. of Potassium oz. $\frac{1}{4}$, Rect. Spirit Oj.), ♏v.-xx. Prep. for external use only. *Solution* (Iodine gr. xx., Iod. of Potassium gr. xxx., Dist. Water fl. oz. j.) *Liniment* (Iodine oz. j$\frac{1}{4}$., Iod. of Potassium oz. $\frac{1}{2}$, Camphor oz. $\frac{1}{4}$, Rect. Spirit fl. oz. x.) *Ointment; or Compound Ointment, B. Ph.*, 1864 (Iodine, Iod. of Potassium, āā gr. xxxij., Proof Spirit fl. drm. j., Lard oz. ij.) For inhalation: *Vapor Iodi* (Tinct. of Iodine fl. drm. j., Water fl. oz. j., mix in a suitable apparatus, and having applied a gentle heat, let the vapour that arises be inhaled).

1201. *The alleged ill effects of Iodine are:*—1. *That it causes emaciation of the body generally.* This is contrary to the experience of Lugol,[1] who, from a large number of observations, concludes—1, that emaciated females acquired a state of *embonpoint;* 2, that corpulent women did not become emaciated; and 3, that those not belonging to either of the preceding classes lost nothing of their middle state, but gained strength and improved health. Dr. Ranking[2] adds that his own observations quite bear out the remarks of Lugol. 2. *That it causes emaciation of the mamma in the female and of the testis in the male.* There are cases recorded by Cullerier[3] and others in which these effects have been observed; but so rare are their occurrence that neither Lugol, Magendie, Ranking, nor Dr. Davies,[4] of Hertford, ever met with a single example, although they have respectively employed this agent in a very large number of cases. In Cullerier's patients the organs resumed their natural size and functions when the medicine was discontinued. Although I have employed this remedy extensively, and continued its use for weeks and even months, I have never met with an instance of emaciation of these organs. 3. *That it produces salivation.* This effect is much more common than either of the preceding. Many instances of it are on record. It differs from mercurial salivation in not being attended with fetor of the breath, by the teeth remaining firmly fixed, by the absence of ulcers of the gums,[5] and by disappearing when the medicine is omitted. It has more frequently been observed when a course of mercury has preceded the use of iodine. 4. *That it occasions catarrhal symptoms, hæmoptysis, gastric irritation, and general disturbance of the system.* These effects, it is now generally admitted, only occur in persons who, from peculiar idiosyncrasy, are unable to take the medicine in any form or dose (such cases, however, are rare), or where the remedy has been exhibited in injudiciously large doses.

1202. *In order to ascertain whether Iodine has become absorbed into the system,* take a strip of starched paper, moisten it with the saliva or urine of the patient, and then touch it with nitric acid. If iodine be present, a more or less intense blue is produced (Rayer.)[6] According to Dr. Rosenthal,[7] iodine may be detected not only in the urine, saliva, and other secretions, but also in the alvine evacuations within from four to seven hours after iodide of potassium has been taken. Iodine may be detected in the urine when it is introduced into the system through the skin, by means of frictions or baths.

1203. *Remarks on its Use.* 1. During the exhibition of iodine, give a light animal diet, carefully avoiding all articles containing much starchy matter, as this, by combining with the iodine, renders it comparatively inert.

2. Enjoin exercise in the open air; close, dark, ill-ventilated rooms retard the action of the remedy.

[1] Op. cit., p. 23.
[2] Op. cit., p. 248.
[3] Lancet, No. 1268.
[4] Selections in Pathology and Surgery, Lond. 1839, p. 51.
[5] Sir F. Smith, Dub. Journ., July, 1841.
[6] Bull. de Thérap., vol. xxxv.
[7] Lancet, Sept. 5, 1863.

3. Give the medicine an hour or two before a meal; if taken on an empty stomach, it is liable to give rise to gastric irritation.
4. Employ an aqueous solution recently prepared, in preference to a strong alcoholic solution, which undergoes changes by long keeping.
5. If it create irritation, diminish the dose and combine it with small doses of henbane or opium.
6. Be careful to regulate the bowels.
7. Up to a certain point, patients often visibly improve under the use of iodine; there then occurs an arrest of benefit, and the disease remains stationary, or even begins to retrograde. Under these circumstances, discontinue the medicine for a week or two, and then resume it.
8. Dr. Rodet, of Lyons, from numerous observations, concludes that iodine will rarely produce any ill effects, if given only in those cases which evidently call for its employment; that it acts much more favourably, if the patient has not already been subjected to other remedial measures; and that, where mercury has been previously taken, iodic ptyalism is likely to occur.
9. When syringes are to be employed, they should be of glass; when baths, the vessels containing the liquid should be of wood, marble, or glass. Metal vessels of all kinds should be avoided.
10. The recent stains of iodine may be effectually removed by a little milk, alcohol, or diluted liquor potassæ.

1204. *Therapeutic Uses. In Scrofula and Scrofulous Affections* generally, iodine and its compounds hold a foremost place in our list of remedies, though the benefit derived from them is far greater in some cases than in others. *Chronic Scrofulous Glandular Enlargements* often speedily diminish in size, and in time are dispersed, under their use. Dr. Balman's[1] treatment of these cases seems very judicious, and in his hands has proved very successful. If the swelling is recent, he commences with iodine lotion or a mixture of 1 part of the tincture (B. Ph.) and 3 parts of water. Pledgets of lint soaked in either of these solutions, are kept continuously applied to the tumour, and in order to retain the moisture, are covered with oiled silk. If the tumour be of longer duration, firm to the touch, or has implicated the surrounding textures, he pencils the surface lightly two or three times with the solid nitrate of silver, or with a solution of iodine. The former is the least irritating to the skin, and therefore in many cases the best to commence with. This application is repeated at intervals of five or six days. All warm bandages, &c., are removed, and the parts freely exposed. If procurable, the tumour may be advantageously bathed with sea-water every morning. This procedure will, in all probability, produce one of two results; either a gradual diminution in the size of the swelling, or suppuration. In the latter case, the abscess should be opened at once in the most dependent position, and the parts surrounding the incision immediately painted circumferentially with the iodine solution. The application should extend as far as the limits of the tumour. The effect of this treatment is to cause the rapid

[1] Lancet, April 13, 1867.

collapse and effectual emptying of the sac of the abscess, and within a very short period, probably, adhesion and closure of its cavity. The punctured wound, which may be covered with a piece of tow or charpie, very often heals without the slightest disfigurement, and we are enabled, if necessary, to continue the other applications. Injections of iodine, advised by Lugol, Tyler Smith, and others, have never, in Dr. Balman's hands, succeeded in producing favourable results. The plan of injecting iodine into abscesses, after the evacuation of their contents, finds favour with many; and Dr. Ringer (p. 56) states that *Iliac and Lumbar Abscesses* may be treated in this way, but the safety and efficacy of this practice, when the abscess is of any great extent, may fairly be questioned. The tincture, pure or diluted, or an aqueous solution (℞ Iodi gr. iij., Potas. Iod. gr. vj., Aq. Oj.), are advised for this purpose. *Scrofulous Ulcers* often improve under the use of the latter solution, pieces of lint moistened with it being kept on their surface, and covered with oil silk to prevent evaporation. Weak iodine ointment is preferable in some cases, and its efficacy has been found to be increased by the addition of a small portion of opium. *In Scrofulous Affections of the Bones and Joints, Caries*, &c., local iodine applications should not be neglected, but they fail to effect any great amount of good unless their local action is supported by constitutional treatment. In all the above cases some iodide compound [of which none is more generally useful than the iodide of iron], or cod-liver oil should be given internally, and a good nutritious diet with a portion of wine; out-door exercise should be enforced at the same time. *Scrofulous Coryza and Otorrhœa* are generally benefited by the same general treatment, aided by local iodine applications.

1205. *In Scrofulous Ophthalmia*, a local plan of treatment, introduced by Dr. Furnival,[1] of Hertford, has in many instances been found serviceable. The eyelid is put on the stretch, and the tincture of iodine (L. Ph.) applied to the external surface of the eyelids. It relieves the profuse lacrymation and the photophobia in a remarkable manner. Dr. Furnival states that he has employed it in this manner for many years, and always with decided benefit: he adds, in the early stages it will altogether and speedily arrest the morbid action; and in the latter periods it will greatly lessen, if not entirely remove, *Opacities of the Cornea*, which have resisted all other remedies. The tincture should be applied once daily with a camel-hair brush. Iodine should be given internally; and at the same time a generous diet, free exposure to the light, and the disuse of dark rooms and of shades, are advised.

[1] Lancet, 1842-3, vol. i., p. 405.

1206. *In Tubercular Meningitis*, especially in the advanced or chronic stage, iodine lotions to the scalp, or inunction of iodine ointment, used conjointly with the internal administration of iodide of iron and cod-liver oil, appear to offer the best chances of success, though these, in common with most other remedies, too often fail to arrest the progress of the disease. Dr. Winn[1] relates a case of *Chronic Hydrocephalus* treated with injection of iodine (Tr. Iod. ℥xiv., Aq. fl. oz. ij.) subsequent to paracentesis. Though the case ended fatally, it would seem to prove that iodine may be injected into the brain without causing any poisonous or other ill effect. The practice is not advocated.

1207. *Diseases of the Lungs. In Phthisis*, iodine, as an internal remedy, has been almost wholly superseded by cod-liver oil, though it is not improbable that some of the efficacy of the latter drug depends upon the small proportion of iodine which it contains. When, however, the cough is troublesome and the expectoration abundant, benefit sometimes results from the use of iodine inhalation (*ante*). It may be employed night and morning. Under the same circumstances, the application of the tincture or ointment of iodine to the sub-clavicular region may be resorted to with advantage; but some care is necessary in their use, as in delicate skins they are apt to create an undesirable amount of irritation or inflammation. The practice of painting the chest with tincture of iodine every night, as a gentle counter-irritant, is not without a certain influence in the way of inhalation: for a portion of the iodine evaporates and slightly impregnates the air around the patient, and this atmosphere of iodine may not be without its influence for good. (Dr. C. J. B. Williams.)[2] Dr. Waters (p. 252) speaks favourably of mild counter-irritation by means of tincture of iodine painted over the chest in the earlier stages of phthisis. Iodine inhalation has occasionally been found useful in some forms of *Chronic Bronchitis*, especially in that supervening on the exanthemata.

1208. In the advanced stages of *Pleurisy*, especially with the view of promoting pleuritic effusions, one of the most valuable means we possess is a strong solution of iodine, externally applied at the same time that the iodide of potassium is given internally; and this, according to Dr. Waters (p. 226) is the best remedy we possess. Good diet, tonics, and even wine should be allowed, in order to keep up the strength. Iodine, if applied to a large surface in these cases, is apt to occasion a good deal of feverishness, in which case its use should be suspended for a day or two. In these cases it has been proposed, after the evacuation of the effusion, to employ injections into

[1] Lancet, Nov. 3, 1855. [2] Ibid., Aug. 15, 1868.

the pleural cavity of a weak solution of iodine (gr. iv.–v., Potass. Iod. gr. iv.–v., Aq. Oj.), the strength to be increased as the patient is able to bear it. "Although," observes Dr. Ringer (p. 55), "no doubt such treatment may often be adopted with much success, still it must be used with the greatest caution, or otherwise much inflammation, with high fever, will result, circumstances which, in many instances, have proved fatal to the patient." In the advanced stages of *Pneumonia*, iodine, in the form of ointment or tincture, applied to the walls of the chest, is an adjunct of considerable value to internal remedies.

1209. *Diseases of the Abdominal Viscera. In Chronic Peritonitis*, especially in that arising in scrofulous subjects, iodine inunction over the abdomen, or painting the surface with the tincture, conjoined with the iodide of potassium or other iodide internally, is often of great service.

1210. *In Chronic Affections of the Liver*, iodine and its preparations, in properly selected cases, are often productive of good, but their indiscriminate use in all cases has tended to bring the remedy into disrepute. *In Waxy Enlargement of the Liver*, Dr. Murchison (p. 33) speaks of them as of undoubted utility, and he considers none of them superior to the tincture in doses of ♏x.–xv. diluted, three or four times daily. *In simple Hypertrophy and Chronic Congestion*, more benefit is derived from the external application, in the form of ointment or strong tincture, than from its internal administration. It is often of great service in these cases. *In Hydatid Disease*, it has been advised, but Dr. Murchison (p. 74) remarks that there is not only no proof of the power of the iodides to destroy the life of the parasite, but there is positive evidence that the iodine does not reach it. Frerichs was unable to discover a trace of iodine in the fluid of an hydatid cyst removed from a woman who had taken iodide of potassium for many weeks, and other similar observations were made by Dr. M. himself. Injecting the emptied cyst with a solution of iodine was practised by M. Boinet;[1] Dr. Murchison directs it to be done with solution of carbolic acid (*q.v.*)

1211. *In Enlargements and Chronic Affections of the Spleen*, iodine, externally and internally, may be used with advantage. One of the largest enlargements I have met with yielded to its use. Sir R. Martin[2] observes that where there is mucous intestinal irritation, attended by a hectic form of fever, he has found benefit from the following mixture:—℞ T. Iodi, T. Ferri Sesquichlor. āā f℥ss., Aq. f℥j., M. gutt. x. ter in die ex aq. sumend. He advises frictions with croton oil, but iodine ointment is preferable. *In the tuberculated condi-*

[1] Med. Times, March 5, 1864. [2] On Tropical Climates, p. 229.

tion of the Spleen, which is met with in children, Dr. Bigsby strongly advises small and long-continued doses of iodine.

1212. *In the Vomiting of Pregnancy*, the tincture of iodine, in ♏x. doses, sometimes succeeds when other remedies fail. It is highly spoken of by Dr. Eulenberg,[1] who found it useful also in relieving *Cardialgia*.

1213. *In Dropsy*, little reliance can be placed on iodine and the iodides as internal remedies, though in combination with other medicines they often seem useful adjuncts in treatment. Success has sometimes attended iodine injections after paracentesis; but the treatment is not devoid of danger, as they are apt to induce peritonitis. In a case of ascites in a girl aged eighteen, M. Leriche,[2] of Lyons, after the operation of paracentesis, injected the following mixture into the peritoneal cavity :—℞ T. Iodi f℥j., Potas. Iod. ℥j., Aq. f℥viij., M. Four ounces only of this injection were returned, the remainder was left in the abdomen. Some irritation followed, but the girl was discharged cured, nineteen days after the operation. M. Dieulafoy[3] also relates two cases cured by iodine injections. No ill effects resulted in either instance. Other examples are recorded by Dr. Costes.[4] The following rules for using iodine injections in ascites are given by Tessier :[5]—1. Do not empty the peritoneal cavity before using the injection. Fatal peritonitis has followed a neglect of this rule. 2. The strength of the injection is to be in conformity with the composition of the peritoneal fluid, the strength being in direct relation to its alkalinity and albuminosity. 3. Practise a preliminary tapping some days previously if the abdomen is very voluminous, in order to diminish the peritoneal surface and so lessen the risk of peritonitis.

1214. As a radical cure of *Hernia*, M. Joubert[6] employed with success in three cases the injection of the tincture of iodine into the hernial sac. The tincture was not allowed to remain permanently in the sac, but was withdrawn by means of a syringe. This mode of treatment was first proposed by Velpeau in his "Annales de Chirurgie."

1215. *In Fistula in Ano*, iodine injections are advised by Mr. Clay,[7] of Manchester. He relates one case of long standing cured by its use. A glass syringe should be used. Other cases successfully treated by this means are related by Dr. Boinet.[8] A case of *Spina Bifida* successfully treated by iodine injections is recorded by Dr. Brainard.[9] The strength of the

[1] Ranking's Abstract, 1861, vol. xxxiii. p. 191.
[2] Med. Times, vol. xvi. (1847) p. 275.
[3] Bull. de l'Acad. Roy. de Méd., June, 1844.
[4] Gaz. Méd. de Paris, Oct. 29, 1853.
[5] Gaz. Méd. de Paris, April 22, 1854.
[6] Med. Times, Sept. 1854.
[7] Med. Gaz., Sept. 1843.
[8] Gaz. Méd. de Paris, Dec. 1853.
[9] Ranking's Abstract, vol. xxxiii. p. 191, 1861.

solution employed was Iodine gr. $\frac{5}{8}$, Iod. of Potassium gr. $\frac{1}{2}$, to Water f℥j. Another case, successfully treated in the same manner, is recorded by Mr. W. Martin Coates,[1] of Salisbury.

1216. *In Chronic Uterine Affections*, Dr. Tilt (p. 159) speaks well of tepid vaginal injections (T. Iod. ♏xxx.–lx., Aq. O$\frac{1}{2}$) once or twice daily; also of a daily hip bath, to which is added oz. $\frac{1}{2}$ of tincture of iodine, and drm. vj. of carb. of soda. As an application to an ulcerated surface, he remarks, it cannot compete with nitrate of silver; but iodized collodion might be more useful, as it would cover the ulcer with a medicated film, and at all events iodine better suits some idiosyncrasies and pseudo-membranous ulcerations. In this class of cases, Dr. Greenhalgh[2] advocates the use of "Iodized Cotton," prepared by dissolving iodine (oz. j.) and iodide of potassium (oz. ij.) in glycerine (oz. viij.); saturating with this solution oz. viij. of cotton wool, and then carefully drying it. A piece about the size of a half-crown, secured by silk thread tied crosswise, is to be introduced through a speculum, and pressed firmly against the cervix uteri, over which a piece of cotton wool, similarly secured, somewhat larger, and freely saturated with glycerine should be placed, and retained *in situ* while the speculum is being withdrawn. It may be applied twice or thrice a week, and be kept in the upper part of the vagina from 24 to 48 hours. The cases in which he found this application most useful are, *Subinvolution of the Uterus, with or without congestion or induration of tissue*, *Chronic Inflammatory Enlargement and Thickening of the Cervix Uteri*, *Chronic Pelvic Cellulitis*, *Hæmatocele*, and *Pruritus* apparently due to acid secretion passing through the os uteri. According to Dr. Graily Hewitt (p. 376), great benefit has been derived in many cases of *Enlarged and Inflamed Cervix Uteri* from the repeated application of the tincture of iodine. It is especially useful in patients of a sluggish habit of body or of a scrofulous diathesis. In cases of *Uterine and Ovarian Enlargement*, Dr. Tilt (p. 146) expresses his faith in iodine preparations: gr. j.–v. Potass. Iod. in a bitter infusion twice daily; and ℥iij–℥iv. of Ung. Plumbi Iod. or Ung. Potass. Iod., rubbed in over the affected part, evaporation being prevented by oil-silk and an appropriate bandage.

1217. *In Dysmenorrhœa*, Dr. Churchill (p. 61) states that, in a case where a false membrane was habitually discharged, he effected a cure by repeated applications of the caustic tincture of iodine to the cervix uteri. *Chronic Uterine Hæmorrhages*, from whatever cause, have been successfully treated by Dr. Dupierris, of Havannah, by means of injections of iodine[3]

[1] Lancet, March 3, 1866.
[2] Lancet, May 26, 1866.
[3] Ranking's Abstract, vol. xxv. p. 230.

(1 part of the tincture to 3 of water). Dr. Savage[1] relates two cases of *Obstinate Menorrhagia* cured by this means. In both cases he employed the officinal tincture (Ph. Lond.): in one he used f℥iij.; in the other f℥ij., diluted with an equal quantity of water.

1218. *In Amenorrhœa, Leucorrhœa, Chlorosis, and Gleet*, iodine has been employed by M. Dorvault, but it is inferior to many other remedies. Dr. Copland considers it calculated to prove useful in obstinate *Chlorosis*. In cases of *Amenorrhœa*, Dr. Riget advises frictions of iodine over the abdomen.

1219. *In Ovarian Dropsy*, the question of the propriety and safety of iodine injections has been much discussed. The treatment consists in first tapping and evacuating the cyst, and then throwing into the cavity, a fluid consisting of equal parts of the tincture or watery solution of iodine (to which a little iodide of potassium is added) and water. This fluid is left in for a few minutes, the cyst being slightly kneaded from without, and then allowed to escape. This operation is only adapted for cases where there is but one cyst, or possibly two large ones, and where there is no other ovarian disease. Where cysts are numerous it is wholly inapplicable, and very little benefit is to be expected from it in cases where further cyst development is in progress. Of 45 cases thus treated, recorded by Boinet,[2] 31 were cures and 14 failures, and amongst the latter 9 deaths. The experience of Dr. West and Sir J. Y. Simpson is in favour of this treatment. Of 10 cases, however, treated by Dr. Tyler Smith, only 2 resulted satisfactorily. The drawbacks to the operation seem to be the uncertainty that it will cure, and the necessity in many cases for repetition before a cure can be obtained. It is difficult, at present, to say whether or not the operation is materially more dangerous than simple tapping; but this further experience will doubtless show. (Dr. Graily Hewitt, p. 630.)

1220. *In Enlarged Prostate*, iodine, in all its forms, has been tried, but according to Sir H. Thompson (p. 66) with no good result. In some cases, benefit is said to have resulted from the persistent use of weak iodine ointment, applied to the enlarged gland by means of the finger introduced into the rectum.

1221. *In Hydrocele*, the plan of treatment most successful is that introduced by Sir Ranald Martin, which consists of the injection, after paracentesis, into the tunica vaginalis of a mixture of 1 part of tincture of iodine and 2 parts of water. From fl. drm. j. to fl. drm. ij. of this solution is sufficient, and it may be allowed to remain in the sac. A cure, in the great majority, is effected by this means.

[1] Lancet, Dec. 5, 1857. [2] Gaz. Heb. de Méd. et Chir., Nov. 21, 1856.

1222. *Other Diseases.* *In Bronchocele*, iodine and its compounds enjoy a well-merited repute; the best form for external application is the red iodide of mercury (*q. v.*), but recent or mild cases will sometimes yield to the application of the simple tincture. Prof. Lücke, of Berne, and Dr. Luton, have successfully treated these cases by the subcutaneous injection of the diluted tincture (1 to 8). The injections were made at several points, at intervals of eight days, commencing with four or five drops of the solution, and increasing the quantity cautiously. In one of Dr. Luton's eight cases, suppuration occurred.[1] Mr. Curling,[2] records a case of large *Cystic Bronchocele* cured by iodine injections, but inflammation, followed by suppuration and separation, ensued. The patient recovered, but Mr. Curling, commenting on the case, states that he regards the seton as the more valuable plan of treatment, and one most generally applicable to these cases. His remarks have reference to the cystic form of bronchocele, which is far rarer than the hypertrophy of the gland, which constitutes the majority of goîtres met with.

1223. *In Inflammation of the Joints*, the external use of iodine is strongly advocated by Dr. Davies (op. cit., p. 106), who considers it superior to the usual modes of treatment. He employs a tincture (gr. xl., Alcohol fl. oz. j.); but at the commencement of treatment this should be diluted to about half its strength or more. The diluted tincture, he states, may be applied at once, all over the inflamed joint, with perfect confidence, that not only no *mischief*, but that *good* will be the result. But when the disease has been pretty well advanced, and where the swelling has been considerable, he prefers leeching the joint first, and then, a few hours after the bleeding has ceased, applying the tincture. It should be applied every day, for two or three times, then, every other or every third day, according to circumstances. If the part should acquire an increase of temperature, he prefers laying over the joint a rag soaked in a spirit lotion; but this need not interfere with the use of iodine. No lead or zinc lotion, or one medicated in any way, should be employed. (Davies.)

1224. *In Hydrarthrosis*, iodine injections have been successfully employed by Velpeau and others. M. Bonnet advises a mixture of 1 part of iodine, 2 of iodide of potassium, and 8 of water. He directs the quantity injected to be very nearly the same as that of the fluid drawn off. The puncture should be as small as possible, care being taken that air does not enter the joint. It is not necessary that the whole of the effused liquor should be allowed to escape. Inflammation generally

[1] Med. Press and Circular, Jan. 20, 1869.

[2] Lancet, Dec. 14, 1867.

ensues, but subsides in a few days. The best position for making the puncture is immediately above the patella, the leg being fully extended at the time. Applied externally in strong solution, it often materially assists in causing absorption of the effused fluid. Five cases of *Hydrarthrosis of the Knee-joint*, successfully treated by iodine injections, are related by Dr. Macdonnell,[1] of Montreal.

1225. *In Gout*, iodine has been advised, both externally and internally. Speaking of its internal use, Dr. Robertson[2] remarks, "There can be little question, that in many chronic and no small proportion of irregular gout cases, and in many cases of confirmed gout, iodine, when carefully used between the paroxysms, is most useful; the more so of course, other things being equal, the more cachetic the habit, or the more that a scrofulous condition seems to be mixed up with the gout." It should be administered in small doses and in the mildest forms. Externally applied, it is a remedy of great value. It was first proposed by Mr. Davies, who states that its application (Iodine gr. xl., Spirit f℥j., Water f℥vj.–f℥j.), once or twice, affords almost immediate relief. Dr. Todd[3] also recommends a similar practice; and Dr. Pereira (i. p. 410) states that, according to his experience, no remedy gives so much relief, and that he has rarely known it to fail. "It deserves, however," adds Dr. Pereira, "especial notice that the skin of different individuals is most unequally susceptible of its influence; in some few it excites great pain, whilst, in others, it produces scarcely any. It is particularly useful when any effusion into the synovial membranes or sheaths has taken place." (See also POTASSII IODIDUM.)

1226. *In Acute Rheumatism*, applied as in gout, it is of great service. It should not interfere with internal treatment. It may also be given internally, with quinine. *In Rheumatic Gout*, Trousseau[4] speaks highly of the value of the tincture given internally, commencing with small doses, and gradually increasing them till as much as 150 drops are taken daily, in divided doses. *In Affections of the Joints, consequent on Rheumatism and Rheumatic Gout*, Dr. Fuller (p. 370) strongly recommends the following application:—℞ T. Iod. Co. ℥iij.–℥vj., Glycerine ℥iijss., Aq. Dest. ℥iv., M. To this he often adds gr. iv.–vj. of corrosive sublimate. It has been found serviceable in numerous obstinate cases. He considers it far preferable to the tincture usually employed. In obstinate cases, in which the joints and tendons are stiff and thickened, he advises iodine plaster, spread upon wash-leather, to be applied closely round the affected part.

[1] Ranking's Abstract, xxvi. p. 201; and xxvii. p. 193.
[2] Essay on Gout, p. 310.
[3] On Gout, pp. 107-8.
[4] Journ. de Méd. et de Chir. Prat., Nov. 1861.

1227. *In Diphtheria*, Dr. Waring-Curran[1] obtained excellent effects from iodine inhalation. ℞ Iodi, Potass. Iod. āā gr. iv., Alcohol fl. drm. iv., Aq. fl. oz. iv., M. Of this solution he commences with fl. drm. j. in Oj. of boiling vinegar, and a "handful" of dried garden sage, placed in a common inhaling jar, and increases the quantity of the iodine solution till fl. oz. ½ is taken with each inhalation, which is to be repeated on an average about twelve times daily. He strongly advocates a trial with this remedy.

1228. *In Croup*, Mr. Copeman[2] derived great benefit from the external application of tincture of iodine twice or thrice daily. Its use was, in all instances, attended with great relief to the patient, and it probably tends to prevent the formation of false membranes. He relates several cases illustrative of its efficacy.

1229. *In Malignant Ulcers of the Tongue and Tonsils*, Dr. Davies (op. cit.) states that he has met with uniform success with iodine. The tincture may be applied locally by means of a fine brush, or made into a gargle, diluted with 7 or 10 parts of water, with the addition of honey. In *Mercurial Ptyalism*, iodine gargles (Tr. Iod. Comp. (Ph. L.) f℥ij.–f℥v. ad Aq. f℥viij.) are very strongly recommended by Dr. Norman Chevers,[3] both as a curative and as a prophylactic. It is worthy of further trial.

1230. *Ranula.* Mr. W. Martin Coates[4] details the cure of a large ranula by the injection of the compound tincture—♏xv. injected by means of Wood's syringe. He describes the procedure as simple, painless, free from danger and annoyance. Though only a solitary case, he advocates further trials with it.

1231. *In Encysted Tumours*, the practice of injecting tincture of iodine after the evacuation of their contents is occasionally followed. If the cyst be of great extent this treatment is inadvisable, as it is apt to be followed by inflammation and much constitutional irritation, and where the cyst is very dense and fibrous, it fails to effect a cure. In small tumours of recent date only it may be resorted to with a prospect of success. *Schirrous and Cancerous Tumours* are little influenced by iodine as ordinarily applied, but in the former, subcutaneous injection, as employed in bronchocele (*ante*), may be worth a trial. The mode of application employed by Dr. Balman in scrofulous glandular enlargement (sect. 1204) might also be tried before determining upon removal by operation. Dr. Walshe[5] states that in *Cancer* he has great confidence in the power of iodine friction, when combined with the internal administration of iodide of arsenic.

[1] Lancet, September and October, 1867.
[2] Prov. Journ., August 12, 1843.
[3] Ind. Ann. Med. Sci., April, 1854.
[4] Lancet, March 3, 1866.
[5] On Cancer, p. 200.

1232. *Chronic Skin Diseases*, especially when occurring in persons of a scrofulous diathesis, often improve under the use of iodine and its compounds, employed both locally and internally. Dr. Davies relates two cases of *Lupus* which yielded to its local application; but Mr. Milton pronounces it of doubtful value. *In Lepra*, *Psoriasis*, *Eczema*, *Sycosis*, *Impetigo*, &c., iodine in the form of ointment or tincture, locally applied, often proves a valuable adjunct to arsenic administered internally. *In Pityriasis*, Dr. Graves advises the tincture to be well rubbed into the scalp with a strong brush. *In Ringworm*, Dr. Hillier (p. 356) states that the most satisfactory treatment he has seen is the use of a mixture of iodine and oil of tar, introduced by Mr. Coster, of Hanwell Schools. A colourless solution distilled from coal tar, sp. gr. ·853, is gradually and carefully mixed with iodine, in the proportions of 4 to 1; some heat is generated in the mixture, and a dark-coloured solution of thick treacly consistence is obtained. The more iodine that can be dissolved the better. The hair round the affected part for the distance of a quarter of an inch should be cut quite short, and the solution rubbed in firmly with a piece of sponge on the end of a stick. It is allowed to dry on the part, and left until the cuticle and black crust separate at the end of seven or ten days. In recent cases *one* application is often sufficient; in long-standing cases it may require to be repeated two or three times. It neither blisters nor causes pain, though containing so much iodine. (Hillier.) It seems well deserving of trial in any case.

1233. *In Erysipelas*, the local application of a tincture of iodine (gr. xl., Spirit. Rect. fl. oz. j.) was first recommended by Dr. Davies (op. cit.), who directs it to be painted over the inflamed parts. He relates several cases in which it afforded speedy alleviation of the symptoms, and proved eminently successful. Experience has confirmed its value in this disease. It is of equal, if not superior, efficacy with nitrate of silver.

1234. *In Carbuncle*, the effect of iodine locally applied (Tinct. Iod. fl. drm. j., Aq. fl. drm. iij.), according to Dr. Balman,[1] is sometimes most striking, the pain and irritation being almost immediately relieved, and the separation of the slough accelerated. *Ganglions*, when situated about the wrist, may be got rid of, he states, by the same means. They should be first punctured with a fine needle, and a slight amount of pressure continued for a few weeks afterwards.

1235. *Ulcers*. Not only in scrofulous ulcers but in others, it has proved highly successful in the hands of Dr. Davies (op. cit.) He says that he has used it in several cases of *Chancre*, and that he has found the ulcer heal much quicker than under

[1] Lancet, April 13, 1867.

the usual mercurial application, or the nitrate of silver. The tincture has likewise been used by him *in Ulcers of Carcinomatous character, and in Malignant Ulcers of the Lips, Tongue, and Tonsils.* He speaks in the highest terms of its efficacy. Dr. Brainard[1] advocates the use of iodine vapour in these cases. He dresses the ulcer with simple cerate, and places the iodine (gr. j.-iv.) in folds of lint over the wound. Oiled silk and bandages are placed over these to prevent rapid vaporization.

1236. *In Phagedenic Ulcerations*, the tincture of iodine has been extensively employed by Ricord. He found it very efficacious, and prefers it to all other applications. Mr. Key[2] regards it as one of the most powerful remedies we possess for arresting the threatened destruction of the soft parts. It should be given internally, combined with other remedies. *In Hospital Gangrene*, its local application proved effectual in the hands of Dr. Surdun.[3] Opium was given internally at the same time.

1237. *In Syphilitic Gummata and Nodes*, Mr. Acton[4] states that the best local treatment consists in painting the affected parts every night and morning with the tincture of iodine. *To indolent Bubo*, it is also a valuable application. *Syphilitic Eruptions* improve under its internal use.

1238. *In Pruritus Pudendi*, the local application of the tincture occasionally affords great relief. In a case of *Pruritus Scroti* which resisted every other treatment for ten days, I witnessed almost immediate benefit from the application of the tincture. *In Pruritus Senilis*, it is also productive of excellent effects, according to the experience of Mr. E. Wilson (p. 271).

1239. *In Onychia*, Dr. Davies (op. cit.) states that he does not remember a case in which the local application of the tincture has failed to subdue the disease. It should be applied twice or thrice daily, in the form of a strong alcoholic solution (gr. xl. ad Spt. Vin. Rect. fl. oz. j.)

1240. *In Small-pox to prevent Pitting*, Dr. Sacheon[5] (U.S.) applied the tincture once or twice daily in thirty cases. The result of his observations was that, although pitting was not absolutely prevented, the marks and cicatrices were much less evident than those in the same individual to which it had not been applied. It was first proposed by Dr. Crawford, of Montreal, in 1844 ; and after nine years' experience in its use, he adduces further evidence of its efficacy.[6]

1241. *In Discoloration of the Skin from a long use of the Nitrate*

[1] Ranking's Abstract, xxxi. p. 139, 1860.
[2] Med. Chir. Trans., vol. xix.
[3] Gaz. Hebdom. de Méd., Jan. 12, 1857.
[4] Lectures, Lancet, Jan. 17, 1846.
[5] Amer. Journal Med. Sciences, April, 1849.
[6] Montreal Med. Chronicle, Nov. 1853.

of Silver, Dr. Patterson[1] strongly advises the internal and external use of iodine and its salts, as affording the best chance of restoring the natural colour.

1242. *To Corns*, a strong tincture (gr. xl. ad Alcohol fl. oz. j.) is advised by Dr. Davies; it has proved successful in the hands of others also. *To Chilblains*, it is also stated to be an excellent application.

1243. *To Varicose Veins*, the external use of the tincture or ointment of iodine has been advised. Bandages equally applied to the whole length of the limb should be used at the same time. Much benefit is doubtless due to the latter measure.

1244. *In Opacities and Ulcerations of the Cornea*, especially when arising in scrofulous subjects, iodine, externally and internally, proves highly serviceable. M. Lohsse[2] relates a case where the opacity consequent on syphilitic ophthalmia was so considerable as almost to destroy vision, but which yielded to a collyrium containing iodine (gr. j., Pot. Iod. gr. ij., Aq. f℥vj.)

1245. *In Glanders*, it has been used with apparent success. M. Ludiche[3] relates a case in which iodine, externally and internally applied, was used with the best effect. The tincture was applied to the mucous surfaces of the mouth and throat, and alkaline baths were employed at the same time. The disease reappeared at the end of four months, but rapidly yielded to the same remedies.

1246. *In ununited Fractures*, frictions with iodine are occasionally useful. Of eleven cases mentioned by Mr. Norris,[4] five were cured by iodine. It may also be given internally.

1247. *Wounds.* The application of tincture of iodine to recent wounds has been proposed by M. Pétrequin. Finding that suppuration was never present when this fluid had been injected into cavities (?) or into the tissues (?), he recommended and practised its application to wounds made in the removal of tumours, especially when situated in the face or neck, where it is very desirable to prevent the formation of scars. (Mr. de Morgan.) This treatment has never come into general use.

1248. IPECACUANHA. Ipecacuanhæ Radix. The root of Cephaelis Ipecacuanha, *D.C. Nat. Ord.* Cinchonaceæ. *Source*, Brazil and Mexico.

Med. Prop. and Action. Emetic, in doses of gr. xx.–gr. xxx. of the powdered root; expectorant and diaphoretic, gr. j.–gr. ij.; alterative, gr. ¼–½. Active principle, *Emetina*. It possesses considerable sedative powers, as is shown by its influence in hæmorrhagic diseases. According

[1] Dub. Med. Press, Aug. 24, 1842.
[2] Brit. and For. Med. Rev., July 1, 1843.
[3] Journ. des Conn. Méd. Chir. March, 1843.
[4] See Med. Gaz., Nov. 15, 1850.

to Mr. Higginbottom,[1] the main efficacy of ipecacuanha consists in the power which he considers it to possess of stimulating and restoring the normal action of the capillary system; and with this view, he states that for fifty years he has been constantly in the habit of prescribing it in *English Cholera*, *Uterine Hæmorrhage*, *Syncope*, *Diseases of Old Age*, &c. As an emetic, it is mild, safe, and certain; it does not operate so rapidly as some other emetics, and does not leave that amount of depression and weakness which follows the use of tartar emetic. It is to be preferred when the powers of the stomach require to be maintained, and when vomiting is requisite in delicate subjects, and in children; for the latter, the Vinum Ipecacuanhæ, in doses of ℥xx.–fl. drm. j., till it cause vomiting, is the best formula. Some persons, from idiosyncrasy, are unable to take ipecacuanha; in such, even the smell of the powdered root produces a distressing sense of suffocation. The powder should be kept in closely-stoppered bottles, and exposed to the light. Boiling renders it inert; it should not, therefore, be given in decoction. Infusion of nut galls is the best antidote for an over-dose. Its external application is highly spoken of by Dr. Turnbull,[2] who considers it far superior to tartar emetic as a counter-irritant. He advises ʒij. of the powder (or Emetine gr. xv.) to be incorporated with ʒij. of Olive Oil and ʒiv. of Lard. This, rubbed on the skin for a few minutes, once or twice a day, produces a copious crop of small pustules, unattended with pain, which remain out for many days, and leave no scars. In this last point it has an advantage over tartar emetic ointment, for which Dr. Turnbull proposes it as a substitute. Dr. Graves (i. p. 167) states that he often gives the infusion of ipecacuanha in the form of enema; and that, employed in this manner, it is a remedy of very considerable value, and not sufficiently appreciated by most modern practitioners. When applied locally in the form of poultice or paste to *Venomous Bites or Stings*, it often allays in a remarkable manner the pain and irritation, and, in such cases, is regarded by some as almost a specific.

Dose:—Of Powdered Ipecacuanha, gr. ½–ij. as an expectorant; gr. xv.–xxx. as an emetic. *Of the Compound Powder* (*infra*), gr. v.–xv. *Of the Wine* (Ipecacuanha bruised oz. j., Sherry Oj.), ℥v.–xl. as an expectorant; fl. drm. iij.–vj. as an emetic. *Of Pill of Ipecacuanha with Squill* (Compound Powder of Ipecacuanha oz. iij., Squill, Ammoniacum āā oz. j., Treacle q.s.), gr. v.–x. *Of Lozenges of Ipecacuanha*, from 1 to 3. Each lozenge contains gr. ¼ of ipecacuanha.

1249. *Therapeutic Uses. Diseases of the Lungs. In Spasmodic Asthma*, ipecacuanha, in a full emetic dose (not less than grs. xx.), so as to produce speedy emesis, is often effectual in arresting a paroxysm, but to be so, it should be given at the outset or as early as possible in the attack. It may, in proportionate doses, be given to children with safety and advantage. Dr. Hyde Salter (p. 192) considers that it acts by depressing nervous irritability and enfeebling the contraction of the bronchial muscle. Dr. C. D. Phillips[3] speaks highly of its value in small doses ℥v. of Vin. Ipecac. repeated every ten to thirty minutes for two or three hours, unless relief comes much sooner, in which case the dose may be diminished and taken less frequently. Thus given, he states that in many cases of nocturnal spasmodic asthma, in which hours are spent in great distress, with livid face and lips, loud wheezing through the chest and want of breath, causing fear

[1] Brit. Med. Journ., Aug. 22, 1868.
[2] Lancet, May 7, 1842.
[3] Practitioner, Nov. 1869.

of suffocation, if there be no organic disease of the heart or of the lungs, ipecacuanha will give quick and marked relief.

1250. *In Hooping Cough*, in the early stages, ipecacuanha often proves very beneficial. Mr. Pearson's formula is a popular and useful one:—℞ Vin. Ipecac. ♏v., T. Opii ♏j., Sodæ Carb. gr. ij., Aq. q.s., ft. haust 4tis vel 6tis horis sumend. In cases occurring in young children the opium may be omitted. Dr. Phillips (op. cit.) employed it in 23 cases in much smaller doses with the best effect, especially when vomiting in the paroxysms forms a prominent feature in the disease. Of a mixture containing ♏xxx. of ipecacuanha wine in fl. oz. iv. of water, he directs a dessert-spoonful to be given every 1, 2, or 3 hours, according to the severity of the cough. Children under five years old should only take a teaspoonful of this mixture, but many children of this age can tolerate and are benefited by much larger doses. He found it act well also in the *Capillary Bronchitis of Children*, even when complicated with croupy symptoms.

1251. *In Croup*, an ipecacuanha emetic at the outset is preferable to tartar emetic where the vital powers are low and the attack mild, but in other cases it is advisable to resort at once to tartar emetic (*q.v.*) In the advanced stages, senega and other more stimulant emetics are preferable. *In Diphtheria*, when emetics are indicated, ipecacuanha combined with sulphate of zinc may be employed. (See Emetics, Part ii.)

1252. *In Pneumonia*, ipecacuanha may be advantageously administered in some cases; it is not to be trusted to alone in a severe case, but as an expectorant and diaphoretic it may be serviceable. When it nauseates and prevents the patient taking nourishment, it may prove prejudicial and should be omitted. (Dr. Waters, p. 50.) This remark applies equally to *Bronchitis*, in which it forms a valuable adjunct to other remedies of the same class. *In Pneumonia supervening on Bronchitis in Children*, an ipecacuanha emetic is of service in rendering the bronchial secretion less viscid, and in promoting its expulsion. When the pneumonia has set in, it may be repeated from time to time; but after a while, if the case is progressing unfavourably, emetics cease to act, and should be replaced by stimulant expectorants, as senega, squills, and muriate or carbonate of ammonia. The diet should be light and nutritious, and in cases of great weakness, wine is indicated. (Dr. Hillier, p. 18.)

1253. *In the Coughs of Childhood*, ipecacuanha is one of the most generally useful expectorants we can use. The following formulæ of Dr. Hillier's are good examples:—℞ Sodæ Bicarb. gr. xvj., Sp. Æther. Nit. ℥j., T. Opii ♏viij., Vin. Ipecac. ♏xxxij., Syrup ℥ij., Aq. Anethi. ad ℥ij., M. Dose, two teaspoonfuls for a child two years old; or ℞ Vin. Ipecac. gr. xxiv.,

Potass. Citrat. gr. xl., Syrup Tolu ℥ij., Decoct. Hordei ad ℥ij., M. Dose, one or two teaspoonfuls.

1254. *Diseases of the Abdominal Viscera. In Dysentery*, we have in ipecacuanha a remedy of the highest value, justly entitling it to its old designation, "Radix anti-dysenterica." From its first introduction by Piso in 1658 to the present time, it has enjoyed more or less repute in this disease, and has formed an ingredient in most of the formulæ employed by our highest tropical authorities; but its real powers were often obscured and almost lost sight of by the practice of conjoining it with other remedies which were supposed to possess similar remedial powers. Of this we have an example in Annesley's formula, which I am bound by experience to say is very serviceable, and which for many years was very generally employed in Southern India:—℞ Pil. Hydrarg. gr. ij.–iij., Pulv. Ipecac. Rad. gr. j.–ij., Opii gr. ¼, M., ft. pil. 4tis vel 5tis horis sumend. Mr. Twining, it is true, trusted to ipecacuanha alone, giving it in eight-grain doses with extract of gentian twice or thrice daily, and others followed his example, but it was not till 1858 that its full powers were demonstrated by Mr. Docker,[1] who re-introduced the plan, originally practised by Piso and Helvetius, of prescribing it alone in large and effective doses; and the result has been not only comparatively speedy cures, but a marked diminution in the rate of mortality in this disease. The treatment in the main, now almost universally practised, is to administer as early in the disease as possible grs. xxv.–grs. xxx. of ipecacuanha, in as small a quantity of fluid as possible, premising half an hour previously ♏xxx. of laudanum or a few drops of chloroform (on this point there are differences of opinion.) The patient should keep perfectly still in bed, and abstain from fluid for at least three hours. If thirsty, he may suck a little ice, or may have a teaspoonful of cold water. It is seldom, under this management, that nausea is excessive, and vomiting is rarely troublesome, seldom setting in for two hours after the medicine has been taken. Sinapisms or turpentine epithems should be applied to the abdomen. In from eight to ten hours, according to the urgency of the symptoms and the effect produced by the first dose, ipecacuanha in a reduced dose should be repeated, with the same precautions as before. The effects of this treatment are soon manifest and surprising; the tormina and tenesmus subside, the motions quickly become feculent, blood and slime disappear, and often, after profuse action of the skin, the patient falls into a tranquil sleep and awakes refreshed. The treatment may require to be continued for some days, the medicine being given

[1] Lancet, July and August, 1858.

in diminished doses, care being taken to allow a sufficient interval to admit of the patient taking some mild nourishment suited to the stage of the disease. As the disease abates, the dose should be reduced. It is well, however, to administer grs. x.–xij. at bedtime for a night or two, after the stools are, to all appearance, healthy. Fomentations, turpentine epithems, or chloroform liniment to the abdomen, lessen tormina and diminish suffering. If a little diarrhœa without the dysenteric odour remain, it may be checked with a little astringent mixture, *e.g.*, Pulv. Cretæ Co., with or without opium. Astringents in any shape during the acute stage are not only useless, but dangerous. (Dr. Maclean.) To sum up, it appears—1. That acute dysentery is more successfully and speedily treated by large doses of ipecacuanha than by other means. 2. That it is more effectual in the acute than in the chronic forms. 3. That large doses, such as are mentioned above, may be given with perfect safety, without fear of hyper-emesis or other ill effects; and 4. That it is less successful with the natives of India than with Europeans. For further elucidation of this important subject, consult instructive papers by Mr. Docker,[1] Dr. Cornish,[2] Dr. Blacklock,[3] Dr. Ewart,[4] and Dr. Maclean's excellent treatise on Dysentery, in Reynolds's "System of Medicine," from which most of this section has been quoted in a condensed form.

1255. *In Diarrhœa*, ipecacuanha proves serviceable, often effecting a cure when other medicines have proved ineffectual. *In the Diarrhœa of Infants, arising either from improper or unwholesome food, or from dentition*, Dr. Pavy (p. 199) employs with most satisfactory results a combination of Vin. Ipecac., T. Calumbæ, and solution of citrate of potash. Conjoined with this he prescribes grey powder (gr. ij.) every morning, or sometimes a powder containing calomel (gr. $\frac{1}{4}$–$\frac{1}{2}$), dried carbonate of soda (gr. ij.), and aromatic chalk powder (gr. v.) *In Infantile Diarrhœa attendant on Teething*, Dr. West (p. 524) advises the following:—℞ Mist. Acaciæ ℥vj., Liq. Potass. ♏xxx., Vin. Ipecac. ♏xxiv., Syr. Altheæ ℥iv., Aq. ℥xiij., M. Dose, ℥iij. every 6 hours for a child æt. 12 to 18 months. *In the Diarrhœa and Dysenteric Diarrhœa of Children*, Dr. Phillips (op. cit.) states that gr. $\frac{1}{4}$ to gr. $\frac{1}{2}$ of ipecacuanha with a little white sugar, at intervals of one to three hours, is generally sufficient, but the quantity must be increased if necessary. *In English Cholera*, Mr. Higginbottom states that he has for years prescribed it with advantage.

1256. *In Atonic Dyspepsia*, especially when the biliary secretion is deficient or vitiated, ipecacuanha, in doses of gr. $\frac{1}{2}$–gr. j.,

[1] Op. cit.
[2] Madras Med. Journ., Jan. 1861, p. 41.
[3] Madras Med. Journ., Jan. 1861.
[4] Indian Ann. of Med. Sci., 1863, p. 396.

in the form of pill, with gr. iij.–iv. of rhubarb, taken before meals, often proves serviceable. Its mode of operation is obscure, but under its use the urgency of the symptoms subsides, the tone of the digestive organs improves, and the evacuations assume a healthy character. *In functional derangement of the Liver*, ipecacuanha, in small and long-continued doses, may be employed with advantage.

1257. *Vomiting.* There are few remedies, Dr. Ringer (p. 294) observes, so powerful in checking some forms of vomiting as ipecacuanha. In drop doses of the wine, administered every hour or three times a day, according to the urgency of the case, he states that in abundant instances he has seen it check *Vomiting of Pregnancy*, *the Morning Vomiting of Drunkards*, *the Morning Vomiting which sometimes accompanies general weakness after acute diseases*, and *that of Acute Catarrh of the stomach in children.* That form of vomiting after meals in which there is no nausea, nor pain, nor even discomfort, the food being merely rejected partially, and often very little digested, is often, according to Dr. Ringer, quickly stayed by these small doses of ipecacuanha. Even *in Vomiting from Cancer of the Stomach*, it has sometimes succeeded when ordinary remedies have entirely failed. According to Dr. Phillips (op. cit.), its beneficial operation is clearly discernible in most cases of continued and obstinate retching or vomiting where the stomach is not primarily affected, but disturbed by sympathy with some other organ or part of the body, whether the primary affection be acute or chronic. Further evidence of its efficiency in the *Vomiting of Pregnancy* is adduced by Mr. C. Fuller.[1] Under the use of single drops of the wine in a teaspoonful of water every hour, he found it arrest obstinate vomiting in the course of two days. He also testifies to its value in those small doses in the *Vomiting and Diarrhœa of children.* In his hands it failed to arrest the vomiting of drunkards.

1258. *Other Diseases.* *In Hæmoptysis*, *Hæmaturia*, *Hæmatemesis*, *Epistaxis*, *and in internal Hæmorrhages generally*, ipecacuanha appears to exercise a powerful influence. Dr. Osborne considers that the production of vomiting is necessary to develope its influence; but Mr. Trenor[2] has published numerous interesting cases, in which it was given in such doses as to produce nausea, without actual vomiting; and this procedure was attended with marked benefit, arresting the hæmorrhage, and restoring heat and life to patients who were in a state of collapse from excessive loss of blood. The doses given by Mr. Trenor varied from gr. j.–ij. every fifteen or thirty minutes, until nausea was felt; when the benefit was generally evident, the medicine was discontinued. The value of

[1] Lancet, Dec. 4, 1869. [2] Dublin Journ., vol. xviii., p. 481.

ipecacuanha in this class of diseases is not sufficiently attended to; at the same time it is better to avoid vomiting, particularly in hæmorrhage from the lungs and stomach, although Dr. Osborne observes that he never saw it produce any ill effect. Prof. Graves (ii. p. 141) also bears testimony to the efficacy of this treatment. Dr. Phillips states that the *Hæmorrhage in the early stages of Phthisis* may often be readily arrested by its means.

1259. *In Uterine Hæmorrhage and Menorrhagia*, ipecacuanha, given in full emetic doses, has often been followed by the best effects. Dr. Osborne,[1] a strong advocate for its use in these cases, advises gr. xx. of the powdered root in the evening, followed by an acidulated draught in the morning. The discharge usually ceased in twenty-four hours; and if a relapse occurred, a repetition of the emetic never failed to render the cure permanent. Dr. Tyler Smith[2] thus explains its action in these cases. "Ipecacuanha," he says, "by its emetic action, excites contraction of the abdominal muscles and compression of the uterus, which may, in turn, re-excite some amount of uterine reflex action; but beyond this, it appears to have a special action upon the uterus, increasing its contractile power beyond what could be imagined to occur from the merely secondary effects of vomiting." He adds, "Ipecacuanha, then, appears to influence the medulla oblongata and the lower medulla spinalis. This double action of ipecacuanha upon the two extremities of the spinal centre is very extraordinary."

1260. *In Cholera*, an ipecacuanha emetic, at the outset of an attack, forms part of the eliminative treatment advocated by some; but unless there is reason to suppose that some crude or undigested food in the stomach is the cause of the attack, the practice does not appear advisable; but in such a case, an emetic, by removing the cause, may be of use. A far more promising practice is to administer it in very small, often-repeated doses, in the manner employed in hæmorrhages by Mr. Trenor. (Sect. 1258.) In the latter affections, even when a state of collapse supervened, the vital powers recovered themselves in a striking manner under the use of ipecacuanha; and the same remedy seems to merit a trial in cholera, even in the stage of collapse; the many points of similarity between cholera and profuse hæmorrhage would alone suggest its probable utility. The more recently ascertained facts with regard to the power of minute doses to arrest vomiting (sect. 1257) are strongly in favour of its probable efficiency.

1261. *In Hydrocephalus and in Infantile Convulsions*, Dr. Hannay[3] strongly advises the following application as a

[1] Trans. of Irish Coll. Physicians, vol. v. p. 18.
[2] Lancet, Dec. 16, 1848.
[3] Edin. Med. and Surg. Journ., Oct. 1, 1843.

counter-irritant :—℞ Pulv. Ipecac. R., Ol. Olivæ āā ʒij., Adip. oz. ½, M. He directs the part which it is wished to irritate to be rubbed freely with this liniment for 15 or 20 minutes thrice daily, and then to be enveloped in flannel. This produces in 30 or 36 hours an eruption, which remains out for three or four days. He states that he has seen great amelioration of the symptoms follow its use. Dr. West (p. 180) speaks favourably of this application when convulsions succeed to the rapid disappearance of an eruption of the scalp. Counter-irritation, however, too often produces great discomfort without any commensurate advantage.

1262. PULVIS IPECACUANHÆ COMPOSITUS. COMPOUND POWDER OF IPECACUANHA. Pulvis Ipecacuanhæ cum Opio, B. Ph., 1864. Dover's Powder. A compound of Ipecacuanha and Opium in powder, āā oz. ½, and Sulphate of Potash oz. iv. Grs. x. contain gr. j. of opium.

Med. Prop. and Action. Diaphoretic, in doses of gr. v.–xv. It is also narcotic, although the ipecacuanha appears greatly to modify the action of the opium, at the same time that the nauseating action of the ipecacuanha is controlled by the opium. It is a very valuable formula, but its operation is far from uniform; in some giving rise to emesis, and very frequently, amongst the Hindoos, to a purgative operation. Diluents, although they promote the diaphoretic action, should be avoided immediately after taking the powder, as under such circumstances it is very apt to be rejected by vomiting.

Dose, gr. v.–x. or more.

1263. *Therapeutic Uses. In Chronic Dysentery*, Dover's powder is often of the greatest service, either in a full dose (grs. x.–xij.) at bedtime, or in small, frequently-repeated doses, in combination with nitrate of silver. It was formerly much in repute in acute dysentery, but it is inferior in efficacy to ipecacuanha alone (*q.v.*)

1264. *In Granular Disease of the Kidney, Morbus Brightii*, it is of the first importance to maintain a free cutaneous discharge, and for this purpose Dover's powder has been found highly serviceable, in doses of gr. v.–viij., thrice daily. It not only acts as a diaphoretic, but allays the pain and irritability. The warm bath every other evening, or oftener, greatly assists its operation. (Christison.)

1265. *In profuse Perspirations*, particularly in those which attend hectic fever, you can put a stop to them, remarks Dr. Graves (i. p. 488), by giving a few grains of Dover's powder at bedtime. It is hard to account for this, he observes, but it is a fact.

1266. *In the Diarrhœa of Fever*, when the symptoms of inordinate vascular determination are present, the evacuations being watery, offensive, or otherwise morbid, Dr. Copland (i.

p. 930) advises a combination of Dover's powder and hydrargyrum cum cretâ, in small doses, to be given every four or five hours. The same combination, in small doses, often proves effectual in arresting the *Diarrhœa of childhood.*

1267. *In Diabetes*, Dover's powder is extremely valuable. It is particularly recommended by Dr. Prout (p. 50), who advises its combination with full doses of peroxide of iron.

1268. *In Calculous Diseases*, Dover's powder is one of the most generally useful palliatives that can be employed. Dr. Prout speaks highly of its efficacy.

1269. *In Chronic Rheumatism, and in some Neuralgic Affections*, opiates and sedatives prove eminently serviceable. In these cases, Dover's powder, in doses of gr. x.–xij. at bedtime, affords a great amount of comfort and relief.

1270. *Coryza, and Catarrhal Affections*, may often be arrested by a full dose of Dover's powder (gr. x.) taken at bedtime at the very outset of the attack. The same measure has been found effectual in *Cynanche Tonsillaris.*

1271. IRIDIN, or IRISIN. A pulverulent extract from Iris versicolor, *Linn.*, Blue Flag, an American plant, the rhizome of which is officinal in the U. S. Pharm. It occurs in the form of a dark brown powder.

Med. Prop. and Action. Mild aperient, cholagogue, and diuretic. According to trials made with it by the Editor of the *Lancet*, it produces effects very similar to those occasioned by blue pill, rhubarb, and aloes. It is said seldom to fail in producing a mild catharsis, with bilious evacuations, and it seems to possess the advantages of (1) not requiring the addition of a mercurial; (2) of not irritating the rectum, as aloes is apt to do; and (3) of not having any astringency, and therefore not producing subsequent costiveness, like rhubarb, when given alone.

Dose, gr. ij.–gr. v. in the form of pill.

1272. *Therapeutic Uses. In a sluggish state of the Bowels arising from torpidity of the Liver, or when the stools are pale, particularly as we find them in the intervals of overt attacks in Gouty persons*, iridin has been found one of the best aperients, much gentler than podophyllum, and more reliable when a slight cholagogue action is required to be maintained for a lengthened period.[1] The eclectics in America ascribe anthelmintic properties to it, and prescribe it in *Syphilis, Chronic Hepatitis, Rheumatism, Scrofula, &c.* (Beach.[2])

1273. JALAPA. Jalap. The dried tubers of Exogonium Purga, *Bentham. Nat. Ord.* Convolvulaceæ. *Source*, Mexico.

Med. Prop. and Action. Cathartic. It is a safe and efficacious purgative, operating with rapidity and certainty, causing little irritation, producing

[1] Lancet, Aug. 30, 1862.

[2] Reformed Practice of Med., p. 882.

copious watery stools, and leaving but little subsequent constipation. Its activity depends upon the resin, which is an efficient purge, and forms an eligible mode for internal exhibition. In some persons, jalap causes vomiting, nausea, &c.; and when the medicine passes into the intestines, griping is often experienced. Its efficacy as a hydragogue is greatly increased by the addition of the acid tartrate of potash. The Pulv. Jalapæ Co. is an excellent hydragogue purgative. Camphor is said to lessen the griping, while it augments its purgative operation.

Dose:—Of Powdered Jalap, gr. x.–xxx. for an adult, gr. ij.–v. for children. *Of the Extract*, gr. v.–xv. *Of the Resin* (obtained by means of rectified spirit), gr. ij.–v. *Of Compound Jalap Powder* (Jalap oz. v., Acid Tartrate of Potash oz. ix., Ginger oz. j.), gr. xx.–lx. *Of the Tincture* (Jalap oz. ij½., Proof Spirit Oj.), fl. drm. ½–ij.

1274. *Therapeutic Uses. In Dropsical Affections*, there is no hydragogue cathartic more generally useful than compound jalap powder in gr. lx. doses, frequently repeated. Dr. Chapman advises its combination thus:—℞ Pulv. Jalapæ Co. gr. xx.–xxx., Potas. Bitart. gr. v.–x.–xv., Ol. Carui gutt. ij., Aq. f℥iss., M. To be repeated so as to keep up an unremitting discharge from the bowels.

1275. *In Dysentery*, the Pulv. Jalapæ Co. was extensively employed by Mr. Twining. Next to castor oil, it is the best purgative that can be employed in these cases.

1276. *In Constipation* depending upon atony of the intestines, jalap, in combination with a carminative or calomel, may be given with advantage. In *the Constipation of gouty subjects*, on the eve of an attack, Dr. Burne[1] advises the following formula:—℞ Pulv. Jalapæ ℥ss., Vin Colchici, T. Hyoscyam., Spt. Lavand. Co. āā f℥ss., Aq. Dest. f℥j., M. ft. haust.

1277. *Against Worms, particularly Lumbrici*, jalap, in combination with calomel, is a safe and efficient vermifuge. It is particularly adapted for children.

1278. JUNIPERUS COMMUNIS, *Linn.* Common Juniper. *Nat. Ord.* Coniferæ. *Hab.* Northern Europe, Asia, and America.

Med. Prop. and Action. The fruit is a stimulant diuretic. *Active principle*, a volatile oil, which is one of the most powerful diuretics in the materia medica. If long continued, juniper communicates a violet odour to the urine, and produces great irritation of the urinary organs, strangury, bloody urine, &c. It was formerly deemed emmenagogue. It is extensively used in flavouring Hollands.

Dose:—Of the Fruit, drm. j.–ij., in the form of infusion. *Of the Volatile Oil*, ♏ij.–v. *Of the Spirit* (Oil of Juniper fl. oz. j., Rect. Spirit fl. oz. xlix.), fl. drm. ½–j.

It is contra-indicated—1, in all inflammatory states of the system; 2, in irritated states of the kidneys and urinary organs; and 3, in congestion and active disease of the pelvic viscera.

1279. *Therapeutic Uses. In Ascites, Anasarca, and Dropsical*

[1] On Habitual Constipation, p. 212.

Affections generally, it is favourably spoken of by Van Swieten. It is chiefly used in leucophlegmatic subjects, when the disease is unaccompanied by inflammation, or much irritation of the urinary organs. The spirit or oil is the best form in these cases. Percival advises its combination with camphor.

1280. *In Asthenic Fluxes, particularly in Leucorrhœa and Gleet*, juniper appears to exercise a beneficial influence. *In Flatulence, Flatulent Colic, and Spasmodic Affections of the Bowels*, the oil or spirit of juniper is useful as a carminative.

JUNIPERUS OXYCEDRUS. See CADINI OLEUM.

JUNIPERUS SABINA. See SABINÆ CACUMINA.

1281. KAMALA. A powder which consists of the minute glands that cover the capsules of Mallotus Philippinensis, *Müll.* (Rottlera tinctoria, *Roxb.*, B. Ph.) *Nat Ord.* Euphorbiaceæ. *Source*, East Indies.

Med. Prop. and Action. Anthelmintic, chiefly in cases of *Tænia* or *Tape-worm*. The first notice of its use in this character, it having previously been employed largely as a dye, occurs in Royle's "Illustrations of Himalayan Botany,"[1] published in 1839; but it attracted little notice till 1853, when Dr. C. Mackinnon,[2] recorded several cases of tænia successfully treated by its use. These results were fully confirmed by Dr. T. Anderson,[3] who furnishes a good account of its physiological action; he found that on an adult, the powder in a dose of drm. ij.–iv., in addition to purging, frequently caused nausea and vomiting, and in some cases griping. Its action on the bowels, however, was found to be very variable. A strong etherial or alcoholic tincture, besides acting more mildly, was found to be followed by more uniform effects; and a dose of the tincture sufficient to produce the full anthelmintic effects of the drug was found never to be followed by more than six stools unattended with griping, or with any observable effects on the pulse or nervous system. The only objection to it is, that when the powder is used considerable nausea occasionally follows, although this does not appear to be more than that produced by pomegranate and other anthelmintics. Dr. Anderson also observed that, after 3iij. of the powder had been administered, the worm was usually expelled in the third or fourth stool, generally entire, and almost always dead. Its action appears to be principally confined to tænia. In cases of lumbrici it seems to exercise very little effect beyond that of an ordinary purgative. Its value as an anthelmintic has been confirmed by Drs. C. A. Gordon,[4] Ramskill,[5] Leared,[6] and others. On the other hand, it is esteemed as inferior to the oil of male fern, by Dr. Peacock,[7] and it has fallen in the estimation of others. The dose of the powder is gr. cl.–gr. clxxx. for an adult, and it is unnecessary to give any other medicine before or after. Of the Alcoholic Tincture (oz. vj.–Sp. Rect. Oj.) the dose is fl. oz. ss., either in one or two doses, with some aromatic water. The natives of India employ an ointment of kamala externally in itch and other skin diseases (Mackinnon); and

[1] Vol. i. p. 329.
[2] Ind. Ann. of Med. Sci., i. p. 286.
[3] Ibid., iii. 1855.
[4] Med. Times and Gaz., Nov. 1856, p. 538, and May, 1857, p. 429.
[5] Lancet, 1858, vol. i. p. 476.
[6] Ibid., p. 541.
[7] Med. Times and Gaz., Nov. 6, 1858.

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Dr. W. Moore[1] states that in *Herpes circinatus* he found kamala applied on moistened lint an effectual cure. He considers that it may prove useful in other allied eruptions.

1282. KEROSOLENE or KEROFORM. An organic radical, or, according to some chemists, an ether or analogous hydrocarbon, obtained in the manufacture of kerosene oil by the destructive distillation of coal. Boils at about 90° F.

Med. Prop. and Action. Its anæsthetic properties were first accidentally discovered in 1861 at Boston (U.S.), and great hopes were entertained at the time that another valuable agent, safer and pleasanter to inhale than chloroform, had been added to our list of anæsthetics. The trials of it by Dr. H. J. Bigelow[2] and Dr. E. Cutter,[3] of Massachusetts, were most satisfactory; but some doubts as to its safety and general applicability are thrown by the experiments of Dr. Dunglison,[4] who, in three cases in which he employed it, found that it induced intermittent pulse and partial asphyxia. Though these unfavourable symptoms may have been a coincidence, yet they suggest caution in its use. "Its action," observes Dr. Bigelow, "is probably more potent than that of ether, requires a freer admixture of air, and may produce upon the system some impression or influence other than that of the mere intoxication attendant on the use of ether. In awaiting further evidence, it may be considered established that kerosolene is an anæsthetic of undoubted efficacy, and that it possesses certain remarkable properties peculiar to itself." On account of its great volatility, it may deserve further trials as a local anæsthetic.

1283. KINO. Kino. The inspissated juice obtained from incisions in the trunk of Pterocarpus marsupium, *D. C. Nat. Ord.* Leguminosæ. *Hab.* India; imported from Malabar.

Med. Prop. and Action. Powerful astringent, containing the same astringent principles as catechu, viz., a species of tannin (mimotannic acid) and catechin. It is best given in tincture, or in the form of Pulv. Kino Co. Alkalies are said to impair its astringent qualities. Combined with cinchona, it is thought to increase the anti-periodic power of the latter. Externally, it is occasionally applied as an astringent to copiously discharging ulcers, and to relaxed mucous surfaces.

Dose:—Of Powdered Kino, gr. x.–xxx. *Of Compound Kino Powder* (Kino oz. iij¾., Opium, oz. ¼, Cinnamon oz. j.), gr. v.–xx. Grs. xx. contain gr. j. of opium. *Of the Tincture* (Kino oz. ij., Rect. Spirit Oj.), fl. drm. ½–ij.

1284. *Therapeutic Uses.* The form of *Diarrhœa* which appears to be the most benefited by kino is that connected with follicular derangement. Dr. Pemberton[5], who thought highly of its virtues as an astringent, asserts that it possesses one peculiar property—namely, never acting as an astringent, unless diarrhœa is present. He employed it in doses of gr. xx. combined with a small portion of opium. M. Bally[6] states

[1] Dublin Hosp. Gaz., Nov. 15, 1857.
[2] Med. Times, Aug. 17, 1861, p. 180.
[3] Amer. Med. Times, Aug. 1861, p. 86.
[4] Loc. cit.
[5] Dis. of the Abdominal Viscera, p. 149.
[6] Med. Gaz., vol. v. p. 700.

that he invariably found that, in doses of gr. xij.–xiv., it effectually checked diarrhœa, even when attended with febrile symptoms. *In incipient stages of Follicular Dyspepsia*, Dr. Pemberton placed his chief reliance upon kino, in combination with opium (Kino gr. x., Opium gr. $\frac{1}{4}$–$\frac{1}{2}$, M., 4tis horis sumend). He preferred kino, as it did not appear to constipate the bowels, unless diarrhœa was present. *In Pyrosis*, kino is often very serviceable. Sir T. Watson (ii. p. 447) speaks of Pulv. Kino Co. (gr. x., ter in die) as an admirable remedy in this affection; and Dr. Wilson Fox (ii. p. 838) also regards it as the best remedy which can be employed.

1285. *In the profuse perspirations of Phthisis*, Sir T. Watson (ii. p. 215) advises the exhibition of Pulv. Kino Co. "It certainly has," he observes, "much power over the perspirations, and it has this further advantage, that (containing opium) it tends to control the diarrhœa and to check the cough."

1286. *In Hæmorrhagic Diseases of a passive character*, kino may be given with benefit. From the large portion of tannin contained in it, it may be substituted for the latter in those forms of hæmorrhage enumerated under that head. (See Tannin.)

1287. *In relaxation of the Uvula*, kino is an excellent application, either dissolved and used as a gargle, or allowed to dissolve slowly in the mouth.

1288. *To ill-conditioned Ulcers*, with a relaxed surface, and a thin ichorous discharge, the tincture of kino, locally applied, acts as an astringent and stimulant.

Kousso. See Cusso.

1289. Krameriæ Radix. Rhatany Root. The dried root of Krameriæ triandra, *Ruiz et Pavon*. *Nat. Ord.* Polygaleæ. Imported from Peru.

Med. Prop. and Action. Powerful and valuable astringent; its virtues chiefly residing in tannin, of which good specimens contain about 40 per cent. It likewise contains a peculiar acid (Krameric Acid.) In the form of powder, it forms a useful astringent ingredient in dentifrices. When chewed, it tinges the saliva red.

Dose:—Of Powdered Rhatany, gr. x.–xl. *Of the Extract*, gr. v.–xx. *Of the Infusion* (Rhatany Root oz. $\frac{1}{2}$, Boiling Water, fl. oz. x.), fl. oz. j.–ij. *Of the Tincture* (Rhatany Root oz. ij$\frac{1}{2}$., Proof Spirit Oj.), fl. drm. $\frac{1}{2}$–ij.

1290. *Therapeutic Uses. In Atonic or Passive Hæmorrhages*, rhatany, either in the form of infusion or extract (*ut supra*), has been found signally beneficial. It is doubtful whether it possesses any advantages over tannin, excepting in general being more easily obtainable. *In Hæmaturia*, it was found by Sir T. Watson (ii. p. 668) to be effectual, after all ordinary measures had failed. He gave it in scruple doses of the

extract, thrice daily. *In passive Hæmorrhage from the Intestines*, it was successfully employed by Lombard, of Geneva; and M. Rilliet relates two cases of *Intestinal Hæmorrhage in new-born infants*, which were cured by injections of the infusion of rhatany, and compresses soaked in the same, applied to the abdomen. *In Menorrhagia*, particularly when occurring about the usual time of the cessation of the menses, Dr. Dewees (p. 156) speaks highly of the efficacy of rhatany. He employs the annexed formula:—℞ Ext. Rhatan. ʒij., Pulv. Rhei ʒ½, Syrup q. s. ft. pil. xl., sumat. ij. ter in die. He adds that, although he found this quantity generally successful, he should not hesitate to increase it greatly, if it were necessary.

1291. *In Leucorrhœa*, attended by relaxation of the tissues generally, and by debility, the extract, in doses of gr. xx. daily, proves serviceable in arresting the discharge, and giving a healthy tone to the system. The infusion may, at the same time, be used as an astringent injection.

1292. *In Ozæna*, Dr. Detmold,[1] of Hanover, advises the following formula:—℞ Decoct. Rhataniæ fʒxij., Calcis Chlor. ʒj.–ʒij., M. Of this, fl. oz. ½ is to be injected into the nostrils, three or four times daily, with a syringe, whose point is sufficiently long to carry the fluid up into the nasal passages. Under its use, the most fetid and profuse nasal discharges were benefited or cured.

1293. *In Chronic Catarrhal Ophthalmia*, Dr. M. Pavise recommends a strong infusion of rhatany as a collyrium. It may be applied three or four times a day, with or without a few drops of liquor plumbi. He found it an efficacious remedy.

1294. *In Chronic Diarrhœa*, it has been successfully employed by Dr. Hurtado,[2] and other Spanish physicians. It appears to be chiefly useful when the stools are mucous and slimy, and in the absence of all inflammatory action.

1295. *Fissures of the Anus.* Numerous cases, occurring both in adults and children, cured by rhatany injections, are reported by Trousseau, Bretonneau, and others. The intestines must first be cleared out by a simple injection of mucilage. After the lapse of half an hour, an injection, composed of 38 oz. of water, ʒj.–ʒij½. of extract of rhatany, and fʒv. of alcohol, is administered. This is to be repeated in the evening. When the pain is moderated, only one glyster is to be given daily; and when the cure appears to be completed, every alternate day for a fortnight longer. Trousseau also advises an ointment of one or two parts of the extract to five of lard. The testimony in favour of this treatment is very strong. Injections of a diluted tincture of rhatany (1 to 16 of water) were found effectual by Dr. Rotté,[3] but they do not appear to have any special advan-

[1] Brit. For. Med. Rev., No. xxiv.
[2] Journ. de Méd., t. xxxvii., p. 216.
[3] Journ. des Connaiss. Med.-Chir., Sept. 1853.

tages. An ointment of rhatany (1 part of extract to 15 of cocoa butter) is stated to be a very efficacious application to *Sore Nipples*.

1296. *In spongy and bleeding Gums*, the powder has been employed as a dentifrice; the tincture is also a good application. The infusion forms a useful gargle in some forms of *Relaxed Sore Throat*.

1297. Lacmus. Litmus. A peculiar colouring matter obtained from Roccella tinctoria and other colorific lichens. It is officinal solely as a chemical test. Acids turn blue litmus paper red, but the former colour is restored by solutions of the alkalies. It is an easy and important test for ascertaining the acidity, or otherwise, of the urine and other secretions.

1298. Lactic Acid. Acidum Lacticum. Acid of Milk may be obtained, by the process termed "viscous fermentation," from milk, the juice of the beet, turnip, carrot, &c.; indeed, it is formed whenever sugar in solution of whatever kind is placed in contact with an alkaline or earthy carbonate in presence of a ferment, as, for example, the casein of milk. (Pelouse.) It occurs in the form of a colourless syrupy fluid of a very sour taste. Sp. Gr. 1·215. The formula of the Hydrated Acid is $C_6H_5O_5 + HO$; or, considered as a Bibasic Acid, $C_{12}H_{10}O_{10} + 2\,HO$. The Lactates of Magnesia and Soda have been proposed as therapeutic agents by M. Petrequin.[1]

Med. Prop. and Action. Taken internally, lactic acid produces no sensible physiological effects. It is supposed to act as a digestive; and as lactic acid exists naturally in healthy gastric juice, it is not improbable that in cases where this acid is morbidly deficient, it may be advantageously supplied by means of this artificial product (see Dyspepsia, *infra*). Considerable interest attaches to this acid from the experiments of Dr. Richardson,[2] who, acting on the suggestion of Dr. Prout, that an accumulation of this acid in the system was the cause of acute rheumatism, instituted a series of experiments, by injecting a solution into the peritoneal cavity of dogs, from which it appears that though it is not proved that lactic acid is the true cause of rheumatic endocarditis, yet it is certain that the acid introduced into the circulation is sufficient to produce such an endocardial condition. The subsequent observations of Möller and Rauch[3] tend to confirm the views of Dr. Richardson; whilst those of Dr. Reyher[4] throw some doubt on the correctness of the conclusions of previous observers. It is to be hoped that further investigations will be made on this interesting subject.

Dose, fl. drm. j.–fl. drs. iij. daily, in the form of lemonade, sweetened with sugar, or made into lozenges.

[1] Ranking's Abstract, xxxvi. p. 134, 1862.

[2] Medical Times, November 28, 1857.

[3] Virchow's Archiv., Bd. xx. Heft i. and ii. p. 211.

[4] Brit. and For. Med.-Chir. Rev., Jan. 1862, p. 253.

1299. *Therapeutic Uses. In Dyspepsia*, it was first introduced by Magendie, who considered that he derived great advantage from its use. Its value has also been attested by Dr. C. Handfield Jones,[1] who employed it chiefly in cases of irritative dyspepsia, when the digestion was painful and imperfect, and had been so for some time. He does not advise its use at the commencement of the treatment of a severe case, but only after the irritation is somewhat reduced. The dose is ♏xv.–♏xx. in fl. oz. ½ of water taken at meal times; it seems then to mingle with the food, and to supply one of the constituents of healthy gastric juice, which is probably imperfectly produced. Its use need not be confined to cases of dyspepsia, but may be extended to all cases where it is desirable to improve the tone and power of the stomach. Dr. O'Connor,[2] who reports favourably of it in dyspeptic cases, regards it as superior to pepsin, an opinion opposed by Mr. Squire.[3] To obtain good effects, it is essential that the acid should be pure and of good quality, which is not generally the case with that sold in the shops.

1300. *Croup and Diphtheria.* From the observations of Bricheteau and Dr. Dureau, it appears that lactic acid is a powerful solvent of false mucous membranes, and that it may prove a valuable local application in *Croup*, and other pseudo-membraneous affections. According to Dr. Dureau, it dissolves the false membrane perfectly, and effects a cure more rapidly than anything else that has yet been tried; it is devoid of disagreeable taste, and, being innocuous, may be used with safety even by the most inexperienced.[4] It is best applied in the form of spray, by means of an appropriate apparatus. Dr. A. Weber[5] testifies to the value of lactic acid inhalations in croup. The patient is made to inhale a solution of the acid (15 to 20 drops in oz. ½ of water), at first every half hour, and afterwards, when the respiration improves, every hour or every two hours. Care must be taken that the vapour does not affect the eyes or face. Carb. of soda, given internally at the same time, appeared to exert a beneficial influence upon the exudation. The inhalation to be discontinued when the dyspnœa subsides, and chamomile to be given to promote expectoration.

1301. *In Phosphatic Deposits, and also in those of the Oxalate of Lime, in the Urine*, lactic acid, from its solvent power over these two substances, has been resorted to, but apparently with no very marked results. Dr. Challier[6] found that it acted as a ready solvent of uric acid; hence he was led to suggest its use in *Lithiasis*. From its power in these cases, it has been recom-

[1] Assoc. Med. Journ., July 14, 1854.
[2] Med. Times, April 25, 1857.
[3] Ibid., May 2, 1857.
[4] Practitioner, Nov. 1868.
[5] Med. Times and Gaz., Jan. 22, 1870.
[6] Dublin Med. Press, Sept. 13, 1843.

mended in the treatment of *Gout*,[1] but evidence of its practical utility is not adduced.

1302. LACTUCA VIROSA, *Linn.* Strong-scented Lettuce. *Nat. Ord.* Compositæ. Cultivated in all parts of the world.

Med. Prop. and Action. The Extract (*off.*), prepared from the flowering herb, is reputed sedative and anti-spasmodic. It has been proposed as a substitute for opium, its alleged advantages being that its operation is unattended by constipation and nervous derangement, which so often follow the use of opiates. The statements regarding it, however, are so vague and conflicting, that doubts may reasonably be entertained of its therapeutic value. This remark applies equally to *Lactucarium*, an extract obtained generally from L. sativa, *Linn.*, which has been held in some esteem.

Dose:—Of the Extract, gr. v.–xv.

1303. *Therapeutic Uses. In the Cough of Phthisis*, and in *Hooping Cough*, the extract has been reported favourably of as a sedative by Duncan and others, but for both affections there are more effectual remedies. For allaying the excitement of *Mania*, it proved useful in the hands of Twining, but in the experience of others it has proved a failure; and little or no reliance is to be placed upon it in *Chronic Rheumatism*, *Dropsical Affections*, and *Spermatorrhœa*, in all of which it formerly enjoyed some repute. It is a remedy of very minor importance.

1304. LAMINARIA DIGITATA, *Lam.* Sea Girdles, or Sea Tangles. A species of Sea-weed inhabiting the coasts of Europe.

Med. Prop. and Action. From the property the stem possesses of becoming greatly reduced in bulk when dried, and again expanding when exposed to moisture, it has been used to form tents for dilating the os uteri. Professor Wilson,[2] of Glasgow, recommends the use of tangle tents in preference to those of sponge, on the ground that they are much more easily introduced; and their advantages are further illustrated by Dr. Kidd[3] and Dr. Braxton Hicks.[4]

1305. LARIX EUROPÆA, *D. C.* The Common Larch. *Nat. Ord.* Coniferæ. *Hab.* Europe.

Med. Prop. and Action. Stimulant, astringent, and diuretic. A tincture prepared from the inner bark of the larch has been used by Dr. Headlam Greenhow[5] to check profuse passive expectoration in cases of *Chronic Bronchitis*. He prefers it to other medicines of the balsamic class on account of its more agreeable taste. Dr. Harley,[6] of Dublin, advocates the use of the tincture of larch bark in *Purpura Hæmorrhagica*, in doses of ℥x.–xv. every hour, or less frequently, according to the severity of the case. It probably acts in the same way as turpentine, and is more agreeable to take. Venice Turpentine is also the product of the larch. (See TEREBINTHINA.)

[1] Brit. and For. Med. Rev., ix. p. 239.
[2] Med. Times, Nov. 28, 1863.
[3] Brit. Med. Journ., Aug. 8, 22, 1868.
[4] Practitioner, Aug. 1869.
[5] Med. Times, Feb. 20, 1864.
[6] Dublin Hosp. Gaz., 1859.

1306. LAUROCERASI FOLIA. CHERRY-LAUREL LEAVES. The fresh leaves of Prunus Laurocerasus, *Linn.* The Common or Cherry Laurel. *Nat. Ord.* Rosaceæ. *Hab.* Asia Minor; cultivated throughout Europe.

Med. Prop. and Action. Powerful sedative, but rarely given internally, as they yield a variable quantity of hydrocyanic acid, produced by the decomposition of amygdaline which they contain, and are consequently very uncertain in their operation. Externally, the bruised leaves are made with bread crumbs into anodyne poultices. The water obtained from the leaves by distillation (Aq. Lauro-cerasi, *off.* in B. Ph.) is powerfully sedative. Its uncertain strength renders it a dangerous remedy; it possesses no properties which cannot be more safely and certainly obtained from hydrocyanic acid. It is rarely used in British practice, but is held in high esteem by the Germans and French. In large doses it is a violent poison.

Dose:—Of the Distilled Water, ♏v.-xxx., cautiously administered. In large doses it is poisonous.

1307. *Therapeutic Uses. In aggravated cases of Cough*, attended with little expectoration and much dryness of the skin, Sir George Lefevre[1] strongly recommends the following mixture:—℞ Aq. Lauro-ceras., T. Digitalis, Liq. Antim. Tart. āā f℥j., M. Dose, gutt. xxx.-xl., four or five times a day, in any simple vehicle. *Spasmodic Affections of the Chest and Stomach* are, according to the same authority, greatly benefited by this medicine. He states that he has seen many cases in which it was used with marked advantage. *In Hooping Cough*, the inhalation of the vapour is favourably spoken of by Dr. Pavesi[2] and others, but its use demands the greatest caution.

1308. *In the early stage of Milk Abscess*, when there is an abundant secretion of milk, and the breasts are distended and very painful, Dr. Caffe[3] states that immediate relief is afforded by the following application:—℞ Aq. Lauro-ceras. f℥j., Spt. Æther. Sulph. f℥j., Ext. Opii gr. iij., M. A piece of linen dipped in this is to be applied constantly to the breast.

1309. *To Cancerous and painful Ulcerations and Tumours*, the leaves in the form of poultice (*ut supra*) or infusion (oz. iv., Aq. Ferv. Oij.) have been used as an anodyne. It is not altogether free from danger.

LAURUS CASSIA. See CASSIÆ CORTEX.

1310. LAVANDULA VERA, *D.C.* Common Lavender. *Nat. Ord.* Labiatæ. *Hab.* Southern Europe, England, &c.

Med. Prop. and Action. The flowers are stimulant and carminative; powdered, they are occasionally used as an errhine. The volatile oil obtained by distillation is stimulant. It is best given in the form of compound tincture. The distilled water is an agreeable perfume.

[1] Thermal Comfort, 8vo, 1844.
[2] Ranking's Half-Yearly Abstract, vol. xiv. p. 205.
[3] Journ. Hebdom., vol. ii. p. 23.

Dose:—Of the Distilled Oil of Lavender, ♏ij.-vj. *Of the Spirit* (Oil of Lavender, fl. oz. j., Rect. Spirit fl. oz. xlix.), ♏xxx.-lx. *Of the Compound Tincture* (Oil of Lavender fl. dr. j½., Oil of Rosemary ♏x., Cinnamon, Nutmeg, āā bruised gr. cl., Red Sandal Wood gr. ccc., Rect. Spirit Oij.), fl. drm. ½–ij.

1311. *Therapeutic Uses. In Nervous and Hysterical cases, in painful Uterine Affections, in Flatulence, and in incipient Syncope*, the compound tincture is an agreeable and valuable stimulant. The following is an excellent form of administration:—℞ T. Lavand. Co., Spt. Chloroformi, Spt. Æther Sulph. Co. āā. ♏xx., Aq. Camph. ℥x., M. ft. haust. Opium may be added if necessary. It is very effectual in the relief of *Headache of Hysteria*.

1312. Leptandrin. A black shining powder, prepared from the root of Leptandra Virginica, *Nutt.* A plant indigenous in North America. *Nat. Ord.* Scrophulariaceæ. The designation properly belongs to the bitter crystallizable principle contained in the root of this plant, but of the virtues of the latter nothing is at present known.

Med. Prop. and Action. The effect of leptandrin is gently to excite the liver and promote the secretion of bile, without producing the least irritation of the bowels. It does not purge at all, and even its laxative effect is very slight, while on the stomach it acts as a decided tonic; hence it is most valuable in *Diarrhœa* and *Chronic Dysentery* when the stools are destitute of bile, and the mucous membrane is irritable. Under its use the stools are said soon to assume a natural colour and consistence. *In Torpidity of the Liver*, it is thought to be superior to blue pill. *In Intermittents*, if given with quinine, it is thought to render the action of the latter more certain and effectual. It is apparently a valuable remedy in some forms of *Dyspepsia*. It is also highly recommended in *Epidemic Dysentery* and *Infantile Cholera*. It is said to be a valuable adjunct to podophyllin and iridin.[1]

Dose, gr. ½–ij., three or four times daily.

Lime, Hypophosphite of. See Sodæ Hypophosphis.

Limonis Cortex et Succus. See Citrus.

1313. Linum usitatissimum, *Linn.* Common Flax. *Nat. Ord.* Lineæ. *Hab.* Europe, India, &c.

Med. Prop. and Action. The seeds (Lini Semina, Linseed) are demulcent and emollient, and may conveniently be given in infusion (gr. clx., Liquorice Root gr. lx., Aq. oz. x.) with sugar, lemon, &c., to taste, in doses of fl. oz. ij., several times daily. If drunk largely, it assists the action of other diuretics. The oil expressed from the seeds (Lini Oleum, Linseed Oil) is emollient and laxative in doses of fl. oz. ss.–fl. oz. j. It is rarely given internally, excepting in the form of enema. The farina of the seeds, after the oil has been expressed (Lini Farina), commonly known as *Linseed Meal*, is extensively employed in the formation of poultices. For this purpose, mix linseed meal (oz. iv.) gradually with boiling water (fl. oz. x.), and then add olive oil (oz. ½), constantly stirring till uniformly mixed.

[1] See Lancet, Aug. 30, 1862, p. 239.

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1314. *Therapeutic Uses. In Catarrh, Diarrhœa, Dysentery, Visceral Inflammations, Calculus, Ardor Urinæ, Gonorrhœa, and affections of the Genito-Urinary Organs*, the infusion of linseed is an excellent demulcent, and its value is greatly enhanced by being generally procurable.

1315. *In Pneumonia, Bronchitis, Pleuritis, Pericarditis*, also in *Hepatitis, Peritonitis, Enteritis*, and *Nephritis, and in Uterine and Ovarian Inflammation*, great benefit often results from the prolonged use of linseed-meal poultices, made as light and soft as possible, and sufficiently large thoroughly to cover the affected part. They not only afford present relief, but appear to exercise a favourable influence on the course of the disease. Where it is desirable to stimulate the skin, a portion of mustard (1 to 4) may be added; where much pain has to be subdued, they may be made with decoction of poppy in place of water, or a little laudanum may be smeared over the surface. They are chiefly applicable in the earliest stages of the inflammation; in the more advanced stages, except in nephritis, blisters are more serviceable. Applied to *Abscesses*, they promote the suppurative process.

1316. *In Ileus*, Dr. Maxwell[1] found large injections of warm linseed oil (Oij.–Oiv.), steadily and slowly thrown up (regurgitation being prevented by pressing the guard of the pipe against the anus), remarkably successful after feculent vomiting had come on, and the usual means had failed. He recommends, in such cases, the patient to be placed on the right side, with the pelvis elevated above the rest of the body, the premature return of the injection being prevented by firmly pressing a ball of linen against the anus. He directs this glyster to be repeated every three or four hours, until relief is obtained; and, when much exhaustion is present, with the addition of opium. (Copland.)

LITHARGYRUM. See PLUMBI OXIDUM.

1317. LITHIÆ CARBONAS. Carbonate of Lithia. L_2CO_3.

Med. Prop. and Action. Alkaline, diuretic, and lithontriptic. The value of lithia depends on its affinity for uric acid, on its small combining proportion, and on the great solubility of urate of lithia. The carbonate of lithia renders the urine more alkaline than the corresponding salts of soda and potash (Garrod, p. 93.)

Dose, gr. iij.–vj. A good form of administration is the officinal Effervescing Solution, of which the dose is fl. oz. v.–x.

1318. *Therapeutic Uses. As a solvent of Uric Acid Calculus*, it was first proposed by Mr. Ure,[2] in 1843; and the success he met with in dissolving extracted calculi, warrants the belief

[1] Edin. Med. and Surg. Journ., vol. xxi. p. 72.

[2] Pharm. Journ., vol. iii. p. 71.

that it is the most efficacious solvent yet known. He found that one grain of lithia dissolved in fl. oz. j. of distilled water took up at 98° F. 2·3 grains of uric acid; and that a solution of 4 grains in fl. oz. j. of water, at the same temperature, lessened the weight of a calculus composed of uric acid with alternate layers of oxalate of lime, 5 grains in five hours. "If," Mr. Ure adds, "by means of injections we can reduce a stone at the rate of a grain an hour, as the above experiment would lead us to anticipate, we shall not merely diminish its positive bulk, but further loosen its cohesion, disintegrate it, so to speak, causing it to crumble down and be washed away in the stream by the urine." Its solvent powers are reported highly of by Binswanger and other German authorities. Dr. Garrod[1] has called attention to the value of the salts of lithia in cases of *Uric Acid Diathesis connected with Gravel*, and in cases of *Chronic Gout*. This recommendation is based upon the fact that lithia possesses great affinity for uric acid, and that the urate of lithia is the most soluble of all the urates. Hence the value of the lithia springs of Baden Baden as shown by Dr. Althaus.[2] Lithium has also been discovered in the Bath thermal waters by Prof. Roscoe.

1319. LITHIÆ CITRAS. Citrate of Lithia. $L_3C_6H_5O_7$. Prepared by dissolving 50 grs. of Carbonate of Lithia in 1 fl. oz. of Water containing 90 grs. of Citric Acid, by the aid of heat; evaporating the solution, and drying the residue at a temperature of 240°.

Med. Prop. and Action. The same as those of Carbonate of Lithia (*q.v.*)
Dose, gr. v.–x.

1320. LOBELIA. The dried flowering herb of Lobelia inflata, *Linn. Nat. Ord.* Lobeliaceæ. *Hab.* North America.

Med. Prop. and Action. The whole plant is officinal. In doses of gr. j.–v. of the powdered leaves it is sedative, sudorific, and expectorant; of gr. xv.–gr. xx. it acts as an emetic or cathartic; and in larger doses it is an acro-narcotic poison. It is best given in simple or ethereal tincture. Of the simple tincture, fl. drs. ij. act as an emetic. If a leaf or capsule be held in the mouth for a short time, it brings on giddiness, headache, a trembling agitation over the whole body, sickness, and finally vomiting. These effects are analogous to those which tobacco produces in those unaccustomed to its use. If swallowed in substance, it excites speedy vomiting, accompanied by distressing and long-continued sickness, and even with dangerous symptoms, if the dose be large. It is extremely unequal in its operation; in some, causing, even when given in small doses, serious constitutional disturbance; whilst in others, large doses are taken with little perceptible effect. As there are no means of determining the cases in which its operation will be thus violent, it is always advisable to commence with small doses, and to increase them as the patient is able

[1] Braithwaite's Retro., xli. p. 29. [2] Med. Times, Nov. 23, 1861.

to bear the medicine, discontinuing its use if it cause nausea, or great depression, or intermittent pulse. Its activity appears to depend upon two principles—1, *Lobelin*, a principle much resembling nicotin; and 2, a volatile oil, or peculiar acid, *Lobelic Acid*.

Dose:—Of the Tincture (Lobelia in coarse powder, oz. ij½., Proof Spirit Oj.), ♏x.-xxx. as a sedative and expectorant; fl. drm. j.-j½. as an antispasmodic and emetic. *Of the Ethereal Tincture* (Lobelia in coarse powder oz. ij½., Spirit of Ether Oj.), ♏x.-xxx.

1321. *Therapeutic Uses.* *In Asthma*, lobelia at one time was held in high esteem, but from want of uniformity in action, it has fallen into comparative disuse. Dr. Hyde Salter (p. 241) reports favourably of the tincture given in repeated doses every half hour, increasing the dose, ♏v. each time, till either the physiological effects (faintness, sickness) are manifested with or without relief, or that relief is obtained without such symptoms. In either case, the medicine is at once to be discontinued. Generally, no relief takes place till symptoms of lobelia poisoning show themselves. Any amount may be given short of producing these effects without any relief at all. The quantity required differs in each case—generally ♏l.-lx. suffices; in others, ♏xc. fail to produce an effect. When once the necessary dose has been ascertained in this way, Dr. Salter directs the patient, on the next occasion, to start with that dose, which generally has the desired effect at once. Two circumstances render great caution in the use of this remedy necessary—1. Some persons exhibit great intolerance to its action, poisonous effects following the smallest doses; and 2. Different specimens differ considerably in strength. In cases which tolerate it well, it is a remedy of great value. Dr. Ringer (p. 392), who reports highly of its efficacy, considers that it should be given with caution where heart disease exists, as the pulse may become irregular, and very weak.

1322. *In Chronic Bronchitis*, it proves in many instances very serviceable as a sedative, by allaying spasm, and facilitating expectoration. It may be given in combination with other remedies. It is often effectual in allaying the *Dyspnœa of Emphysema*, but is inapplicable if heart disease is present. In the same way it proves useful in *Chronic Pneumonia*.

1323. *In Hooping Cough*, Dr. Ringer (p. 392) speaks highly of lobelia in large doses. For a child æt. two, he prescribes ♏x. of the tincture every hour, with an additional dose each time the cough comes on, if there be sufficient warning to accomplish this. By these means, he states, the severest attacks are immediately made much milder, while in no instance has it been found to produce the unpleasant symptoms witnessed in adults; hence it may be concluded that lobelia is better borne by children than by adults. *Other forms of Paroxysmal Cough* are often greatly benefited by its use. *In Hay Fever*,

Mr. Gordon, of Welton,[1] found the tincture an effectual remedy.

1324. LUPULINE. Lupulina. The yellow pulverulent substance separated from the strobiles of Humulus Lupulus (Hops) by the process of rubbing and sifting.

Med. Prop. and Action. Tonic, sedative, and anaphrodisiac. It produces neither headache, nervousness, constipation, nor any other unpleasant symptoms; in which respect it is superior to camphor.

Dose, gr. vj.–xij. in powder, with sugar or in pill. By long keeping, it loses much of its efficacy.

1325. *Therapeutic Uses. In Nervous Affections*, when opium cannot be tolerated, Eberle[2] found lupuline peculiarly useful. *In Chronic Hysteria, attended with morbid vigilance*, he found it, in doses of gr. x. every six hours, afford great relief, without causing any unpleasant effects. Dr. Tilt (p. 103) mentions a case of *Sleeplessness*, in which lupuline (gr. lx. in the form of pill) produced sound sleep after opium and henbane had failed.

1326. *In certain Irritable States of the Generative Organs*, it is a remedy of great value. *In Gonorrhœa*, it was first used by Dr. Byrd Page,[3] who found it effectual not only in removing *Chordee*, but in allaying irritation of the inflamed mucous membrane of the urethra. Whenever it is desirable to keep the penis at rest, as in cases of *Chancre, after the operation of Phymosis, during the treatment of Stricture, &c.*, lupuline, in doses of gr. v.–x., or even gr. xv., may be resorted to with advantage. *In Spermatorrhœa*, it is a remedy of great power. Amongst others, Dr. Pescheck[4] has recorded high testimony in its favour when given in doses of gr. xv. at bedtime. He sometimes added to it gr. j.–ij. of pulv. digitalis. It has also been found very serviceable in mitigating the *Urethral Irritation and Discharges consequent on former excesses*, more so indeed than either iron or quinine. Dr. Handfield Jones[5] records an interesting case of the latter affection, which yielded to the following formula:—℞ Lupulin gr. vj., Camphor, gr. j½., Ext. Belladonnæ gr. ¼, M., bis in die sumend. A valuable peculiarity in the operation of lupuline is the beneficial action it exerts on the digestive process, which is so often at fault in these cases. *In Nymphomania*, it seems well worthy of a fair trial. Herzfelder[6] used it with advantage in *Nocturnal Incontinence of Urine.*

[1] Med. Gaz., vol. iv.
[2] Therapeutics, ii. p. 56.
[3] Philadelphia Med. Examiner, May, 1849, p. 284.
[4] Buchner, Repert. für Pharm., No. i. 1856.
[5] Lancet, May 25, 1867.
[6] Bull. Gén. de Thérap., lii. p. 187.

1327. *In Scrofula and Scrofulous Affections*, Dr. Zambaco[1] states that he employed lupuline with excellent effects. *In Intermittent Fevers*,[2] it has been found occasionally effectual in doses of gr. vj.–xij. daily. It is a popular remedy amongst the Neapolitans.

1328. LUPULUS. HOP. The dried strobiles of the female plant of Humulus Lupulus, *Linn.* *Nat. Ord.* Urticeæ. Cultivated in England.

Med. Prop. and Action. Tonic, stomachic, diuretic, and slightly narcotic. These virtues reside in a volatile oil and a bitter principle, *Lupulite* or *Humulin*, which constitutes about 10 per cent. of *Lupuline*, the minute yellow grains adherent to the base of the scales. (See LUPULINE.) The tonic and stomachic properties of hops are supposed to reside chiefly in the lupuline and its bitter principle, and their narcotic properties in the volatile oil. The odorous emanations of the oil are said to be also hypnotic. Statements as to the virtues of hops are generally vague and unsatisfactory.

Dose:—Of the Extract, gr. v.–xv. *Of the Infusion* (Hop oz. ½, Boiling Water, fl. oz. x.), fl. oz. j.–ij. *Of the Tincture* (Hop oz. ij½., Proof Spirit Oj.), fl. drm. ½–ij.

1329. *Therapeutic Uses. In Mania and in the Delirium of Fever*, a hop pillow (the hops having been previously wetted with spirit to prevent rustling) is occasionally employed, with a view of inducing sleep. It is stated to have been successful in the case of George III.; and Pereira (ii. p. 376) has several times seen it used with success. Their internal use, in the form of extract, is favourably spoken of by Mr. Mayo. Prof. Van der Kolk (p. 156) considers that hop as a sedative in *Mania* deserves every consideration; he finds that the remedy is generally well borne, promoting sleep, and not producing constipation like opium. He directs an infusion of a few drachms (?) in 6 or 8 oz. of water, and of this he orders a few spoonfuls several times in the evening; a quiet night is thus obtained, and he states that the congestion which it otherwise occasionally produces is thus in a great measure obviated. He regards its alleged anaphrodisiac effect as very doubtful. *In Delirium Tremens*, Prof. G. B. Wood (i. p. 285) regards the tincture as an admirable adjunct to opium, having seen sleep induced by it when opium alone had failed. In convalescence from this disease, also, he considers it one of our best remedies for sustaining a moderate tonic and soporific influence.

1330. *In Dyspepsia*, the various preparations of hops are sometimes given with benefit; perhaps none is superior to a *pure* bitter ale. *In Dyspepsia attended with Pyrosis*, the extract has been found very serviceable.

[1] Bull. Gén. de Thérap., lii. p. 187, Aug. 30, 1854.

[2] Edin. Med. Surg. Journ., No. xlv. p. 244.

1331. *In Rheumatism*, Dr. Maton[1] found the extract, given internally, very efficacious in allaying pain, and in producing sleep. It had a marked effect on the pulse. In the hands of Dr. Bigsby it altogether failed.

1332. *In Cancerous and other Ulcerations*, Mr. Freake[2] speaks favourably of the external application of powdered hops, in the form of ointment.

1333. *In painful Swellings and Tumours*, Dr. A. T. Thomson (p. 484) states that he has seen hop fomentations afford much relief.

1334. *In Intermittent Fevers*, the tincture of hop, in doses of fl. drm. j.–ij., may advantageously be used as an adjunct to cinchona or quinia.

1335. Magnesia. Magnesia. MgO.

> Magnesia Levis. Light Magnesia. MgO. Prepared by burning light carbonate of magnesia in a Cornish or Hessian crucible at a red heat, as long as any of the powder effervesces with dilute sulphuric acid.

Med. Prop. and Action. Antacid, in doses of gr. x.–xx.; laxative, in doses of gr. xxx.–gr. lx.–gr. xc.; for a child the dose is from gr. ij.–x. It is supposed by Hufeland to possess, in addition to its antacid, a specific property of diminishing gastro-intestinal irritation, by a directly sedative action. As an antacid, it is preferable to the carbonate, as the latter, when brought in contact with the acid of the stomach, gives rise to much flatulence. After exerting its antacid effects in the intestinal canal, it becomes absorbed, and renders the urine alkaline. It is, therefore, of use in increased excretion of uric acid and urates. As an aperient, it is mild and unirritating, and is well adapted for children: it may be given alone in a little milk, or combined with a few grains of rhubarb. It is an antidote *in poisoning by the mineral acids.*

Dose, of Magnesia or Magnesia Levis: as an antacid, gr. x.–gr. xx.; as a laxative, gr. xxx.–gr. xc.

1336. *Therapeutic Uses. In Acidity of the Primæ Viæ, Cardialgia, Sympathetic Vomiting, and some irritable states of the Stomach*, magnesia, in doses of gr. xv.–gr. xx., may be given with advantage. *In the Heartburn of Pregnancy*, Dr. Simms particularly recommends the following formula:—℞ Magnes. Ust. ʒj., Aq. Ammoniæ fʒj., Spt. Cinnam. fʒiij., Aq. fʒvss., M. Dose, two or three table-spoonfuls, immediately after every meal, or when required.

1337. Magnesiæ Carbonas. Carbonate of Magnesia ($(Mg, CO_3)_3.MgO.5H_2O$. Magnesiæ Carbonas Ponderosum (Ph. Dub.)

[1] Obs. on Humulus Lupulus, by A. Freake.

[2] Op. cit., p. 13.

MAGNESIÆ CARBONAS LEVIS. Light Carbonate of Magnesia. Identical in chemical composition with the Carbonate of Magnesia.

Med. Prop. and Action. Purgative, in doses of gr. xx.–gr. lx.; antacid from gr. v.–gr. xx. It is particularly adapted as a purgative for children, in doses of gr. ij.–v., and may be given in aq. anethi, or combined with rhubarb. Milk is also a good vehicle for it. Its purgative action is supposed, in a great measure, to arise from the magnesia combining with the acids of the alimentary canal, forming with them soluble compounds; "For," observes Dr. A. T. Thomson (p. 1076), "if no acid be present, magnesia does not appear to increase in any degree the peristaltic motion of the bowels." If given in large and continuous doses, it may prove hurtful by accumulating in the intestines. Sir B. Brodie (p. 204) mentions a case in which, after death, many pounds of magnesia were found collected in the colon, above a contracted part of the rectum.

Dose of the Carbonate or Light Carbonate, gr. v.–gr. xx., as an antacid; as an aperient, gr. xx.–gr. lx. It may be advantageously exhibited in the form of Fluid Magnesia (Liq. Magnesiæ Carbonatis, B. Ph.), in doses of fl. oz. j.–ij. Each fl. oz. contains about gr. xiij. of the carbonate. Fl. oz. j., mixed with citric acid or lemon-juice, forms an agreeable effervescing aperient.

1338. *Therapeutic Uses. In Acidity of the Primæ Viæ*, gr. xx. of carb. of magnesia in some aromatic water or mild bitter infusion, proves eminently serviceable. *In Sympathetic Vomiting, particularly in that of Pregnancy*, attended with acidity, it also occasionally affords complete relief; and *in Cardialgia* arising from the same cause, it is often successful when other means have been unavailing. It is best taken immediately after a meal. *In Pyrosis*, it is occasionally effectual.

1339. *In the Diarrhœa of Children*, it proves valuable as an antacid and absorbent. It is best combined with a few grains of rhubarb and an aromatic. *In Aphthæ and Aphthous Ulceration*, it may also be given with advantage.

1340. *In Calculous Diseases, when lithic or uric deposits* in the urine indicate the exhibition of alkalies, Sir B. Brodie prefers the use of magnesia to other remedies of the same class. He considers that it does not possess the same attenuating action on the fluids of the body, as that which is rendered soluble, by its combination with the acid in the stomach, can alone enter into the circulation. He advises the following formula, which is generally found to agree well with the stomach, and to produce a very immediate effect on the urine :—℞ Magnesiæ Carb. gr. vj., Potass. Bicarb. gr. xij., Potassæ Tart. gr. xv., M. ft. pulv. vespere sumend.

1341. *In Chronic Gout*, magnesia and its carbonates are often of great service. It forms a moderately soluble salt, with uric acid : it is also an alkali, and acts both as a direct and remote antacid : it is useful as an adjunct, especially when there is great acidity of the intestinal canal, and a sluggish

state of the bowels. The salt formed in the stomach by its union with the acid, produces a purgative effect, which tends to relieve the portal circulation, and often aids indirectly the function of the kidneys. Carbonate of magnesia dissolved in excess of carbonic acid, is an elegant form of administration. (Dr. Garrod, i. p. 866.)

1342. *In the Flatulence of Childhood*, a few grains of magnesia in any aromatic water, are generally very effectual.

1343. *In Poisoning by Oxalic and the strong Mineral Acids*, it is a valuable antidote, but not superior to chalk.

1344. *In Diabetes*, Dr. Willis[1] speaks in the highest terms of the value of magnesia. In addition to his own testimony, he adduces that of Hufeland, who speaks favourably of it, and mentions two cases treated by Mr. B. Phillips, in which, under the use of this remedy, the sugar disappeared from the urine, and the thirst and all the other symptoms of the disease were immediately relieved. Subsequent experience has shown, that though occasionally useful as a palliative, it is of no value as a curative agent.

1345. *In Herpes Zoster*, to relieve the deep-seated pain in the chest, Dr. A. T. Thomson[2] advises the following formula:—℞ Magnes. Carb. gr. xx., Vin. Colchici, T. Opii āā f℥ss., Mist. Camph. f℥j., M. ft. haust.

1346. MAGNESIÆ CITRAS. Citrate of Magnesia. May be formed extemporaneously by mixing the solutions of 240 grs. of Citric Acid and 210 grs. of Magnes. Carb. and evaporating.

Med. Prop. and Action. Mild purgative. Its operation is much milder than the sulphate; and it has the advantage of being devoid of any unpleasant taste. The Granulated Effervescing Citrate is a useful and elegant form for administration.

Dose, gr. clxxx., or more.

1347. *Therapeutic Uses. In Febrile and Inflammatory Attacks in the Puerperal state*, when a mild refrigerant aperient is required, the following may be employed:—℞ Acid. Citric. gr. xxx., Aq. fl. oz. j., Syr. Aurant. fl. drs. ij. Add this to fl. drs. x. of fluid magnesia, and drink whilst effervescing.

1348. *In Hydrocephalus*, Dr. Cheyne found ℥j.–℥ij. of carbonate of magnesia, saturated with lemon-juice, taken every two or three hours, sit well on the stomach, even when it was irritable, and act freely as a purgative in most cases. He advises its use.

1349. *In Nervous and Dyspeptic Headaches*, a dose of the effervescing citrate is often very effectual. It should not be

[1] On Urinary Diseases, 8vo, 1839. [2] Cyc. Pract. Med., vol. ii.

had recourse to frequently, as constant repetition is likely to injure the tone of the gastric mucous membrane.

1350. MAGNESIÆ SULPHAS. Sulphate of Magnesia. $MgSO_4$. $7H_2O$. Epsom Salts.

Med. Prop. and Action. Purgative, in doses of gr. cxx.–oz. j., dissolved in Oss. of water or infusion of senna. A smaller relative dose is required if the salt be largely diluted; thus, oz. ss. of the salt, in Oj. of fluid, acts quite as powerfully as double the quantity in only Oss. of fluid. It is a refrigerant purgative, lowering the force of the pulse, and producing a small degree of depression. It is apt to produce flatulence, to avoid which it should be given in some aromatic water. If it excite vomiting, this may generally be obviated by the addition of a few drops of dilute sulphuric acid, which, at the same time, materially increases the purgative action of the salt; it is best given in combination with senna, whose purgative effect it promotes, at the same time that it modifies its griping tendency. The compound infusion of roses is a good vehicle for its administration. It is supposed to operate chiefly on the duodenum. By moderate exercise in the open air, while taking this salt, its purgative operation is diminished, and its diuretic effect increased. Sir W. O'Shaughnessy[1] judiciously directs that it should not be administered during the prevalence of cholera, as it is apt to occasion too profuse and exhausting evacuations, and thus to bring on an attack of that disease. Natives, and inhabitants of the tropics, generally bear the operation of Epsom Salts very badly; it induces in them a great depression of the system, and often exhausting purgation. It is best adapted for febrile and inflammatory attacks occurring in persons of a robust, plethoric habit. In small doses and freely diluted, it acts as a diuretic. It is an antidote *in poisoning by the salts of lead and barytes.* It is sometimes employed in the form of enema (oz. j., Olive Oil oz. j., Mucilage fl. oz. xv.)

Dose: as a purgative, gr. cxx.–oz. j.; as a diuretic, gr. xx.–gr. xl., freely diluted.

1351. *Therapeutic Uses. In the early stages of Acute Febrile and Inflammatory Diseases,* where the patient is young and robust, and purgatives are indicated, the sulphate of magnesia, variously combined, forms an eligible remedy, but it is a powerful depressant, and as a general rule inferior to compound jalap powder. *Obstinate Constipation* will sometimes yield to small, frequently-repeated doses of the salt, with the addition of a few drops of diluted sulphuric acid, when stronger purgatives have failed to produce any effect.

1352. *In Dyspepsia, accompanied by Costiveness,* the sulphate of magnesia, in small doses, has been found very effectual. The best mode is to dissolve oz. j. in Oiss. of infusion of gentian or quassia, with the addition of fl. drs. ij. of aromatic spirit of ammonia, and of this to drink a wineglassful every morning fasting. Mr. Langston Parker speaks favourably of the following mixture:—℞ Magnes. Sulph. ʒvj., Magnes. Subcarb. ʒiss., Vin. Aloes fʒvj., T. Humuli fʒij., Acid. Hydrocyan. Dil. ♏xv., Infus. Cascarillæ fʒvij., M. sumat. coch. amp. iij. bis in die.

[1] Beng. Pharm., p. 337.

1353. *In Menorrhagia*, a mixture containing very small doses of this salt, with a little diluted sulphuric acid and syrup, is exceedingly useful during the days of profuse catamenial flow. (Dr. Graily Hewitt, p. 424.) When associated with debility, it should be given with tonics, especially sulphate of iron. *In Hæmatemesis and Melæna*, Dr. Barlow[1] remarks that, previous to the employment of astringents, it is advisable to clear out the bowels, and for this purpose he advises the following formula:—℞ Magnes. Sulph. ʒj.–ʒij., Acid. Sulph. Dil. ♏x., Aluminis gr. x., Syr. Papav. ʒ½., Infus. Rosæ Co. ʒxj., M. ft. haust. 4tis horis sumend. *In the severer forms of Jaundice*, Dr. Budd recommends the following purgative:—℞ Magnes. Sulph. gr. xxx.–lx., Magnes. Carb. gr. xv., Spt. Ammon. Arom. ♏xxx., Aq. ʒx., M. ft. haust. ter die sumend.

MAGNESIÆ SULPHIS. See SODÆ SULPHIS.

1354. MANGANESII OXIDUM NIGRUM. BLACK OXIDE OF MANGANESE. MnO_2.

[[*Med. Prop. and Action.* Alterative-tonic, hæmatinic, and sedative. According to the researches of M. Hannon,[2] there is a close similarity in properties between manganese and iron, and they are applicable to the same class of cases. In one respect, however, he found them to differ, manganese not being found in the fæces of persons who have taken it, or at least in very small quantities. Neither does it cause constipation, as some of the iron salts do. *In simple Anæmia*, he found it act as beneficially and as rapidly as iron, and the benefit appeared to be more permanent. It should not, however, be persevered in so long as iron, as its salts are more rapidly assimilated. Dr. Leared[3] remarks, the ordinary black oxide is very impure, and unfit for use; it should, therefore, be prescribed in a purified state. The carbonate (gr. x.) and the sulphate (gr. v.) have also been employed, but in these doses have been found to induce gastric irritation, whilst the black oxide is easily borne. From some experiments Dr. Goolden[4] made with the sulphate of manganese, it appears to exercise a specific influence on the liver and gall-bladder. Externally it is used in the form of ointment (gr. lx.–gr. cxx., Lard oz. j.) or gargle (gr. cxx.–clxxx., Barley Water fl. oz. vj.) It is of great importance in the process for generating chlorine (*q. v.*)

Dose: gr. iij.–gr. x.–gr. xx., thrice daily.

1355. *Therapeutic Uses.* It has been employed in *Syphilis, Scrofula, Scurvy, and many diseases of the Skin*, both externally and internally, but it has fallen into disuse. Its effects are very uncertain.

1356. As a remedy *in certain irritable conditions of the Stomach and forms of Dyspepsia*, the oxide has been strongly recommended by Dr. Leared (op. cit.) Corroborative evidence as

[1] Pract. of Med., p. 403.
[2] Rev. Méd.-Chir. June, 1849.
[3] Glasgow Med. Journ., Jan. 1865.
[4] Med. Gaz., 1844-5.

to its value in cases of *Gastric Irritation* is given by Dr. Goddard Rogers.[1] The dose employed was gr. x.-xv., thrice daily.

1357. MANNA. A concrete saccharine exudation obtained from the incised stems of Fraxinus Ornus, *Linn.*, and F. rotundifolia, *D.C. Nat. Ord.* Oleaceæ. *Hab.* Southern Europe, especially Calabria and Sicily.

Med. Prop. and Action. Laxative. From its sweet taste and general mild action, it is well adapted for children; but it is apt to cause griping and flatulence. It is a good adjunct to senna and the neutral salts, to cover their nauseous taste. It consists chiefly of a peculiar sugar termed *Mannite* ($C_3H_7O_3$). It contains, besides, a small amount of bitter matter.

Dose, gr. lx.-oz. j.

1358. *Therapeutic Uses.* Similar to those of senna, but it is chiefly used as an adjunct. *In Retention of the Meconium in new-born Infants*, Dr. Burns[2] speaks of manna as one of the best purgatives which can be used. As an aperient in *Gout*, Dr. Barlow[3] advises the following draught:—℞ Mannæ ʒj½., Vin. Colchici ♏xx., Potas. Tart. ʒij., T. Card. Co. ʒj., Infus. Sennæ Co. ʒx., M.

1359. MASTICHE. MASTICH. A resinous exudation from the incised stem of Pistacia Lentiscus, *Linn. Nat. Ord.* Anacardiaceæ. *Hab.* S. Europe, W. Africa, and the Levant.

Med. Prop. and Action. Astringent and diuretic; used in the same cases as turpentine, to which it is inferior in every respect, excepting in taste. It was formerly esteemed in uterine diseases, but is now rarely employed.

Dose, gr. xx.-gr. xl.

1360. *Therapeutic Uses. In Diarrhœa of Infants*, Dr. Ure[4] states that mastich water (water in which mastich had been boiled) is a popular and successful remedy among the Albanian physicians.

1361. *In Toothache*, great relief occasionally results from introducing into a carious tooth a piece of cotton saturated with a solution of mastich in ether or chloroform.

1362. MATICÆ FOLIA. MATICO LEAVES. The dried leaves of Artanthe elongata, *Miquel. Nat. Ord.* Piperaceæ. *Hab.* Peru.

Med. Prop. and Action. Astringent; a powerful topical styptic. It may be given internally in powder, infusion, or tincture (Matico oz. viij., Proof Spirit Oij.), the latter in doses of fl. drm. j.-fl. drs. ij. Matico contains only traces of tannic acid, a peculiar acid *Artanthic Acid*, and a volatile oil. It contains no piperine, although it has been said to affect the genito-urinary mucous membrane and rectum like pepper or cubebs. As an

[1] Lancet, March 5, 1864.
[2] Principles of Midwifery.
[3] Pract. of Med., p. 145.
[4] Compend. of Mat. Med., p. 117.

internal remedy, its astringent properties are not well marked, as, though it acts externally as a reliable hæmostatic, the effect is probably due rather to the mechanical action of the leaf than to astringency. (Scoresby-Jackson.) For external application, the underside of the leaf should be used, being more powerfully styptic than the upper. The powdered leaves are also frequently used. It was introduced into England by Dr. Jeffreys,[1] in 1839. Much interesting information on its properties will be found in a valuable paper by Prof. Bentley, in Pharm. Journal, 1863.

Dose:—Of Powdered Matico, gr. xxx.–gr. cxx. *Of the Infusion* (Matico Leaves oz. ½, Boiling Water fl. oz. x.), fl. oz. j.–iv.

1363. *Therapeutic Uses. In Internal Hæmorrhages*, it has been said to be very successful. *In Hæmatemesis, Hæmaturia, Hæmoptysis, &c.*, it is advised by Dr. Jeffreys (op. cit.) *In Menorrhagia and Uterine Hæmorrhage*, it has been highly praised. A case illustrative of its efficacy is mentioned by Mr. Horne; and Dr. Giraud[2] relates a case in which the pounded leaves, made into a paste and introduced into the vagina, arrested the discharge, when a strong solution of nitrate of silver had previously failed. *In Epistaxis*, it has been stated to be very effectual; a severe case is related by Mr. Horne,[3] which, after resisting all other remedies, yielded to the administration of matico. In slight cases of *Hæmoptysis*, Dr. Theophilus Thompson[4] observes that the infusion of matico alone is often sufficient. Sir H. Thompson (p. 173) regards the infusion of matico in doses of fl. oz. ij. every two or three hours equal to gallic acid, lead, &c., in *Hæmaturia*. He speaks also (p. 175) of having, in some exceptional cases, arrested the hæmorrhage by injections of an iced infusion of matico, immediately after removing the clots from the bladder.

1364. *Hæmorrhage from Leech-bites, from superficial wounds, after the extraction of Teeth, &c.*, may be readily arrested by the local application of the underside of the leaf.

1365. *In Leucorrhœa* depending upon an atonic state of the secernent capillaries of the mucous lining of the uterus and vagina, Dr. B. Lane[5] employed an injection of infusion of matico with decided benefit.

1366. *In Atonic Diarrhœa*, Dr. Lane administered the infusion, in some cases with excellent effect, in others with no benefit. The results were unsatisfactory.

1367. Meconine, or Opianyle, a crystalline alkaloid of Opium, which yields about 0·1 to 0·2 per cent. of it. Discovered by Pelletier. It occurs in fine white silky prisms, is freely soluble in hot water, and in hot glycerine, from both of which, on cooling, nearly the whole is deposited in the original form. Readily soluble in chloroform;

[1] Lancet, Jan. 7, 1839; and Trans. of Prov. Med. Assoc., vol. xi. 1843.
[2] Prov. Journ., April, 1851.
[3] Lancet, April 13, 1849.
[4] Ibid., July 19, 1851.
[5] Med. Gaz., Oct. 6, 1843.

less so in ether, and in alcohol, and in sulphuric acid. All its solutions have a mild bitter taste, followed by a peculiar dryish sensation.

Med. Prop. and Action. These have been examined by Dr. Harley (p. 151, *seq.*) When swallowed to the extent of grs. v. it produces not the slightest hypnotic or other effect; in fact, it appears doubtful whether it, like narceine, is absorbed by the stomach. Introduced subcutaneously, however, it acts as a tranquillizer and hypnotic, and its action is not followed by any unpleasant results. Thus employed, the maximum effect is reached by a dose of one, or at the most, two grains. "Compared with opium," Dr. Harley observes (p. 156), "the hypnotic effect of meconine is so feeble, that it cannot be expected to take the place of opium or of morphia in cases which require but moderate doses of them to produce sleep. But in children, and in those who yield readily to a soporific influence, gr. ½ of meconine will generally, I believe, be found effectual. In the former class of persons, where convulsions impend, and in the latter where morphia disagrees, meconine promises to be a valuable remedy, and the necessity of introducing it by the skin appears to be the only objection to its use." Combination with atropia increases its soporific effect.

1368. MEL. HONEY. A saccharine secretion deposited by the Hive Bee (Apis mellifica, *Linn.*) in the honeycomb.

Med. Prop. and Action. Mildly laxative; chiefly employed for disguising the taste of nauseous medicines. Clarified honey is an ingredient in some of the officinal confections, &c. It is of no therapeutic value.

1369. MENTHA PIPERITA, *Linn.* Peppermint.

MENTHA PULEGII, *Linn.* Pennyroyal.

MENTHA VIRIDIS, *Linn.* Spearmint.

These three plants agree closely in botanical character (*Nat. Ord.* Labiatæ), in their habitat (*Europe*), and in their medicinal properties.

Med. Prop. and Action. All three are aromatic, stimulant, carminative, and stomachic. The volatile oils in doses of ♏j.–v. are used as stimulant stomachics, and as adjuncts to purgatives. The Distilled Waters (fl. oz. j.–ij.) are carminative, and are much used as vehicles for saline aperients. The officinal Spirit of Peppermint (Oil of Peppermint fl. oz. j., Rect. Spirit fl. oz. xlix.) is a good form for administration. The dose of the Essence (Oil of Peppermint fl. oz. j., Rect. Spirit fl. oz. iv.) is ♏x.–xx. Mentha Pulegii and its oil, though equally useful with the other two, is not officinal in B. Ph.

1370. *Therapeutic Uses. In Flatulence, Flatulent Colic, Nausea, and Spasmodic Affections of the Bowels*, the volatile oil of these plants (it is not a matter of importance which is selected) may be given with advantage. A few drops of laudanum may be conjoined, according to the urgency of the symptoms. Their efficacy is often increased by the addition of magnesia.

1371. *In Puerperal Fever*, the oil of peppermint has been proposed as a substitute for the nauseous oil of turpentine by

Mr. Dove,[1] of Norwich. In severe cases he employed it, giving ♏ xxx.–xl. in divided doses in the twenty-four hours, preceding its use by a stimulating aperient. The effects were, on the whole, very satisfactory. Mr. Dove considers that probably all essential oils would act as well as turpentine.

1372. Methyl, Iodide of. Obtained by distilling wood-spirit with iodine and phosphorus, *Comp.* CH_3I. A very heavy fluid. Sp. gr. 2·199; vapour density 71; boils at 110 F. In the concentrated form it is rather easily decomposed, free iodine being given off.

Med. Prop. and Action. These were first investigated by Dr. Turnbull, and subsequently by Dr. B. W. Richardson, in 1867.[2] According to the experiments of the latter, it may, when quite pure, be administered by inhalation, and so given, it produces general anæsthesia; but if it be undergoing change, the free iodine which is evolved, causes lachrymation, salivation, and excessive bronchial secretion; in one experiment an animal died from artificial bronchitis thus induced. It may also be given by the mouth; one minim being equal to three grains of iodide of potassium. It should be prescribed in solution of pure methylic alcohol. Of all the iodides, it possesses the greatest activity of action on the body, and may be expected to be of service in *Tertiary Syphilis* specially.

Its antidotal powers in poisoning by strychnia and the alkaloids generally, are worthy of attention. It has been shown by How that when the iodide of methyl acts upon strychnia, brucia, morphia, and other alkaloids, it combines with them, and beautiful crystalline bodies are produced, which differ considerably in character from the salts of the alkaloids. The interesting experiments of Drs. Fraser and Brown,[3] of Edinburgh, prove also that the iodide modifies in a remarkable manner their physiological effects. Thus it is well known that strychnia, in doses of gr. $\frac{1}{20}$–$\frac{1}{30}$, rapidly produces in rabbits violent convulsions and speedy death, whilst 12 grs. of the iodide of methyl-strychnium administered by subcutaneous injection produced no effect whatever on these animals. Fifteen grains produced symptoms, and twenty killed; but the animal died with symptoms altogether different from those produced by strychnia. In place of violent and spasmodic convulsions and muscular rigidity, the appearances were those of paralysis with complete general flaccidity. The spinal motor nerves were either paralyzed, or speedily became so; and instead of the speedy occurrence of muscular rigidity, the muscles remained flaccid, contractile, and alkaline for several hours. In short, by the addition of iodide of methyl to strychnia, the toxic properties of the latter are diminished about 140 times; and the body produced, possesses the physiological action of curare, viz., paralysis of the end organs of the motor nerves. Similarly, Fraser and Brown have discovered that the toxic properties of brucia, thebaia, and codeia, are immensely diminished by the addition of the iodide of methyl; and that the bodies produced, instead of being, as all three of these alkaloids are, strongly convulsent, possess, on the contrary, the physiological action of curare. Morphia, as is well known, possesses both soporific and convulsent properties; its toxic action is much diminished by the addition of the iodide of methyl; its convulsent action is destroyed, but its soporific action remains. The subject is one of the deepest interest.

[1] Brit. Med. Journ., April 9, 1859.
[2] Ibid., April 18, 1868, p. 398.
[3] Brit. Med. Journ., March 7, 1868, p. 231.

1373. METHYLAMINE, or METHYL-AMMONIA. C_4H_5W. A volatile alkaloid obtained from the coffee berry during the process of roasting.

Med. Prop. and Action. Tonic? Experiments with the acetate of methylamine by Dr. Behier and M. Personne,[1] demonstrate that it exercises a considerable influence on the circulation, that it increases arterial tension, and in some cases produces irregularities of the pulse, whilst it exercises little effect on the pulse frequency; and these effects were equally observable in persons with very weakly, and with comparatively strongly acting hearts. According to Dr. Behier, there is a strong similarity between the action of this salt and that of the acetate of ammonia. The doses employed varied from ℥lxxx. to fl. drs. ijss.

1374. METHYLENE, BICHLORIDE OF. $C_2H_2Cl_2$, or CH_2Cl_2. A thin, colourless fluid, closely resembling chloroform in general appearance and smell. Sp. gr. 1·34. Boils at 88° F. Unlike chloroform, the vapour is inflammable. Being very volatile, it should be kept in well-stoppered bottles, and it is advised to be kept in the dark, inverted under water.

Med. Prop. and Uses. Valuable anæsthetic; first brought to notice in this character by Dr. Richardson, in 1867. The following is a summary of his researches:[2]—1. It is an effective general anæsthetic, producing as deep insensibility as chloroform. 2. In action it is rather more rapid than chloroform, but to develope its effects more of it is required, in the proportion of six parts to four. 3. It produces a less prolonged second degree of narcotism than other anæsthetics. 4. When its effects are fully developed, the narcotism is very prolonged, and is reproduced with great ease. 5. Its influence on the nervous centres is uniform, and it creates little, if any, disturbance or break of action between the respirating and circulating functions. 6. Its final escape from the organism is rapid, so that the symptoms of recovery are sudden. 7. In some cases it produces vomiting. 8. Where it kills, it destroys by equally paralyzing the respirating and circulating mechanisms. 9. It interferes less with the muscular irritability than perhaps any other anæsthetic. 10. It combines with ether and with chloroform in all proportions.

1375. Bichloride of methylene is best administered by means of an inhaler, such as has been devised by Mr. Rendle, made of leather or other material sufficiently thick to retain the shape, yet thin enough to yield a little in fitting on the face. It may be of various sizes; about seven inches in length by about three in diameter is the most convenient for use. The top is dome-shaped and perforated to admit just sufficient air to enable one to breathe without effort. The sides are not perforated, and the open end is shaped to fit nose and chin. In the interior is a flannel bag, the mouth of which is turned over the edge of the leather and secured by an elastic band. Thus the edge is made soft to the face, and the flannel lining is kept in position. Into this inhaler one fluid drachm of the bichloride is sprinkled, and the inhaler applied closely over the nose and mouth; the patient is directed to breathe freely, anything tight around the chest or neck having previously been loosened, and the respiration and pulse being closely watched. In some cases the respiration proceeds naturally; in others, chiefly from fear, there are convulsive efforts at inspiration for a few seconds. This generally ceases, and respiration becomes natural. If not, it is advisable to remove the inhaler, and allow one inspiration only, and then reapply it. But all unnecessary admission of air must be avoided,

[1] Practitioner, Oct. 1868.

[2] Med. Times and Gaz., Nov. 2, 1867.

as the rapid effects are dependent on the rapid inhalation of the bichloride with a minimum of air. The pulse is invariably strengthened and accelerated at first, but soon returns to its normal state. Insensibility to pain ensues generally in about 20 seconds, but in general surgery it is better to continue it a few seconds longer up to sixty. The duration of anæsthesia varies much. In dentistry, where the inhaler has of necessity to be removed, and the pain is peculiarly acute, anæsthesia is short, though quite long enough for one and often for three or four extractions. In other operations, where the inhalation can be continued until the drachm of bichloride is exhausted, the effects last about five minutes, and then the patient recovers, and is able to walk away with slight unsteadiness in gait, which passes off in a minute or two, and recovery is perfect. No sickness or headache follows unless the inhalation has been continued many minutes, or a second dose given to keep up the effect. If the inhalation be prolonged, the after-effects resemble, though in a less degree, those of chloroform save one—absence of muscular excitement. This rapidity of action and recovery appears to be due to its great volatility and solubility, enabling a large quantity to reach and escape from the nerve-organs at once; its safety, to its rather stimulant action on the heart and its rapid elimination. (Mr. Rendle.[1]) A symptom peculiar to the action of the bichloride is stated by Mr. Marshall[2] to be the occurrence of double strabismus.

1376. The following abridged analysis of 123 cases in which it was employed by Mr. Rendle contains many points of interest. The ages of the patients varied from 6 months to 70 years. Anæsthesia was produced in 30 seconds in 18 cases; in 60 seconds in 70; in 2 minutes in 25; in 3 minutes in 5; in 5 minutes in 3; in 9 minutes in 2. Anæsthesia was maintained 1 minute in 20; 2 minutes in 31; 3 minutes in 19; 4 minutes in 14; 5 minutes in 11; 6 to 10 minutes in 10. Less than 1 fluid drachm was used in 20 cases; 1 fluid drachm in 54; an additional half-drachm in 20; an additional drachm in 16; additional 2 to 4 drachms in 13. Fifty recovered within 1 minute; 23 in 2 minutes; 9 in 3 minutes; 28 in 5 minutes; 11 in 10 minutes; 2 were continued with chloroform. Vomiting occurred in 15—*i.e.*, 1 in 8; but in all of these it was continued beyond the second minute; and in 9, more than 1 drachm had been used. Some had just been eating. Three female adults and one child became rather blue, and the pulse slower than normal; but, on removal of the inhaler, and turning them slowly on the left side, they recovered well and rapidly.

1377. Methylic Ether.

Methyl-ethylic Ether.

Med. Prop. and Action. Anæsthetic. The anæsthetic properties of methylic ether were first discovered by Dr. Richardson in 1867, and by trials made with it on his own person it was found that anæsthesia was induced in seventy seconds, and that recovery took place almost instantaneously, without nausea, headache, or other unpleasant symptoms. The ether is made by digesting one part of pure methylic alcohol with two of strong sulphuric acid. The mixture is heated, and the methylic ether, which passes over as a gas, is subject to frequent washings in a strong solution of potash. It is chemically an oxide of the radical methyl. The strongest objection to it is that it is a gas, but this is to a large extent overcome by the fact of its being very soluble in various substances; water takes up 37 volumes of the gas, yielding an ethereal fluid of a very pleasant taste; pure ethylic ether and alcohol take up over 100 volumes, and chloroform and bichloride of methylene nearly as much. Dr. Richardson prefers absolute ethylic ether of sp. gr. 0·720 and a boiling point of 92° F. as a

[1] Brit. Med. Journ., Oct. 16, 1869. [2] Ibid., May 9, 1868.

solvent. The ether is charged with the gas at 32° F., and the compound, *Methyl-ethylic Ether* thus formed, is at once bottled and firmly corked down. It should be kept for a time before being used, the process of keeping producing a comparatively stable compound. From one to two drachms inhaled from a suitable apparatus suffices for producing speedy narcotism. In eleven cases of tooth extraction in which methylic-ether was employed, the whole operation, from the commencement of the inhalation to complete recovery, was under three minutes; in several cases one minute was sufficient, whilst in two cases 45 seconds sufficed. In no case was there spasm, syncope, or asphyxia, during inhalation, or any after-nausea, and in all cases there was a semi-consciousness, so that the patients did what they were bid to do, remembered what had been done, and yet were not conscious of pain. This is a very important feature in its operation. With regard to methyl-ethylic ether, Dr. Richardson found that it produced no excitation of the nervous centres which supply the vascular system as chloroform does, and that consequently there was an absence of muscular spasm, of contraction of blood-vessels, and of syncope from fatal contraction of the heart. When carried to the extent of arresting life in the inferior animals, it produced death by paralyzing the organic nervous centres. This extreme result was preceded by convulsive action similar to that which is seen in death from hæmorrhage, the convulsion being due to the absence of arterialized blood in the muscles. So well, however, does the heart still retain its power, that in one case, in a lower warm-blooded animal (a guinea-pig), the respiration returned spontaneously in pure air 4 minutes and 45 seconds after it had ceased. No fact could more definitively speak in favour of the safety of this agent. For the production of rapid anæsthesia for short operations it seems to offer peculiar advantages. It is superior to nitrous oxide gas, because it allows air to be given with it, and does not asphyxiate, and to bichloride of methylene, because it does not produce muscular spasm and syncope. (Dr. Richardson.[1])

1378. MEZERII CORTEX. MEZEREON BARK. The bark of Daphne Mezereum, *Linn.*, Mezereon, and of Daphne Laureola, *Linn.* Spurge Laurel. *Nat. Ord.* Thymelaceæ. *Hab.* Europe.

Med. Prop. and Action. Stimulant, diaphoretic, and diuretic. It is rarely given alone, but chiefly in combination with sarsaparilla. Of the simple decoction (drs. ij., Liquorice-root oz. ½, Water Oij., boiled to Ojss. the dose is fl. oz. ij., three or four times daily. Its operation is very uncertain; in some instances producing no sensible effect, whilst in others its continued use is followed by disturbance of the cerebro-spinal system, and sometimes by strangury. In large doses it produces vomiting and purging. Cullen observes that it frequently communicates a filamentous appearance to the urine. Externally applied, the bark is irritant and vesicant; it should be first steeped in hot vinegar and applied to the skin by a compress and bandage: it requires to be applied fresh night and morning, until it produces vesication. On account of its acridity, it has been proposed as a substitute for savine ointment, for keeping a blister open. Active principles, 1, an acrid resin; 2, a peculiar crystalline principle (*Daphnin*); and 3, an acrid volatile oil. These principles appear to be dissipated by boiling. An Ethereal Extract, officinal in B. Ph., is an ingredient in Lin. Sinapis Co.

Dose of the bark, gr. x. infused in fl. oz. ij. of water, twice or thrice daily.

1379. *Therapeutic Uses. In Syphilis*, mezereon was intro-

[1] Lancet, April 2, 1870.

duced by Dr. A. Russell[1] as an efficacious cure for venereal nodes, and at one time it was much employed; but Dr. Pearson (p. 49), after extensive trials with it, having stated that it possessed no virtue either in syphilis or its sequelæ, it has fallen into comparative disuse, excepting as an ingredient in compound decoction of sarsaparilla.

1380. *In Chronic Rheumatism*, it appears to have been too much neglected. Dr. Fuller speaks favourably of a strong infusion (oz. ½, Aq. Oj.) in doses of fl. oz. j.–j½., either alone or with iodide of potassium and sarsaparilla. Though it does not possess the power attributed to it by Dr. Russell, of curing secondary syphilis, it certainly proves stimulant, diaphoretic, and alterative, and in many instances is said to produce effects such as cannot be obtained from the iodide alone. In purely muscular rheumatism it sometimes exerts a beneficial influence, but its good effects are most manifest in the class of cases which are benefited by iodide of potassium. (Dr. Fuller, p. 419.)

1381. *In Lepra, Psoriasis, and other Chronic Skin Diseases, especially when they are of a Syphilitic character*, infusion of mezereon appears to be useful, but rather as an adjunct to other medicines than as a remedy possessed of any special power of its own.

1382. Morphia. Morphia. $C_{17}H_{19}NO_3$. An alkaloid contained in opium, of which it constitutes the chief narcotic principle, the proportions varying from 2 or 3 to 10 or 12 per cent. It is soluble in alcohol and solutions of the caustic alkalies, but almost insoluble in water. It is rarely if ever given internally, one of the following officinal salts having replaced it in practice.

Morphiæ Acetas. Acetate of Morphia. $C_{17}H_{19}NO_3$. $C_2H_4O_2$. A white powder, soluble in water and in spirit.

Morphiæ Hydrochloras. Hydrochlorate of Morphia. $C_{17}H_{19}NO_3$. HCl. $3H_2O$. Called also Muriate of Morphia. Occurs in white, flexible, circular prisms, of a silky lustre, soluble in water (20 parts) and in spirit.

Morphiæ Sulphas. Sulphate of Morphia. $C_{17}H_{19}NO_3$. SO_4 $7H_2O$. Readily soluble in water. Not officinal in B. Ph.

Med. Prop. and Action. Analogous to but more powerful than opium, over which, as a general rule, it possesses the advantage of producing a lesser degree of vascular and arterial excitement, less headache and vertigo, less subsequent depression, less constipation, and more quiet

[1] Med. Obs. and Inq., iii. p. 194.

and refreshing sleep undisturbed by dreams. The effects of morphia and its salts, which latter are preferable as therapeutic agents to the alkaloid itself on account of their greater solubility, differ materially in different individuals, which, according to Dr. Harley (p. 133) are determined by peculiarities of nervous constitution. In some the hypnotic—in others the excitant—effects on the nervous system are so equally balanced, that in moderate doses the drug has no very decided action, or, at most, only a tonic and stimulant one; effects which in increased doses may rise to active delirium. In others the hypnotic effect prevails, and the stimulant action is apparently confined to the heart. In a third class, the excitant action counteracts to a greater or lesser degree the hypnotic, and insomnia, with restlessness or delirium, results. Women are more liable to its excitant action than men; and amongst women, individuals of a highly emotional, excitable, and energetic temperament are those to whom opium in any form is a very distressing remedy, and when hypodermically used, a most dangerous one. Notwithstanding its similarity in its effects to opium, the morphia salts cannot be substituted in all cases for the crude drug; they are chiefly indicated when the object is to relieve nervous irritability and induce tranquillity of the system. The nausea and gastric irritability which occasionally follow their use are due to their action on the vagus nerve. Morphia proves fatal by depressing, and ultimately paralyzing the respiratory movements. Introduced into the system by the hypodermic method, its effects are more speedily manifested than when administered by any other mode. For this purpose the acetate is the best form, with a minimum of acetic acid in hot distilled water, gr. v. to 1 fl. drm., or in glycerine in the same proportion. One minim of this will represent $\frac{1}{12}$ gr., a very useful minimum dose in cases of slight neuralgic pain. Two minims ($\frac{1}{6}$ gr.) is the best commencing dose for the relief of severe pain, and as a hypnotic in states of nervous irritability. Three minims (or $\frac{1}{4}$ gr.) is an *unsafe dose to commence with*, dangerous and even fatal results having resulted from such a dose. It should not be given till smaller doses have been tried. It can rarely be advisable to increase the dose above six minims ($\frac{1}{2}$ gr.) except in persons habituated to indulgence in opiates. The salt used in this manner is at least three times as powerful for every therapeutic purpose as when swallowed, and meantime the majority of unpleasant symptoms which opiates are apt to produce are entirely obviated. The fact seems to be that in the gastric digestion of morphia much of the salt becomes decomposed, and its specific effect on the blood is lost, but during the digestive process it acts depressingly upon the gastric nerves, and disorders the functions of the stomach. In addition to this, its effects are far more permanent, especially in the relief of nerve-pain; so much so, indeed, that the discovery of the hypodermic method has initiated quite a new era in the treatment of severe neuralgia. (Dr. Anstie.[1]) Dr. E. T. Wilson[2] calls special attention to the three following points in the subcutaneous injection of morphia:—1. That the solvent should be distilled water, without any admixture of acid; 2. That the initial dose should be much smaller than that usually given; 3. That the injection should be performed slowly. With these precautions, he remarks, morphia may be introduced into the system safely, and for indefinite periods, with but slight disturbance of the bodily functions. Perfect quiet subsequently to an injection should be strictly enjoined. Contraction of the pupil ensues in ten or fifteen minutes after the subcutaneous injection of morphia. For other remarks, see Opium; and Hypodermic Method, Part ii.

Dose:—Of either of the Morphia Salts, gr. $\frac{1}{8}$–$\frac{1}{2}$, up to gr. j. internally. For hypodermic injection, gr. $\frac{1}{12}$–$\frac{1}{6}$ (see *ante*). *Of the Solution of the Acetate* (Acetate of Morphia gr. iv., Diluted Acetic Acid ♏viij., Rect. Spt. fl. drm. ij. Distilled Water fl. drm. vi.), ♏x.–lx. *Of the Solution of the Hydrochlorate* (Hydrochlorate of Morphia gr. iv., Diluted Hydrochloric Acid ♏viij., Rect. Spirit fl. drm. ij., Distilled Water fl. drm. vj.), ♏x.–lx. *Of Morphia Lozenge*

[1] Practitioner, July, 1868. [2] St. George's Hosp. Rep., iv. (1869) p. 19.

and of Morphia and Ipecacuanha Loxenges, 1 to 6. Each Lozenge contains gr. $\frac{1}{32}$ of hydrochlorate of morphia, and the latter gr. $\frac{1}{12}$ of ipecacuanha. *Morphia Suppositories.* Each contain gr. $\frac{1}{2}$ of hydrochlorate of morphia.

The following combination of morphia and chloroform is stated [1] to be far more effectual as an anodyne than morphia given singly, and leaves none of the unpleasant after-effects of opium:—Morphia by weight 1 part, Rectified Wine-vinegar 2 parts, Rectified Spirit 20 parts. This solution, when cold, is mixed with 80 parts of Chloroform. Each drop contains $\frac{1}{300}$th gr. of morphia. Dose: for a child, gutt. ij.–xv.; for an adult, gutt. xxx.–xl.

1383. *Therapeutic Uses. In Sciatica, Lumbago, Tic Douloureux,* and *other Neuralgic Affections*, no remedy promises more speedy and permanent benefit than morphia subcutaneously injected. Affections of this kind, observes Dr. Anstie, which under any of the older plans of treatment would at least have been very tedious, are sometimes cured after three or four injections of $\frac{1}{8}$ gr. each; and very many yield after a week or ten days of such injections repeated twice daily. It may almost be regarded as a specific. The endermic application of morphia (gr. $\frac{1}{2}$–gr. j.) sprinkled on a blistered surface over the seat of pain, is sometimes effectual, but is less certain in its operation than when injected hypodermically.

1384. *In Painful Uterine Affections*, Dr. Tilt (p. 110) speaks favourably of morphia suppositories: in some cases, he applies the acetate (gr. $\frac{1}{2}$) to the cervix uteri by means of the speculum and forceps, or even by the finger. In this class of cases, subcutaneous injection proved successful in the hands of Dr. H. Bennet.[2]

1385. *For the Relief of the Pains and After-pains of Labour*, Dr. Koomann[3] employs subcutaneous injections of the sulphate of morphia. He also speaks of the practice as effectual in painful complications of labour, especially in cramps of the muscles of the extremities. The locality selected for the injection was the thigh. By the same treatment, Scanzoni[4] successfully treated some forms of *Puerperal Convulsions.*

1386. *In the distressing Pruritus attendant on many Skin Diseases*, the subcutaneous injection of morphia merits a trial. Dr. H. Beigel[5] relates a case of *Pruritus Senilis* cured by this means (gr. $\frac{1}{4}$). Great relief is often obtained from the application of the officinal solution, applied continuously to the part by means of a piece of lint soaked in it, in cases of *Painful Sprains, Bruises,* and *Gouty and Rheumatic Inflammations.*

1387. *In Diseases of the Heart*, Dr. Clifford Allbutt[6] has employed morphia subcutaneously with marked advantage. He commences with gr. $\frac{1}{8}$ or $\frac{1}{6}$ of the hydrochlorate, and in ordinary cases increases it to gr. $\frac{1}{4}$ for an adult, to be injected

[1] Brit. Med. Journ., April 13, 1867.
[2] Lancet, March 12, 1864.
[3] Practitioner, Nov. 1868.
[4] Edin. Med. Journ., May, 1860.
[5] Med. Mirror, Feb. 1866, p. 88.
[6] Practitioner, Dec. 1869.

in the evening, and followed by perfect quiet. The class of cases most benefited by this treatment he found to be *Angina with diseased coronary arteries*, *Neuralgic distress from Interthoracic Tumour*, and *Mitral Regurgitation*. It proved valuable also, in small doses, in so-called "*Irritable Heart*," whether this were due to weakness of the heart or instability of its nerves. It is less useful in disease of the aortic valves, and less valuable in mitral obstruction than mitral regurgitation. *In Aortic Disease*, however, where the heart is big and pumping, it gives much ease. In all these cases the urine should be examined, and the morphia withheld, or given with caution, if albumen be found. Dr. Allbutt, however, considers that there need be no great fear of it during *Albuminuria only secondary to heart disease*, unless there be reason to suppose that excessive renal congestion be present, and head symptoms impending. In heart disease, associated with granular kidney, he thinks it should be avoided. As pointed out by Dr. Allbutt, there is a marked difference between morphia injections and opium or morphia administered in the old way by mouth; the safety of the latter in this class of cases is very doubtful.

1388. *In Chronic Deafness*, morphia is sometimes effectual. Dr. Hobecke[1] relates a case in which all other remedies had failed; he then applied a small blister behind each ear, and on the denuded surface sprinkled gr. ss. of sulphate of morphia. On the following day the deafness on the left side had ceased, and all the other symptoms were much relieved. *In Inflammation of the Iris and Sclerotic*, Mr. J. Z. Lawrence[2] found morphia produce a marked antiphlogistic effect. Its action apparently depends upon the known power of the remedy of reducing nervous irritability, which may be regarded as the primary cause of the inflammation.

1389. *In Chronic Gastritis*, morphia is a valuable palliative, although generally inferior to hydrocyanic acid. Drs. Bardsley and Stokes advise it in doses of gr. $\frac{1}{12}$ twice the first day, three times the second, and so on, increasing the quantity, until the patient consumes 1 or $1\frac{1}{2}$ grains in twenty-four hours. It was found particularly serviceable when there was an abundant secretion of mucus. Dr. Clifford Allbutt[3] obtained excellent effects from the subcutaneous injection of morphia (gr. $\frac{1}{4}$) in those forms of *Dyspepsia* characterized by irritability or erethism, or such as is often associated with hysteria, or which arises from great mental exertion or depression. *In Ileus*, *Violent Colic*, and *Spasmodic Affections of the Bowels*, the same treatment promises to be of great value. In these cases the endermic method, the spine being the site selected for the

[1] Med.-Chir. Rev., No. lxxiv. Edin. Med. Journ., Dec. 1862.
[2] Med. Times, Dec. 31, 1859; and [3] Practitioner, June, 1869.

application, has occasionally been found effectual. Subcutaneously injected, it proved successful in allaying obstinate and alarming *Hiccough*, in the hands of Dr. J. Constable.[1] Three interesting cases of *Obstruction of the Bowels*, attended with obstinate vomiting, &c., cured by morphia injections subcutaneously, are recorded by Dr. J. Barclay, of Banff.[2]

1390. *In Dislocations*, the subcutaneous injection of morphia, according to Dr. Thierfelder,[3] possesses advantages over anæsthetics in inducing relaxation of the tissues, and thus facilitating reduction. Four cases in which it was successfully employed, are adduced. The following are given as the chief advantages of morphia over chloroform:—1. The amount of narcosis necessary for muscular reaction can be obtained more rapidly, and with greater safety, from morphia than from chloroform. 2. Morphia does not, like chloroform, cause loss of consciousness; and this is an important matter for the operator. The latter agent, when administered to spirit-drinkers—a class of individuals supplying a very large contingent to cases of luxation—is apt to cause excitement rather than complete stupefaction. In cases of this kind there is no surer narcotizing agent than morphia. 3. The subcutaneous injection of morphia is generally justifiable, even in cases where chloroform is contra-indicated in consequence of organic disease. 4. The personal assistance required for the administration of chloroform can, with the subcutaneous injection of morphia, be dispensed with.

For further therapeutic uses, see OPIUM.

1391. MORRHUÆ OLEUM. Cod-liver Oil. The oil extracted by a steam heat not exceeding 180° from the fresh liver of the Cod (Gadus Morrhua, *Linn.*) and others of the family Gadidæ.

History. Cod-liver Oil has for a long period been esteemed in Germany and Holland in the treatment of scrofulous and rheumatic diseases. It was introduced into England by Dr. Percival, in 1771, as a remedy for chronic rheumatism, and was employed in the Manchester Infirmary some time after this period. It however fell into disuse, till Schenk published an account of sixteen cases of chronic rheumatism successfully treated by it. It was not, however, till 1841 that its value was fully ascertained by British practitioners, when Dr. J. H. Bennett[4] published an essay on its properties; since that date it has been fully recognised as a remedy of great power and usefulness in tubercular disease; so much so, that in one year (1853) not less than six hundred gallons were administered in one institution—the London Hospital for Consumption and Diseases of the Chest.

1392. *Chemical Composition.* According to the analysis of De Jongh, 100 parts of the pale oil contain oleic acid along with a peculiar principle called

[1] Lancet, Aug. 21, 1869.
[2] Med. Press, Dec. 29, 1869.
[3] Brit. Med. Journ., Sept. 5, 1868.
[4] Treatise on Oleum Jecoris Aselli, Lond., 1841.

gaduin, 74; margavic acid, 11·75; glycerine, 10·17; butyric acid, ·07; acetic acid, ·04; various biliary principles about ·32; iodine, ·037; chlorine and bromine, ·148; phosphorus, ·021; with phosphoric and sulphuric acids, and traces of lime, magnesia, and soda. According to Winckler, the oil does not contain true glycerine, but yields an analogous substance, termed propyline, or oxide of propyle. (Dr. Scoresby-Jackson.) Sulphuric acid added to a small quantity of the oil poured on a plate produces a violet colour; hence it has been spoken of as a test for the purity of cod-liver oil. The fallacy of this was long since pointed out by Dr. Pereira: it is a test only for liver oil generally; it does not distinguish one liver oil from another, for it reacts equally with the oil of the liver of the ray and with that of the liver of the common cod. Neither does it distinguish good cod-liver oil from bad, for it produces its characteristic reaction both with common brown cod-oil and with the finest and palest qualities. But it serves to distinguish oil procured from the liver, from oil obtained from other parts of the animal. (Pereira.) Iodine or iodide of potassium may be added to train-oil to imitate cod-liver oil. This may be detected by shaking the suspected oil with alcohol, which abstracts the iodine, or by adding a solution of starch with a few drops of sulphuric acid, by which the blue iodide of starch is produced. (Pereira.)

1393. There are three varieties of cod-liver oil met with in commerce:—1, the pale; 2, the light brown; 3, the dark brown. The differences of colour, odour, and flavour in the varieties of cod-liver oil depend upon the different methods in which it is prepared, the degree of heat employed, the state of freshness or putrefaction of the livers, the quantity of decomposed matter present in the oil, and the length of exposure to the air. The oil contained in the cells of the fresh liver is nearly colourless, and the finest specimens are nearly devoid of colour, odour, and flavour, having only a bland, fish-like, and not disagreeable taste. The dark varieties contain more empyreumatic matter and are intensely disagreeable. On the question of the relative value of the different varieties of cod-liver oil, the Editors of the edition of Pereira of 1857 remark:—"Experience fully confirms the inference drawn from observation of the chemical constitution of these varieties of cod-liver oil, as to their relative therapeutical value. At the Brompton Hospital it has been found that the use of the darker kinds cannot be long continued; the clear and straw-coloured inodorous oil is that which is now administered in this institution." The great weight of testimony is in favour of the pale oil, which is the kind officinal in B. Ph.

1394. *The modus operandi of Cod-liver Oil* is ill understood. Dr. Bennett (op. cit.) considers that its operation consists in the stimulation of the lymphatic glands and vessels, thus increasing the activity of the capillary system. By its action on the former the process of assimilation is facilitated, and the appetite increased. The quality of the blood is thus improved, and the different organs of the body become better nourished and receive more turgor vitalis. From Dr. T. Thompson's observations, it appears that the oil improves the richness of the blood; its red corpuscles become increased. Whilst taking it, patients often gain an almost incredible increase of weight, exceeding many times the amount of the oil which has been taken during the period. Some assert that its operation is that solely of a nutritive agent; others, that its action is purely chemical; while a third class ascribe all the benefit derived from it to the presence of iodine and bromine. Dr. De Jongh[1] believes that the beneficial operation of cod-liver oil does not depend solely upon the iodine, nor upon the phosphorus, nor on the biliary matter, nor on the fat, but on the admixture of these ingredients, the union of the whole forming a compound which acts in a way which cannot be imitated by the disunited components. An observation of Klencke's merits attention. He observes that there exists a great similarity between this oil and bile; that the oil contains fat, resin, and saline constituents of the same character as those of the bile. From

[1] Treatise on Cod-liver Oil, translated by Dr. Carey, Lond. 1849.

this circumstance, he concludes that it acts as a succedaneum to bile in the process of chylification. This view is also supported by Dr. Panck, of Moscow. Dr. T. Thompson and Dr. Williams also conclude that the oil owes its action chiefly to its oleine. Dr. Williams believes that the oil acts as a nutrient, affording fat of a better kind, more fluid, less prone to change, and more capable of being absorbed into the tissues than other forms of fat. Dr. T. Thompson [1] thinks that its action is promoted by the addition of Liq. Potassæ.

1395. *The immediate action of Cod-liver Oil* on the stomach and bowels is to produce increased appetite, the proper assimilation of food, and an improved colour and character of the evacuations. The skin, from being acrid, burning, or cold, becomes warm and perspirable, and the health and strength, after some perseverance in the remedy, gradually improve. Occasionally it acts as a diuretic. Most patients acquire *embonpoint* under its use.

1396. *Modes of disguising its taste.* One great objection to the use of this oil is its nauseous taste. Various modes of disguising it may be tried. Thus, 1, it may be given on orange wine or on orange or lemon juice, or on a mixture containing T. Aurantii with a little nitric acid and syrup; 2, it may be given floating on porter or bitter ale, or on some aromatic water; 3, in emulsion, with confection of almonds and T. Cardam. Co.; 4. with the addition of a few drops of dilute nitric acid to the vehicle; 5, with hot milk; 6, in the form of pills. To form these, Des Champes directs 600 parts of the oil, 20 of water, and 80 of caustic soda. A mass is formed which, with tragacanth powder, can be made into pills. Should it still nauseate, a drop or two of dilute hydrocyanic acid may be added. Mr. Spencer Wells [2] advocates its administration in capsules, either alone or combined with quinine, the iodides of mercury, iron, &c. Each capsule should contain ℥xx. of the oil.

1397. *The Dose* varies according to circumstances. It is better to commence with one teaspoonful three times a day, and gradually to increase the dose to a tablespoonful or more, as the stomach becomes accustomed to it. The best time to administer it is immediately after a meal. Patients who can take it at no other time will sometimes retain a dose if given the last thing before going to bed. Inunction with the oil is useful as a supplementary measure. For some useful hints on the administration of this remedy, see sect. Phthisis (*infra*).

1398. *Various substitutes* have been proposed. Vegetable oils have been stated by Dr. Duncan and Mr. Nunn, of Colchester, to be nearly if not equally efficacious with cod-liver oil. Dr. T. Thompson, however, found that almond or olive oil did not enrich the blood in the same way as cod-liver oil. He thought that cocoa-nut oil bore a nearer resemblance to cod-liver oil in this respect. Dr. Bagot has obtained excellent effects from other fish-oils. MM. Girardin and Pressier consider the oil of the liver of the skate preferable to that of the cod. Oils also from the livers of the shark and ray closely resemble cod-liver oil. Glycerine has also been proposed, but it proved a failure.

1399. *Ozonized Cod-liver Oil* has been thought by some preferable to the ordinary oil, from the power it has been shown by Dr. E. S. Thompson to possess, of reducing the frequency of the pulse, an important point, especially in phthisis. This effect was not perceived when a less quantity than fl. drm. ij. twice daily was administered. It was more marked when this dose was doubled. The oleine of the cod-liver oil, instead of the simple oil, has been advocated by Dr. Leared, but it does not appear to have been generally adopted.

1400. *Etherized Cod-liver Oil.* In order to render the oil more readily asssimilated, Dr. B. Foster [3] advocates its exhibition in combination with ether. He uses three formulæ. No. 1 consists of ℥x. of pure ether (B. Ph.) in fl. drm. ij. of the oil. Nos. 2 and 3 consist respectively of ℥xv. and

[1] Lond. Med. Gaz., x. 796.
[2] Med. Times & Gaz., Dec. 5, 1857.
[3] Brit. Med. Journal, Aug. 8 and 22, 1868.

mxx. in the same quantity of oil. The dose of this "Etherized Cod-liver Oil" to commence with is fl. drm. ij. In some cases, the ether may be given in the same or larger doses in water before meals. This combination is based upon the experiments of Claude Bernard, which tend to show that ether has the power of augmenting the pancreatic secretion, which is so important an element in the assimilative process.

1401. *Therapeutic Uses. Scrofula.* In the scrofulous or tubercular diathesis, and in the various diseases in which this state of the constitution manifests itself, cod-liver oil is the remedy from which we may, as a general rule, anticipate the greatest amount of good. *Scrofulous Glandular Enlargements* are generally but little amenable to its action, and only yield very gradually as the constitution improves, under its continued use; but when suppuration ensues, and the resulting abscess is discharging, the operation of the oil is more manifest and speedy. Inunction with the oil daily to glandular enlargement, has in some instances seemed to aid its internal administration; but it may admit of a doubt if inunction of other substances, *e.g.*, iodine ointment, might not produce equally good, if not better effects. *In Scrofulous Diseases of the Skin*, it often produces the most salutary effects. Although not capable of itself of curing the local disease, it places the constitution in the best condition for receiving benefit from other specific remedies. It is a valuable adjunct to arsenic, &c. *In Scrofulous Affections of the Joints and Bones*, it is a remedy on which most reliance may be placed. Under its use, the discharge from *Scrofulous Abscesses* often speedily improves in character, diminishes in quantity, and finally disappears. It is also often of manifest service in *Scrofulous Ozæna and Otorrhœa, and Scrofulous Ophthalmia.* In all these cases the remedy, to be effectual, requires to be persevered in, and a good hygienic system pursued.

1402. *In Phthisis*, no remedy is deserving of greater confidence than cod-liver oil; its efficacy is established beyond a doubt. The earlier in the disease it is had recourse to, the greater the chances of its success. Although it may admit of a question whether it is capable of *curing* the disease, it appears certain that, under its use, life may be considerably prolonged, and a greater amount of health enjoyed than under any other system of treatment. In the majority of cases there is a manifest, indeed often a remarkable increase of weight of the body under the use of the oil. Amelioration of the symptoms does not invariably accompany an increase of weight, though in the great majority of cases it does so; the exceptions are rare. On the other hand, a diminution of weight is almost invariably associated with an aggravation of the symptoms. The *modus operandi* of the oil in phthisis is obscure, but from the following table, it is probable that

acts, in a great measure at any rate, by restoring a normal condition of the blood :—

	Blood in health. (Simon.)	Phthisis. (Simon.)	Phthisis. (Simon.)	Phthisis after taking Cod-liver Oil for a long period. (Simon.)
Water	791·000	807·500	825·200	750·000
Solids	208·000	192·500	174·800	250·000
Fibrine	2·011	4·600	6·500	a trace.
Globulin	112·346	71.230	61·110	94·500
Hæmatin		3·110	2·690	2·750
Albumen	75·590	98·360	90·350	131·000
Fatty matters	1·978	2·350	4·200	3·750
Extractives and Salts	14·174	9·350	8·000	15·250

In addition to the general directions given above, Dr. C. J. B. Williams[1] furnishes the following useful hints for its administration in this disease :—1. The best time for administering it is immediately after, or to those who prefer it, at or before a solid meal. 2. In cases of peculiar weakness of stomach, with tendency to retching or vomiting, strychnia (gr. $\frac{1}{32}$-gr. $\frac{1}{24}$) proves a most valuable adjunct. So does salicine. Neither of these, though a powerful tonic, has any of the heating properties of quinine or iron. If their bitter taste is objected to, they may be given in the form of pill after or before the oil. 3. It may be advantageously combined with a mineral acid. Nitric acid is best in inflammatory cases, and in those attended with much lithic deposit in the urine, but its tendency to injure the teeth is an objection to its long-continued use. Sulphuric acid is more eligible where there is liability to hæmoptysis, profuse sweats, or diarrhœa. But in most cases, for long continuance, diluted phosphoric acid is preferable to either. 4. The bulk of the whole dose of the oil and vehicle should be so small, that it may be swallowed at a single draught; therefore the vehicle should not exceed a tablespoonful, with at first a teaspoonful of the oil, to be gradually increased to a tablespoonful. 5. The dose of the oil should rarely exceed a tablespoonful, twice or thrice daily. Larger quantities either derange the stomach or liver, or some of it passes unabsorbed by the bowels. 6. The diet requires attention. With some persons the oil agrees so well, and so much improves their digestive powers, that they require few or no restrictions in diet; but this is not the case with the majority. The richness of the oil proves more or less a trial sooner or later to most persons; therefore it becomes proper to omit or reduce

[1] Lancet, July 4, and Aug. 15, 1868.

all other rich and greasy articles of food. All pastry, fat meat, rich stuffing, &c., should be avoided, and great moderation observed in the use of butter, cream, and very sweet things. Even new milk in any quantity is not generally well borne during a course of oil, and many find malt liquor too heavy, increasing the tendency to bilious attacks. A plain nutritious diet of bread, fresh meat, poultry, game, with a fair proportion of vegetables, and a little fruit, and only a moderate quantity of liquid at the earlier meals, commonly agrees best. 7. Should a bilious attack come on, indicated by nausea, headache, furred tongue, offensive eructations, high-coloured urine, &c., it is necessary to suspend the oil, lighten the diet, and give blue pill or calomel, with an aperient on alternate nights, and an effervescing saline twice or thrice during the day. In a few days, when the attack has passed off, the oil may be resumed, beginning with small doses as at first. 8. In all cases during the use of the oil, the bowels should be kept regular in action, and if this cannot be done by regularity of habit and diet, it should be effected by the use of a mild daily pill of rhubarb or aloes. 9. According to Dr. Ringer (p. 212), a little salt taken immediately before and after the oil, often removes the taste, and prevents nausea.

1403. *In Tabes Mesenterica*, it has been employed with great advantage. Under its use, the patient rapidly gains strength and flesh, the appetite returns, the tumefied belly becomes reduced, and a perseverance in this remedy is followed by a mitigation or removal of all the symptoms; the stools lose their clayey colour, and become bilious and healthy. Dr. Bennett observes, that in no disease, with the exception of rachitis, are the good effects of the oil so well established as in this. In these cases, indeed, it is often very striking in its operation, curing the disease when every other remedy has failed. It should not only be given internally, but used as a liniment to the abdomen.

1404. *In Rachitis*, Dr. Bennett considers it the most efficacious of all remedies. M. Trousseau[1] relates numerous cases in which it proved successful. He states that he generally found improvement at the end of eight or ten days, and that, in the majority of instances, a cure was effected in six weeks. He gave it in doses of fl. drm. ½.–fl. drm. iij. daily, mixed with sugar or syrup. Dr. Hillier (p. 101) classes it with iron, as the most useful drug in this disease.

1405. *In Chronic Hydrocephalus*, occurring in scrofulous children, improvement sometimes follows a course of the oil. If the child be thin, Dr. Hillier (p. 172) suggests that it should be given occasionally for a month or two, especially in

[1] Journ. de Méd., March, 1845.

cold weather, as an article of diet. The food, at the same time, should be of the most digestible and nutritious character.

1406. *Chorea*, especially when associated with cachexia, or occurring in scrofulous children, often manifestly improves under the use of cod-liver oil. Dr. Radcliffe (ii. p. 141) reports very favourably of it. He generally gives it in conjunction with hypophosphite of soda (gr. v.–viij.), making the draught containing this salt the vehicle for the oil. With these, according to circumstances, he associates camphor or ammonia or both, adding the carbonate of ammonia to the draught containing the hypophosphite, and dissolving the camphor in the cod-liver oil. He finds this an excellent way of giving the camphor, which in its turn masks the taste of the oil not a little, and makes the stomach more tolerant of it. This treatment appears well worthy of further trial. It is also favourably spoken of by Dr. Hillier (p. 236), especially when the patient is of a tubercular family or of spare habit.

1407. *In Epilepsy*, Dr. Anstie[1] employed cod-liver oil in twelve cases; of these three were complete failures, three improved, and in the remaining six "the fits have entirely ceased, and, so far as can be seen, the disease has been cured." This is very encouraging. The remedy requires to be persevered in for a long time. It is well worthy of further trials in cachectic cases. Other cases of *Chorea*, *Paralysis Agitans*, and *Mercurial Tremors* treated with this oil are recorded by the same author;[2] and he states that in all these cases, as well as in epilepsy, it has appeared to him more constantly useful than any other medicine.

1408. *Many forms of Neuralgia*, which resist quinine and other ordinary remedies, will sometimes yield to the plentiful ingestion of fat as an article of diet. Of these fatty remedies, cod-liver oil holds the highest rank; and when it does not immediately disagree with the stomach, it is, according to Dr. Anstie,[3] the best fat to employ. But in other cases, he remarks, butter, and especially cream, may be employed with great advantage. Even the vegetable olive oil, though far inferior to animal fats, may occasionally be used with good effect. It is necessary, in many cases, to make a series of trials before we arrive at the particular form of fatty food which is best suited to the particular patient. Dr. Durant[4] cites several cases of neuralgia which yielded to cod-liver oil. Its *modus operandi* is obscure.

1409. *In Chronic Rheumatism*, the use of cod-liver oil, in this country, dates as far back as 1771, when it was introduced by Dr. Percival, and in those cases where it is associated with

[1] Med. Times, April 5, 1862.
[2] Ibid., March 28, 1863.
[3] Reynolds' Syst. of Med. ii. p. 744.
[4] Assoc. Med. Journ., Oct. 6, 1855.

debility or cachexia, it is a remedy of considerable efficacy; but as observed by Dr. Fuller (p. 420), it is necessary, in order to obtain its full effects, to combine it with iodide of iron, quinine, or other remedies according to circumstances. Friction with the oil to the affected parts has been advised, but there is no satisfactory evidence of its possessing any special virtues over other oil used in the same manner. *Rheumatic Ophthalmia* sometimes improves under a course of the oil.

1410. *In Atrophy, whether connected with Rheumatism or Scrofula, or mal-assimilation of Food*, cod-liver oil has proved signally beneficial. *In Gaol Cachexia*, or in that cachectic state which occurs in those who have been long shut up in close, ill-ventilated prisons, it is strongly recommended by Mr. C. Rose.[1]

1411. *Laryngismus Stridulus.* To correct the faulty constitution, or to give a healthy impulse to the vegetative forces, the most sure means of diminishing that excessive nervous irritability which is of itself sufficient to induce spasm, Dr. Merei[2] states that no remedy can bear comparison with cod-liver oil. To a child of from two to four months old, he gives ℥j.–℥ij.; to one of six months, ℥iv.–℥vj. or more. If it cause diarrhœa, it may be combined with Dover's powder. When it disagrees, f℥ss.–f℥j. should be rubbed daily on the spine. In the advanced stages of *Hooping Cough, and other Spasmodic Coughs, supervening on Bronchitis*, especially when occurring in weakly children, great benefit often results from cod-liver oil.

1412. *In Anæmia*, from whatever cause arising, cod-liver oil is a valuable resource; it has already been shown (sect. 1402) that it exercises a marked influence in improving the blood. Its efficacy may be further increased by combining it with iodide of iron or other ferruginous salt.

1413. *The Obstinate Constipation of Children* sometimes yields to the oil, and its return is prevented while the remedy is continued. (Dr. Ringer.)

1414. *In Diabetes*, it has been advised; and Dr. Thompson[3] records a case in which there was a remarkable diminution of urine under its use. Experience, however, has failed in establishing it as a remedy of any value. It may be useful as an adjunct in debilitated subjects.

1415. *In many Diseases of the Skin of a non-scrofulous origin, especially in Eczema, Lepra, Psoriasis, Ringworm, Pemphigus, &c.*, where the patient is cachectic and weakly, especially in the case of ill-fed children, cod-liver oil, conjoined with nutritious diet, often acts as a powerful auxiliary to local or other treatment. *In Prurigo*, it is especially worth a trial. Mr. Milton[4] remarks that there are only two remedies which have

[1] Prov. Journ., Nov. 27, 1850.
[2] Edin. Month. Journ., April, 1850.
[3] Lancet, Sept. 13, 1851.
[4] Dis. of the Skin, p. 6.

ever been shown to possess certain control over prurigo, viz., cod-liver oil and arsenic, and he considers that these ought to have a fair trial in every case before it is pronounced incurable. *In Lupus*, Dr. Begbie[1] pronounces treatment by cod-liver oil eminently useful and successful; and though facts have not borne out the high estimate he formed of it, there is no doubt that in many cases it proves a valuable adjunct to other remedies. When a strong syphilitic taint exists, its use may be associated with iodine or mercury.

1416. Morus. The Mulberry. The fruit of Morus nigra, *Linn. Nat. Ord.* Urticaceæ. It is a grateful refrigerant, but is officinal only in the form of syrup as a colouring and flavouring agent. It is of no therapeutic value.

1417. Moschus. Musk. The inspissated and dried secretion from the preputial follicles of the Musk Deer, Moschus moschiferus, *Linn.*, a native of the mountains of Central Asia. Imported from China and India.

Med. Prop. and Action. Stimulant and anti-spasmodic in doses of gr. v.–gr. x., repeated every six or eight hours. It may be given in the form of bolus, emulsion, or tincture (gr. cxx., ad Spt. Rect. Oj.) In large doses it is narcotic, and by Eastern nations is regarded as an aphrodisiac. Taken internally, it causes a sensation of warmth in the stomach, which gradually extends over the whole body; it increases the action of the heart and arterial system, and augments the secretion of urine and perspiration, to both of which it communicates its odorous principle. This has also been detected in the blood, and after death in the solids of the body. Much of the value it might otherwise possess, is lost in consequence of the extensive adulteration to which it is subject. Its high price is, with the uncertainty of its operation, a great drawback to its employment.

1418. *Therapeutic Uses. Spasmodic Diseases. In purely Spasmodic or Nervous Asthma*, musk is often productive of benefit. The average dose is from 10 to 15 grains, but this must be regulated by the severity of the attack. Dr. Ahrensen[2] states that he applied musk endermically in this disease with decided benefit. From gr. vj. to xv. were used at each application.

1419. *In Epilepsy*, musk is occasionally beneficial. Dr. A. T. Thomson[3] states that he can bear testimony to its powerful influence in diminishing the violence of the paroxysms of idiopathic epilepsy, and in greatly lengthening the intervals, when the dose is carried to the extent of ʒj. every eight hours. He prefers giving it in the form of a bolus. *In Chorea*, it has been used occasionally with benefit, but it most frequently fails to produce any good effects. Cases successfully treated with it are recorded by Dr. Powell.[4]

1420. *In Hooping Cough*, musk has been long and successfully

[1] Lancet, May 3, 1851.
[2] Essay on the Endermic Method.
[3] Cyc. Pract. Med., vol. i. p. 102.
[4] Med. Trans., vol. v.

employed by the Russian physicians. Sir George Lefevre[1] states that, after the febrile stage has subsided, it seems to exercise a specific influence; he adds, "A grain of musk, three or four times a day, will in general arrest the most convulsive species of coughing in a few days."

1421. *In Hysteria*, musk is a valuable remedy, in doses of gr. x.–xv. thrice daily. Dr. Conolly,[2] who speaks highly of its efficacy, states that he found it particularly useful when the surface was pale and the pulse languid. *In Nervous Affections*, especially when arising from uterine derangement, it also proves highly serviceable. Its use has been advocated in *Puerperal and Infantile Convulsions*, but it is inferior to many other medicines.

1422. *Other Diseases. In Typhus and Typhoid Fevers*, musk may often be given with advantage. Prof. Huss,[3] of Stockholm, gives the following indications for its use:—"When the patient," he observes, "lies constantly on his back, when he keeps muttering or talking to himself, when he is constantly picking the bed-clothes, when the muscular twitchings, subsultus tendinum, or more violent muscular action, are present, when, at the same time, the first sound of the heart is inaudible and the pulse thready, musk, in doses of gr. v. with gr. j. of camphor, may be given every two hours, and may be relied on with the greatest confidence." As the patient progresses to health, the intervals between the doses should be lengthened.

1423. When *Pneumonia* assumes a typhoid character, particularly if it is attended with delirium, musk is stated by M. Recamier to operate almost as a specific. He gave it in doses of gr. xxiv.–xxx. daily. Cases in which unequivocal benefit was obtained are also related by Dr. Roche.[4]

1424. *In Retrocedent Gout*, musk has been advised. Cullen[5] states that, in many instances, he has seen large doses of musk afford immediate and complete relief.

1425. *In Sleeplessness, occurring in nervous and irritable subjects, in Hypochondriacs, and hysterical Females*, Dr. Graves (ii. p. 535) states that musk, in doses of gr. j. every two hours, often proves eminently successful, even when opiates fail. It may be given with assafœtida or alone.

1426. MUCUNA PRURIENS, *D.C.* Cowhage. *Nat. Ord.* Leguminosæ. *Hab.* East and West Indies.

Med. Prop. and Action. The setæ, or hairs from the outside of the pod, are anthelmintic. Their action is purely mechanical, as is shown by the fact, that in infusion or tincture they are perfectly inert. Externally, cowhage has been used as a local stimulant.

[1] An Apology for the Nerves, p. 178.
[2] Cyc. Pract. Med., art. Hysteria.
[3] Dub. Journ., Sept. 1845.
[4] Med. Chir. Rev., vol. lv. p. 193.
[5] Mat. Med., vol. ii. p. 381.

1427. *Therapeutic Uses. As a remedy against A. Lumbricoides or Round Worm*, cowhage has enjoyed great repute. Its action is mechanical; the setæ are supposed to wound and irritate the worms, obliging them to leave their hold on the lining coat of the intestines. The setæ are to be made into an electuary with honey or treacle, and of this one or more teaspoonfuls should be taken for three or four successive mornings. This should be followed by a brisk purgative. The pods should be dipped into honey before being scraped, as if the setæ prick the hands they cause intense itching. It is rarely employed by British practitioners.

1428. *In Paralysis*, the setæ have been employed as a local stimulant by Graefe and others. Their position on the affected limb is to be maintained by a bandage. They create some cutaneous inflammation, and require frequent renewal.

1429. MUSA PARADISIACA, *Linn.* The Plantain Tree. *Nat. Ord.* Musaceæ. The fruit of this tree, which abounds in most tropical countries, is an invaluable article of food, containing from 60 to 68 per cent. of starch, meal, &c. It is slightly laxative.

Medical Uses. The young, tender leaves of the plantain are highly valuable as *a substitute for spermaceti ointment in dressing blisters*. I have seen some hundreds of cases in which they have been thus employed, and have never observed any ill consequences arise from their use; on the contrary, the blistered surfaces have healed rapidly and healthily in an average of about five days. For the first two days, the upper smooth side should be placed next to the skin, and subsequently the under side, until the surface has healed. They are in common use in the native regiments in India. A piece of the young fresh leaf forms an excellent cool shade for the eyes *in Ophthalmia, and other affections of the Eye.*

1430. MYLABRIS CICHORII, *Fabr.* Telini Fly. A Coleopterous insect, allied to Cantharis vesicatoria. Found in many parts of the East, and in the Indian Peninsula; extending from Egypt to China.

Med. Prop. and Action. A powerful rubefacient and vesicant. As an external application, it is a good substitute for cantharides, but contains a larger proportion of cantharidine, and is consequently more powerful in its action. If, however, it be used of a proper strength, it is perfectly safe, is speedy in its action, and renders the medical man in India independent of the European article, at least as an external application. For internal use, it should not be substituted for the tincture of cantharides, as the strength and operation of the latter is well ascertained and uniform, which is not the case with the mylabris. Externally it may be applied in tincture (gr. clxxx., Proof Spirit Oij.), or in acetous solution (oz. ij., Acetic Acid Oj.) The latter I have used in a great number of cases, with excellent effect; the fluid should be rubbed on the skin with a feather, and dressed with a light poultice, some simple cerate, or plantain leaves.

Therapeutic Uses. See BLISTERS, Part ii.

1431. MYRISTICA. Nutmeg. The kernel of the seed of Myristica officinalis, *Linn.* *Nat. Ord.* Myristaceæ. Cultivated in the Malayan Archipelago, and East and West Indies.

Med. Prop. and Action. Stimulant and carminative; in large doses producing occasionally great disturbance of the nervous system, characterized by vertigo, delirium, and stupor. Its activity resides principally in a volatile oil. Mace, the lanceolate envelope of the nutmeg, also possesses, though in a minor degree, carminative properties. Both mace and nutmeg are much used as condiments, and are supposed to assist the digestive process.

Dose:—Of Nutmeg, gr. x.–xx. *Of the Volatile Oil*, ♏j.–v. *Of the Spirit of Nutmeg* (Vol. Oil of Nutmeg fl. oz. j., Rect. Spirit fl. oz. xlix.), ♏xxx.–lx. *The Expressed Oil* (Myristicæ Adeps, B. Ph., 1864), is intended only for external use.

1432. *Therapeutic Uses.* *In Asthenic Diarrhœa*, nutmeg may be given with advantage. Dr. Pereira states that he has frequently employed it in mild cases as a substitute for opium; and advises warm brandy and water as a vehicle, unless the spirit is contra-indicated.

1433. *In Flatulence and Flatulent Colic*, a few drops of the volatile oil (gutt. ij.–v.) afford relief, or a small portion of nutmeg may be given in warm brandy and water.

1434. *In Toothache*, a drop or two of the volatile oil introduced into the hollow of a carious tooth, gives immediate ease in some cases.

1435. *In Chronic Rheumatism, Paralysis, Sprains, &c.*, the expressed oil of nutmegs, diluted with soap liniment, forms a very useful stimulating embrocation.

1436. MYRRHA. Myrrh. A gum-resinous exudation from the stem of Balsamodendron Myrrha, *Ehrenb.* *Nat. Ord.* Burseracea. *Source*, Abyssinia and Arabia Felix.

Med. Prop. and Action. Stimulant, expectorant, and emmenagogue, in doses of gr. x.–gr.xx. In these doses it acts as a stimulant of the digestive organs, and improves the appetite. In doses of oz. ½, Cullen found it cause a burning sensation in the stomach, increased arterial excitement, and profuse diaphoresis, and, like other medicines of the same class, it exercised a great influence on the urinary passages. It also appears to possess the power of diminishing profuse discharges from mucous membranes, particularly from the pulmonary and genito-urinary organs. Its operation as an expectorant is greatly increased by combining it with squill, and as an emmenagogue, by the addition of aloes or iron. The Tincture (oz. ij½., Rect. Spirit Oj.) is of great value as a gargle, &c., when diluted with water, or some astringent infusion.

1437. *Therapeutic Uses.* *In Amenorrhœa*, myrrh has long been held in high esteem. By itself, its power is very limited; but, in combination with iron and aloes, it appears to impart to those medicines an activity which they do not possess when given singly. It is an important constituent in Mist. Ferri Co., and Pil. Ferri Co. (Ph. L.) Dr. Tilt (p. 219) speaks of

the following so-called "Elixir of Paracelsus" as a very good emmenagogue:—℞ T. Myrrhæ fl. oz. iv., T. Croci, T. Aloes āā fl. oz. iij., M. Dose, fl. drm. ij.–iij., twice daily, in a little water. *In Chlorosis and Leucorrhœa*, it appears to exercise a beneficial influence.

1438. *In Bronchitis* of long standing, Dr. Williams states[1] that he has found myrrh a very valuable medicine, particularly after a course of expectorants, when its grateful and tonic effects upon the stomach give it an additional recommendation. It is inadmissible when any fever or irritability is present. It was formerly in high repute in *Phthisis*, but it has now been abandoned.

1439. *In the Asthma of Old Persons*, myrrh has been found occasionally useful in arresting the exhaustion consequent on profuse expectoration.

1440. *In Sponginess of the Gums, Ulcerated Sore Throat, Ptyalism, &c.*, a gargle or wash, composed of fl. drs. ij.–fl. drs. iv. of the tincture in fl. oz. iv. of water or infusion of cinchona, is highly serviceable.

1441. *To foul and indolent Ulcers*, the diluted tincture has been used as a stimulating wash.

1442. NARCEIA. NARCEINE. $C_{46}H_{29}NO_{18}$ or $C_{28}H_{20}NO_{12}$. A neutral crystallizable body obtained from opium. It occurs in radiating tufts of fine silky acicular crystals, white, inodorous, and of a slightly bitter taste.

Med. Prop. and Action. "The most somniferous substance of opium," according to Claude Bernard.[2] Subsequent trials by Drs. Behier, Debout, Eulenburg and others,[3] though indicating its being possessed of considerable powers as a narcotic, do not seem to substantiate Bernard's high estimate of it. Carefully examined by Dr. Harley (p. 150), he draws the following conclusions:—1. Narceia is a pure hypnotic, but its action is so feeble, that five grains or more are required to induce a slight tendency to sleep, when it is given by the stomach; and when introduced by the skin, one grain is equivalent to only $\frac{1}{3}$ of a grain of a salt of morphia at most. 2. It is impossible to reduce this quantity to the state of a non-irritating solution of such bulk that it may be introduced by one or two punctures, without risk of subcutaneous inflammation. 3. Evidence is wanting to show that it possesses any advantage over morphia. 4. It is therefore practically useless as a medicine. 5. Narceine is eliminated by the kidneys, and if sufficient be administered by the skin, mechanical suppression of urine may result, from the insolubility of the substance. 6. It kills by depressing, and ultimately paralyzing, the respiratory movements. Dr. Pavy[4] tried it in one case of *Diabetes*, with negative results.

1443. NARCOTINA, NARCOTINE, ANARCOTINE. A neutral crystallizable body contained in opium, in proportion of from 1 to 8 per cent. It occurs in colourless flat prisms,

[1] Cyc. Pract. Med., vol. i. p. 322.
[2] Bull. Gén. de Thérap., 1864.
[3] Cited by Dr. Harley.
[4] Guy's Hosp. Reports, 1870, p. 420.

pearly in lustre, inodorous, insipid, insoluble in water or potash solution; soluble in rectified spirit, and more so in ether. With diluted acids it forms very bitter solutions, which do not yield crystalline salts, or become blue with perchloride of iron.

Med. Prop. and Action. Tonic and anti-periodic. When pure, it is wholly devoid of narcotic properties; in large doses, diaphoretic.

Dose:—As a tonic, gr. ½–gr. j., thrice daily. As an anti-periodic, grs. ij.–iij.–v., in water, acidulated with hydrochloric or sulphuric acid, thrice daily.

1444. *Therapeutic Uses. In Intermittent Fevers*, its use was first pointed out by Sir W. O'Shaughnessy. Early trials with it in England, by Dr. Roots and others, were unsatisfactory, but the recent and extensive employment of it in India, by Dr. Balfour[1] and Dr. Garden,[2] leaves no doubt of its powers as an anti-periodic. According to Dr. Garden, after testing it in 684 cases, there is no drug (quinine excepted) which cures intermittents so rapidly, so surely, and with so little expenditure of the drug itself, at the same time that it is free from disagreeable effects in the majority of cases. Large doses (above gr. vj.) are occasionally followed by nausea, vomiting, and giddiness. It has a tendency to cause constipation, hence an occasional purgative is necessary.

1445. *In Debility, especially in that produced by prolonged Lactation, and in Convalescence from febrile and inflammatory diseases*, narcotine has been used with excellent effects in the East.[3]

1446. Nectandræ Cortex. Bebeeru Bark. The bark of Nectandra Rodiæi, *Schomb.* Greenheart Tree. *Nat. Ord.* Lauraceæ. *Hab.* British Guiana.

Med. Prop. and Action. Tonic and anti-spasmodic; the presence of a small proportion of tannin renders it also slightly astringent. It is officinal only for the sake of its alkaloid, Beberia, the sulphate of which has a place in B. Ph. See Beberiæ Sulphas.

Nicotiana Tabacum. See Tabaci Folia.

Nicotine. See Tabaci Folia.

1447. Nitric Acid. Acidum Nitricum. An acid prepared from nitrate of potash or nitrate of soda by distillation with sulphuric acid and water, and containing 70 per cent. by weight of the nitric acid HNO_3, corresponding to 60 per cent. of anhydrous nitric acid N_2O_5. Sp. gr. 1·42.

Diluted Nitric Acid. Acidum Nitricum Dilutum.

[1] Indian Ann. of Med. Sci., vol. v. p. 547.

[2] Ind. Ann. Med. Sci. 1861, vii. p. 400.

[3] Pharm. of India, p. 22, 438.

Prepared by diluting nitric acid fl. oz. vj. with Distilled Water fl. oz. xxiv., and then adding more water so that at 60° F. it shall measure fl. oz. xxxi. Sp. gr. 1·101.

Med. Prop. and Action. Strong nitric acid is a powerful caustic and escharotic, communicating a permanent yellow stain to the cuticle. The dilute acid, in doses of ♏x.–xx., is antalkaline, alterative-tonic, and refrigerant. If continued for a long period, it causes salivation; it has also apparently a more direct action on the liver than the other acids, but it disagrees with the stomach sooner than sulphuric acid. As a tonic, according to Dr. C. J. B. Williams,[1] it is peculiarly adapted for *Convalescence after inflammation, and in Cachexia following on acute disease, or on habits of intemperance.* It is an excellent alterative after long courses of mercury, renovating the strength, and improving the tone of the system in a remarkable manner. See Acids, Part ii. As it acts injuriously on the teeth, any medicine containing it should be sucked through a quill or glass tube, and the mouth should be rinsed out with an alkaline solution after each dose. As a fumigating agent it is very valuable, though inferior to chlorine; the vapour may be readily developed by pouring one part of nitric acid over one part of the nitrate of potash, placed on a heated sand-bath.

1448. *Therapeutic Uses. Calculous Disease. In the Alkaline and Phosphatic Diathesis,* nitric acid may be employed with advantage. Sir B. Brodie (p. 218) speaks highly of its value. "In extreme cases," he observes, "you may give ♏xxx.–xl., or even more, of the strong acid, sufficiently diluted with syrup and water, in the course of the day." The effect of these large doses in correcting the alkaline quality of the urine is very remarkable. He also employed it as a direct solvent, by injecting into the bladder a mixture containing one drop of the strong acid in fl. oz. j. of water. From numerous experiments, he (p. 299) came to the conclusion that a calculus, composed externally of the phosphates, may be acted on by this injection, so as to become gradually reduced in size, while it is still in the bladder of a living person. It is now rarely employed.

1449. *In Chronic Cystitis,* the employment of injections of a very weak solution of nitric acid was first proposed by Sir B. Brodie, and they are recommended by Sir H. Thompson (p. 150). He employs them of the strength of ♏j.–ij. of the diluted acid in fl. oz. j. of warm water, in the manner directed in Art. Injections (Part ii.) Dr. Braxton Hicks[2] bears strong testimony to the value of weak acidulated injections in these cases. His treatment is as follows:—He washes out the bladder with warm water, slightly acidulated with a few drops of nitric, hydrochloric, or acetic acid to the ounce (a tablespoonful of vinegar to a pint of water answers very well). As much as the bladder can bear should be used; this is allowed to flow out again, and if it can be borne, another similar quantity is injected and allowed to escape. After this, a solution of morphia (gr. j., Aq. fl. oz. j.) slightly acidulated

[1] Lancet, Dec. 9, 1865. [2] Ibid., 1867.

is thrown in and retained as long as possible, the longer the better. This should be repeated if possible twice a day. Sometimes when these fail, or where there is hæmorrhage, a solution of tannin (gr. ij., Aq. fl. oz. j.) proves successful.

1450. *To Hæmorrhoids and Painful Hæmorrhoidal Tumours*, the application of strong nitric acid, first proposed by Dr. Houston,[1] of Dublin, is often attended with the best results. It is principally applicable to internal piles, and when the parts cannot be protruded it may be applied through a speculum. The great danger of its use is its extension beyond the point or points to which it is intended to apply it; for this and other reasons it is deemed by some inferior to the ligature. Much valuable information on this remedy and its mode of application will be found in Mr. H. Smith's work "On Hæmorrhoids," (Lond. 1860.) Dr. Ringer (p. 86) states that a lotion (Acid Nitric Dil. ʒj.–ʒjss., Aq. O½) is an excellent application to bleeding piles, staying the hæmorrhage, constringing the swollen and inflamed tumour, and easing the pain.

1451. *In Syphilis*, nitric acid as an internal remedy, introduced by Dr. Scott, of Bombay, in 1796, was formerly much employed, but it has fallen into comparative disuse, at least in the primary form of the disease. *In Secondary or Constitutional Syphilis*, it still holds a high place, especially in old, debilitated subjects, whose constitutions have been impaired by the abuse of mercurials or by long residence in tropical countries; in *Syphilitic Rheumatism* and *Syphilitic Eruptions*, its use is often attended with benefit, in doses of ♏x. of the diluted acid in Decoct. Sarsæ Co. thrice daily. Most forms of secondary syphilis are benefited by nitric acid baths (fl. oz. j.–ij. to each bath). It has been proposed to apply the strong acid to *Chancres* immediately on their appearance, with the view of destroying its specific character, arresting absorption of the syphilitic poison, and thereby preventing secondary symptoms, but experience has shown that the practice, for these purposes, is useless in the case of the common infecting chancre, although it may with advantage be adopted in the case of the chancroid or soft sore. *Syphilitic Condylomata* may be effectually removed by the application of the strong acid; the parts should be subsequently dressed with black wash, or a strong solution of iodide of potassium, anti-syphilitic remedies being given internally. (Dr. Graily Hewitt, p. 462.)

1452. *In Chronic Hepatitis*, especially in old subjects, where mercurials have been largely used, a course of nitric acid and sarsaparilla or taraxacum is often productive of good. Nitro-hydrochloric acid fomentations may be employed at the same

[1] Dublin Journ. of Med., xxiii. and xxvi.

time. *In Waxy Liver*, Dr. Murchison (p. 33) states that in more than one instance he has met with marked improvement under the continued use of nitric acid conjoined with vegetable bitters, *e.g.*, gentian or quinine.

1453. *In Chronic Diarrhœa*, a combination of dilute nitric acid (♏x.–xv.) and laudanum (♏xv.–xx.) in a bitter vegetable infusion, proved very successful in the hands of Mr. Twining, of Calcutta. *In the Diarrhœa of Phthisis*, Dr. Barlow[1] recommends the following:—℞ Acid. Nit. Dil. ♏xij., T. Opii ♏v.–x., Syrup ʒj., Aq. Cinnam. ʒx., M., ft. haust. 4tis vel 6tis horis sumend. *In Cholera*, copious draughts of demulcents, acidulated with nitric acid, have been favourably reported of as an adjunct to the treatment.

1454. *In Habitual Constipation*, Dr. Graves (ii. p. 215) states that he has occasionally derived remarkable benefit from the use of nitric acid, given in sufficient doses. He considers that it possesses the advantage of combining tonic with aperient qualities.

1455. *In Chronic Affections of the Spleen*, in addition to the employment of tonics and purgatives, Annesley recommends the internal use of nitric acid together with the daily use of the nitro-hydrochloric lotion over the region of the spleen and liver. Many chronic cases in old Indians are much benefited by this treatment.

1456. *In Puerperal Intestinal Irritation*, where diarrhœa is a prominent symptom, the latter may often be removed by a combination of nitric acid (♏x.) with a few drops of T. Opii. (Sir C. Locock.[2])

1457. *In Chronic Rheumatism*, where the constitution has been debilitated by mercury, or repeated attacks of syphilis, dilute nitric acid (♏x.) in combination with sarsaparilla and with Dover's powder, at night, has been found productive of the best effects.

1458. *Cardialgia or Heartburn*, which resists the use of the fixed alkalies, is often curable by dilute nitric acid, in doses of ♏v. every four hours.

1459. *In Hospital Gangrene and Phagedenic Ulcerations*, the local application of strong nitric acid was first advised by Mr. Wellbank,[3] who gives the following directions for its use:—Having thoroughly cleansed and dried the ulcer, the surrounding parts should be covered with a thick layer of lard or ointment, to prevent the acid coming in contact with them. A pledget of lint, fastened to the end of a stick, is to be saturated with the acid, and to be carefully pressed on every part of the ulcer, till it is converted into a firm dry mass. After the first pain, which is generally severe, has subsided, the previous

[1] Pract. of Med., p. 309.
[2] Lib. of Med., vol. i. p. 363.
[3] Med.-Chir. Trans., vol. xi. p. 369.

sufferings will be greatly relieved. Cold-water dressings are to be applied. The eschar formed by the acid is to be removed in twenty-four hours, and a common stimulating ointment or lotion applied. Should the phagedenic character of the ulcer reappear, it will be necessary to repeat the application of the acid. This, without doubt, is the best and most certain treatment of phagedenic ulceration. The constitutional treatment must be regulated according to the state of the patient. Mercury in every form should be avoided. *To sloughing and ill-conditioned Ulcers*, nitric acid largely diluted (♏l.–lx. ad Aq. Oj.) forms a useful lotion.

1460. *In Cancrum Oris*, strong nitric acid is the most effectual caustic in the worst forms of this disease. The constitution must at the same time be supported, and quinine administered.

1461. *In Lepra, Impetigo, and other obstinate Skin Diseases*, manifest benefit often follows a course of nitric acid in combination with sarsaparilla or hemidesmus. *In Alopecia*, a serviceable liniment is made by adding to olive oil as much nitric acid as will render it pungent but not acrid. *Warts* are easily removed by cutting off the top and touching them daily with nitric acid, and removing from time to time the disorganised and hardened portion with the knife. (E. Wilson.)

1462. *In Hooping Cough*, nitric acid is strongly advocated by Dr. Gibb.[1] To a tumblerful of thin syrup as much diluted nitric acid is added as will render it as sour as lemon-juice, and of this a child under one year of age may take a dessert-spoonful every hour, and an adult may take the whole tumblerful in three or four hours. As much as ♏xl.–lx. of the diluted acid is given to a patient ten years of age and upwards, and ♏x. to young infants, when well sweetened with honey or syrup. No evil results are said to have followed these large doses. To avoid injury to the teeth the mouth should be well washed out with a solution of carbonate of soda after each dose. This treatment has been highly reported of.

1463. *In Intermittents*, Dr. Hammond[2] corroborates the statement of Drs. Bailey and Mendenhall as to the anti-periodic powers of nitric acid, in doses of gutt. x. properly diluted with water thrice daily.

1464. *Nævus*. Prominent cutaneous nævi, when irregular in shape or ill-defined in their boundaries, are best attacked with nitric acid; the "anhydrous acid" is the best for the purpose. It should be painted on with a glass brush in a thin layer until all appearance of vascular tissue has disappeared. The brush should never be so much saturated with acid that a drop could fall from it on the adjacent parts. Some carbonate of

[1] On Hooping Cough, Lond. 1854. [2] Ranking's Abs., 1862, xxxvi. p. 42.

soda should be at hand in case of accident, and to apply to the nævus when the cauterization is complete. (Mr. T. Smith.[1]) This treatment is regarded by Mr. T. Holmes[2] as the best for superficial nævi. It should be carefully applied to the whole surface of the nævus, but not to the healthy skin around it, which should be protected by a layer of oil.

1465. Nitro-hydrochloric Acid, Diluted. Acidum Nitro-hydrochloricum Dilutum. Diluted Nitro-muriatic Acid. Prepared by mixing Nitric Acid fl. oz. iij. and Hydrochloric Acid fl. oz. iv., and allowing them to remain for 24 hours in a bottle, the mouth of which is partially closed, and then adding Distilled Water fl. oz. xxv. in successive portions, shaking the bottle after each addition; the mixture to be preserved in a stoppered bottle. Sp. gr. 1·074.

Med. Prop. and Action. Alterative-tonic and antalkaline; in doses of ♏v.–x., properly diluted, it is given internally as an alterative and tonic. Externally it is used largely diluted as a bath or stimulating wash. (See *Chronic Hepatitis, infra.*) As it is prejudicial to the teeth, the mouth should be washed out with an alkaline solution, after each dose of the medicine. See Acids, Part ii.

1466. *Therapeutic Uses. Calculous Diseases. In the Oxalic Acid Diathesis*, Dr. Prout (p. 73) advises the mineral acids generally, either alone or combined with the sulphate of iron or quinine. He particularly recommends the nitro-muriatic acid in distilled water, till the lithate of ammonia or lithic acid begins to appear in the urine, or for a stated period of three or four weeks. By adopting such a course of acids three or four times in the year, and by a carefully regulated diet, he states that he has seen the diathesis gradually subdued, and at length removed altogether. In all instances its effects should be watched; and when the lithates or lithic acid begin to appear, its use should be discontinued. It, in common with the other acids, should be left off after a time; as, when too long persisted in, it not only ceases to do good, but in most instances does harm. The above treatment should be combined with an animal diet, avoiding all food containing starch, sugar, &c. *In the Cystic Oxide Diathesis*, Dr. Prout (p. 234) has seen most benefit from the nitro-muriatic acid. Under its use, he states that he has seen the peculiar smell of the urine which accompanies this diathesis very much abated; and all the properties of the secretion so much improved that the peculiar principle itself has for a time disappeared. The complaint, however, has generally shown a disposition to return when the medicine has been left off; but by recurring to the acid, the deposition has been again suspended.

[1] Lancet, 1867. [2] Dublin Quart. Journ., Aug. 1869.

1467. *In Chronic Hepatitis, in advanced stages of Acute Hepatitis, and Congestion of the Liver*, nitro-hydrochloric acid, both internally and externally, has been used with great advantage. It was first proposed by Dr. Scott, in 1796. Mr. Annesley, who employed it extensively, placed great reliance on it; and Sir J. M'Grigor observes, after employing it in about 200 cases, "One fact we are clear and decided in, that the injury to the constitution is infinitely less from the acid than from the mercurial ointment, and that men are not half the time convalescent from the first as they are from the last remedy." It is in the form of bath that it is most used and proves most serviceable. Sir Ranald Martin[1] gives the following directions for its use:—1. The proportions of acid are, Hydrochloric Acid f℥iij., Nitric Acid f℥ij., Water f℥v. 2. Two gallons of water (about ten bottles) may suffice for a bath. 3. To each gallon of water add f℥iij. of the above acid. 4. The bath thus prepared will keep in use for three days, by adding f℥ss. of the acid and Oj. of water, morning and evening, in order to make up for the waste by evaporation. 5. A portion only of the bath to be heated for use, after which it is to be added to the remainder, so as to make the whole of a comfortable warmth (96°–98°). 6. Let both feet be placed in the bath, while the inside of the legs and thighs, the right side (over the liver), and inside of both arms, are sponged alternately. This should be continued for ten or fifteen minutes morning and evening. 7. While using the bath, a gentle aperient should be taken every other morning. 8. Earthenware or wooden vessels should be preferred as foot-baths, and all the sponges and towels should be kept in cold water, as the acid corrodes them. 9. In urgent cases, a general bath to envelope the whole body may be used. 10. If the acid-bath create much irritation of the skin, the quantity of the acid may be diminished. 11. The influence of the acid is not in the least degree counteracted by opium, even when exhibited in the largest doses.

1468. *In Jaundice*, the acid, as advised in the preceding section, was praised by Annesley, Scott, and others. Dr. Copland (ii. p. 310) states that he has found it decidedly beneficial in some cases, when employed internally as well as externally. It is inadmissible when inflammatory action is present. *In Dysentery*, especially when connected with hepatic disease, Mr. Annesley directs lotions of this acid (*ut supra*) to be applied to the abdomen. *In Dropsy from disease of the Liver or Spleen*, much service will accrue from the nitro-hydrochloric acid bath, or from sponging the surface of the hypochondria, night and morning, with a warm lotion containing these acids, or from their internal use. (Copland.)

[1] Lancet, Dec. 9, 1865.

1469. *In Sciatica and other forms of Neuralgic Rheumatism, accompanied with Oxaluria*—by no means an uncommon combination—one of the most effectual remedies is nitro-hydrochloric acid in full doses (♏vj.–x.), aided by an occasional brisk purgative, the cold shower-bath, or a cold douche down the spine followed by friction, and change of air and scene where practicable. (Dr. Fuller, p. 478.)

1470. *In Rheumatic Gout in weakly cachectic constitutions*, Dr. Fuller (p. 355) states that the mineral acids in full doses, combined with bark, quinine, strychnia, or other vegetable bitters, aided by the daily use of the cold shower-bath, prove, in many cases, very valuable. ℞ Acid. Nit., Acid. Hydrochlor. āā ♏iij.–v., Quiniæ Disulph. gr. ij. (vel Strychniæ Sulph. gr. $\frac{1}{16}$), T. Arnicæ ♏xxv., Syrup. Aurant. ʒiijss., Decoct. Cinchonæ (vel Infus. Aurant. Co.) ℥j., M., ft. haust. ter die sumend.

1471. *In Secondary and Constitutional Syphilis*, the use of nitro-hydrochloric acid internally with sarsaparilla, and externally in the form of bath, is often attended with benefit. *In Syphilitic Sore Throat* it forms an excellent gargle, properly diluted with water and honey.

1472. *In Typhus and Typhoid Fevers*, diluted nitro-hydrochloric acid (♏xx. every 2 or 3 hours) forms a valuable adjunct to a nourishing diet of beef tea, milk, &c. The objection to it is that it is apt to create griping and diarrhœa, but this may in a great measure be obviated by the addition of a little opium or morphia.

1473. *In Rickets*, Mr. Brodhurst[1] derived excellent results from the use of nitro-hydrochloric acid baths. The general health requires at the same time to be attended to; flannel next the skin, a full animal diet, a dry pure air, tepid bathing, cod-liver oil, and some preparation of iron internally, are the other measures which seem most beneficial.

1474. *In Chronic Bronchitis*, sponging the surface of the chest with the acid lotion (*ante*) is often of great service in checking profuse expectoration, and in otherwise mitigating the severity of the symptoms. *In Gangrene of the Lungs*, it may be advantageously given internally, combined with cinchona. *In Asthma*, the inhalation of the vapour of the dilute acid (f℥j., Aq. O$\frac{1}{4}$ at 150° F.) for a few minutes three or four times a day has been recommended, but Dr. Hyde Salter (p. 315) considers it should be used with great caution during a paroxysm.

1475. *In Acne Rosacea*, much benefit often results from the application of a lotion containing this acid; and also from the use of the acid foot-bath. *In Favus*, Mr. E. Wilson (p. 471) advises its internal administration.

[1] Lancet, Nov. 14, 1868.

1476. *In Scarlatina*, an excellent gargle is formed by diluting this acid with water, and sweetening with honey. It should be made of such a strength as to cause slight smarting, without actual pain. It may also be advantageously given internally in decoction of cinchona, five or six times daily.

1477. Nitrogen, Protoxide of. Nitrous Oxide Gas. NO =22. Obtained by heating nitrate of ammonia in a glass retort.

Med. Prop. and Action. Excitant in small, anæsthetic in large doses. It has long been known by the name of *Laughing Gas*, from the fact that when inhaled in small quantities with a large proportion of air it produces a peculiar exhilaration, manifested, amongst other effects, occasionally, by laughter. Its applicability as an anæsthetic in surgery was first noticed by the late Sir J. Y. Simpson,[1] in 1847; but it was not till twenty years afterwards that it came into general use, and then only in those cases where speedy anæsthesia was required for short operations, *e.g.*, dentistry, to which its use has been principally limited. Amongst others who have advocated its employment is Mr. C. J. Fox,[2] who assigns the following reasons for its use:—1. Its safety. 2. The rapidity with which anæsthesia can be induced, viz., 50 to 100 seconds. 3. The readiness with which the patient can either be kept for a long period in the anæsthetic state, or, if necessary, can be promptly and thoroughly awakened. 4. Because it is actually pleasant to inhale, and therefore much fright and mental distress are avoided, diminishing the danger of death by syncope. 5. Because the recovery is usually bright, pleasant, and complete, any after discomfort being very rare. 6. Because sickness has never to his knowledge occurred during its administration, and but rarely afterwards. Its advantages and disadvantages have been further pointed out by Mr. R. Rendle.[3] *Advantages.* These are the rapid production of and recovery from anæsthesia, the absence of sickness, and the agreeable taste of the gas. That it is safe in all short operations there can be no doubt, and perhaps for longer ones, provided there is due admission of air at proper intervals; but great care is required in its use, as is shown by the alarming symptoms which manifested themselves in some cases. *Disadvantages.* These are the time and trouble required in its preparation; its bulk and non-portability even when compressed into iron bottles; the complex apparatus necessary for its administration; and its unsuitability to certain cases, especially where muscular relaxation is required. The rigidity and congestion preclude its use for operations within the eye, where there is any increased tension. The muscular twitchings interfere with all delicate operations. Moreover, it has the objection common to all gaseous anæsthetics, as pointed out by Dr. Richardson, viz., that they remain gases at the temperature of the blood, and do not condense when introduced into it. Hence it is necessary to give it in very large quantities to produce anæsthesia, and this renders its use expensive. But notwithstanding all these disadvantages, some of which may yet be overcome, it is very useful in certain cases, especially dental. (Rendle.) One of these disadvantages—its bulk and its consequent non-portability—has been obviated in a degree, by reducing the gas, by means of great pressure (750 lbs. to the square inch) to a liquid form.[4]

1478. "The muscular twitchings," noticed above, constitute a great objection to its use, and yet they form one of the diagnostic marks of the patient being under the full influence of the anæsthetic. They not only interfere with delicate surgical operations, but they give to the countenance an appearance at once painful and alarming to the bystanders or the inex-

[1] Account of a New Anæsthetic (Chloroform), p. 16.
[2] Lancet, April 2, 1870.
[3] Brit. Med. Journ., Oct. 16, 1869.
[4] See Brit. Med. Journ., May 14, 1870.

perienced. They, however, subside almost immediately on the free admission of air. Dr. C. Kidd,[1] who furnishes a graphic description of anæsthesia by the protoxide, points out its unsuitability for eye operations, in consequence of the rather dangerous bulging forward of the eye, caused by twitching of the muscles of the eyeball. He also mentions that the eye, under its use, rolls and bulges in a curiously unsteady manner, which would render an operation dangerous.

NUX VOMICA. See STRYCHNOS NUX VOMICA.

1479. OLIVÆ OLEUM. OLIVE OIL. The expressed oil from the ripe fruit of Olea Europœa, *Linn.* *Nat. Ord.* Oleaceæ. *Hab.* S. Europe, Mediterranean Islands, N. Africa.

Med. Prop. and Action. Emollient; slightly laxative in doses of fl. oz. j.-ij., but is rarely employed in this character. It is composed of about 72 per cent. of Elaine or Oleine, and 28 of Margarine. In medicine it is principally used as an emollient ingredient in enemas, and as a mechanical antidote in cases of poisoning, enveloping the poisonous particles, and protecting the gastric mucous surface from their action. The value of inunction of the whole body with warm olive oil in the treatment of infantile diseases, has recently been set forth by Dr. H. G. Knaggs,[2] the process being repeated every 12, 6, or 4 hours, according to the urgency of the case. He mentions having successfully employed this treatment in *Atrophy*, *Bronchitis*, *Diarrhœa*, *Febrile disturbance*, and indeed in all *Disorders of Childhood* which are accompanied by an unnatural state of the skin. He considers that it has all the advantages of a warm bath without its disadvantages. Olive oil enters into the composition of a large number of liniments, cerates, and ointments. With alkaline bases it forms soaps. See SAPO.

1480. *Therapeutic Uses.* *In Pruritus Pudendi*, a little olive oil, spread over the parts with a feather, often affords relief when other remedies have failed. *In Pruritus Scroti, seu Ani*, it is also very efficacious. *In the pruritus and burning pain attendant on many Skin Diseases*, the continuous application of olive oil by means of rags kept moistened with it, not only affords present relief, but seems in some instances to promote the curative process, partly, perhaps, by excluding the action of the air, and partly by its emollient properties. *Scabies* has been found to yield to frictions with olive oil, but more slowly and with less certainty than under sulphur ointment. *In that extreme irritation which so often accompanies the presence of Ascarides in the Rectum*, an enema containing fl. oz. ij.-fl. oz. iij. of olive oil often affords immediate relief. Dr. Bennett found it relieve the itching produced by cowhage, more effectually than any other remedy.

1481. *In Ophthalmia Tarsi, and Granular Disease of the Eyelids*, a great amount of relief, sometimes permanent, will follow the introduction of a drop of olive oil into the eye. *Many forms of Ophthalmia*, attended with much irritation, are benefited

[1] The Oxide of Nitrogen, &c., Dublin, 1868.

[2] Lancet, Jan. 22, 1870.

by this application; and it often manifestly allays the *pain caused by stimulant collyria of nitrate of silver, &c.*

1482. *Otalgia* is often greatly relieved by introducing a few drops of olive oil (with or without a few drops of T. Opii) into the meatus, which should be previously syringed out with tepid milk and water, or with diluted liquor plumbi.

1483. *In Stricture of the Urethra*, the following hint of Sir H. Thompson's[1] is worth remembering:—"When you have a very narrow stricture to deal with, instead of oiling the instrument, it is as well to throw oz. ½ or oz. j. of olive oil into the urethra, holding the syringe well round the meatus. It is easy to insinuate this quantity of oil through a very narrow stricture. It lubricates the parts, and sometimes the urethra is distended with the oil, so that if you can cleverly retain it with the finger and thumb, you may introduce the instrument when you have been unable to do so in any other way. It does not do well when there is much bleeding, or the tissues are torn, but when it is not so, the plan is sometimes useful."

1484. *As a preventive of the Plague*, olive oil has, for a long period, enjoyed great repute. In 1797, it was observed by Mr. Baldwin,[2] the British Consul in Egypt, that among the million of inhabitants who died of plague in that country in the space of four years, not a single oilman, or dealer in oil, had suffered. Sir J. M'Grigor[3] remarked that all the men employed in applying oil to the camels' feet, during the Egyptian campaign, escaped the plague; and Mr. Jackson[4] states that the coolies employed in the oil stores of Tunis smear themselves with oil, and are rarely affected with the plague, when it rages in that city. It is also stated by Luigi,[5] of Pavia, that during the twenty-seven years that he was an attendant at the pest-house at Smyrna, he found frictions with oil more efficacious than any other medicine, both as a prophylactic and as a means of cure. In addition to these facts, it may be added, that when the plague, or a disease closely resembling it, ravaged the northern provinces of India, in 1815 and in 1819, other facts of a similar nature were recorded by Mr. M'Adam and Mr. White.[6] The latter gentleman justly observes, that if the disease be communicated by the touch, there can be no more powerful antidote than oily friction; but where the infection is received by the breath, it will prove efficacious only in so far as it invigorates the general system, and enables it to resist the influence of the disease.

1485. The other therapeutic uses of olive oil are—1, as a

[1] Lancet, 1868.
[2] Duncan's Annals, 1797.
[3] Medical Sketches, 1804.
[4] On the Commerce of the Mediterranean, p. 46.
[5] Quoted in Cyc. Pract. Med., art. Plague.
[6] Trans. of Med. Phys. Soc. of Bombay, vol. i. pp. 169—185.

laxative in *Abdominal Inflammation;* 2, as an emollient enema in *Dysentery;* 3, as an antidote to the *Poison of venomous Snakes;* 4, as an external application in *Ascites and Anasarca, and also to Burns and Scalds.* In none of these respects does it require separate notice.

1486. Oleum Nigrum. Black Oil. Under this name the late Dr. Herklots brought to notice a black empyreumatic oil, obtained by a rude form of distillation, practised among the natives of India, from the seeds of Celastrus paniculata, *Willd*, and which was regarded as a sovereign remedy for *Beri-beri*. Its action is that of a powerful stimulant diaphoretic, in doses of gutt. x.–xv., twice or thrice daily. Though it has failed to realise Dr. Herklots' encomiums, yet in some cases treated with it, detailed by Dr. Malcolmson, its beneficial effects were unequivocally evidenced; in others, however, it failed. It appears to be chiefly adapted for recent cases, and for those in which the nervous and paralytic symptoms predominate. (Malcolmson.[1])

1487. Olibanum. Frankincense. A gum-resin, from Boswellia floribunda, *Endl. Nat. Ord.* Burseraceæ. *Hab.* Somali Coast, westward of Cape Guardafui.

Med. Prop. and Action. Terebinthinate-stimulant; its action, when taken internally, being chiefly on the mucous membranes, especially of the lungs Dr. Delioux[2] considers that of late years it has fallen into unmerited disuse, and that it possesses virtues equal to the balsams of Tolu and Peru, for which it may be advantageously substituted in hospital practice, on account of its comparative cheapness, and from the fact of its generally being more agreeable to the stomach. The fumes generated by heat, act as an expectorant. Locally applied in the form of ointment (Olibanum, Olive Oil, White Wax, āā oz. j.), it acts as a stimulant.

Dose:—From gr. x.–xx. in emulsion or pill.

1488. *Therapeutic Uses. In Chronic Bronchitis, and Laryngitis*, Dr. Romei reports very favourably of olibanum fumigations, the gum-resin being placed on burning coals. By this means he found the secretion was moderated, and the cough and dyspnœa alleviated.

1489. *On Carbuncle*, locally applied, it exercises, according to Dr. Romei, a specific influence, and its good effects in these cases are attested by Drs. Caifassi[3] and Desmartins.[4] It seems well deserving of a trial. Dr. J. Newton[5] reports having frequently used it as a local stimulant to "*blind boils*," so common at certain seasons in some parts of India; he

[1] On Beri-beri, p. 311.
[2] Brit. For. Med. Chir. Rev., Jan. 1832.
[3] Rev. Thér. du Midi, Feb. 28, 1853.
[4] Rev. Thérap. du Midi, and Chemist, 1854, p. 506.
[5] Ph. of India, p. 443.

regards it as "the best application, bringing them to a head sooner than any other remedy." *To Indolent Ulcers*, the ointment (*ante*), is a very useful application.

1490. OPIUM. OPIUM. The juice, inspissated by spontaneous evaporation, obtained by incision from the unripe capsules of the poppy, Papaver somniferum, *Linn.* There are four important varieties met with in commerce, named after their respective sources :—1, Turkey or Smyrna (*offic.*) (the best kind, yielding the largest proportion of morphia); 2, East Indian or Bengal; 3, Egyptian; 4, European.

Med. Prop. and Action. The primary effect of a small dose of opium is stimulant; the pulse is increased in force and frequency, the countenance is flushed, the eye bright, and the mind filled with cheerful images. The secondary effects are drowsiness, depression of the arterial action, loss of appetite, and constipation, with great mental languor. In larger doses, after the first stage of excitement has subsided, opium proves narcotic, anodyne, and anti-spasmodic. The dose requisite for the production of these effects differs in almost every individual, being greatly influenced by the age, sex, and strength of the patient, the severity and character of the disease to subdue which opium is given, and, above all, by the patient being accustomed or not to the habitual use of the drug. The principal seat on which opium operates is the cerebro-spinal system, and, through the nerves arising therefrom, it affects more or less every organ of the body. The following excellent summary of the effects of opium in poisonous doses we give in the words of Dr. Guy (p. 522) :—"*The insensibility* produced by opium differs, except on the near approach of death, from that present in apoplexy or epilepsy. At first, the patient is easily roused; but, in the more advanced stages, this can be effected only by violent shaking, loud speaking, tickling the nostrils, injecting water into the ear, or flecking the hands and feet with a towel. *Convulsions* are of comparatively rare occurrence, but have been observed in more than one case in a marked form, sometimes constituting the most prominent symptoms, at other times alternating with stupor. Locked-jaw and violent tetanic spasms have also been present in a few cases. The reflex function is often extremely active, the leg being forcibly retracted when the foot is tickled, though the patient lies quite insensible. *Delirium* is of rare occurrence, but has existed either with or without convulsions. *The pupils* are almost always contracted, and nearly or altogether insensible to light. Dilatation of the pupil has been observed at the moment of death from opium, or in the comatose state which precedes it. *The countenance* is commonly pale and calm, as in a person in a profound sleep; but it has been observed flushed and excited. *The breathing* is generally slow, except in some instances in the first stage. In the long sleep which follows recovery from the urgent symptoms, the respiration is remarkably slow. In one case it was only six in the minute, while the pulse was upwards of 80. *The pulse* sometimes is nearly natural in frequency and force; in other cases, it is full and accelerated, but this happens chiefly in the first stage. In the stage of insensibility, while the patient can still be roused, the pulse is generally full and slow; but towards the fatal termination, it becomes small, frequent, and irregular. *The secretions*, with the exception of the perspiration, which is sometimes very abundant, are diminished, and the bowels are generally inactive; but cases are recorded in which both diarrhœa and diuresis were present. *Vomiting* is sometimes present from the first; but, in other cases, is among the early signs of recovery. It also follows the successful application of remedies."

The post-mortem appearances in poisoning by opium are neither constant nor well marked. Turgescence of the vessels of the brain, with or without serous effusion into the ventricles, and at the base, and very rarely accompanied by extravasation of blood, forms the most marked morbid appearance. Lividity of the skin, congestion of the lungs, a fluid state of the blood, and early putrefaction of the body, are among the less constant appearances. (Guy.)

The shortest period within which opium or its preparations have proved fatal is three hours; few cases are prolonged twenty-four hours: the average may be stated at from seven to twelve hours. When a patient survives *twelve* hours, there is good hope of his recovery.

The smallest dose which has proved fatal is four grains in an adult, and two drops of laudanum in an infant. Enormous quantities have been taken by adults with impunity. In one instance, recovery took place after no less than eight ounces of solid opium!

Treatment of Opium poisoning. See ANTIDOTES, Part ii.

1491. *Treatment of the habit of Opium-eating.* This has been made the subject of an interesting paper by Dr. A. Fleming,[1] of which the following is a brief abstract:—It is of the greatest importance that the habit should be suddenly and completely suspended; this is infinitely more efficient, and easier to the patient than the gradual diminution of the dose. To carry it out requires much moral courage, both on the part of the practitioner and the patient. At first there is generally an increase in the mental as well as the bodily suffering of the patient; he is a prey to intense depression, sleepless, excessively irritable, full of alarms as to his condition, and will (unless he be a man of unusual strength of mind) pitifully implore to be allowed an opiate to relieve his distress, declaring, if refused, that his life is in danger. The reality of any danger, however, as far as Dr. Fleming's experience goes, is an illusion. At the same time, the patient suffers much from pains in various parts of his body, but especially in the stomach and bowels, the pulse rises in frequency—sometimes as high as 120—the tongue is coated with white fur; there is an increasing thirst, and total loss of appetite; the bowels, which were formerly confined, are now much relaxed, and diarrhœa supervenes; the skin softens, and finally sweat pours out from the surface. There is also marked diuresis and frequent micturition. In severe cases these symptoms may endure for a week, but ordinarily for about three or four days; they disappear gradually, and the patient becomes conscious of a grateful sense of returning health and peace of mind, such as he has not known since he became an opium-eater.

Having interdicted the opium, and taken the necessary precautions against the patient procuring it surreptitiously, Dr. F. prescribes the following:—℞ Acid. Phosph. dil. ʒx., Tinct. Lupulinæ (D.) ad. ʒxxx., M. Of this fʒij. are taken in a large wineglassful of water every four hours, one hour before food. This helps to sustain the patient, lessens the force of his suffering, and shortens its duration. All the strong bitter tonics act in the same way, but none so efficiently as the above. The dose may be either increased or lessened according to circumstances. If wakefulness be very protracted, the following draught may be given at bedtime:—℞ Tinct. Cannabis ♏xxx.-lx., Spt. Ætheris ʒj., Aq. ad ℥j., M. With regard to diet, milk and beef tea alternately, every four hours, may be allowed at first, and gradually, as the appetite improves, chickens, chops, &c., until the stomach can accept the ordinary diet. If there should be any very manifest signs of faintness, a little port wine or brandy should be given every four hours, one hour before the medicine; but in ordinary cases there is no need whatever for alcoholic stimulants, and their use is injurious, by keeping up irritation of the stomach, and delaying the recovery of appetite. The surface of the body should be frequently sponged with water, slightly acidulated with nitro-hydrochloric acid, and the clothing changed so as to

[1] Brit. Med. Journ., Feb. 15, 1868, p. 137.

keep the surface dry. During convalescence, a tonic regimen, good food, pure air, a daily bath, cheerful occupation, and genial society, are requisite. As blood tonics, zinc and iron, given for a month at least, are valuable. ℞ Zinci Valerian. gr.–ij., Quiniæ Sulph. gr.–j., Ext. Lupuli q.s., M., ft. pil. To be taken morning and evening, every second day. ℞ Syrup. Ferri Phosph. ʒxiv., Acid. Phosph. dil. ad ʒxx., M., ft. mist. One drachm in a wineglassful of water to be taken immediately after dinner and supper, every second day. Dr. Fleming is convinced that more advantage is obtained, from this plan of giving iron and zinc on alternate days, than if the zinc were given first, and the iron subsequently, for a fortnight or more continuously.

1492. *Opium Smoking*, a vice originating in China, has gained a strong hold amongst the lower orders, and the debased, of most Eastern nations; and in Great Britain also, according to Dr. Scoresby-Jackson (p. 331), the practice of opium-eating, in one form or other, is carried to a deplorable extent. Sir W. O'Shaughnessy[1] gives the following graphic description of those examples so constantly met with in Calcutta:—"Stupor, reverie, and voluptuous listlessness are the immediate effects produced. In this state, the patient can be at once and easily aroused to exertion or business. No sickness, or constipation, or any other functional disturbance, supervenes on each indulgence; gradually, however, the appetite diminishes, the bowels become irregular, emaciation takes place, sexual tendencies are destroyed, and premature old age comes on." "This," he continues, "is an extreme case; when the habit is but moderately followed, it appears to occasion no greater evil than a proportionate indulgence in wine, or other spirituous liquors." From this opinion I beg to dissent; nor do I consider the above picture in the least exaggerated, even for a "moderate" opium-smoker, if, indeed, such a being exists; for, when once the practice is commenced, it becomes rapidly an all-absorbing passion. In all the patients who have been opium-smokers, who have been under my care, I have found a cachectic state of the body, a premature decay both of mind and body, and derangement of most of the functions; and in them, the slightest scratch often degenerates into a foul and ill-conditioned ulcer. Opium-smoking has been said not to shorten the term of life, but good statistics are yet wanting to support the assertion. Alibert[2] considers that the use of opium renders the body less susceptible to the influence of miasmatic and other morbific actions.

1493. *Remarks on the Use of Opium.* 1. Some persons are peculiarly susceptible to the action of opium, and are unable to take even the smallest dose without its occasioning delirium, a high state of nervous irritability, vomiting, diarrhœa, &c. Where this idiosyncrasy exists, opium should not be given, unless some more than ordinary circumstances demand it. When, however, its exhibition is necessary in these subjects, it is sometimes tolerated, if given in the form of an enema; or, if given by mouth, a few grains of capsicum will be found to allay the vomiting, and the addition of camphor, or tartar emetic, will in a great measure obviate the nervous irritability. As a general rule, however, opium should not be given in any form in these cases.

2. Infants and young children bear the exhibition of opium badly. Numerous are the instances on record, in which two or three drops of laudanum have produced fatal results in young children; and opium in every form should be avoided, unless it is imperatively called for, and should never be given without the greatest caution. It should be laid down as a rule, that when it is necessary to prescribe opiates for children, those preparations whose strength is regulated by a certain standard should be preferred to those whose strength is variable and uncertain. Thus, Dover's powder is preferable to syrup of poppies, the strength of which is very variable.

3. Persons unaccustomed to opium require a much smaller quantity of the drug, to produce a certain effect, than those who are habituated to its use.

[1] Bengal Dispensatory, p. 180. [2] Elémens de Thérap., t. xi. p. 76.

4. Combination with other drugs greatly modifies the action of opium: ipecacuanha increases its action on the skin; mercurials obviate its constipating influence; and tartar emetic lessens the action which it would otherwise excite in the nervous system.

5. When a large dose of opium has been administered, and the patient is still suffering intense pain, how long should we wait before it would be considered safe to repeat it? This question, put by Dr. Griffin,[1] is answered by him, that half an hour is the limit within which crude opium will be found to manifest its effects; and that the dose may be safely repeated, if the pain or spasm be not relieved, however often it may be given. The liquid preparations of opium act rather sooner than the solid drug.

6. When opium is given for the relief of a pain, particularly of a periodical character, a third part of the dose which was required to relieve the paroxysm is required to prevent its recurrence. In fact, a moderate dose given in the interval will sometimes prevent the accession of the fit, when no quantity, however great, can control it after it has once set in.

7. When opium or opiates have been given for any length of time, or in large doses, a period of exhaustion and sinking almost invariably ensues, from twelve to twenty-four hours after the drug has been discontinued. A great amount of exhaustion and sinking has been observed to follow the omission of even a very reduced dose, particularly in children. A little nourishment, or some slight stimulant, is here necessary.

8. An over-dose of opium will produce effects very similar to those of an under-dose. Where a restless night has resulted from an over-dose having been given, sound sleep may occur next night without any opium whatever. Again, if the doses of opium, given with advantage during the existence of inflammation, be continued when this has subsided, stupor or troubled sleep, according to the degree of surplus opium given, will result.

9. In order to procure sleep, opium should be given an hour or two before the usual hour of retiring to rest, in order to allow the stage of excitement to pass off, previous to that time.

10. When, from irritability of the stomach, or from some other cause, opium cannot be administered by mouth, its full physiological effects may be speedily induced by the subcutaneous injection of morphia (*q.v.*) It may also be administered in the form of enema; a larger dose, a third or half larger, is required when it is exhibited in the latter mode. It may also prove of great service when applied externally, in allaying pain, irritation, and inordinate action, not only of the skin, but of the subjacent tissues.

11. As a diaphoretic, opium is best combined with ipecacuanha. The cutaneous and the mammary secretions are the only ones not sensibly decreased by opium; the former, it increases. On this point Sir H. Holland[2] observes, "Of the various internal means of obtaining diaphoresis, I believe opium, in one or other of its forms, is the most uniformly certain and beneficial. Its action appears to depend upon its power of allaying inordinate circulation, or other excitement of the system."

1494. *Antagonism between opium and belladonna* has been asserted to exist by Anderson, Bell, and others, and several cases in which they have mutually been employed as antidotes are on record. The subject has been carefully examined by Dr. Harley, who (p. 309) draws the following conclusions: 1. That the evidence of antagonism, in any given place, is inconclusive. 2. That, taken individually or collectively, the cases (of which he furnishes a full table) show that belladonna has no influence whatever in accelerating the recovery from the poisonous effects of opium. 3. That somnolency, stupor, narcotism, and coma—the essential effects of the action of opium—are both intensified and prolonged by the concurrent action of belladonna. 4. That belladonna is powerless to obviate the chief danger of opium-poisoning, *i.e.*, depression of the respiratory func-

[1] Medical Problems, art. x., from which this and the three following remarks are drawn.

[2] Medical Notes and Reflections, p. 61.

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tion. 5. That the results of the combined action of opium and belladonna are the same, whether given in medicinal or toxical doses. While, therefore, belladonna cannot in any sense be regarded as an antidote against opium, but in large doses, the exact reverse, it may, when the heart shows indication of failing power, be used in conjunction with other remedies, and always in very small doses, as a means of aiding recovery.

1495. *An antagonism between opium and quinine* was first pointed out by Dr. Gubler.[1] Dr. Nivison, who has examined the subject, maintains that this antagonism is only partial, influencing or modifying only the bad effects of these agents, enabling us to prescribe them simultaneously with advantage, when they could not otherwise be given.[2]

1496. *Opium is either contra-indicated, or should be given with caution, in the following states:*—1. In cerebral affections occurring in persons of a plethoric habit, and where congestion of the vessels of the brain is suspected. 2. In acute sthenic inflammation in plethoric subjects, previous to the employment of depletion. 3. In pulmonary affections, when the cough is dry and hard, and the expectoration is difficult and scanty. 4. In affections of mucous membranes of the air-passages, attended with copious secretion. In such conditions the narcotizing influence of opium, by diminishing the respiratory function, has often proved fatal. 5. In morbid states of the body, where venous congestion is evident. 6. Whilst the urine is scanty and high-coloured. Alkalies should, in such a case, be generally administered first; but if the symptoms be urgent, and opium is imperatively called for, it should be given in combination with alkalies. It acts prejudicially in Bright's disease. 7. During pregnancy. Dr. Denman[3] states that he is persuaded that the frequent use of opiates by pregnant women is prejudicial to the fœtus. Testimony to the same effect is adduced by the late Dr. Adams, of Blanchory,[4] who considers, on good grounds, that the administration of opiates to pregnant women ought to be proscribed. 8. In fevers and other morbid states, accompanied by contraction of the pupils.

1497. *The Constituents of Opium.* There is perhaps no single drug in the Materia Medica which contains so many principles of so diversified a character as opium. First in order and most important are its somniferous or hypnotic principles, *Morphia*, *Codeia*, *Narceia*, *or Narceine*, *and Meconine*, *or Opianyle*. These are placed in the order of their potency; the hypnotic power of the two latter being greatly impaired, and their value consequently lessened, by their comparative insolubility. *Cryptopia* is another somniferous principle, according to Dr. Harley (p. 168), twice as active as narceia and meconine, and one-fourth as powerful as morphia. It exercises, however, a peculiar influence in causing dilatation of the pupil when administered in large doses. Standing opposed to these principles is another, *Thebaia* or *Paramorphia*, a powerful stimulant, which acts exclusively on the motor nervous centres, inducing in them that highest degree of excitement, which results in tetanic spasm or cramp, proving fatal to life by arresting the respiratory movements. We have next *Apomorphia*, which, in quarter-grain doses, acts as a speedy and energetic emetic; and then *Chlorocodide*, possessed of a bitterness equal to that of strychnia, and which promises to be of value as a tonic and anti-periodic: in this respect it approaches to the salts of another opium-constituent, *Narcotine*, more properly designated *Anarcotine*, which according to some good authorities is little inferior to quinine in controlling periodical or malarial fevers. It is also of value as a tonic. Further notices of these principles will be found under their respective headings.

Dose:—Of Opium, gr. ½–ij. *Of the Extract*, gr. ½–ij. *Of the Liquid*

[1] Gaz. des Hôpitaux, May 29, 1858.
[2] Amer. Journ. of Med. Sci., July, 1861.
[3] Midwifery, p. 235.
[4] Edin. Med. Journ., Nov. 1867.

Extract, ℥x.–xl. *Of the Tincture, Laudanum* (Opium oz. j½., Proof Spirit, Oj.), ℥v.–xl. Contains opium gr. j. in ℥xv. nearly. *Of the Ammoniated Tincture* (Opium gr. c. Saffron, Benzoic Acid āā gr. clxxx.; Oil of Anise, fl. drm. j.; Strong Solution of Ammonia fl. oz. iv.; Rect. Spirit fl. oz. xvj.), ℥xxx.–lx. Contains opium gr. v. in fl. oz. j. nearly. *Of the Wine: Vinum Opii* (Extract of Opium oz. j.; Cinnamon, Cloves, āā bruised gr. lxxv., Sherry Oj.), ℥x.–xl. Contains Ext. of Opium gr. xxij. in fl. oz. j. nearly. *Of the Compound Powder* (Opium oz. j½., Black Pepper oz. ij., Ginger oz. v.; Caraway oz. vj.; Tragacanth Powder oz. ½), gr. ij.–v. Contains opium gr. j. in grs. x. *Of the Confection* (Compound Powder of Opium gr. cxcij.; Syrup fl. oz. j.), gr. v.–xx. Contains opium gr. j. in grs. xl. *Of Opium Lozenges*, 1 to 6. Each contains gr. $\frac{1}{10}$ of Extract of Opium. *Enema of Opium* (Tinct. of Opium ℥xxx.; Mucilage of Starch fl. oz. ij.) Prep. for external use only. *Liniment of Opium* (Tinct. of Opium, Liniment of Soap āā fl. oz. ij.) *Opium Plaster* (Opium oz. j., Resin Plaster oz. ix.) Opium likewise enters into several preparations, which will be considered under their separate headings.

1498. *Therapeutic Uses. In Inflammation*, the powers of opium, in properly selected cases, are often very marked. "If," observes Prof. Stillé (i. p. 730), "we regard only the phenomena which are essential to inflammation—those, namely, which are strictly local—it may be doubted whether the internal use of opium has any direct power of controlling them: but these local inflammatory symptoms are frequently aggravated and perpetuated by concomitant states of the general system (notably by nervous excitement), or by the peculiar circumstances of the diseased organ, and over these conditions opiates, in many cases, exert a paramount influence, thereby indirectly tending to cure the inflammation. In general terms, their effects may be illustrated by those of rest upon an injured limb: they remove or hold in check causes of irritation, and thus allow the recuperative powers of the inflamed part to act without hindrance. It is in this manner, probably, that must be explained the very unequal and indeed opposite effects of opium in the inflammation of different organs." That opium is more applicable and beneficial in some inflammations than in others is universally admitted, and Sir T. Watson (i. p. 240) has endeavoured to draw the line of distinction in these cases, which in the main holds good, although his views require some modification, in consequence of the facts elicited by recent investigations as to the powers of opium in the shape of morphia when subcutaneously injected; it being evident from these that many of the ill effects of the crude drug, when swallowed, arise from its decomposition in the process of gastric digestion. "As a general rule," Sir T. Watson observes, "you must be very careful how you give opium in inflammatory diseases that tend to produce death by coma or apnœa. If there be any unnatural duskiness of the face, if ever so slight a tinge of purple mingle itself with the colour of the lips, this is an appearance which should warn you against opium. It shows that the blood is imper-

fectly arterialized; and imperfect arterialization of the blood either results from, or conduces to, a state of coma. On the other hand, it is, *cæteris paribus*, in cases where the tendency is towards death by asthenia, that the use of opium, as a remedy for inflammation, is most serviceable; thus it has a capital effect often, after depletory measures, in cases of peritonitis and of enteritis." Dr. Stokes,[1] of Dublin, has drawn the following conclusions on this subject:—1. That in cases of recent inflammation of serous and mucous membranes, where depletion by blood-letting and other antiphlogistic measures are inadmissible, and the system is in a state of collapse, the exhibition of opium has a powerful effect in controlling the disease. 2. That under these circumstances, the remedy may be given with great benefit and safety. 3. That its effect then is to raise the powers of life, and to remove the disease. 4. That the poisonous effects of opium are rarely observed in these cases; the collapse and debility of the patient appearing to cause a tolerance of the remedy. In some cases of acute inflammation, when the pain is excessive, and forms the prominent symptom, and when this is accompanied with much nervous irritation, opium, after local or general depletion, may be given, not only with safety, but with benefit. A full dose (gr. ij.) may be given, and repeated until there is a mitigation of the pain or excitement. The combination of opium and tartar emetic, as first proposed by Dr. Graves, is often admissible and beneficial in certain inflammations, when opium singly would be contra-indicated: thus, in *Inflammation of the Brain*, the formula proved most serviceable in the hands of Dr. Griffin; if resorted to, however, in this affection, it should be employed with extreme caution. It is playing with a double-edged sword; in proper cases it may do good, in others, incalculable harm.

1499. *In Typhus Fever*, opium, though not to be trusted to alone as a curative agent, fulfils many important indications, and, judiciously employed, is capable of effecting much good. On this point, Dr. Buchanan (i. p. 554) observes:—"The headache, sleeplessness, and delirium are frequently lessened, even though there be a good deal of suffusion of the eyes, by opium:" he states that he constantly gives ♏v. of the tincture every four hours, or else a night-dose of ♏xv., with considerable advantage to these symptoms; but he avoids opium when the pupils are very small, when there is coma, or when there are any serious lung complications; with these exceptions he considers there are no contra-indications to the use of this drug. If opium be given with the object of soothing delirium, he advises that it should be given in full doses at night, and

[1] Dublin Med. Journ., No. 1.

not in small and frequent doses; under the above circumstances he thinks, if possible, it is better to avoid opium. Combined with a small quantity of tartar emetic, opium has an increased power of relieving headache and of inducing sleep. Two prominent points in this passage—*a*, the avoidance of opium when contraction of the pupil is present; and *b*, the advantage of a combination of opium and antimony—were first pointed out by Professor Graves,[1] of Dublin, in 1838, and his observations have in a remarkable degree been confirmed by the subsequent experience of others. After remarking that a contracted state of the pupil is often present in typhus fever, he observes, "Whenever, in attending a case of fever, you meet with a contracted state of the pupil, even in a slight degree, although your patient may be restless and greatly in want of sleep, *beware of opium*. I have often," he continues, "seen it tried, and I think scarcely ever without more or less injury to the patient. When opium is administered in the advanced stage of fever, with symptoms of cerebral derangement, and a tendency to contraction of the pupil, you will find that the pupil which has been moderately contracted to-day will be greatly contracted to-morrow, and that the patient will soon sink into an irrecoverable state of coma. The contracted state of the pupil may exist in the extreme and most marked form in typhus fever, without being necessarily accompanied by headache and delirium; the patients are restless, and in a state of remarkable nervous excitement; but they answer questions, not unfrequently, in a tolerably clear and rational manner, and many of them distinctly affirm that they have no pain in the head. These circumstances may deceive the unwary; but the experienced practitioner, who has witnessed many such cases, will feel that a fatal termination is threatened. Under these circumstances, opium in every shape is injurious; and even tartar emetic fails in controlling or diminishing the pernicious effects of the opium. This is somewhat remarkable, as the combination of tartar emetic and opium seldom fails in relieving cases similar in all respects, except the symptom of contraction of the pupil." In a subsequent part of this valuable lecture, Dr. Graves suggests a combination of opium and belladonna when the above symptom is present, the latter counteracting the power of the opium, in inducing or aggravating contraction of the pupil. He quotes some cases in which the combination was given with apparent advantage, but the subject requires further investigation. In the advanced stages of the fever, opium should be combined with camphor, wine, and other stimulants. When there is muttering delirium with muscular tremors and great prostration,

[1] Dublin Journal of Med., July 1, 1838.

laudanum, Dr. Ringer (p. 376) observes, may be given alone with the most signal benefit. He directs ♏lx. (or morphia gr. j.) to be mixed with oz. iv. of water, and of this a teaspoonful to be given every five or ten minutes till three or four doses have been administered. If by that time the patient be not asleep, the medicine should be discontinued for half an hour, and if there be still no sleep a few more doses may be given. By this method, he adds, calm, refreshing, and invigorating sleep can frequently be produced which may last for several hours, and the patient wakes refreshed and free from wandering, while the appetite and digestion are considerably strengthened, and the skin is made comfortably moist. With this mode of treatment patients progress favourably with less alcoholic stimulant than would otherwise be required. Brandy or wine, if indicated, may be freely given with the laudanum.

1500. *In Typhoid Fever*, opium under the circumstances mentioned in the last section is often serviceable, but there are special circumstances in this form of fever in which its use is indicated: thus, severe abdominal pain is often best relieved by an occasional full dose of opium; *in Intestinal Hæmorrhage*, it forms an excellent adjunct to acetate of lead and other styptics, especially in the form of enema, thus:—℞ Plumbi Acet. gr. x., Acid. Acet. dil. ♏x., Morphia Acet. gr. ½, Aq. Tepid. fl. oz. iv., M., ft. enema. *In Diarrhœa*, it may advantageously be combined with sulphuric acid (℞ Acid. Sulph. dil. ♏xxx., T. Opii ♏x., Decoct. Cinchonæ fl. oz. 1½., M., ft. haust. 4tis horis sumend.), or with sulphate of copper and other styptic salts. Opiate enemas (℞ T. Opii ♏xv.–xxx., Mucilag. Amyli fl. oz. iv.) are of great value in allaying that irritability of the lower bowel which often induces purging. When enemas cannot be retained, we may still use suppositories: *e.g.*, Pil. Sapon. Co. gr. v.–x. (Dr. Harley.) Sir W. Jenner[1] considers that opium, as tending to increase the depression, should be avoided as far as possible; but Dr. Mercer[2] has shown, in one case at least, that opium had the effect of raising the vital powers when apparently hopelessly depressed: in this case there was persistent sleeplessness and active delirium, with an extremely rapid, weak, fluttering, and indistinct pulse, indicating the failure of the heart's action. Improvement followed the administration of gr. ½ of opium, and recovery commenced from that date. Though little importance is to be attached to single cases, this one is highly instructive and suggestive.

1501. *In Intermittents*, Dr. Lind[3] warmly advocated a full dose of opium half an hour after the commencement of the hot

[1] Med. Times and Gaz., July 27, 1867.

[2] Med. Times, Sept. 28, 1867.

[3] On Fevers, &c., 1763.

stage, as affording present relief and mitigating the course of the disease. Others[1] have advocated its use at the commencement of the cold stage, and some trials which I made with it convinced me that a full dose (♏xl.) given on the first appearance of the cold stage, often had the effect of cutting it short almost like a charm; and although it did not seem to shorten the subsequent hot stage, it appeared in many instances to mitigate its severity. Any anti-periodic power possessed by opium is probably due to the narcotine it contains.

1502. *In Hay Fever*, Mr. White Cooper[2] speaks highly of the tincture of opium in doses of gutt. ij.–iij. every two hours for three times, followed by one drop every two hours until the discharge from the eye and nose diminishes. This treatment should be continued at longer intervals for three or four days.

1503. *In Small-pox*, in the early stage, when patients are restless and sleepless, anodynes often fail to procure rest; but it may be worth while to try them once to see the effect, and repeat the dose or not, as may be judged right. In the wakefulness of the advanced stage of the disease, in patients who are otherwise doing well, an anodyne given once or twice, just to get them into the habit of sleeping, answers admirably, and nothing does so well as hydrochlorate of morphia (gr. iv., Aq. fl. oz. j.; dose, ♏xx.–xxx.) Neither this nor any other anodyne should be given when there is copious salivation and mucous expectoration, as during sleep these are apt to collect in the air-passages, "and thus the patient dies, gradually asphyxiated by the secretion accumulated in those parts." (Mr. J. F. Marson, i. p. 457.)

1504. *Diseases of the Brain and Nervous System. In Insanity*, opium, if given judiciously, is a remedy of great value, but much discrimination in its use is necessary. Dr. Maudsley[3] has furnished us with some valuable remarks on the subject. It is, according to his experience, most beneficial in the incipient stages of insanity, at that early period of mental depression which so often precedes actual derangement of thought; here opium (gr. j.), combined with extract of aloes (gr. ij.), every night at bedtime, and tonics with a moderate allowance of stimulants during the day, almost immediately dispel all troubles. In other cases, morphia, gr. $\frac{1}{4}$–$\frac{1}{2}$ thrice daily, is more suitable, and should be persevered with, notwithstanding an apparent want of success at first. In confirmed *Melancholia*, when the patient is incapacitated from all healthy exertion, and his mental suffering is so great that he asserts he cannot

[1] Cyc. Pract. Med., ii. p. 226.
[2] Lancet, Jan. 25, 1862.
[3] Practitioner, Jan. 1869.

bear it, and dreads that he may do some injury to himself—when paroxysms of acute anguish and despair come on at times, and he hardly knows what he does—the systematic use of opium proves most useful. Even in the more distressing cases, where there is persistent suicidal impulse, opium is of value, though not so much so as in the former cases. When given in these cases, it should be in sufficient doses, beginning with at least gr. j., twice or thrice daily. *In Melancholia connected with suppressed menstruation*, great benefit sometimes follows a combination of opium, aloes, and strychnia; but in that dependent on "change of life" in women, *Climacteric Melancholia*, it seems to do no good. Neither does it produce benefit in acute frenzical melancholia, nor in chronic melancholia with a settled delusion, nor in that form where the patient appears like one utterly demented, but where the mind is really absorbed in one great and terrific delusion. Here purgatives appear to offer a better prospect of success. As opium agrees better with persons of a melancholic than with those of sanguine temperament, so it appears on the whole to be more useful in melancholia than in maniacal forms of insanity. This is true in the main, still there are cases of acute mania in which it acts beneficially; where, for instance, there is no heat or congestion of the head, but where the face is pale, the pulse weak, and where a restless activity and incoherence are accompanied by want of sleep. *In Puerperal Mania, in the Mania following on continued intemperance*, and *the Mania or Delirium of nervous exhaustion*, such for example as *sometimes occurs after acute fevers*, the best results are obtained from opium. In such cases, the best treatment is to give sufficient nourishing food, a fair allowance of stimulants, and morphia or opium in such doses as may be necessary to allay irritation and to procure sleep. The cases in which opium is either useless or hurtful are—1, sthenic mania; 2, mania dependent upon organic disease of the brain, and in that occurring in the course of general paralysis; 3, hysterical mania, epileptic mania, and that connected with sexual or uterine excitement. In the two first classes, digitalis or henbane, and in the third, especially in the epileptic variety, bromide of potassium, offer better prospects of success than opium in any form. Dr. Maudsley's valuable paper will well repay careful perusal.

1505. *In Delirium Tremens*, opium was formerly regarded as the sheet anchor, and when judiciously employed, under special conditions, it is doubtless a remedy of great value; but its indiscriminate use in heroic doses is now well-nigh abandoned. If, as Dr. Wilks[1] observes, you give large and frequently repeated doses of opium, "on the principle that sleep must be

[1] Med. Times and Gaz., Sept. 19, 1868.

procured at all hazards, and as soon as possible, you will without doubt kill many of your patients." In recent cases, in young robust subjects, when much vascular excitement is present, the combination of tincture of opium and antimonial wine (āā ℥xx.) originally introduced by Prof. Graves, repeated every three or four hours, according to circumstances, is often productive of excellent effects. In other cases, where there is much depression, where the patient is old, and has been subject to repeated attacks, it may be advantageously combined with carb. of ammonia (gr. iij.–v.), or quinia (gr. ij.–iij.) Camphor, in these cases, is said to prove an excellent adjunct to opium. It is of the utmost importance for patients labouring under this disease to have a full animalized diet, and as the stomach is unable to digest solid food, strong broth or beef tea, milk, &c., should be taken as often and as largely as possible. Anything which will interfere with the assimilative process is objectionable, and it is probable that opium, by its depressing influence on the visceral nerves, may in this manner prove highly prejudicial. This is one of the ill effects of opium overlooked by most of the older writers on this disease. To obtain the full effect of the drug, without deranging the digestive organs, it would be far preferable to employ morphia hypodermically. Dr. Anstie[1] is of opinion that in this disease we ought never to give opiates by mouth, when subcutaneous injection of morphia is possible. As a hypnotic in this disease, chloral promises to supersede opium.

1506. *In Epilepsy*, opium has had its advocates from the earliest ages; for safety and efficacy it is not to be compared to bromide of potassium (*q. v.*) *In Chorea*, it has also been advised, but the experience of Dr. Radcliffe (ii. p. 137) is opposed to its use; there is a remarkable tolerance of opium in this disease, and enormous doses have been given with the object of procuring sleep.

1507. *In Tetanus*, opium has been given in enormous quantities, with the view of overcoming the spasmodic paroxysms; but repeated experience has proved it inoperative, and with physostigma, aconite, belladonna, and chloroform at hand, it would be waste of time (if not worse) to resort to opium. *In Hydrophobia*, it has also been used in large doses, but without effect, even in mitigating the symptoms.

1508. *In Sciatica, Tic Douloureux, and other Neuralgic Affections*, opium, internally administered and locally applied, is of great occasional service, but both these modes are far inferior to morphia introduced hypodermically; when thus used, its effects are often speedy and permanent. (See MORPHIA.) In the words of Dr. Anstie,[2] the discovery of the hypodermic

[1] Practitioner, July, 1868. [2] Ibid., July, 1868.

method has initiated quite a new era in the treatment of severe neuralgias. Dr. Fuller (p. 471) recommends the following application, especially in *Sciatica*:—℞ T. Opii, Sp. Æther. Sulph. Co., Glycerini, āā ʒiij., Ext. Belladon. gr. xx., M. A strip of flannel soaked in this should be applied along the course of the nerve, and then covered with oiled silk to prevent evaporation. Speedy relief soon follows in some cases. *The deep-seated pain in Herpes Zoster* is greatly relieved by opiate applications such as the above.

1509. *Diseases of the Chest. In Phthisis*, in the advanced stages, opium proves a valuable palliative. By its judicious use, we may in a measure relieve the cough, lessen the amount of expectoration, check the diarrhœa, and afford a great degree of sensible comfort. It may be given by mouth, or in the form of enema; and in such doses as the patient can bear without producing deep sleep, or any inconvenience. It is a valuable resource, often available when other expedients fail.

1510. *In Pneumonia*, opium, observes Dr. Waters (p. 49), is very desirable in many cases; often relieving pain, allaying the distressing cough, and procuring sleep. He adds, that the pain in the side which so frequently accompanies pneumonia, and for which depletion was formerly prescribed, may generally be relieved by a dose of opium. The same remark holds good with respect to *Acute Pleurisy* (p. 227). Opium is likewise of great value as a means of arresting *the Delirium which is apt to supervene in Pneumonia*. On the first appearance of the indications of approaching delirium, *e.g.*, want of sleep, restlessness, slight staring of the eyes, and slight tremor of the hands, a few doses of opium, and the exhibition of stimulants and nourishment, may at once arrest the attack. At the same time, avoid all depletory measures; rather make it your object to improve the nutrition of the brain, and give vigour to the circulation, and as you accomplish these results you will find that the delirium will disappear. (Dr. Waters, p. 71.)

1511. *In Asthma*, opium is of doubtful value. On this point, Dr. Hyde Salter (p. 231) wisely observes, "Prefer any other sedative to opium; and unless there is some special complication that indicates it, never give it at all." The complication which calls for its use is bronchitis, where the asthmatic tendency is kept up by the irritation of the inflamed bronchial membrane; here it often acts very beneficially, just as it allays *Bronchitic Cough*, in which it is often of signal service. In these latter cases, however, opium may prove dangerous, if there is much accumulation in the bronchi, as it is apt to deaden the sensibility of the bronchial membrane to such an extent as to prevent its expulsion, and the bronchi may consequently remain clogged for want of expulsive cough, and fatal results may

ensue. *Bronchitic* and other *Chronic Coughs* are often much benefited by an opiate plaster to the chest.

1512. *In Pleurodynia*, Dr. Graves (ii. p. 538) states that he has seen great benefit from directing the part to be well steeped, and then rubbed with warm laudanum. This will often procure immediate relief.

1513. *In Hooping Cough*, opium has long been prescribed with the view of allaying spasmodic action. This is best effected by morphia, which has been successfully employed by Dr. Müller, of Berlin, and others. Dr. E. Smith (i. p. 282) especially advocates this treatment, which consists essentially in causing the slightest oppression of the sensorium, as a measure of the required effect of the drug, and maintaining this from three to six days, till the spasm yields wholly or in part. With children under one year of age, the dose of the hydrochlorate or acetate of morphia should be gr. $\frac{1}{64}$ repeated every four hours; between 1 and 3 years, gr. $\frac{1}{48}$–$\frac{1}{32}$; for those yet older, gr. $\frac{1}{32}$–$\frac{1}{20}$. The dose selected should be repeated three or four times, and if no perceptible drowsiness be induced, it should be increased a step, and repeated in like manner; and again increased, if necessary, until the dose has been found which produces the slightest oppression of the sensorium. The aim must then be to maintain this effect, by repeating the same dose, or by further increasing it from time to time. The cases of simple hooping cough, he remarks, are extremely few, in which *slight* drowsiness has been produced and uniformly maintained for three or four days without the spasms having subsided, and the cough being nearly reduced to that of a common cough. It is rarely necessary to add any other remedy; but in some cases carbonate of soda has tended to lessen the irritability of the larynx, and promote expectoration.

1514. *In Influenza*, opium is best avoided in the early stages, but at a later stage, when the expectoration is coughed up easily, and all danger of lung congestion is passing off, opium with ipecacuanha quiets the paroxysms of cough, and gives great ease. It requires to be used in bad cases with the greatest caution. When, however, the cough is extremely violent, and conium and henbane do no good, opium must be given. Dover's powder, with nitre and lobelia, is a good form, or, if this fails, morphia with ipecacuanha may be substituted. (Dr. Parkes, i. p. 48.)

1515. *Common attacks of Coryza and Catarrh* may often be cut short, if, at the outset, a full opiate be given at bedtime, followed by a laxative in the morning.

1516. *Diseases of the Heart.* Dr. Waters (p. 376) considers that in this class of diseases opium should, as a general rule, be avoided, unless special circumstances call for its employment; it has a tendency to lower the circulation, and therefore

is objectionable. He is in favour of its use in *Pericarditis;* great benefit, in his opinion, is to be derived from its regular administration in grain doses every 3, 4, 6, or 8 hours; and he states that he has found that great relief to pain which often follows the local abstraction of blood, may be equally obtained by the administration of opium. The value of opium in *Rheumatic Pericarditis* has been further attested by Dr. Sibson, Dr. Walshe,[1] Dr. Farre,[2] and others. To be effectual, it requires to be given in large and repeated doses. If the surface has been blistered, morphia may be used endermically. In many diseases of the heart where opium internally is inadmissible, benefit has been found to result from the subcutaneous injection of morphia (*q.v.*)

1517. *In Internal Hæmorrhage*, opium is a valuable adjunct to acetate of lead and other astringents. It proves highly serviceable in allaying the nervous excitement which so often accompanies profuse hæmorrhage, and it should then be given together with stimulants.

1518. *Diseases of the Abdominal Viscera* comprise a class of diseases especially benefited by opium. *In Peritonitis*, it has been found sufficient, of itself, to effect a cure. Dr. Stokes[3] has specified the following cases in which it may be thus employed:—1. Peritonitis arising from the escape of fæcal matter into the peritoneal cavity, through a perforating ulcer of the intestine. 2. That arising from the bursting of an abscess into the serous cavity, or from rupture of the intestine, induced by external violence. 3. That occurring after the operation of paracentesis in delicate subjects. 4. Low typhoid peritonitis after delivery. In all these cases, depletion is decidedly contra-indicated; and the indication clearly is to support and strengthen the patient. With this view, and with that also of preventing further mischief, Dr. Stokes advises opium in large doses, gr. j. every hour, until a decided impression is effected. It is extraordinary the large doses which will be borne without inconvenience; in one of Dr. Stokes's cases, the man took 105 grains of opium, in eight days, without the slightest cerebral disturbance. Dr. Stokes relates several instances in which the above treatment was eminently successful. Mr. Stanley[4] relates a highly instructive case of *Peritonitis from injury*, which yielded to the persevering use of opium. The patient, a boy five years old, took ℥xxij. of T. Opii per diem for ten days, without any unpleasant symptoms, or any unusual amount of sleep. Purgatives were strictly prohibited (this is a point also enjoined by Dr. Stokes), although the bowels were not open for nine days. *In other Abdominal*

[1] Dis. of Lungs and Heart, p. 604.
[2] St. Bart. Hosp. Rep., ii. 1867.
[3] Cyc. Pract. Med., iii. p. 315.
[4] Lancet, Oct. 5, 1850.

Inflammations, including Enteritis, Gastro-Enteritis, and *Hepatitis*, opium alone, or in combination with other remedies, also proves of signal use.

1519. *In Ulcer of the Stomach*, Dr. Brinton (p. 187) bears the highest testimony to the value of opium. He considers that its efficacy in this class of cases is not due to its sedative or anodyne properties, but rather to its supporting the strength, buoying up the nervous system, and checking the waste or expenditure of the tissues generally. Its great utility is supported by the experience of others. Where vomiting is moderate, or where diarrhœa is prominent, Pulv. Kino Co. is a very convenient formula. But where vomiting is at all excessive, or resists a combination of this powder with bismuth, the drug is generally better borne in a solid form, either as a small pill of the watery extract, or a few grains of the compound soap or styrax pill, twice or thrice daily. Thus given, its effects are often very striking (p. 189). *In Perforating Ulcer of the Stomach*, it proves of essential service, when given in large and frequently repeated doses.

1520. *In Dysentery*, opium is a remedy of great value, possessing the peculiarity of being applicable, more or less, to every stage, and almost to every form of the disease. It fulfils three important indications—1, allaying pain and vascular excitement; 2, moderating the peristaltic motion of the intestines; and, 3, promoting the cutaneous secretion. On the whole, however, especially at the outset of an acute attack, it is inferior in efficacy to ipecacuanha (*q. v.*), though even here, when the latter drug is employed, a preliminary dose of opium is often of great service in enabling the stomach to retain it, and preventing its emetic operation. There is a great tolerance of opium in this disease, and the dose of solid opium may be gradually raised from gr. j. to grs. iij.–iv., three or four times a day, not only without inconvenience, but with marked benefit. Nausea or vomiting, tympanitic distention of the abdomen, and scanty stools, are signs that the remedy has been carried as far as is consistent with safety. *In Chronic Dysentery*, it is even more valuable than in the acute form, and may with advantage be given in large doses, in combination with acetate of lead, nitrate of silver, or sulphate of copper, as the case requires. *Tormina* and *Tenesmus* are best relieved by opiate enemas.

1521. *In Diarrhœa*, opium is also most valuable. When the attack arises from the ingestion of crude or indigestible food, &c., an aperient should first be given, in order to remove the irritant matter; should the diarrhœa persist after that, opium, either by mouth, or per rectum in the form of enema, will often succeed in arresting it. *In the so-called Summer or Autumnal Diarrhœa*, a combination of opium (T. Opii ♏ x.–xx.)

and diluted sulphuric acid (ɱxv.–xx.) is often effectual. A similar formula is sometimes useful in the *Diarrhœa of Phthisis*. *The Diarrhœa of Childhood* will often yield to a few doses of Pulv. Cret. c. Opio. Dr. Goodeve (i. p. 102) furnishes some valuable remarks on opium in diarrhœa, showing that it acts less as an astringent, on the hepatic secretion especially, than as a sedative to the peristaltic action of the intestines. He especially commends its combination with ipecacuanha. When the tenesmus and purging continue after the use of castor oil and other remedies, Dr. West states that these symptoms will be more effectually soothed by an opiate enema than by any other means; ɱiij. of laudanum in fl. oz. ½ of mucilage, suffices for an infant of a year old. (Dr. West, p. 605.)

1522. *In Strangulated Hernia*, the induction of narcotism by opium is a valuable auxiliary to, if indeed in some instances it does not obviate the necessity of having recourse to, an operation. As pointed out by Dr. Butler Lane,[1] the benefit of this treatment is twofold—1, it subdues the local and general irritation, thus materially augmenting the chance of reduction; and, 2, should it be finally necessary to have recourse to an operation, this treatment will place the patient in the condition most favourable for its performance, more or less anticipating and preventing the constitutional disturbance which would be liable to occur. The hypodermic injection of morphia, as advised in Dislocations (*infra*), would probably be preferable to the administration of opium by mouth. Mr. Maunder,[2] however, enters a timely caution against its use, unless an operation has been determined upon; the taxis, aided by chloroform, having failed to effect reduction, the ease and comfort produced by the remedy are apt to mislead the practitioner, and "the soothing effect of the drug might ultimately lead to the death of the patient, unless the medical attendant fully understands that during this apparent improvement, serious pathological changes are occurring in the contents of the hernial sac." This caution is well worthy of being borne in mind. No amount of relief to vomiting, &c., is of any avail so long as strangulation exists, which may be known by the unaltered condition of the tumour, and the absence of expansive impulse on coughing.

1523. *In the Passage of Biliary Calculi, or Gall-stones*, the intense agony is more effectually relieved by a full dose of opium, than by any other remedy, particularly if it be combined with the use of the hot bath. Two grains of solid opium, or ɱxl. of T. Opii, administered either by mouth or in the form of enema, will generally be found sufficient; but should it not

[1] Prov. Med. Journ., June 16, 1847. [2] Lancet, Feb. 26, 1870.

prove so, it may be repeated in half an hour. It may be advantageously combined with a full dose of ether or chloroform. Dr. Thudichum regards opium rather as an auxiliary in these cases than to be relied upon alone, and he speaks strongly of the danger of over-dosing the patients with opiates.[1] The subcutaneous injection of morphia, observes Dr. Murchison (p. 350), is particularly adapted for cases of this sort, from the rapidity with which it takes effect, and also on account of the irritability of the stomach often leading to the rejection of all remedies taken by mouth. A quarter of a grain of morphia may be injected beneath the skin of the arm, and may be repeated from time to time, according to its effect.

1524. *In Cholera*, opium, either alone or in combination with calomel, &c., was formerly regarded as a sheet anchor; but clearer views of the pathology of the disease, and experience of its inutility, indeed of its danger, have led to its comparative disuse. In the premonitory or early stage, conjoined with acetate of lead, it apparently assists the latter in restraining diarrhœa; and in some cases it seems to arrest vomiting, but for this purpose it is inferior to chloroform. In very small doses, in a liquid form, as employed by Dr. Ayre (see CALOMEL), it seems to assist the action of other remedies; but its use in large and repeated doses, in the solid form especially, in all stages of the disease, as formerly employed, is now almost universally and justly condemned by those who have had the largest opportunities of studying the disease. Dr. W. Bates[2] relates a case of cholera successfully treated by the hypodermic use of morphia.

1525. *In all Spasmodic Affections of the Bowels*, opium in full doses (gr. j.–ij.) proves generally more useful than any other remedy. Fomentations, sinapisms, &c., may be employed at the same time. If obstinate constipation be present, the opium may be combined with calomel, and followed by castor oil or some carminative aperient. *In Colica Pictonum*, and other severe forms of *Colic*, the same plan of treatment may be used with advantage, the opium being repeated till relief is obtained. In severe cases, morphia hypodermically employed may be advisable.

1526. *Obstinate Constipation* which resists the use of the strongest purgatives, will sometimes yield to opium in large doses. It acts mainly by relaxing the spasm of the muscular coat of the intestines, on which the constipation depends. In such cases, strong irritant purgatives only serve to increase the mischief. The advantages of opium compared with purgatives in severe cases of *Obstruction of the Bowels*, are well set forth

[1] Ranking's Abst., 1863, xxxvii., p. 275.

[2] Lancet, Aug. 21, 1869.

by Dr. G. Evans.[1] Cases of *Intus-susception of the Bowels* successfully treated by full doses of opium carried to narcotism, are recorded, and both reason and experience would lead us to expect the best results from its use. As in the former case, purgatives are to be prohibited.

1527. *In Chronic Catarrh of the Stomach*, when there is much irritability of that viscus, or vomiting of mucus, opium has a special value. Its action may often be assisted by its combination with astringents, particularly with Pulv. Kino Co. Its beneficial effect appears to be twofold: locally it allays the irritation of the stomach, and checks excessive mucous secretion; while by tranquillizing the nervous system and procuring sleep, it restores the tone of the digestive organs, and frequently enables the patient to digest solid food. Opium is also of use in cases of *Subacute Inflammation of the Stomach*, when great nervous irritability and atony coexist; in these cases it may often be advantageously combined with nitrate of silver (*q. v.*) (Dr. Wilson Fox, ii. p. 887.) *In Pyrosis*, Dr. Pavy (p. 134) states that he has rarely found the following draught fail in affording speedy relief:—℞ Liq. Opii Sed. ♏viij., Infus. Gent. Co. fl. oz. j., M., thrice daily.

1528. *Nervous or Sympathetic Vomiting* sometimes yields to a few drops of laudanum, given in an effervescing draught. Dr. Pavy (p. 98) mentions an obstinate case of vomiting, which, after all other remedies had been used in vain for weeks, yielded to morphia gr. $\frac{1}{2}$, thrice daily. *In Vomiting connected with Uterine Disease*, Dr. Tilt (p. 325) states that he has seen it checked by gr. j. of acetate of morphia applied to the cervix uteri. Mr. Harrison[2] relates an obstinate case of *Vomiting during Pregnancy* cured by prolonged hypodermic injections of morphia. In these cases, Dr. Graily Hewitt remarks (p. 381) that an opiate liniment rubbed over the hypogastric region, or morphia applied endermically, has been found of great service. In severe cases a few drops of laudanum may be used in beef tea as an enema, repeated as necessary. Opium, in the same manner, has been advised as a preventive or cure of *Sea Sickness*, but it too often fails to produce any good effect.

1529. *In Dropsy*, opium has sometimes been thought useful, by diminishing irritation and promoting the cutaneous secretion. Dr. Graves (ii. p. 277) speaks very favourably of its influence in these cases, especially when conjoined with the daily use of the vapour bath. "There seems," he observes, "to be an analogy between chronic dropsy and diabetes, and experience has proved to me that this mode of treatment is most likely to be attended with success. Opium and other diaphoretics," he adds, "increase the strength, remove dropsical

[1] Edin. Monthly Journ., Jan. 1853. [2] Brit. Med. Journ., Aug. 22, 1868.

swellings, diminish the quantity of albumen in the urine, and bring on convalescence, without producing any bad effects on the head or digestive system."

1530. *Diseases of the Genito-Urinary Organs. In Inflammatory and Irritable States of the Kidneys*, opium is a remedy of great value. Its action is much assisted by the plentiful use of diluents, the hip bath, and large linseed-meal poultices over the lumbar regions. In robust subjects, local depletion by cupping or leeching may advantageously precede the use of opiates. *In Nephralgia, caused by the presence or passage of renal calculi*, opium in full doses is the remedy most calculated to afford relief. The hot hip bath and plentiful diluents should also be used at the same time. In all those cases where opium given by mouth fails to afford relief, it will often succeed when employed in the form of enema or suppository. The subcutaneous injection of morphia, however, promises to be more effectual than any of these modes of administration.

1531. *In Calculous Diseases*, the most generally useful medicine we possess is opium. Whatever may be the character of the calculus, whenever much pain and constitutional irritation are present, opium proves signally beneficial. It may be given by mouth; also in the form of enema or suppository; or it may be applied externally as a plaster. Some patients derive more benefit from one preparation of opium than from another. Solid opium, Liq. Opii Sed., or Dover's powder, are the most generally useful forms. Morphia and its salts do not seem to exercise the same beneficial influence as opium itself. It may be given in full doses (gr. j.–ij.), and repeated until relief is obtained; large doses will generally be borne without inconvenience. Sir T. Watson (ii. p. 586) expresses his belief that no single drug has so much power to render alkaline urine acid as opium.

1532. *In Cystitis*, opium proves of the greatest value, especially when its action is aided by the use of the hot hip bath, fomentations, and linseed-meal poultices well sprinkled with mustard, over the hypogastric region. Sir H. Thompson (p. 151) states that a suppository of morphia (gr. ½–gr. j.) is often of the greatest service. A favourite suppository of the late Mr. Liston was a combination of opium (gr. ij.–iv.) and extract of hyoscyamus (gr. x.–xv.) "Its effects," he remarks (p. 105), "are almost instantaneous; all pain goes off; the patient becomes quiet, loses all recollection of his former sufferings, and often remains in a state of enviable comfort for twelve or sixteen hours. The suppository may be repeated as need be; the preferable time for its exhibition is the hour of sleep." Alkalies and copious mucilaginous diluents should also be given. *In Irritable States and Painful Affections of the Bladder*, the above treatment, modified according to the urgency

of the case, may be had recourse to with advantage. It proves in many instances essentially useful in alleviating the severe pain occasioned by the *presence of Calculus in the Bladder*. In such cases it is best administered in the form of enema or suppository.

1533. *In Spasmodic Stricture of the Urethra*, and in *Inflammatory Retention of Urine*, a hot bath, and a full dose of opium, followed by a dose of castor oil, will often suffice to give relief in recent cases of no great severity following a debauch, exposure, &c. Sir H. Thompson (p. 78), however, is strongly opposed to the delay which must occur in this treatment, and advises speedy resort to the catheter—a gum one at first, but if this should fail, to a silver one (not larger than No. 6). He thinks the risk of doing a little mischief to the urethra, under such circumstances, is preferable to that of the atony of the bladder which is likely to supervene if that viscus be for a long time subject to great distention.

1534. *In Gonorrhœa*, in the acute stage, Mr. Morgan[1] has found great relief from opiate injections (℞ T. Opii. ♏xxx.–lx., vel Ext. Opii. Aquos gr. j., Aq. fl. oz. j.) applied so as to reach the deeper parts of the urethra. (See Injections, Part ii.) *In Spermatorrhœa*, he also states that he has found a sedative solution (℞ T. Opii. ♏xxx., Aq. fl. oz. j.), used night and morning, most efficacious in allaying hyper-sensibility, except in those rare and severe cases which require stronger local applications by the porte caustique or sponge.

1535. *In Acute Orchitis*, Mr. J. Rouse[2] pronounces the treatment by opium "the simplest, most satisfactory, and most efficient." After a purgative, he commences with opium (gr. j.), night and morning, and gives at the same time, ♏xx. of T. Ferri. Perchlor. thrice daily; the testicle to be supported, and kept enveloped in a hot fomentation of liquor plumbi and laudanum, which is of considerable use in producing ease. In ordinary cases nothing else is necessary. Improvement speedily ensues, and a cure is effected in about a week. This treatment seems well worthy of further trial.

1536. *In Diabetes*, the beneficial influence of opium has long been recognised, but it has generally been looked upon rather as a palliative than a curative agent. This view, however, is combated by Dr. Pavy (p. 274), who is satisfied, after extensive experience, that it exerts a direct remedial effect on the disease. He states[3] that he knows no medical agent capable of exerting a controlling influence over the disease like that exercised by opium. He admits that alkalies and ammonia exercise a slowly beneficial influence on the complaint, but he has never observed from their use the immediate and striking effects

[1] Dubl. Quart. Journ., May, 1869.
[2] St. George's Rep., 1870, iv., p. 251.
[3] British Medical Journal, May 1, 1869.

obtainable from opium. He mentions one case in particular, in which it effected a direct and perfect cure. It should be given in full doses, and it is worthy of remark, that diabetic patients will bear large doses of opium without its producing its ordinary soporific effect. It is best adapted for old cases occurring in the aged, and it requires to be persevered in.

1537. *In Cancer of the Uterus*, opium stands first in the list of palliatives, quieting constitutional irritation, and allaying local pain. For this purpose it requires to be given by mouth, in large and repeated doses, and per rectum in form of enema or suppository. Morphia introduced hypodermically may prove superior to either of these modes of administration. The dose must be regulated by the amount of relief afforded. *In Uterine Inflammation*, Dr. Tilt[1] considers the local application of opiates, in suppositories or enema, more effectual than their internal administration. For the relief of *Uterine and Ovarian Pain* of a non-inflammatory character, Dr. Graily Hewitt (p. 379) states that one of our best remedies is a combination of Battley's Liq. Opii Sed. and Sp. Æther Sulph. Co. *In Irritable Uterus*, opium gives more speedy relief than any other remedy; but as Dr. Graily Hewitt observes (p. 365), the long-continued use of opiates in these cases is perhaps the worst form of treatment that could be devised. Gooch found that the patients who remained longest uncured were those who gradually accustomed themselves to a daily enormous allowance of opium. When congestion exists, a few leeches should precede, and in many cases may obviate the necessity for the use of opiates. In these cases, and in *Ovarian Irritation*, pessaries of opium (gr. ij.), as originally advised by Dr. Churchill,[2] often afford marked relief.

1538. *In Dysmenorrhœa*, when the pain is very severe, opiates are necessary, and are best used in the form of enemata; but in simple or ordinary cases, we can dispense with opium. (Dr. Graily Hewitt, p. 443.) It may often be advantageously combined with camphor. A hot linseed-meal poultice sprinkled with laudanum, applied to the hypogastrium, often affords relief. When the pain is habitually severe, one hypodermic injection of morphia will often be sufficient at each menstrual period. (Dr. Tilt, p. 116.)

1539. *In Suppression of the Menses, consequent on violent mental emotions*, opium is a most valuable remedy. In cases of sudden suppression in young women of weakly habit, who have been subjected to disturbing emotional influences at the menstrual period, opium and a supply of good nourishment should be freely given, and rest and quietude enjoined. (Dr. Graily Hewitt, p. 414.) *In sudden suppression from a chill*, the action

[1] Lancet, Feb. 2, 1861. [2] Dublin Journ. of Med., Aug. 1851.

of the skin should be excited, by placing the patient in bed and giving Dover's powder (grs. x.–xv.), and applying sinapisms to the hypogastric region, and hot-water bottles or bags to the loins. Cupping over the loins, or leeches to the vulva, may also be had recourse to.

1540. *In threatened Abortion*, opium proves in some instances of great value; but caution is necessary in its use. Dr. Lever[1] has ably pointed out those cases in which it may be used with advantage, and those in which it is inadmissible. When abortion occurs from fœtal disease or imperfection, so that the premature emptying of the uterus is but an effort of nature to get rid of that which she cannot accomplish; if, with the discharge, there is a patent state of the os uteri, and if the cervix be soft and loose, the exhibition of opium will do harm by retarding the emptying of the uterus, which must sooner or later take place. When, however, it arises from accident, or from mental causes, or from those which may be said to be due to habit, he has known the exhibition of opium by mouth, or, what is better, a cold starch injection with opium, thrown into the bowel, and repeated every night or oftener, according to existing circumstances, followed by the best results. Application of cold, perfect quietude, and unstimulating diet should be enforced. When, however, *abortion has taken place*, especially if the event has been attended with much loss of blood, opium, in almost every case, may be given not only with safety, but with benefit. It will then allay excitement, tranquillize the circulation, and procure sleep.

1541. *In Parturition*, there can be no doubt of the value of opium in certain stages, and under certain circumstances, but its indiscriminate use cannot be too strongly condemned, as the large and repeated doses in which it has too often been administered are apt to exercise a prejudicial and even fatal influence on the fœtus. Many of the indications for which opium used formerly to be given are now fulfilled, and with greater certainty and speed, by anæsthetics. The action of opium in these cases has been much elucidated by Dr. P. C. Barker, of Morristown, U.S.[2] From careful observation in many cases, he concludes that opium possesses the power of relaxing the circular fibres, at least of the os, and of stimulating the longitudinal and oblique fibres into active contraction. Instead of its exercising, as has been generally thought, a general anodyne effect upon the uterus, he considers it to possess special power as a parturient agent. "I say general effect," he remarks, "for while it sometimes quiets uterine contractions (witness its universal use for this purpose), yet it

[1] Med. Gaz., Dec. 23, 1850.
[2] Braithwaite's Retrosp., 1869, vol. lx. p. 243.

is in those cases in which the circular fibres are called into action alone, or when the longitudinal and oblique fibres contract irregularly—in short, in *false pains*. I am fully persuaded that opium never did, or can, arrest a physiological labour. I have many times been called to cases in which the pains have returned regularly, and with increasing intensity, for a number of hours, without producing dilatation to any extent, and after giving a full opiate, have had the satisfaction of finding a marked improvement, after a sufficient time had elapsed for its absorption, the patient having even harder contractions with less distress than before, and the os uteri being speedily dilated." Acting on his views of the action of opium, he states that he has administered it in *Hour-glass and other Irregular Contractions of the Uterus*, and that he has found it a prompt and reliable remedy; in fact, in all cases of *Delayed Labour dependent on inefficient uterine contractions*, he uses opium instead of ergot. In three cases of *Placenta Prævia*, he also used opium with the effect, in each instance, of saving the life of the mother; in these cases, he considers that it meets two important indications—1. It facilitates dilatation, thus shortening the period of greatest danger. 2. It promotes the expulsive power of the uterus. It serves also to lessen hæmorrhage, by a special hæmostatic action. The property claimed for opium, of stimulating into action the longitudinal and oblique fibres of the uterus, and at the same time of relaxing the circular fibres of the os, being established, the administration of this agent admits of wide application in uterine therapeutics. In *Dysmenorrhœa*, *Abortion*, *Irregular Contractions of the Uterus of all kinds*, *previous*, *during*, *or subsequent to Labour* (*After-pains*), *and in Placenta Prævia* (as an adjuvant to Barnes's dilator), it will be found valuable, and more certain in action, when given under proper indications, than any other remedy. (Dr. Barker.)

1542. *In Uterine Hæmorrhage*, opium exercises a powerful influence, partly in virtue of its special hæmostatic action, and partly from its power of increasing uterine contraction. For the principle which should guide us in employing it, see the preceding section.

1543. *In Puerperal Convulsions.* 1. In convulsions, especially those of the hysterical form, occurring, as they do, more frequently during pregnancy than during labour, opium is a valuable remedy. "This form of convulsions," observes Dr. Lever, "evidencing itself, as it does most frequently, during gestation, is readily recognised by the predisposition of the patient, often induced by mental anxiety, irregularity of diet, preceded by intolerance of noise, sleep short and interrupted, twitchings, startings, oppression of the chest, difficulty of breathing, &c., and when the convulsions manifest themselves,

the larger muscles are more often affected than the smaller; here we find, after the paroxysm is over, that a mild opiate soothes the patient, allays the twitching, and procures sound and refreshing sleep." 2. *In the anæmic form of Puerperal Convulsions*, associated as it not unfrequently is with large losses of blood, where the face is pale, the eyes glassy, the features shrunken, the countenance betokening exhaustion, the skin cool, the breathing laboured, the pulse small, quick, and irritable, with noise in the ears, and pain and weight on the top of the head; where there is sleeplessness or restlessness, partial amaurosis, strabismus, and sometimes delirium; while close attention is paid to the position of the head and body, while stimulants are administered with judgment, while contraction of the uterus is secured, opium will be found to act like a charm. 3. *In genuine Puerperal Convulsions* (eclampsia), where vascular excitement has been subdued, and relaxation of the soft parts has been accomplished by depletion, purgation, and tartarized antimony, and where the repetition of the fits seems to depend upon irritation, Dr. Lever states that he has occasionally seen them checked by the administration of a full opiate. According, however, to the experience of others, it proves injurious in convulsions occurring in plethoric subjects. *Puerperal Insanity*, see sect. 1504.

1544. *In Puerperal Fever*, opium is a very valuable remedy. It tends in a marked degree to allay the pain, and to reduce the excitement of the nervous and vascular systems. Dr. Churchill (p. 471) speaks highly of its efficacy. He states that he has seen cases yield to the administration of one grain of opium, repeated every hour until the symptoms have subsided. Dr. Stokes was the first to point out the value of opium in these cases, and Dr. Churchill states that he has repeatedly verified his remarks on its value. The treatment of puerperal fever by large and repeated doses of opium has also been advocated by Dr. A. Clark, of New York.[1] He regards it as chiefly useful when *Peritonitis* is a prominent element; and to be successful, he adds, it should be commenced early, and the patient brought under its influence as rapidly as is consistent with safety. The tolerance of opium in this disease is very marked. The great value of opium in *Pelvic Inflammation* is lucidly set forth by Dr. Lauchlan Aitkin,[2] who considers that opium or morphia suppositories, frequently repeated, or the subcutaneous injection of morphia, are generally the best forms of administration. *In Puerperal Intestinal Irritation*, after the bowels have been well cleared out, opium, either alone or combined with alteratives, is highly serviceable. It may also be given in the form of enema. *Puerperal Diarrhœa* may

[1] Ranking's Abstract, xxii. p. 186. [2] Edin. Med. Journ., April, 1870.

often be effectually arrested by a few drops of the tincture, either alone or in combination with the mineral acids.

1545. *Diseases of the Eye, Ear, and Throat. In Purulent, Gonorrhœal, Variolous, Scrofulous, and Catarrho-Rheumatic Ophthalmia*, vinum opii, either pure or diluted, with one or two equal parts of water, forms an excellent application. It should never be of sufficient strength as to cause much pain. It is particularly useful when there is much scalding pain, lachrymation, and photophobia. It produces excellent effects in that relaxed condition of the conjunctiva which frequently remains after the acute stage has been subdued. *In Ophthalmia Tarsi*, it often proves useful. In these cases, the pain may often be relieved by applying the vapour of a warm solution of opium, by means of a proper glass, to the eye.

1546. *Otalgia* is often speedily relieved by the introduction into the external meatus of a piece of cotton wool soaked in equal parts of tepid laudanum and olive oil. In some forms of *Deafness*, the endermic use of opium proves serviceable. (See Morphia.)

1547. *In Toothache*, a piece of solid opium, or cotton wool saturated with the tincture, introduced into a carious tooth, frequently affords temporary relief.

1548. *In Ptyalism*, opium has been given internally with the view of arresting the excessive discharge. Dr. Graves (i. p. 478) quotes a case in his practice, in which its influence was very marked. The patient was profusely salivated; every means had failed to diminish the flow of saliva, until opium (gr. j. every four hours) was ordered; an almost immediate cessation of the discharge ensued.

1549. *Other Diseases. In Acute Rheumatism*, the treatment by large and repeated doses of opium, originally proposed by Dr. Cazenave, of Pau, has been strongly advocated by Sir D. Corrigan,[1] of Dublin, and the cases recorded by him, Dr. Sibson,[2] and others, demonstrate its power and value as an anti-rheumatic. Sir D. Corrigan generally commences with gr. j., every two or three hours, and recommends the dose to be increased, both in frequency and quantity, until the patient feels decided relief, when it should be kept up at that dose until the disease is steadily declining. The average quantity required in twenty-four hours is about grs. xij., and even that quantity does not affect the head; occasionally he found it produce diarrhœa, which required astringents to check it. The tolerance of opium in this disease is very remarkable. Dr. Fuller (p. 90), who is not in the habit of prescribing opium alone in acute rheumatism, but who combines it with other

[1] Dublin Med. Journ., November, 1839.

[2] Brit. Med. Journ., Nov. 21 and Dec. 5, 1858.

remedies, alkalies, colchicum, &c., testifies to its value in doses far exceeding in amount the quantity usually administered. In the early and most painful stage of the disease in adults, he considers that it may be given with the greatest advantage in doses of grs. vj.–viij. daily, and to children, in doses of gr. ½ every three or four hours. In these doses, when combined with other treatment, he states that he has never seen it check secretion, or produce the slightest cerebral disturbance; rarely indeed did it occasion sleep, but it calmed the patient's irritability, and alleviated his sufferings; more than this, it seemed in some instances to hasten convalescence, and lessen the frequency of inflammation of the heart. As a general rule, the continuance of pain is the best practical test of the propriety of its administration, and of the extent to which its exhibition is required; and whether ten or two grains only are needed in the course of the day, it may be given with impunity, and indeed with advantage, as long as pain and restlessness continue. Its only contra-indication is the suspension of secretion; the only circumstances calculated to point to its having been given in too large doses, the supervention of stupor or narcotism. (Dr. Fuller.) *In Rheumatic Carditis*, opium is of all remedies that which comes most powerfully in aid of blood-letting and mercury. In every case, opium in *full doses* is indispensable. To the weak and irritable, to whom mercury is of little service, it proves particularly valuable. (Dr. Fuller, p. 233.) If, after all active symptoms have subsided, there remains much irritability of the heart, it is expedient, whilst attending to the general health, to administer occasional doses of opium and digitalis, and to apply an opium or belladonna plaster to the chest. (Ibid., p. 242.) *In Chronic Rheumatism*, opium is valuable in relieving pain and in procuring rest, but beyond this it appears to have little influence. Dover's powder is one of the best forms of exhibition. (Ibid., p. 424.) Diligent friction with opium liniment is often serviceable in *Lumbago*, *Crick of the Neck*, and other local rheumatic affections. An opiate plaster is also productive of comfort in this class of cases.

1550. *In Gout*, opium, internally and locally to the affected part, was employed to mitigate the severity of the paroxysm, by many of the older physicians. At the present day, it is rarely exhibited alone, although it may be advantageously combined with other remedies. Purgatives should in every case precede the internal use of opium in this disease. "In weakly habits," observes Dr. Copland (ii. p. 50), "or where there seems to be a state of asthenic or irritative action in the fit, and particularly if the external affection shifts its seat, the opiate should be combined with camphor, in doses proportioned to the urgency of the nervous symptoms, or of vital depression. This combination will promote the cutaneous excretion; the

camphor preventing any tendency to the retrocession or suppression of the paroxysm that may exist, or that the opium may occasion." A linen compress, soaked in tepid laudanum, applied locally, often affords marked relief. A solution of hydrochlorate of morphia (grs. viij., Aq. fl. oz. j.) is a more elegant and equally effectual application.

1551. *In Phlegmasia Dolens*, Dr. Graves (ii. p. 293) observes that, in addition to the application of leeches, and the use of anodyne ointments, we should employ large doses of opium internally. Some patients, he adds, if the bowels be regulated, will bear from gr. iv.–v. or even gr. vj. of opium in the day, when the disease has advanced to the second stage.

1552. *In Cancer*, opium, in large and increasing doses, has been employed with the view of alleviating the patient's sufferings. Dr. Copland believes that, when combined with suitable remedies, it is otherwise productive of benefit.

1553. *In Mortification*, opium is an invaluable remedy. It soothes the pain, and diminishes the restlessness and irritability with which mortification is so often accompanied, and frequently procures sleep. It is especially indicated when spasms or convulsions arise in the progress of the disease. *In sloughing phagedenic Ulcerations*, Dr. Tweedie states that he has seen the most astonishing results from large doses of opium; and I can bear witness, in my own practice, to its value in these cases. *In Chronic Ulcerations*, especially of the lower extremities, Mr. Skey[1] speaks highly of the value of opium administered internally. He considers no other remedy as comparable to it. Mr. C. Heath[2] also speaks highly of it in ulcers of the legs; he has found it of greatest service, however, in the small irritable *Ulcer often found in combination with Varicose Veins*, and also especially in any form of ulcer in which a sloughing action has supervened.

1554. *In Carbuncle*, Mr. Paget,[3] who does not place much reliance on internal remedies in this affection, remarks that opium is often very valuable, especially in all the earlier stages, in which it relieves suffering as thoroughly as incisions or any other measure. After the early stages, however, he regards it as unnecessary, except for some patients who are unable to sleep.

1555. *In Syphilis*, it was formerly highly esteemed; but, at the present day, it is only regarded as an adjunct to other treatment, to reduce any increased constitutional irritation, and to prevent other remedies, particularly mercurials, from passing off by the bowels. *In Syphilitic Eruptions, and Syphilitic Sore Throat* attended with phagedenic ulceration, opium

[1] Lancet, Jan. 26, 1856.
[2] Practitioner, Aug. 1869.
[3] Lancet, Jan. 16, 1869.

is a valuable means of quieting the constitutional disturbance and arresting the progress of the disease. Dr. Schedel[1] states that he has seen it in several cases effect a cure, where the eruptions and other symptoms had resisted all other measures. It is to be given, he adds, at first in ½ gr. doses, gradually increased, every three or four days; it may be carried as far as gr. iv. daily, but it requires to be watched.

1556. *In Psoriasis*, attended with distressing irritation, Sir H. Holland (p. 431) states that he knows of no application which is more beneficial than soft poultices, prepared with a small proportion of a solution of opium, and continued until the state of the skin is thoroughly changed.

1557. ORYZA. RICE. The husked seeds of Oryza sativa, *Linn. Nat. Ord.* Gramineæ. Cultivated throughout the tropics, where it constitutes the principal food of thousands.

Med. Prop. Demulcent, and slightly diuretic, when taken in the form of decoction (Rice oz. j., Water Oij., boil and strain). This is also in very general use as an enema, in affections of the bowels. 1. Finely-powdered rice-flour is used as a substitute for wheat flour, as a local soothing application to *Erysipelatous Surfaces*, *Burns*, *Scalds*, &c. 2. Smoothly mixed with water, it forms an excellent poultice, equal in most cases to linseed meal. Dr. Tilt (p. 49), indeed, considers it preferable as an application to the mucous membrane of the vulva. 3. *In poisoning by Iodine* it may be substituted for starch, if none of the latter be at hand. New rice is apt to produce diarrhœa and colic. As an aliment, it is highly nutritious, some samples containing as much as 80 per cent. of starch.

OURARI POISON. See STRYCHNOS TOXIFERA.

1558. OVUM. The egg of the hen of Gallus Banckiva, *var.* domesticus. The Common Domestic Fowl.

Med. Prop. and Action. The shell of the egg, composed chiefly of the carbonate and phosphate of lime, was formerly much used as an antacid and absorbent; and entered into the composition of Miss Stephens's nostrum for dissolving calculi. The white (*Albumen Ovi*) and the yolk (*Vitellus Ovi*) are well known as light and nutritive articles of diet, particularly during convalescence. The yolk is much used in pharmacy, in making emulsions, &c. It is an ingredient in Mist. Sp. Vini Gallici (*v.* ALCOHOL). The white is useful in some cases of poisoning. Agitated with alum, it forms an astringent poultice. (See ALUMEN.)

1559. *Therapeutic Uses. In Poisoning by Corrosive Sublimate, the Salts of Copper and Zinc, by Creasote and Corrosive Poisons generally*, the white of an egg, from the quantity of albumen which it contains, is one of the best antidotes. The white of one egg has been stated to be sufficient to counteract the effects of four grains of corrosive sublimate.

1560. *In Poisoning by the Mineral Acids*, the shells of eggs finely powdered may be substituted for chalk, lime, &c., should these latter not be at hand.

[1] Lib. of Med., vol. i., p. 440.

1561. *In Hæmorrhage from Superficial Wounds, Leech-bites, &c.*, the local application of the white semi-opaque membrane which lines the shell is, in ordinary cases, sufficient to arrest the bleeding.

1562. Oxygenium. Oxygen. O = 16. An essential constituent of all living bodies. Water contains $\frac{8}{9}$ of its weight of oxygen, and the atmosphere about 23 per cent. by weight. Sp. gr. 1·1057. Combined with other elementary bodies, it forms oxides.

Med. Prop. and Action. Stimulant (?). When pure oxygen is inhaled, it increases the force and frequency of the pulse, causes exhilaration of spirits, and a gentle diaphoresis. These effects soon pass off. Animals confined in an atmosphere of pure oxygen soon die, and after death the blood, both arterial and venous, is found of a bright scarlet hue, very liquid, and is rapidly coagulated. (Pereira.) According to Dr. Richardson,[1] oxygen proves fatal, not by the introduction of a poison into the system, but by a negation or withdrawal of some principle extant in the primitive oxygen which is essential to life. MM. Demarquay and Leconte,[2] from a series of experiments on the effects of oxygen on man, have arrived at the following conclusions:—1. Oxygen applied locally to wounds (by a special apparatus), whether recent or old, causes little pain, but ultimately gives rise to a more or less vivid reaction. It rapidly modifies, and in some cases removes, the inflammatory or congestive redness which surrounds wounds. 2. It may be injected into the mucous or serous cavities without ill effects. In one case, *Hydrocele* underwent a cure after its injection. 3. It may be inhaled in doses of 20 to 40 litres at one time daily, without inducing any accident. 4. Its essential property is to increase the strength, stimulate the assimilative powers, and develope the appetite. They believe it to be especially indicated in *Anæmic Conditions* and certain diatheses, as *Diphtheritis, Syphilis, and Diabetes.* They believe it to be contra-indicated in febrile states, except under certain diathesic conditions, as croup; in deep-seated inflammatory action and visceral lesions; in diseases of the heart and large vessels; in neuralgia unconnected with anæmia, and where there is a disposition to hæmorrhage. The value of *Oxygenated Water* as a therapeutical agent has been examined by M. Ozanam.[3] The water is distilled, and then charged with oxygen under high pressure. He finds that it improves the condition of the blood in asthma, cyanosis, and other diseases in which that fluid is impaired or deficient. It possesses an oxidizing or metamorphic influence in cases where the organic products are arrested in their development, as *Glycosuria, Gout, Uric* and *Oxalic Gravel*, and perhaps *Scrofula.* It exerts a regulating and exciting action on the brain and thyroid gland, and hence is of use in *Goître* and *Cretinism.* The properties and uses of oxygen have been made the subject of a *brochure* by Dr. S. B. Birch, whose estimate of its powers are very high.

1563. *Therapeutic Uses. In Asphyxia* due to accidental suffocation, oxygen is a valuable resource; it may be also useful in cases of strangulation, hanging, and drowning, as well as in poisoning by noxious gases or vapours. (Dr. C. Paul.[4]) Though successful in some cases, and therefore worthy of a trial, it is by no means uniformly effectual.

[1] Brit. Medical Journ., July 14, 1860.

[2] Med. Times and Gaz., Feb. 27, and March 26, 1864.

[3] Year-Book of Sydenham Soc., 1862, p. 173.

[4] Bull. Gén. de Thérap., Aug. 15, 1868.

1564. *In Chronic Pulmonary Affections*, oxygen inhalations are occasionally beneficial. Dr. Paul (op. cit.) speaks of it as a valuable remedy in *Nervous Asthma;* and in *Humid Asthma* also—*i.e.*, *Catarrh complicated with emphysema*—he regards it as serviceable, provided its use be persisted in. A case of *Asthma* in which the inhalation afforded great relief is recorded by Dr. J. Hooper.[1] It is of doubtful safety in asthma complicated with heart disease. *In Phthisis*, oxygen inhalation, formerly much esteemed, did not, in Dr. Paul's hands, give such good results as were expected; it afforded immediate relief, and so far was valuable, but fresh exacerbations followed, more intense perhaps than the preceding ones. At the best, it can only be regarded as a palliative. By its action on the liver (sect. 1566), it may serve to relieve secondary *Bronchial Congestion.*

1565. *In Albuminuria*, oxygen, in Dr. Paul's opinion, may become a valuable remedy, if it be found by further observation to cause the albumen to disappear from the urine, as was observed in a case by Eckart, and in another in Dr. Paul's own practice. The same remark is applicable to *Diabetes.*

1566. *In Gout*, it promises to be of value. Dr. Goolden[2] found that the inhalation of a mixture of 1 part of oxygen and 4 of air, pretty uniformly clears the urine of the lithates; and further, that the formation of urea instead of uric acid may be promoted by supplying the system with oxygen. For this purpose oxygen may be inhaled, or the binoxide of hydrogen (fʒj. in Aq. fl. oz. ij.) exhibited. This, he found, had a marked influence on the biliary secretion, which it increases in quantity and improves in quality, often producing excessive biliary dejections, and thus relieving congested livers and secondary bronchial congestion. This serves to corroborate the statement of Dr. Birch, that he has often found the proper exhibition of oxygen afford immediate relief in *Constipation depending upon torpid and congested liver, with chronic derangement of the biliary secretion.*

1567. *In Chronic Nervous Affections, Epilepsy, Paralysis, Spasm, &c.*, oxygen inhalations have been employed by Dr. Ramskill.[3] In a case of epilepsy occurring in connection with syphilitic cachexia, the inhalation of oxygen two or three times a day seemed productive of benefit. The inhalation should be stopped on the accession of giddiness or other uncomfortable symptoms. For children, Dr. Ramskill adopts the plan of making them inhale atmospheric air through a glass inhaling apparatus one-third full of solution of peroxide of hydrogen. The solution should be well charged with oxygen; and to facilitate its being given off, the inhaling apparatus should be agitated by an attendant during the process, and a hot, moist cloth kept

[1] Brit. Medical Journ., March 15, 1862.

[2] Lancet, March 10, 1866.

[3] Med. Times, July 4, 1863.

wrapped round it. The inhalation should be continued until some sensible effect is produced on the pulse or the feelings of the patient. The slightest feeling of giddiness is considered a sign of sufficient action. *Neuralgia*, as in a case recorded by Dr. J. Hooper (op. cit.), is sometimes relieved or cured by oxygen inhalation.

1568. *In Local Gangrene*, if there be not obliteration of the arteries, oxygen is spoken of by Dr. Paul (op. cit.) as a sovereign remedy. M. Laugier[1] found local oxygen gas baths very serviceable in *Senile Gangrene;* they may be continued for an hour or more, and repeated 6 or 8 times a day. Dr. Goolden (op. cit.) mentions two cases of *Phagedenic Ulceration* which yielded to the local application of the gas, and the internal administration of binoxide of hydrogen (℥j. in Aq. fl. oz. ij.) As a local agent in these cases it seems well worthy of further trials.

1569. Panis. Bread. Panis Triticeus. Wheaten Bread. A most valuable and nutritious article of food.

Medical Uses. 1. Bread poultice, which is thus directed to be prepared by Mr. Abernethy:—Put half a pint of hot water into a basin; add to this as much crumb of bread as the water will cover; then place a plate over the basin, and let it remain for about ten minutes. Stir the bread about in the water, or, if necessary, chop it a little with the edge of a knife, and drain off the water by holding the knife on the top of the basin; but do not press the bread as is usually done; then take it out lightly, and spread it about a third of an inch thick on some soft linen, and lay it on the part. A little liquor plumbi or olive oil may be mixed with it. It is an excellent application to *Burns*, *Scalds*, *Excoriations*, *Irritable Ulcers*, *Abscesses*, &c. Milk is sometimes substituted for water. 2. Bread is often used in the formation of pills, but it is objectionable for such a purpose, as it becomes very hard by keeping; and the chloride of sodium which enters into its composition is apt to decompose the active ingredient; this is particularly the case with the nitrate of silver.

Bread is objectionable as a diet for diabetic patients, as it tends, from the large proportion of starch (53 per cent.) which it contains, to increase the saccharine constituents in the urine. Almond or bran biscuits are the best substitutes. Some excellent remarks on the employment of the latter article of diet in *Diabetes* have been published by Dr. Camplin,[2] who speaks highly of its value.

1570. Papaveris Capsulæ. Poppy Capsules. The nearly ripe dried capsules of the White Poppy, Papaver somniferum, *Linn.* *Nat. Ord.* Papaveraceæ. Cultivated in Britain.

Med. Prop. and Action. Sedative, anodyne, possessing the properties of opium in a milder and varying degree. The extract (*infra*) is the best form for internal use; it is milder in its operation than opium, and is considered to produce less nausea and excitement. The syrup, which is a common ingredient in cough mixtures, &c., for children, is objectionable on account of its varying strength, and from its rapidly fermenting at high temperatures. Fomentations of the decoction (oz. ij., Aq. Oj½.,

[1] Medical Circular, July 2, 1862. [2] On Diabetes, Lond. 12mo, 1858.

boiled to Oj.) act as an anodyne, though much of the effect is due to the combined heat and moisture. The seeds yield a bland oil.

Dose:—Of the Extract of Poppies, gr. ij.–v. *Of the Syrup*, fl. drm. j.–ij.

Therapeutic Uses. See OPIUM.

1571. PAPAVERIS RHŒADOS PETALA. RHŒADOS PETALA, B. Ph. RED POPPY PETALS. The fresh petals of Papaver Rhœas, *Linn.* Officinal only, in the form of syrup, as a colouring agent. Of no therapeutic value.

1572. PAREIRÆ RADIX. PAREIRA ROOT. PAREIRA BRAVA. The dried root of Cissampelos Pareira, *Linn. Nat. Ord.* Menispermaceæ. *Hab.* Common throughout the tropics of both hemispheres.

Med. Prop. and Action. Mild tonic and diuretic. It is advantageously given in infusion (gr. cccIx. ad Aq. Ferv. Oj.) in doses of fl. oz. iss.–fl. oz. ij., three or four times daily. Sir B. Brodie's formula (*infra*) is also very good. The root contains a peculiar alkaloid, *Cissampeline;* a bitter yellow matter, some resin, starch, and salts. The properties of the plant are supposed to depend on the alkaloid. It appears to exercise a specific action as an astringent and sedative on the mucous membrane of the genito-urinary system.

Dose:—Of the powdered Root, gr. xxx.–lx. *Of the Extract*, gr. x.–xx. *Of the Liquid Extract*, fl. drm. ½–ij. *Of the Decoction* (Pareira Root oz. j½., Water Oj.), fl. oz. j.–ij.

1573. *Therapeutic Uses. In the advanced stages of Acute, and in Chronic Inflammation of the Bladder*, pareira brava proves particularly useful. Sir B. Brodie (p. 109) states that he is satisfied that it exerts a great influence over this disease; very materially lessening the secretion of ropy mucus, and diminishing the inflammation of the bladder. He recommends the following formula:—Take of the root ℥ss., add water Oiij.; simmer over the fire until reduced to Oj. Of this f℥viij.–f℥xij. to be taken daily. From ♏xxx. to lx. of the fluid extract may be substituted, if preferred. To this may be added tincture of hyoscyamus; and where there is a deposit of the phosphates, hydrochloric or nitric acid.

1574. *In Catarrhal Affections of the Bladder*, Dr. Prout (p. 392) considers that pareira is undoubtedly one of the best remedies we possess. *In Cystirrhœa*, it has been given with unequivocal benefit. The above formulæ may be employed.

1575. PEPSINA. PEPSINE. The active digestive principle of the gastric juice of mammalia; prepared in a variety of ways from the stomachs of calves, sheep, and pigs. As used in medicine, it occurs as a nitrogenized, light, amorphous, greyish-white or fawn-coloured powder, soluble in water and in weak spirit; of a peculiar faint odour, and bitter nauseous taste; but when quite pure,

it is both tasteless and inodorous. It is decomposed by a heat of 120° F., and afterwards no longer possesses its digestive properties. (Dr. Scoresby-Jackson.) Much of the pepsine of commerce is almost or wholly inert. It should be preserved in well-stoppered bottles.

Med. Prop. and Action. Taken internally, it produces no marked physiological effects beyond increasing the appetite for food, and, under certain conditions, allaying irritability of the stomach. It forms, in fact, a sort of artificial digestive, and in this character is undoubtedly useful in some cases; but the extravagant laudations of some individuals, combined with the fact that many spurious, inert articles are sold under its name, have served to bring it into disrepute. It should be taken immediately before meals wrapped up in a wafer, or in the first spoonful of soup; and precaution must be taken not immediately afterwards to eat food which is at a high temperature. Several modes of administration have been proposed: we shall mention the following:—1. *Elixir.* Take (ordinary) Pepsine gr. lx., Distilled Water fl. drs. vj., White Wine fl. oz. j., Spirits of Wine fl. drs. iij., White Sugar oz. j., M. The dose, a tablespoonful, to be taken immediately after a meal. It has an agreeable taste, and women and children take it readily. 2. *Pastiles* or *Lozenges.* These are composed of gum acacia paste, with a few drops of essence of lemon; each should contain four grains of pepsine. Their agreeable taste is their great recommendation. The syrup is an objectionable form. Some persons will take it readily spread on bread and butter, in the form of a sandwich.

Dose of Pepsine, gr. xv.–gr. xx. To be taken immediately before or with a meal.

1576. *Therapeutic Uses. In Dyspepsia connected with deficient secretion of gastric juice*, pepsine seems to be especially indicated. Dr. Ballard[1] remarks that it is especially useful in gastric disturbances following the use of animal food. It often enables a patient who has not dared to attempt it, and could not do so without suffering, at once to eat it with impunity. Even the severest cases of *Gastralgia* are relieved by its use. If it fail to afford relief after three or more doses, it is probable either that the dyspepsia does not arise from a defect of the gastric secretion, or that some other condition predominates as its cause. Dr. Wilson Fox (ii. p. 821) bears strong testimony in its favour, not only in *Atonic Dyspepsia*, but also in some conditions where the digestive process is impaired by irritative states of the mucous membrane. It may often be advantageously taken with hydrochloric acid at meal-times. It may be given conjoined with other medicines, which do not at all impede its therapeutic action: thus, with hydrochlorate of morphia, to relieve violent pain of the stomach; with strychnia, to stimulate peristaltic movement; with nitrate of bismuth, lactate or iodide of iron, &c.

1577. *In Obstinate Vomiting of Pregnancy*, pepsine is a remedy of great power. It was first used for this purpose by Dr. Le Gros,[2] who relates seven cases in which it proved signally

[1] On Artificial Digestion, &c., Lond. 8vo, 1857.

[2] Bull. Gén. de Thérap., Feb. 15, 1858.

beneficial. Its *modus operandi* in these cases is obscure, but its efficacy is often striking. In one case in my own practice, the elixir (*ante*) proved completely and speedily effectual when all other means had failed.

1578. *In the Inanition of Infants*, pepsine proved most effectual in the hands of Dr. Joulin.[1] He considers that it should be employed in all cases of congenital feebleness, with arrest of development of the digestive system, and even in complicated cases in which the lesion affects, at the same time, the digestive and respiratory systems. By removing one of the complications which threaten the life of the child, nature is frequently enabled to complete the cure; and the improvement of the digestive system is the first to be accomplished. In the *Diarrhœa of young infants*, dependent on the presence of undigested food, pepsine in small doses proved effectual in the hands of M. Corvisart.[2]

1579. PETROLEUM. Rock Oil or Barbadoes Tar, a bituminous treacle-like exudation from rocks, and found on the surface of certain lakes. It is met with abundantly in Trinidad, Barbadoes, also near Rangoon, on the banks of the Irrawaddy, and on the shores of the Caspian Sea.

Med. Prop. and Action. Terebinthinate stimulant, and expectorant. Externally applied, rubefacient.

Dose, gutt. xx.–xxx. in emulsion, or in any convenient vehicle.

1580. *Therapeutic Uses. In Asthma and Chronic Coughs*, unattended with inflammation, it has been given with the effect of stimulating the expectoration.

1581. *In Chronic Rheumatism*, it has been used externally and internally with great advantage. O'Shaughnessy[3] states that it stimulates the skin, and, entering the circulation by imbibition, proves diuretic and diaphoretic. Speaking of the Rangoon petroleum, Dr. Fleming[4] states that he has found more benefit from it than from the most costly cajeput oil. *In Paralytic Affections*, it has also proved serviceable.

1582. A case of *Beriberi*, successfully treated by petroleum externally and internally, is related by Mr. S. Arokeum,[5] but how far the recovery was due to this agent is doubtful.

1583. *In Chronic Skin Diseases*, it is a useful application. Dr. Mudge[6] relates an obstinate case of *Chronic Eczema* which, after a variety of other means had failed, yielded to petroleum incorporated with soap (℥j. ad Sapon. ℥j.) *In the Scabies of Children*, Dr. Monti,[7] of Vienna, has successfully employed a

[1] Brit. and For. Med.-Chir. Rev., Jan. 1862, p. 235.
[2] Rev. Méd.-Chir. de Paris, Dec. 1856.
[3] Beng. Dispensatory, p. 693.
[4] Asiatic Researches, xi.
[5] Madras Med. Journ., July, 1863.
[6] Indian Ann. of Med. Sci., 1854, vol. ii. p. 450.
[7] Practitioner, Nov. 1868.

combination of petroleum and olive oil or glycerine, equal parts, or 3 of petroleum to 1 of the diluent.

1584. *In Gonorrhœa*, it has occasionally been substituted for copaiba in doses of gutt. xx.–xxx. in emulsion.

1585. PHOSPHORUS. (P = 31.) A non-metallic element obtained from bones. A semi-transparent, colourless, wax-like solid, which emits white vapours when exposed to the air. Sp. gr. 1·77. Insoluble in water, but soluble in ether and in boiling oil of turpentine. Ignites in the air at a temperature a little above its melting point, 110° F.

1586. *Med. Prop. and Action.* Nervine, tonic, and stimulant; in over-doses, poisonous. In small medicinal doses it produces no well-marked physiological effects, but the nervous system, if previously impaired or debilitated, gradually manifests increased strength and vigour; and this is probably due to its supplying the phosphatic element to the nervous tissue, which may be presumed to be deficient in those cases, from the fact that in cases of over-taxed nervous energy it has generally been observed that the urine contains an excess of phosphatic matter. Its action on the nervous system is probably analogous to that of iron on the blood. Solid phosphorus given in as small a dose as $1\frac{1}{2}$ grain acts as a poison, death seeming to take place in a gradual and painless way, with perfect retention of consciousness. There may be some vomiting, and the substances ejected appear luminous in the dark, as also does the stomach itself after death when cut open in a dark place; but it is rare to find any marked inflammation of this organ. In the case of a bird poisoned by eating several grains of phosphorus, Dr. Thorowgood, whose remarks we are quoting, could find scarcely a trace of inflammation anywhere in the digestive tract. In a case recorded by Casper, where a dose of three grains of phosphorus proved fatal to a lady in twelve hours, the body after death presented the extraordinary phenomenon of luminous vapour issuing from each of its outlets. Analysis of the various tissues of animals poisoned by phosphorus has demonstrated the presence of phosphoric acid in unusual amount; this arises from the oxidation of the phosphorus in the body. Phosphoric acid is also increased in the urine of those who have taken any preparation of phosphorus. The action of phosphorus as a poison appears not to be due to any direct action on the nervous system, but to its preventing the assimilation of oxygen by the constituents of the blood; by thus checking oxidation it may cause the fatty degeneration of the liver so often met with in those who have been poisoned by phosphorus, and which is doubtless connected with the symptoms of severe icterus so often seen in the patients before death. (Dr. Thorowgood.[1]) The fumes of phosphorus cause violent irritation of the mucous membranes of the air passages, nostrils, and eyes, and persons exposed much to its vapour in manufactories are liable to necrosis of the lower jaw. Externally applied, it is a violent irritant. No certain antidote in poisoning by phosphorus is known, but the oil of turpentine appears to hold out a prospect of acting effectually in this character.

Dose, gr. $\frac{1}{60}$–$\frac{1}{40}$ in the form of pill or capsule, made by melting finely-divided phosphorus with fat, and then covering the pill with an impermeable covering. The solid form, however, is objectionable; a preferable form is a solution in oil prepared by gently warming phosphorus (2 parts) in almond oil (100 parts) for about twenty minutes in a flask that is closed so as almost to exclude the air; when cool the oil is to be decanted off from the

[1] Practitioner, July, 1869.

undissolved phosphorus. Of this the dose is gutt. iij.–viij. in emulsion or with cod-liver oil. A solution in ether (gr. iv. ad Ether fl. oz. j.) has also been employed in about the same doses. The great objection to both these formulæ is their nauseous taste. All the good effects of phosphorus, without its drawbacks, are to be obtained probably by the use of the alkaline hypophosphites. (See Sodæ Hypophosphis.)

1587. *Therapeutic Uses. Affections of the Nervous System. In all cases of Nervous Exhaustion*, especially in those induced by mental causes, phosphorus or its compounds are indicated, and may be advantageously combined with strychnia and quinia in the form of syrup. *In Paralysis*, it has been successfully employed by Dr. Delpech, though in some cases in which it had previously been given by Dr. Hughes Bennett, it failed to produce any marked benefit. In both instances the phosphorated oil was employed. *In Softening of the Brain*, phosphorus in small doses was some years since recommended by Dr. Forbes Winslow, but subsequent experience has failed to confirm his recommendation.

1588. *In Epilepsy*, it was tried in two severe cases by Dr. Anstie,[1] and though it failed to influence the actual paroxysms, the patients improved much in general health, and the sense of languor and depression was sensibly relieved. He regards it as well worthy of further trial. Dr. Radcliffe (ii. p. 142) reports very favourably of its action *in Chorea*, but he has abandoned its use for the hypophosphite of soda, which he gives in combination with cod-liver oil (*q.v.*) He regards phosphorus, in the form of phosphorated oil or ether, as perfectly innocuous when given in proper doses carefully watched.

1589. *In Mercurial Trembling*, marked benefit is stated to have resulted from the use of the phosphide of zinc.[2] Whatever efficacy it possesses is doubtless due to the phosphorus, which seems worthy of a trial in these cases.

1590. *In Impotence*, occurring in old, debilitated subjects, it is reported to be efficacious. It formed the basis of the famous nostrum of Kæmper. Its aphrodisiac effect is said soon to pass off, and its habitual use induces debility, stupor, and precocious old age. (Ryan.)

1591. *In Phthisis*, phosphorus was tried in twenty-five cases by Dr. Cotton,[3] who draws the following conclusions: 1. Phosphorus exerts no specific action upon consumption. 2. In some cases it seems to act as a tonic and stimulant, but its influence in this respect is inferior to that of many other remedies of a similar kind. 3. Although in many cases it seems to agree very well with those who take it, yet it sometimes occasions loss of appetite, nausea, and abdominal derangement.

[1] Med. Times and Gaz., April 5, 1862.

[2] The Practitioner, Aug. 1868.

[3] Med. Times and Gaz., July 6, 1861.

1592. *In Cataract*, M. Tavignot[1] has recorded some cases tending to show that by means of frictions on the forehead with phosphorated oil, and instillations of the same into the eye, the hardened lens or capsule may become absorbed, and restoration of sight established, thus obviating the necessity of an operation.

1593. Acidum Phosphoricum Dilutum. Diluted Phosphoric Acid. Phosphoric Acid, H_3PO_4, dissolved in water, and corresponding to 10 per cent. by weight of anhydrous phosphoric acid, P_2O_5. Sp. gr. 1·08.

Med. Prop. and Action. Tonic and refrigerant. In large doses, it acts as a powerful stimulant of the nervous and vascular systems; it is absorbed into the system, and has been detected in the blood; it also communicates a peculiar odour to the breath. In very large doses it is an irritant poison. Dr. Pavy's[2] experiments with this acid, showing that when injected into the duodenum it is capable of inducing a diabetic state of the urine, are both important and interesting.

Dose, ℥x.–xl., diluted in sugar and water.

1594. *Therapeutic Uses. In Scrofula*, Mr. Balman[3] states that he has seen phosphoric acid exercise a very beneficial effect in a large number of cases; and that he does not hesitate to assert that, as a therapeutic agent, it will be found in no degree inferior to iodine, cod-liver oil, or barium. "Its effects," he observes, "are sometimes very marked in those obstinate forms of *Strumous Conjunctivitis* which sometimes resist for a long period every kind of treatment, and at other times will quickly disappear under the influence of some simple local application; but which perhaps will as speedily return under the slightest exciting cause." In *Intermittent Forms of Ophthalmia, arising in a Scrofulous Constitution*, he found this medicine of especial service, not only in completely removing the disease, but also in preventing its recurrence. He prescribes it in doses of ℥v. of the dilute acid, gradually increased to ℥xx. or more, in infusion of calumba. Thus given, it may be continued for any length of time without producing any unpleasant effects.

1595. *In Dropsy*, it has been employed as a stimulant tonic, in purely chronic and asthenic cases. It is of very doubtful value as an internal remedy; but it has been attended in some cases with apparent benefit, diluted with oil and used as an embrocation over the abdomen.

1596. *In Hæmoptysis*, M. Hoffman[4] reports favourably of this acid (gutt. x.–xxx. in mucilage thrice daily). He con-

[1] Lancet, Jan. 23, 1869.
[2] Guy's Hospital Reports, 1861, vol. vii.
[3] Med. Gaz., Aug. 22, 1851.
[4] The Practitioner, Aug. 1868.

siders it superior to the other mineral acids. He has also found it useful in *Genito-urinary Catarrh.*

1597. *In Calculous Disease*, phosphoric acid has occasionally been employed with a view of correcting alkalescence of the urine. In a case related by Mr. Balman,[1] after the nitric, hydrochloric, and acetic acids had been administered successively without effect, he found the phosphoric acid of great service, acting as a tonic to the digestive powers, and diminishing the quantity of ropy mucus in the urine.

1598. *In Diabetes*, phosphoric acid, largely diluted, assuages the inordinate thirst so common in this disease, more effectually than any other acidulated drink. (Paris.) In a case recorded by Dr. Thornley,[2] it not only had the effect of allaying the urgent thirst, but acted apparently as a curative agent.

1599. *In Cardialgia*, Dr. Todd states that he has employed phosphoric acid with excellent effect.

1600. *In Caries*, phosphoric acid, diluted with eight or ten parts of water, was locally applied by Lentin,[3] under the idea that the disease arose from a deficiency of phosphoric acid in the bone. In some instances it appears to have been beneficial. It is also supposed to exert an influence on the growth of *Osseous Tumours.*[4]

1601. PHYSOSTIGMATIS FABA. CALABAR BEAN. The seed of Physostigma venenosum, *Balfour*. *Nat. Ord.* Leguminosæ. *Hab.* Western Africa.

Med. Prop. and Action. An energetic poison, long in use amongst the people of Calabar and other parts of Western Africa in their trials by ordeal; hence its name, the *Ordeal Bean of Calabar.* Attention to its physiological effects was first called in this country by Prof. Christison, who tried it on his own person in a dose of twelve grains: the prominent symptoms were vertigo, a sense of extreme prostration, and syncope, whilst the action of the heart and circulatory system were rendered very weak, tumultuous, and irregular; the mental faculties, however, remaining unimpaired. Subsequently, many cases of poisoning occurred, some of them with fatal results, the principal symptoms in all being contraction of the pupil, paralysis of the lower extremities, and more or less of other parts of the body, without loss of sensation. Dr. Fraser, whose able investigations have thrown much light on the operation of this agent, found that in large doses it causes also nausea, vomiting, and purging, together with a peculiar epigastric sensation which is always relieved by eructation. He likewise observed that it causes excessive perspiration, which is most marked when a large dose is administered by subcutaneous injection. Dr. Fraser gives the following summary of the physiological action of the kernel or embryo of the bean, as observed in the lower animals:—1. It acts on the spinal cord by destroying its power of conducting impressions. 2. This destruction may result in two well-marked and distinct effects: *a.* In muscular paralysis, extending gradually to the respiratory apparatus, and producing death by asphyxia; *b.* In a rapid paralysis of the heart, probably due to the extension of this action to the

[1] Med. Gaz., Dec. 1, 1848.
[2] Med. Press, May 20, 1868.
[3] Quoted by Pereira, vol. i. p. 349.
[4] Garrod, Ess. Mat. Med., p. 35.

sympathetic system, thus causing death by syncope. 3. A difference in dose is accompanied by this difference in effect. 4. This action does not extend to the brain proper *pari passu* with the action on the spinal cord; the functions of the brain may, however, be influenced secondarily. 5. It also produces paralysis of muscular fibre, striped and unstriped. 6. It acts as an excitant of the secretory system, increasing more especially the action of the alimentary mucous glands. 7. Topical effects follow the local application of various preparations; these are, destruction of the contractility of muscular fibre when applied to the muscles, and contraction of the pupil when applied to the eye-ball.

1602. It is chiefly used as a topical agent in ophthalmic surgery. In 1856, Van Hassett found contraction of the pupil to follow the internal administration of the bean; while Dr. Fraser, in 1862, showed that its local application was sufficient to induce this condition. In 1863, Dr. Argyll Robertson further pointed out that the local application of this remedy induced spasm of the accommodation of the eye as well as contraction of the pupil, and was capable of counteracting or modifying the dilatation of pupil and paralysis of accommodation resulting from the application of belladonna or atropia to the eye. Mr. Bowman further observed a degree of astigmatism, or irregular refraction of the media of the eye, as one of the symptoms. The following are the effects observed upon the application of a drop of a moderately strong solution of the spirituous extract to the conjunctiva of the eye. In the course of about ten minutes the accommodation of the eye becomes affected, objects beyond a few inches from the eye appear dim, enlarged, and close to the eye, while upon the use of a suitable concave glass these symptoms disappear—in fact, a condition of short-sightedness results. At the same time a sensation of straining is felt in the eye, similar to that experienced after a prolonged near inspection of fine objects. After a short interval the pupil becomes contracted, and this may reach such an extent that the pupil does not measure above one-third of a line in diameter. As a consequence of this contraction, less light is admitted to the retina, and objects appear darker than natural, while the pupil of the other eye becomes sympathetically somewhat dilated. As the effects pass off the affection of the accommodation gradually returns to its normal state, and secondarily the pupil dilates, and in the course of about twenty-four hours the eye has returned to its natural condition. These symptoms are most readily explained by the supposition that Calabar bean possesses a stimulant action upon the ciliary nerves which are distributed to the circular fibres of the iris, thus causing contraction of the pupil, and to the ciliary muscle, thus causing myopia. The local employment of this agent is beneficial, 1st, in cases of paralysis of the circular fibres of the iris and of the accommodation, such as are apt to follow exposure to cold, or to occur in the course of diphtheria, continued fever, or other debilitating diseases; 2nd, to counteract the effects of atropia or belladonna on the eye; 3rd, to diminish the amount of light admitted to the eye in cases of acute inflammation of the choroid or retina; and 4th, in the case of penetrating ulcers or wounds at the peripheral part of the cornea, with the view of preventing or reducing prolapse of the iris. (Dr. Scoresby-Jackson.) With regard to the antagonism of physostigma and atropia, the reader is referred to some interesting observations by Mr. Wharton Jones,[1] which tend to show, 1, that atropia stimulates the sympathetic, and physostigma the third nerve; and 2, that while atropia contracts the arteries, physostigma contracts the veins.

Dose:—Of the Powdered Bean, gr. j., cautiously increased to gr. iij., or at most gr. vj. *Of the Extract*, gr. $\frac{1}{16}$, increased to gr. $\frac{1}{4}$, or more. For dose and mode of administration hypodermically, see sect. 1603. For local application, a solution of the extract in glycerine, of such a strength that one minim contains the active ingredients of gr. iv. of the bean, is most generally employed. *Calabarized Gelatine* is a very convenient and

[1] Practitioner, Sept., 1869.

portable form. It consists of thin sheets of gelatine, saturated with a spirituous solution of the bean, and marked out into small squares, or cut into minute discs, each of which is sufficient for a single application. They are applied by means of a fine moistened camel-hair pencil to the conjunctiva, where they are dissolved by the tears and produce their due effect. (Dr. Scoresby-Jackson.)

1603. *Therapeutic Uses. In Tetanus*, physostigma promises to be a remedy of much value. Dr. Fraser,[1] of Edinburgh, has collected notices of twelve cases in which it has been employed, and the results are, on the whole, encouraging. The extract is the best form for an adult; gr. j. by the stomach, or gr. $\frac{1}{3}$ by subcutaneous injection, will be generally sufficient to commence with, repeated in two hours, when its effects will usually have passed off, and the succeeding doses may be modified according to the experience thus gained. When used hypodermically, the dose of the extract should be carefully mixed with ♏x.–xv. of water, and its acidity neutralized with a solution of carbonate of soda, or which is still better, according to Dr. Haining,[2] with bicarb. of potash. For children, the dose must be regulated according to age, one-third, or one-fourth, or even less, of the above dose sufficing. It is necessary to repeat these doses frequently—every hour, every hour and a half, or every two or three hours, according to the severity of the disease. The great object is to produce as quickly as possible, and then to maintain, the physiological effects of the drug in diminishing reflex excitability. The dose must therefore be continued in increasing quantities until this effect is produced, or until its sedative action on the circulation is carried to a dangerous extreme, or until constant nausea and vomiting compel us to desist. Dr. Fraser is in favour of subcutaneous injection, especially in severe cases; but Dr. Eben. Watson, who has had great experience in its use, states that by this mode of application he has failed to obtain any very decided or reliable effect. He prefers prescribing the alcoholic extract in solution as a weak tincture; but should the stomach reject this, he gives a double dose in starch water, in the form of enema. He coincides with Dr. Fraser in the necessity of giving it in large and frequently repeated doses, the sole limit being the complete subsidence of the tetanic spasms, or the development of the poisonous effects of the drug to a dangerous degree. The tolerance of the remedy is wonderful. In one case under Dr. Watson's[3] care, the patient during 43 days took 1,026 grains of the alcoholic extract, the quantity in one day amounting to 72 grains! In another case, successfully treated by Dr. Haining (op. cit.), within a month no less than ten drachms were introduced into the system, chiefly by sub-

[1] Practitioner, August, 1868.
[2] Lancet, Dec. 18, 1869.
[3] Practitioner, April, 1870.

cutaneous injection, through 140 punctures made over both arms and shoulders, and over the chest, abdomen, and left thigh! A few small abscesses resulted, but they appear to have been of little consequence. Dr. Watson maintains the safety of a very full and free administration of Calabar bean in traumatic tetanus, if only two conditions be fulfilled: 1, that the patient be well and intelligently watched, so that the drug be given really as often and as much as the patient requires at the time; and 2, that his strength be well supported by fluid nourishment and stimulants. The relaxation produced by the bean enables the patient to swallow fluid food, and therein consists its superiority to all other relevants, such as chloroform or chloral, for instance, which prevent the taking of food. It is not, of course, always successful: an instance in which it failed even to afford relief, though the physiological effects of the drug were produced, occurred in the practice of Mr. F. Mason, at Westminster Hospital.[1] For much information on this subject see Dr. Eben. Watson's papers in "Glasgow Medical Journal," November, 1868, and "Lancet," April 4 and 11, 1868.

1604. *In Poisoning by Strychnia*, the experiments of Dr. Fraser tend to the conclusion that we shall find an antidote in physostigma. A case successfully treated by it is related by Dr. Keyworth.[2] It acts, as in tetanus, by directly and powerfully diminishing the reflex activity of the spinal cord. It should be employed hypodermically.

1605. *In Chorea*, it has been successfully employed by Dr. Harley[3] and Dr. Ogle.[4] Its use is indicated in those cases in which the involuntary contractions demonstrate an exaggerated condition of the reflex motor function of the spinal cord; but as Dr. Fraser observes, the experience we yet possess is much too limited to allow us to arrive at any decided opinion as to its value. Dr. Ogle also mentions a severe case of *Paralysis Agitans*, in which he gave physostigma in very large doses for a long period without obtaining any benefit.

1606. PIMENTA. Pimento. All-spice. The unripe fruit of Eugenia Pimenta, *D. C. Nat. Ord.* Myrtaceæ. *Hab.* West Indies, &c.

Med. Prop. and Action. Stimulant and carminative. Its activity depends on a volatile oil (Oleum Pimentæ), which, in doses of ♏j.–v., is the best form of administration. The Distilled Water (fl. oz. j.–ij.) is much used as a vehicle for other medicines.

Therapeutic Uses. Similar to those of Carum Carui.

[1] Lancet, Oct. 10, 1868.
[2] Glasgow Medical Journal, Nov. 1868.
[3] Med. Times and Gaz., Jan. 16, 1864.
[4] Ibid., Sept. 2, 1865.

1607. PIPER NIGRUM. BLACK PEPPER. The dried unripe berries of Piper nigrum, *Linn.* *Nat. Ord.* Piperaceæ. *Hab.* East and West Indies.

Med. Prop. and Action. Stimulant and carminative, in doses of gr.v.-x. Pepper is also regarded as anti-periodic; this attribute is as old as the time of Celsus.[1] When taken internally, it acts as a stimulant, increasing the arterial action, the cutaneous and other secretions. On the mucous membranes of the rectum and the genito-urinary organs, it seems, in common with cubebs, to exercise a specific action. In large doses it produces inflammation of the stomach, and acts as an irritant poison. It contains three active principles—1, a crystalline principle, Piperine (*q.v.*); 2, a volatile oil, on which the odour and taste of the drug depend; 3, an acrid resin. Under each of these principles intermittent fevers have been said to have been cured; but, on the other hand, they have each, when given singly, been found to fail; it appears probable that none of them, given singly, is so uniform in its operation as when they are administered together in the form of pepper. Externally, ground pepper is irritant, and is occasionally added to sinapisms, to increase their activity. The volatile oil is sometimes employed as a rubefacient. White Pepper is merely black pepper deprived of its outer integument.

Dose:—Of Black Pepper powdered, gr. v.-xx. *Of the Confection* (Black Pepper oz. ij., Carraway fruit oz. iij., each finely powdered, Honey oz. xv.), gr. lx.-cxx.

1608. *Therapeutic Uses.* *In Intermittent Fevers*, pepper bruised and macerated in spirit and water, has long been a popular remedy in the East and West Indies. Mild, uncomplicated cases occasionally yield to its use, but most frequently it fails to produce any benefit. It should be given immediately before an expected paroxysm. Dr. Pereira quotes several German authorities, who testify to the febrifuge powers of this remedy.

1609. *In Hæmorrhoids occurring in old persons, or proceeding from debility, and also in a relaxed condition of the Rectum, producing occasional Prolapsus*, the administration of the confection in doses of gr. lx.-gr. cxx., persevered in for three or four months, often affords great relief, and sometimes effects a cure. It is only applicable in chronic cases, and in weak, leucophlegmatic habits. An occasional aperient should be given to prevent its accumulating in the bowels.

1610. *In Cholera*, the natives of India often prescribe an infusion of recently roasted black pepper. Dr. Ainslie[2] states that he has known it put a stop to the vomiting, when many other remedies had failed. A "cholera pill" popular in Bengal is a combination of powdered pepper (gr. j.), assafœtida (gr. j.), and camphor (gr. ij.) Given early, it is said to be often effectual in arresting the disease.

1611. *In Gonorrhœa*, it has in some instances been effectually substituted for cubebs.

1612. *In Tinea Capitis*, an ointment composed of oz. iv. of

[1] Lib. iii. cap. 12.

[2] Mat. Med. of Hindostan, p. 34.

powdered black pepper and lb. j. of lard, has been well spoken of as a stimulant application.

1613. PIPERINA. PIPERINE. A crystalline principle obtained from Black and Long Pepper; it exists probably in the fruit of other Piperaceæ.

Med. Prop. and Action. Tonic and anti-periodic.

Dose, gr. vj.-x., twice or thrice daily.

1614. *Therapeutic Uses. In Intermittent Fevers*, it was highly reported of by Dr. Hartle, of Trinidad,[1] Dr. Blom,[2] and others, but it has not sustained the character they assigned to it. Sir W. O'Shaughnessy,[3] indeed, states that in no instance did he find it of the least utility, though he prescribed it in all doses, from 1 to 30 grains. It appears to possess some value as a tonic, and may be serviceable in convalescence from fevers and other exhausting diseases.

1615. PIX BURGUNDICA. Burgundy Pitch. A resinous exudation from the stem of the Spruce Fir, Abies excelsa, *D.C.*, melted and strained; imported from Switzerland.

Med. Prop. and Action. Burgundy Pitch is employed solely as a plaster (Empl. Picis); and, as such, it acts as a stimulant and rubefacient. It should be evenly spread on a piece of leather, and should always be employed fresh. By adopting the usual plan of keeping the pitch in a ladle, and remelting the same portion repeatedly, it loses much of its irritant qualities, and consequently of its efficacy. It will remain adherent to the cuticle for several weeks. In some persons it produces an intolerable itching; and in others a pustular eruption, which renders it necessary to remove it in a few hours after its application. Powdered hydrochlorate of ammonia sprinkled over its surface increases its stimulant action.

1616. *Therapeutic Uses. In Chronic Coughs, Chronic Bronchitis, and other Pulmonary Affections*, a Burgundy pitch plaster often proves highly serviceable, not only by protecting the chest from feeling the atmospheric changes, but by acting as a rubefacient and counter-irritant. In the first stage of *Phthisis*, Dr. Barlow[4] speaks of the following plaster as a valuable method of counter-irritation:—℞ Emp. Picis Co. ℥j½., Ant. Tart. gr. x., M., ft. Emplast.

1617. *In Lumbago and Chronic Rheumatism*, the application of one of these plasters over the seat of pain often proves very beneficial, and affords great comfort to the patient.

1618. PIX LIQUIDA. TAR. A bituminous liquid obtained from the wood of Pinus sylvestris, *Linn.*, and other Pines,

[1] Edin. Med. Surg. Journ., Jan. 1841.
[2] Ibid., Oct. 1, 1837.
[3] Bengal Disp., p. 527.
[4] Pract. of Med., p. 303.

by destructive distillation. *Source*, Russia and North America.

Med. Prop. and Action. Terebinthinate stimulant, and diuretic. Its effects are very similar to those of turpentine, but it is milder in its operation, and communicates the odour of tar, instead of that of violets, to the urine. The vapour, when inhaled, acts as a stimulant and irritant of the lining membrane of the air passages. Tar water is prepared by shaking together one part of tar with four of water. The water takes up the soluble portions of the tar. Applied externally to ulcers, tar acts as a mild stimulant, and often induces a healthy action. The officinal ointment contains 5 parts of tar to 2 of yellow wax, melted together. The *Glycerole of Tar* is proposed by Mr. Brady[1] as superior to the ordinary ointment. It is formed by warming glycerine (fl. oz. vj.), stirring in powdered starch (gr. cxx.), adding tar (fl. oz. vj.), and raising the temperature of the mixture rapidly to boiling point. Strain through a cloth, if necessary, and stir whilst cooling.

Dose, of Tar, ℥xxx.–fl. drm. j., or more, made into pills with flour. The dose of Tar Water is fl. oz. j.–fl. oz. iv.

1619. *Therapeutic Uses. In Phthisis*, tar vapour diffused through the apartment, generated by heating tar over a spirit lamp, with the addition of a small quantity of potash to neutralize the irritant acid fumes, was introduced in 1817 by Sir A. Crichton, and obtained considerable repute, but it proved a failure in the hands of Dr. J. Forbes, Sir C. Scudamore, and others, and has fallen into disuse. It appears to be more serviceable in *Chronic Bronchitis*. It was in this latter affection that Bishop Berkeley lauded the internal administration of tar water; and, more recently, Dr. Dunglison[2] has employed, with great benefit, the following formula:—℞ Pix Liquid. oz. j., digere in Aq. Dest. Oij., per dies viij., et cola. Dose, fl. oz. viij.–xij., daily, in milk.

1620. *Habitual Constipation* may often be effectually removed by tar, in doses of gr. v.–x. every night. It requires to be persevered in for some time. Prof. Simpson speaks favourably of it, and Bishop Berkeley relates several surprising cures by the use of tar-water.

1621. *In Typhoid Fever*, Dr. Chapelle[3] speaks of tar-water as incontestably the most efficacious of remedies. To oz. ij. of tar he adds Oij. of boiling water; after it has stood a few hours, the patient commences to drink it, as much at a draught as he can, and filling up with ordinary water, so that the same quantity of tar will last during the whole treatment. He likewise employs injections, prepared by rubbing up the yolk of one or two eggs with a tablespoonful of liquid tar, and adding Oj. of warm water. This serves for two injections, of which six, eight, or even ten, should be administered daily.

1622. *Diseases of the Skin. In Lepra and Psoriasis*, tar inter-

[1] Pharm. Journ., Sept. 1862.
[2] Practice of Med., 1844.
[3] Ranking's Abstract, xxiii. p. 23.

nally and externally is occasionally of great service: it is, however, as a local application that it is principally used at the present day. If the eruption be extensive, there is, according to Dr. M'Call Anderson,[1] no class of remedies so generally useful as the preparations of tar. However, as he remarks, its application is sometimes not well borne; a single application in such cases having been known to aggravate greatly the inflammation of the skin. As there are no means of foretelling in what cases this is likely to occur, it should be commenced cautiously, using at first a diluted preparation, in preference to pure tar. When applied to an extensive surface, especially if it be firmly rubbed in on the skin, it is apt to become absorbed into the system, and induce nausea, vomiting, diarrhœa, and feverish symptoms. The matters vomited, the stools, and the urine, have a green or black appearance, owing to the presence of the colouring matter of the tar. These symptoms, however, rapidly subside, if the treatment be omitted for a few days, and diuretics are administered. Tarry preparations are objectionable for the head, owing to their glueing the hair together; or to the face, owing to the discoloration they produce. *In Eczema and Impetigo*, as well as in the preceding affections, Brady's glycerine of tar (*ante*) is a most useful application. Hebra's tincture, which consists of equal parts of tar, soft soap, and methylated spirit, is also highly spoken of. It should be applied twice daily, suffered to dry on the skin, and washed off with soft soap or petroleum soap.[2] *Ringworm* sometimes yields to tarry preparations locally applied.

1623. *To indolent and foul Ulcers*, tar ointment (*ut supra*) acts advantageously as a gentle stimulant, induces a healthy action, and hastens the healing process. MM. Corne and Demaux[3] speak highly of the value of a powder made by triturating from one to five parts of common *coal tar* with 100 parts of plaster of Paris, as a deodorizing and disinfecting application to *foul and gangrenous Ulcerations*. The powder is sprinkled over the sore, or is made into an ointment with oil.

1624. Plumbum. Lead. Pb = 207. In its metallic state, it is generally considered inert, although persons who are long exposed to its influence, as by handling it, become affected with lead poisoning. It is the basis of several important preparations.

1625. *The Physiological Effects of the Salts of Lead* are thus ably summed up by Dr. Pereira (i. 783):—"In small doses they act on the alimentary canal as astringents, checking secretion, and causing constipation. After absorption, the constitutional effects of lead are observed, the arteries become

[1] Glasgow Med. Journ., July 1865.
[2] Neligan's Medicine, p. 114.
[3] Comptes Rendus, July 18 and 25, 1859.

reduced in size and activity, the pulse becomes smaller, and frequently slower also; the temperature of the body is diminished, and sanguineous discharges, whether natural or artificial, are frequently checked, or even completely stopped. This constringing and sedative effect seems extended to the secreting and exhaling vessels; the discharges from the mucous membranes, the exhalations from the skin, and the urine, being diminished in quantity. Thus we observe dryness of the mouth and throat, greater solidity of the alvine secretions, diminution of the bronchial secretion, and of cutaneous exhalation. When the system becomes impregnated with the metal, it occasions a peculiar blue or leaden discoloration of the gums, mucous membrane of the mouth, and teeth. Salivation, and a bluish colour of the saliva, have also been observed occasionally. In very large doses, some of the salts of lead, the acetate for example, act as irritant and caustic poisons, giving rise to the usual symptoms indicative of gastro-enteritis." Dr. Bence Jones places lead and its preparations foremost in the class of remedies which acts by directly retarding oxidation in the system. As acids are the antitheses of alkalies, he remarks, so lead is the antithesis of iron. The multitude of organic substances, from albumen to sugar, that are precipitated by lead salts, shows the innumerable chemical actions they must occasion in the body. Probably they precipitate both the hæmoglobin of the blood-globules and muscles, and the protagon of the nerves and blood-globules. Certainly the most marked visible effects take place on muscles, nerves, and blood-globules. Combinations are formed which prevent further change, so that an arrest of action in the formation of muscles, nerves, and blood-globules takes place. From the affections of the muscles and nerves, paralysis and pain are produced; and from the affection of the blood-globules, anæmia results, and this causes diminished oxidation in the tissues, and hence accumulation of the urates in the textures is apt to occur, and though acute or chronic gout may follow, yet the increased chemical action is usually insufficient to remove the deposit which the arrest of oxidation continues to produce. (Dr. Bence Jones.[1]) Lead and its preparations are eliminated from the system by the urine, the perspiration, the milk, and probably by the bowels. The poisonous effects of lead salts comprise colic, rheumatism, paralysis, and a peculiar cerebral affection named encephalopathy. For an excellent account of lead-poisoning, or Plumbism, and its treatment, see a paper by Dr. E. Clapton.[2]

1626. Plumbi Acetas. Acetate of Lead. $Pb(C_2H_3O_2)_2 . 3H_2O$. Called also Sugar of Lead.

Med. Prop. and Action. Internally, it is astringent and sedative; diminishing the secretions, and reducing the activity of the capillary system (see *Phys. Effects, ante*). Externally, in solution (gr. xxx.–gr. lx., ad Aq. fl. oz. vj.), it is used as a lotion.

1627. *Obs. on its Use.* 1. In order to prevent the acetate being converted into a carbonate, it is advisable to combine its use with dilute acetic acid, which can be taken in the form of draught, after each dose of the acetate.

2. It should be given in the form of pill. It is usually combined with opium, an unchemical but efficacious formula. Common water should never be used as a vehicle.

3. It is one of the few astringents admissible during the presence of inflammation. It may often be safely and beneficially administered with opium, after depletion. Its action is then rather that of a sedative, than of an astringent.

4. The acid infusion of roses, sulphuric acid, all the sulphates, as of magnesia or alum, as well as the phosphates and carbonates, should be prohibited during its use, as they interfere with its operation.

5. During its administration, if a blue line be observed on the gums,

[1] Med. Times and Gaz., 1866. [2] Ibid., Nov. 28, 1868.

(Dr. Burton[1] observed this in one case, after giving five doses of gr. v. each), or if there occur gripings, tightness of the chest, or burning of the stomach, it should be discontinued. Large doses, however, may be given, particularly if conjoined with the use of acetic acid, without these effects being observed.

6. The acetate in any form should not be locally applied when ulceration of the cornea exists, as it is apt, under such circumstances, to leave an indelible opaque deposit of carbonate of lead in the tissue of the cornea. Many eyes are irreparably damaged by neglect of this caution.

Dose:—Of the Acetate, gr. j.–iv. *Of the Pill of Lead and Opium* (Acet. of Lead in fine powder gr. xxxvj., Powdered Opium gr. vj., Conf. of Roses gr. vj.), gr. iij.–v. Contains opium gr. j. in eight grains of the mass. *The Compound Lead Suppositories*, B. Ph. 1867, each contains gr. iij. of Acetate of Lead, and gr. j. of Opium. *The Ointment* of the Acetate of Lead contains gr. xij. of the Acetate to oz. j. of Benzoated Lard.

1628. *Therapeutic Uses. Diseases of the Abdomen. In the advanced stages of Acute and in Chronic Dysentery*, acetate of lead (grs. iij.–iv.) in combination with Dover's powder (grs. iv.–v.) often proves highly serviceable, especially when the stools contain much mucus. Though less effectual perhaps than nitrate of silver or sulphate of copper, it possesses the great advantage of being applicable at a much earlier stage than either of these salts, from the comparative mildness of its operation. It may often be advantageously administered in the form of enema:—℞ Plumbi Acet. gr. x.; Acid. Acet. dil. ♏x.; Morphiæ Acet. gr. ¼; Aq. Tepid fl. oz. iv., M.

1629. *In many forms of Diarrhœa*, the acetate proves very effectual. *In the Diarrhœa of Typhoid Fever*, Dr. Harley (i. p. 631) speaks of it as a very suitable and efficacious remedy; but its continued use, he thinks, should be avoided, as it may subsequently affect the system injuriously. It may be given by mouth, or in the form of enema. *In the Diarrhœa of Typhoid Fever in Children*, Dr. Hillier (p. 340) recommends the acetate in doses of gr. ¼–½. He furnishes the following formula, which is an eligible form of administering this salt, in the *obstinate Diarrhœa of Children*:—℞ Plumb. Acet. gr. viij., Acid. Acet. Dil. ♏xij., T. Opii ♏viij., Mucilag. Tragacanth ℥ij., Aq. ad ℥ij., M. Dose, two teaspoonfuls for a child two years old. *In the Diarrhœa of Phthisis*, acetate of lead and opium will sometimes succeed even when stronger direct astringents fail.

1630. *In Cholera*, few remedies are more effectual at the outset of the disease in checking the diarrhœa than acetate of lead and opium, originally proposed by Dr. Graves, of Dublin. Its use, however, is limited to the earliest stages of the attack. Dr. Goodeve (i. p. 177) prefers administering the acetate in a fluid form:—℞ Plumbi Acet. gr. xxx., Acid. Acet. ♏x., Aq. Dest. ℥vj., M. Dose fl. oz. j.–j½., every half hour or hour; opium (gr. j.), to the extent of one or two doses,

[1] Med.-Chir. Trans., vol. xiii. art. v.

being given independently. As a general rule, he thinks, we should limit the quantity of opium to grs. iij., and the acetate to grs. x.–xv. in the first three hours; and if the disease shows signs of yielding, the doses can be diminished or stopped altogether.

1631. *In Ulcer of the Stomach*, the acetate is often effectual in allaying in a remarkable degree the severity of the symptoms, at the same time it apparently assists in some cases in establishing a healthy state of the ulcerated surface. It is especially useful in controlling *Hæmorrhage from the Stomach*, whether this arises from ulceration or idiopathically. It is best given in doses of gr. ij.–iij., combined with acetate of morphia gr. $\frac{1}{4}$–$\frac{1}{2}$. Thus given, it sometimes proves effectual *in Pyrosis*.

1632. *In Incarcerated Hernia*, enemas containing the acetate of lead have been successfully employed by Dr. Huxthausen,[1] who relates three cases illustrative of its efficacy. The strength was ℥j. of the salt to f℥vj. of water. This quantity was found sufficient in the majority of cases, but it may be repeated if necessary. In each of the three cases above mentioned, spontaneous re-position took place within five hours. The efficacy of this treatment is further attested by Dr. Neuhold,[2] who relates several cases in which these enemas were attended with complete success. He found that from four to six enemas, each containing gr. x. of the acetate, were the utmost required. They were repeated every two hours.

1633. *Diseases of the Lungs. In Chronic Bronchitis*, accompanied by profuse secretion of mucus, and in *Bronchorrhœa*, the acetate often proves signally useful. *In Phthisis*, it proves serviceable by diminishing *the expectoration*, checking the *hæmorrhage and diarrhœa*, and in a minor degree *the profuse perspirations*. Dr. Symonds,[3] however, whilst regarding the acetate in gr. v. doses, with morphia and acetic acid, as effectual in tubercular phthisis, objects to its use on the ground that anorexia quickly ensues after a few doses.

1634. *In Asthenic Pneumonia*, especially when occurring in debilitated subjects, the acetate is highly recommended by Prof. Christensen; he prescribes it generally with quinine, gr. j. of each every two hours. If the cough is very violent, opium is substituted for quinine. Dr. Bramsen has been very successful with it in the *Pneumonia of Children*. Dr. Brandes obtained equally favourable results, and extols particularly its calming properties in this disease. He prescribed it in doses of gr. $\frac{1}{2}$ for children of one to eight years of age.[4] This treat-

[1] Brit. and For. Med. Rev., Oct. 1838.

[2] Monthly Journ. of Med., Feb. 1849.

[3] Brit. Medical Journal, June 13, 1868.

[4] Ranking's Abstract, 1859, xxx. p. 64.

ment is very favourably reported of by Dr. Leudet, of Rouen:[1] out of forty cases treated by the acetate, thirty-seven recovered and three died.

1635. *Diseases of the Circulatory System. In Aneurism*, a systematic course of the acetate has been employed with the view of promoting coagulation of the blood within the sac, but the success of the treatment seems doubtful. It was first tried by Dupuytren,[2] in three cases of *Aneurism of the Aorta*, with satisfactory results. After a small bleeding, he administered a pill containing gr. j. of the acetate, twice daily, and this was gradually increased until gr. vj. were taken in twenty-four hours. Amongst others who have employed it successfully, is Dr. Owen Rees,[3] who cured a popliteal aneurism as large as a duck's egg, by the steady use of the acetate, in doses of grs. iij.–v., thrice daily. In the hands of others, however, it has proved a failure; thus Dr. Waters (p. 410) states that, in the cases in which he tried it, it did not produce any apparently beneficial effect. Stillé (i. p. 198) limits its use to the sacculated form of aneurism; this he does not hesitate to affirm is cured, and can only be cured, by coagulation of the blood in the sac; and, in so far, he adds, as the acetate of lead, and other sedatives and astringents promote this object, they contribute to the cure. At the best, the acetate must be regarded as an auxiliary, a valuable one perhaps, to the more important items of rest, diet, and mechanical appliances.

1636. *In Hypertrophy of the Heart*, in incipient stages, the acetate is highly commended by Valentin,[4] but it is very doubtful how far it is capable of exercising any curative power. From the statements of M. Salgues[5] and others, there is little doubt that it serves in some instances to relieve *Violent Palpitations connected with Hypertrophy*, but this, as far as we know, is the limit of its utility.

1637. *In Hæmorrhages, active or passive, whether proceeding from the Lungs, the Stomach, the Kidneys, the Nose, or other parts*, the acetate of lead (gr. ij.–iv.), combined with opium (gr. ss.–j.), proves signally useful. The auxiliaries are the external application of cold, acidulated drinks, perfect rest, and antiphlogistic diet. *In Hæmorrhage from the Bowels in Typhoid Fever*, it often proves of great service, especially when given in the form of enema.

1638. *Diseases of the Genito-Urinary Organs. In Gonorrhœa, Gleet, and Leucorrhœa*, a solution of the acetate (gr. vj., Aq. fl. oz. j.: vel Liq. Plumb. Subacet. fl. drm. ij., Aq. Oj.) forms a useful sedative injection.

1639. *In Chronic Cystitis*, Sir H. Thompson (p. 150) regards

[1] Brit. Med. Journ., Jan. 17, 1863.
[2] Archiv. Gén. de Méd. 1839.
[3] Lancet, March, 1865.
[4] Brit. and For. Med.-Chir. Rev., Jan., 1862.
[5] Rev. Méd.-Chir., 1847.

the acetate in the form of injection as perhaps the best mild astringent when the urine is alkaline, and depositing phosphates; gr. j. to ʒiv. of warm water, to be used once a day. The rules laid down in Art. Injections should be carefully observed.

1640. *Menorrhagia*, which resists gallic acid and other remedies, will sometimes yield to an enema of the acetate:—℞ Plumbi Acet. gr. xv.–xx., T. Opii ♏xl., Mucilag. fl. oz. ij., M. In mild cases, the combination of the acetate and opium, taken internally, is sometimes effectual. *In Uterine Hæmorrhage, with threatened Abortion*, it is a valuable adjunct to opium when that drug is indicated. (See Opium.)

1641. *Diseases of the Eye.* In the treatment of *Granular Lids, Acute and Chronic Catarrhal Ophthalmia, Scrofulous Affections of the Eye, Vascular Cornea, &c.*, the acetate of lead in substance has been successfully employed as a local application by Dr. Cunier, of Brussels, and by Dr. Buys.[1] It is directed to be reduced to an impalpable powder; a moistened pencil should then be dipped in it, and about a grain or a grain and a half applied to the inner surface of the lid. When the lid is touched, it should be kept everted until the tears have dissolved the acetate, and those portions of the salt which escape solution should be taken off with the pencil. *In Ophthalmia, especially of Children*, a very weak solution (Liq. Plumbi Subacet. ♏x.–xv., Aq. fl. oz. j.) is a very soothing application; but in these and other cases, it is inadmissible when ulceration of the cornea exists, as it is apt, under such circumstances, to leave an indelible opaque cicatrix.

1642. *In Erysipelas, Urticaria, Lichen, and other Skin Diseases*, the following lotion is favourably spoken of by Mr. Erasmus Wilson (p. 159) as a means of allaying the pain and irritation:—℞ Ammoniæ Carb., Plumbi Acet. āā ʒj., Aq. Rosæ fʒviij., M. ft. lotio.

1643. Plumbi Carbonas. Carbonate of Lead.

Med. Prop. and Action. A poisonous salt, very seldom exhibited internally. Externally applied, it is a local sedative and astringent. It is sometimes mixed with starch, and dusted on the surface, in the *Excoriations of Children* and fat persons, or used in the form of ointment (gr. lxii. ad Ung. oz. j.) *to Excoriated Surfaces, Burns, and Ulcers;* but its absorption produces poisonous effects, and there are many more safe and equally efficacious remedies.

1644. Plumbi Iodidum. The Iodide of Lead. PbI_2.

Med. Prop. and Action. Alterative-tonic, in doses of gr. ⅛–¼. Rarely administered internally. Chiefly applied externally in the form of ointment (gr. lxij. ad Ung. oz. j.) or plaster (oz. j., Soap Plaster, Resin Plaster āā oz. iv.)

[1] Ranking's Abstract, Dec., 1850.

1645. *Therapeutic Uses. In Scrofulous Enlargement of the Glands*, MM. Cottereau and De Lisle, who introduced the use of this remedy in 1831, state that it is the most efficacious of all the salts of iodine; that it promises the most prompt and certain action; and that it is, moreover, free from the inconvenience of creating cutaneous inflammation. Velpeau employed this salt in three cases with unequivocal benefit. It should be used externally and internally. Occasionally it produces gastric irritation. *In Scirrhus of the Mamma*, Lisfranc employed it locally with decided advantage.

1646. *In Chronic Enlargement and other Affections of the Spleen*, it has proved highly useful. Sir R. Martin[1] states that he has derived great benefit from its internal use, and that with it he cured the largest spleen he ever saw in Bengal. He advises the following formula:—℞ Plumb. Iod. gr. xxx., Conf. Ros. q.s. ft. pil. cxliv. Of these, one is to be given night and morning, increasing their number gradually.

1647. *In Porrigo*, Dr. Neligan[2] first employed the ointment with great success. Dr. Mercer[3] considers that its use may advantageously be extended to other skin diseases, and he cites cases of *Chronic Eczema*, *Erythema*, and *Psoriasis*, in which it was productive of good effects. He regards the officinal ointment as far too strong, and proposes to substitute grs. xij. in place of grs. lxij. to the oz. j. of the diluent. In the case of eczema, the following ointment afforded immediate relief to the intense itching:—℞ Plumb. Iod. grs. xij., Glycerin. fl. drm. j., Chloroform. ♏xl., Ung. ad oz. j., M.

1648. Plumbi Nitras. Nitrate of Lead. $Pb(NO_3)_2$.

Med. Prop. and Action. Astringent. Externally, it is used as an astringent lotion (gr. x.-gr. lx. ad Aq. fl. oz. j.) It is chiefly valuable as a disinfectant. A solution (gr. lx. ad Aq. fl. oz. j.) is said entirely to destroy the effluvium of decaying animal and vegetable substances. This is Ledoyen's Disinfecting Fluid. It is also said to be antiseptic.

Dose, gr. ¼-gr. j. in the form of pill, twice or thrice daily.

1649. *Therapeutic Uses. In Hæmoptysis*, Dr. Pereira (i. p. 802) considers that the action of acetate of lead and opium in these cases is rendered more certain and speedy by being given with a draught containing nitric acid, nitrate of lead being then formed in the stomach.

1650. *To Sore and Fissured Nipples* it has long been an esteemed application. Prof. J. G. Wilson[4] finds nothing so effectual as a solution of the nitrate (gr. x.) in glycerine (fl. oz. j.) It generally causes a sharp smarting pain for a time, but this

[1] Johnson's Tropical Climates, 6th ed., p. 299.
[2] Dublin Quart. Journ., Aug. 1848.
[3] Dublin Quart. Journ., Aug. 1867.
[4] Glasgow Medical Journ., May, 1869.

soon subsides. It should be applied freely to the affected nipple after suckling, and care should be taken to wash the part previous to the next application of the infant. A similar solution proves useful in *Chapped Lips and Hands*.

1651. *In Onychia*, to destroy the sanious fungous ulcers, Dr. De Moerloose[1] speaks highly of the local employment of the powdered nitrate. A single application every twenty-four hours suffices, a light bandage being applied in the interval. After the first application, the pain is stated to cease, the suppuration to be lessened, and the fetid odour destroyed.

1652. PLUMBI OXIDUM. OXIDE OF LEAD. PbO. Lithargyrum, B. Ph. 1864.

Med. Prop. and Action. Imperfectly known; it is not administered internally; it is the chief ingredient in Emplast. Plumbi, used in surgical practice as a support to weak parts, strapping, &c.; it is an ingredient in many officinal plasters.

1653. *Therapeutic Uses. Carbuncle.* "In local treatment one of the best things you can do, if the carbuncle is small, is to cover it with empl. plumbi spread upon leather, with a hole in the middle through which the pus can exude, and the slough can come away. That, occasionally changed, is all the covering a small carbuncle will need. It is, however, difficult thus to cover the whole surface of a large carbuncle, and to keep it clean (which is of the greatest importance), and therefore the best application for that, is the common resin cerate, which should be spread large enough to cover the whole carbuncle, and over it should be laid a poultice of half linseed-meal and half bread." (Mr. Paget.[2])

1654. PLUMBI SUBACETATIS LIQUOR. SOLUTION OF SUBACETATE OF LEAD. Subacetate of Lead, $PbC_2H_3O_2$, dissolved in water. Called also Goulard's Extract, after its proposer Goulard, in 1770. Sp. gr. 1·26.

PLUMBI SUBACETATIS LIQUOR DILUTUS. DILUTED SOLUTION OF SUBACETATE OF LEAD. A mixture of Sol. of Subacetate of Lead and Rectified Spirit āā fl. drm. ij., and Distilled Water fl. oz. xix½. The filtered solution to be kept in a well-stoppered bottle.

Med. Prop. and Action. Mildly astringent and sedative, applied externally in the form of lotion (fl. drm. j.–ij. ad Aq. Oj.) or Ointment (Sol. of Subacetate fl. oz. vj., Camphor gr. lx., White Wax oz. viij., Oil of Almonds Oj.) Not prescribed internally.

1655. *Therapeutic Uses. In the acute pain occasioned by the presence of a Stone in the Bladder*, Dr. Prout (p. 348) states that

[1] Rev. de Thérap. Med., Oct. 1868. [2] Lancet, Jan. 16, 1869.

he has seen great temporary relief produced by a lotion composed of Liq. Plumb. Subacet. Dil. and T. Opii in equal parts, applied as hot as possible, by means of a sponge, to the perinæum. Opium or other remedies, as indicated in each case, may be given internally at the same time. *In Prostatorrhœa*, Prof. Gross[1] recommends the following injection:—℞ Liq. Plumbi Subacet., Vin. Opii āā f℥j., Aq. f℥x., M. To be used thrice daily.

1656. *Nævus Maternus.* Dieffenbach[2] states that flat nævi, up to the size of an inch in diameter, may be removed by the following process:—A piece of lint steeped in pure liquor plumbi is to be fastened over the part by a bandage, and is to be kept constantly wetted with fresh solution, without frequent removals. The application requires patience and perseverance. Cases successfully treated in this manner are related by Dr. Sigmund.[3]

1657. *In Pruritus Pudendi*, the following is a very soothing application:—℞ Liq. Plumb. Subacet. fl. drm. j., T. Hyos. fl. drs. ij., Mist. Camph. fl. oz. viij., M. It should be applied tepid. Rest and strict antiphlogistic regimen should be enforced. It proves useful in other forms of *Pruritus*. *In the Vulvitis of Children*, the constant application of cloths saturated with a tepid lotion, containing this solution, is often attended with excellent effects. *To Painful Piles*, Dr. Graves (ii. p. 246) advises the following lotion:—℞ Liq. Plumb. Subacet. Dil. f℥vj., Spt. Rosmar., T. Opii āā f℥j., M. To be applied five or six times daily.

1658. *Many Skin Diseases*, attended with heat and pain, are much benefited by the local application of an ointment composed of fl. drm. j. of liquor plumb. ad ung. oz. j. It should be spread on lint, and the whole covered with an emollient poultice.

1659. *In Lupus*, Mr. Milton[4] speaks favourably of liquor plumbi as a local application, especially when there is a large open surface. It should first be warmed by placing it over hot water, and as soon as it begins to smoke, it should be painted several times over the surface; the residuum should be thrown away. It ought to be applied at least once daily, all the crusts and exudations having been previously removed. It may be repeated as frequently as the patient wishes.

1660. *To Inflamed and Erysipelatous surfaces*, *Ecthyma*, *Onychia*, *Chilblains*, *inflamed Glands*, *painful Bruises*, *Sprains*, *&c.*, the diluted solution kept constantly applied to the parts, is a soothing application. *To indolent and ill-conditioned Ulcers*, it

[1] North Amer. Med.-Chir. Rev., July 1860.
[2] Med. Times, vol. xvi. p. 355.
[3] Edin. Med. Journ., April 1, 1843.
[4] Journ. of Cutaneous Med., July, 1867.

may also be applied with advantage. *To Chapped Hands and Lips*, it proves very serviceable.

1661. PODOPHYLLI RADIX. PODOPHYLLUM ROOT. The dried rhizome of Podophyllum peltatum, *Linn.* *Nat. Ord.* Ranunculaceæ. *Hab.* North America.

PODOPHYLLI RESINA. RESIN OF PODOPHYLLUM. PODOPHYLLINE. A resin obtained from Podophyllum root by means of rectified spirit.

Med. Prop. and Action. Purgative, approximating to scammony and jalap in its operation. Valuable cholagogue properties have been assigned to it by Dr. Ramskill and others, but recent researches detailed by Dr. J. H. Bennett tend to show that it is possessed of no such properties; on the contrary, he found, 1, that in doses of grs. ij.–viij., when given to dogs, it diminished the solid constituents of the bile, whether it produced purgation or not; and 2, that doses which produced purgation, lessened both the fluid and solid constituents. It probably acts in the same manner as mercury, as pointed out by Dr. Murchison (pp. 126, 404), by irritating the upper part of the small intestines, propelling onwards the bile as fast as it flows into the duodenum, and that the biliary accumulations thus excreted, constitute the so-called "bilious stools," which have generally been regarded as the result of increased biliary secretion from the liver itself. Some remarks on its use have been published by Dr. Clarke,[1] of the London Hospital. From the recorded experience of American physicians, the following points seem to be established:—1. That the purified resin of podophyllum is escharotic, producing, when applied to the skin, small pustules which are difficult to heal; and when administered internally, giving rise to extreme griping and violent catharsis. 2. That chloride of sodium given with podophylline increases its purgative action to an undesirable extent, and should therefore be avoided, except in cold phlegmatic habits, where the action of the drug is feeble. 3. That lactic acid counteracts its operation, and that sugar, sweetmeats, pickles, and like substances should be avoided when it is administered. On the other hand, many writers recommend it to be well triturated with four or five times its weight of fine sugar. 4. That its use should be avoided in inflammatory states of the stomach and bowels, particularly of the mucous lining of the primæ viæ. 5. That a warm infusion of ginger is the best means of relieving tormina and griping caused by its use. 6. That for an over-dose, sour milk, whey, or any form of lactic acid, are the best remedies. Lastly, that, as a purgative, bitartrate of potash (gr. xx.-xxx.) is the best adjuvant; whilst, when given as a cholagogue or alterative, it is well to combine it with small doses of belladonna, hyoscyamus, or cannabis Indica. In some cases, a kind of ptyalism has been observed to follow its continued use. Mr. Hugh Norris[2] states that he has observed it produce emmenagogue, in addition to its purgative effects. Its emmenagogue action is likewise noticed by Dr. Tilt (p. 217, 318), who advises its exhibition with aloes, when the object is to promote menstruation. It appears to be ill adapted as a purgative for children.

Dose:—Of the Resin, Podophilline gr. ¼–gr. j. in the form of pill, as a purgative. To obtain its cholagogue effects gr. ⅛–¼, twice or thrice daily. The powdered root is a bad form of administration.

1662. *Therapeutic Uses.* *In Liver Affections*, podophylline seems particularly indicated. Dr. Gardner, whose statements

[1] Med. Times and Gaz., Jan. 4, 1862.

[2] Lancet, Oct. 31, 1863.

are principally followed, states that he has seen *Jaundice*, where the stools exhibited no trace of bile, and where the skin and eyes were of a deep yellow colour, cured by a single dose, incredible quantities of bile being evacuated. *In Engorgement of the Liver*, and *in Torpor of the Liver occurring in persons long resident in tropical climes*, he speaks most favourably of its action. In these cases it often does not act for ten or twelve, or even in some cases for sixteen or twenty hours, the purging appearing to result from the large amount of bile thrown into the bowels. Sometimes its action is without uneasiness, but generally there is a sense of tormina or twisting, and spasmodic action in the upper region of the abdomen about the navel. In all cases where it is desirable to evacuate or stimulate the liver, as in *Fevers*, *Bronchitis*, *Headache*, *&c.*, Dr. Gardner states that he has used podophylline with highly satisfactory results.

1663. *In Constipation*, without other disorder, Dr. Gardner usually prescribes gr. $\frac{1}{6}$–$\frac{1}{4}$ in a pill with Pil. Rhei Co. It acts, he remarks, very much the same as we expect a grain of calomel or five grains of blue pill with the compound rhubarb pill to act, and he considers that in very numerous cases it may be substituted for mercurials with great advantage. *In the Constipation of Phthisis*, often depending upon fatty degeneration of the liver, it has been resorted to with the best effects, and notwithstanding the length of period which elapses before it operates, with a marked degree of benefit not obtainable from any other purgative.

1664. *In Gout*, when it is often an important point of treatment to secure free biliary evacuations, Dr. Gardner employs with good effect, podophylline in the form of pill with henbane or belladonna, which latter medicines modify its operation. The same treatment has been adopted in *Acute Rheumatism*.

1665. *In Secondary Syphilis*, it has been employed by Dr. Marston, of the Royal Artillery, and by Dr. R. S. Sisson,[1] as a substitute for mercury, with marked success. It has also been largely used in America in the treatment of *Syphilitic Affections*. The dose recommended by Drs. Marston and Sisson is gr. $\frac{1}{6}$, combined with a sedative, three times a day. Dr. Kidd,[2] of Cincinnati, found that in small repeated doses it was of great value as a deobstruent in *Scrofula*, *Syphilis*, *Rheumatism*, and other chronic diseases.

1666. Potassa Caustica. Caustic Potash. Hydrate of Potash. KHO, containing some impurities. Called also Potassæ Hydras and Potassa Fusa. Prepared by boiling solution of potash till it assumes a solidified consistence.

[1] Lancet, Jan. 16, 1864. [2] Ranking's Abstract, vol. xxxv. 1862, p. 348.

Med. Prop. and Action. Powerful caustic, and escharotic; and when taken into the stomach it acts as a corrosive poison. It is never prescribed internally. For external use it is generally moulded into pencils, which should be of a white colour, but are frequently variously coloured, from the presence of impurities. One of its chief medicinal uses is in making issues, but the rapidity with which it deliquesces is a great objection to its use. It readily attracts moisture from the atmosphere, and should therefore be kept in closely-stoppered bottles. The mixture of equal parts of Caustic Potash and Lime (Potassa cum Calce) is also used as a caustic. It has the advantage of being less deliquescent than caustic potash. It is used in the form of paste made with spirit.

1667. *Therapeutic Uses. In Hospital Gangrene*, Prof. Restelle[1] considers that caustic potash is not only the best application, but that it neutralizes the virulence of the poison itself. He employed it with success in 400 cases. On the first day, he applied pieces of the caustic in substance to the wound, endeavouring to penetrate into all its sinuosities. The next day the wound was dressed with a solution of gr. xx. ad Aq. f℥j., and every day the strength was diminished by four or five grains, to the fifth day, when the wound was simply dressed. Even the worst cases improved under this treatment. In the subsequent management of the wounds, charcoal, and especially the carbonate of magnesia, were of great service.

1668. *In Uterine Ulceration*, Dr. H. Bennet[2] speaks highly of the value of caustic potash and potassa cum calce as local applications. He considers them, however, a last resource, only to be employed when all other treatment, local and general, has failed. If incautiously or imprudently employed, serious results may follow. Dr. Tilt (p. 174) prefers potass. c. calce to the simple caustic potash. His *résumé* of the comparative value, uses, and modes of application of this and other caustics in uterine diseases, is well worthy careful perusal.

1669. *Nævi Materni.* Mr. Wardrop[3] re-introduced the ancient practice of destroying superficial nævi by the application of caustic potash. An eschar forms, and after the ulcer heals, a cicatrix remains in the place of the nævus: the benefit of the exchange is doubtful. Comparing it with nitric acid, Mr. T. Holmes[4] remarks that it penetrates deeper than the acid, and is therefore applicable to the treatment of thicker nævi; but it is much more painful, and leaves a more evident scar.

1670. *In Eczema*, solutions of caustic potash have been recommended as external applications by Hebra and Dr. T. M'Call Anderson.[5] The latter recommends that in the mildest cases, with only slight infiltration, gr. ij. of caustic potash in

[1] Brit. and For. Med.-Chir. Rev., Oct. 1850.
[2] Lancet, July 15 and Aug. 5, 1854.
[3] Med.-Chir. Trans., vol. ix.
[4] Dublin Quarterly Journ., Aug. 1869.
[5] Med. Times and Gaz., July 11, 1863.

aq. fl. oz. j. be applied; but in more severe cases, the strength of the solution may be increased to 5, 10, 20, or even 30 grains or more to the ounce. The solution should be applied with a broad brush, and should be washed off speedily with water. The stronger solutions should not be applied more than once a day. If it produce any manifest destruction of the skin, it has been applied of too great a strength, or been allowed to remain too long. In very obstinate cases, and where the eruption is very limited, Hebra sometimes uses a solution of gr. lx. of the caustic potash to aq. fl. drs. ij., or even applies the solid caustic itself. This must be done, however, with the greatest circumspection, and the caustic must be washed off immediately.

1671. *Strictures of the Urethra.* Mr. Whately, in 1804, proposed substituting caustic potash for nitrate of silver in arming bougies to be applied to strictures of the urethra; but the practice fell into disuse till, in 1851, Mr. Wade[1] warmly advocated its use. The cases in which he advises it are—1, Strictures having a cartilaginous hardness, and impervious to instruments; 2, Strictures of long standing, which, although admitting the passage of a small bougie, bleed more or less freely on its introduction; 3, Irritable strictures. He considers that the principal superiority of this caustic over nitrate of silver, in the treatment of stricture, consists in its more powerful effect in moving hard strictures, and that with perfect safety, and comparatively with but little pain. Much difference of opinion exists amongst high surgical authorities as to the safety and efficacy of direct caustic applications in these cases. Sir H. Thompson strongly condemns their use.

1672. Potassa Sulphurata. Sulphurated Potash. Potassii Sulphuretum, *Lond. Ph.* Hepar Sulphuris, *Dub. Ph.* Prepared by fusing together, in a covered crucible, Carb. of Potash oz. x. and Sublimed Sulphur oz. v.

Med. Prop. and Action. Stimulant, diaphoretic, and expectorant; it increases the force and frequency of the pulse, and the action of various secreting organs. It requires to be commenced in small doses, and cautiously increased. Its chief use is as an external application, in solution (drm. j.–ij., ad Aq. Oj.), or in the form of ointment (grs. xxx. ad Ung. oz. j.) Its action is impaired by keeping. The sulphuretted bath is prepared by dissolving Sulphurated Potash (or Soda) oz. iij., Carbonate of Soda drm. ij., Chloride of Sodium, drm. ij., and Sulphate of Soda, oz. j. in Distilled Water Oj. Add this to 20 gallons of water at 98° F. (Planche and Boullay.)

Dose:—gr. iij.–gr. x.

1673. *Therapeutic Uses. In Dyspepsia*, when the mucous follicles are supposed to be implicated, much benefit will be

[1] On Permanent Stricture, Lond. 1851.

derived from the exhibition of this salt in doses of gr. x., either alone or combined with some aromatic. Dr. Todd[1] considers that it possesses a specific action upon the mucous follicles.

1674. *In Albuminuria*, it is of importance to establish free diaphoresis. For this purpose, Dr. Osborne[2] advises the following formula:—℞ T. Guaici Am. f℥ss., Potass. Sulphuret. gr. v., Liq. Amm. Acet. f℥ss., Aq. ℥j., M.; to be taken at bedtime, followed by a pint of hot whey. *In Chronic Rheumatism*, it is occasionally prescribed as a stimulant diaphoretic.

1675. *In Scabies*, sulphurated potash is an efficacious remedy. The following mode of application, adopted by Alibert, &c., has met with great success. In one bottle is placed a solution of the sulphuret (℥j. ad Aq. Oij.); in another bottle is placed f℥ij. of dilute sulphuric acid. At the time of the application, the patient places a glassful of each in a basin of hot water, and washes the parts affected for half an hour, morning and evening. It has not a very strong odour, and does not stain the linen—two great advantages. The Liniment of Jadelot is composed thus:—℞ Potass. Sulphuret. ij., Sapon. Alb. lb. j., Ol. Papav. lb. ij., Ol. Thymi, ℥j., M. ft. unguent. bis die applicand. Valentin's Liniment is equally efficacious, and less irritating:—℞ Pot. Sulphuret. ℥j., Ol. Amygd. ℥j., Camphor gr. xx., M. By the use of these a complete cure is effected in less than fourteen days.[3]

1676. *In Acne Simplex*, Dr. Todd[4] advises the local application of a solution (Potas. Sulphuret. ℥j., Aq. Oj.) twice a day; or which is more effectual, a sulphuretted bath (℥iv. ad Aq. Occ.) *In Ringworm*, a lotion, composed of Potas. Sulph. gr. lx.–cxx., Aq. Calcis lb. j., has been found very successful. *In Sycosis or Mentagra*, Duparc advises that the pustules should be painted, night and morning, with a concentrated solution of sulphurated potash. It is said to be efficacious. It has also been successfully used as a lotion in *Tinea Capitis*, *Eczema*, *Lepra*, *&c.*

1677. *In Lead Poisoning*, the sulphuretted bath is one of the most effectual remedies we possess.

1678. *In Chorea*, Dr. Hillier (p. 234) states that he has seen good results from baths, each containing oz. iv. of this salt: in eight cases thus treated, five derived decided benefit. Of 57 cases treated with these baths by Sée, 50 were cured, in an average of twenty-two days. (Hillier.)

1679. Potassæ Acetas. Acetate of Potash. $KC_2H_3O_2$. Prepared by the action of acetic acid on carbonate of potash.

[1] Cyc. Pract. Med., vol. ii. p. 641.
[2] Dub. Quart. Journ., Aug. 1851.
[3] Med.-Chir. Rev., July, 1845.
[4] Cyc. Pract. Med., art. Acne.

Med. Prop. and Action. In doses of gr. xx.-gr. lx., it is an efficient and mild diuretic; in doses of gr. cxx.-gr. ccxl. it acts as a purgative; but in the latter character it is inferior to other saline purgatives, as it causes much griping and flatulence. When administered in continuous doses, it is absorbed into the system, the hydrogen and part of the carbon of the acetic acid become oxidized in the blood, and the salt appears in the urine in the form of carbonate, rendering that secretion alkaline, and generally producing an increase in its quantity. Mr. Easton observes that, in all cases in which it was administered, the urine was not only augmented in quantity, but that its solid constituents were increased in a remarkable degree. Dr. Golding Bird considered that in rheumatism, skin diseases, &c., it probably acts by altering and correcting a morbid condition (lactic acid ?) of the blood. Its diuretic effect is increased by giving it largely diluted. It should be kept in well-stoppered bottles.

Dose:—As a diuretic, gr. x.-gr. lx., largely diluted; as a purgative, gr. cxx.-gr. ccxl.

1680. *Therapeutic Uses. In Dropsical Affections, Œdema, Anasarca, &c.*, acetate of potash often proves eminently useful as a diuretic. For this purpose it should be combined with squill or digitalis. It should not be given in larger doses than gr. xxx. every three or four hours, or it may act as a purgative, and pass off by the bowels.

1681. *In Gastro-intestinal Affections, especially in Chronic Catarrhal Conditions of the gastro-intestinal mucous membranes*, the acetate is regarded by M. Marotte[1] to exercise a special influence in arresting or diminishing the excessive mucous secretion. He calls especial attention to the anti-emetic qualities of this salt, though in real inflammatory states it appears rather to excite than diminish vomiting.

1682. *In Acute Rheumatism*, it is highly spoken of by Dr. G. Bird.[2] He states that the acetate, given with a mixture of sugar, water, and essence of lemons, acts with marvellous rapidity. In addition to this, he administers Pil. Sapon. c. Opio gr. v. night and morning; by this he not only relieves the pain, but prevents the other remedy passing off by the bowels. If the liver be engorged, a mild mercurial may be employed. The dose usually employed is gr. xxx. every four hours. The vapour bath may be also employed. For his explanation of its action, see *ante*.

1683. *In Diseases of the Skin*, the internal exhibition of the acetate of potash has proved very beneficial in the hands of Mr. Easton.[3] He relates some cases of *Psoriasis, Lepra, and Eczema* which yielded to its use.

1684. POTASSÆ BICARBONAS. Bicarbonate of Potash. $KHCO_3$.

Med. Prop. and Action. Antacid and diuretic. In its operation it closely resembles the carbonate, but is milder in its action, and from its less

[1] Practitioner, Jan. 1869.
[2] Med. Gaz., June 15, 1849; and Lancet, Feb. 15, 1851.
[3] Monthly Journal of Med., May, 1850.

disagreeable taste its use is more generally available. Like liquor potassæ (*q.v.*), its effects on the system are probably modified by the period after or before meals at which it is administered. Its action as a diuretic is increased by copious dilution. It is frequently used in the form of effervescing draughts (gr. xx. of the Bicarbonate saturates gr. xiv. of Citric Acid, gr. xv. of Tartaric Acid, or fl. drs. iijss. of Lemon-juice).

Dose, gr. x.–gr. xxx. It should be freely diluted.

1685. *Therapeutic Uses. In Acute Rheumatism*, the alkaline plan of treatment, advocated by Dr. Garrod (i. p. 910), consists in administering a dilute solution of this salt, grs. xxx. every four hours, until the joint symptoms and febrile disturbance have completely disappeared. These doses produce no inconvenience either to the stomach or bowels; the urinary secretion is not notably increased, but its character is completely altered, and the re-action becomes either neutral or alkaline; it usually remains clear, but occasionally there is a deposit of the triple phosphates. Upon the heart the alkaline bicarbonate acts as a sedative, reducing the frequency of the pulse, sometimes 48 beats in the minute, but not causing any faintness. When a patient is fully under its influence, the blood is distinctly altered, and the coagulation of the fibrine takes place more slowly. Dr. Fuller,[1] who advocates a mixed form of treatment, bears strong testimony to the value of alkalies in this disease, considers that oz. j$\frac{1}{2}$. is the minimum dose of an alkaline carbonate which will suffice to overcome the acid condition of the blood during the first 24 or 48 hours of treatment, and in sthenic cases oz. ij. are often needed. Small doses he regards as useless. Alkaline baths (lb. j. of carb. of potash or soda to a bath) are often of great service in *Rheumatic Gout* and *Chronic Rheumatism*.

For other Therapeutic Uses, see POTASSÆ CARBONAS.

1686. POTASSÆ CARBONAS. CARBONATE OF POTASH. K_2CO_3, with about 16 per cent. of water of crystallization.

Med. Prop. and Action. Antacid and diuretic. Its action resembles that of liquor potassæ, but it is less caustic, and therefore can be administered in larger quantities. Milk is a good vehicle for its exhibition, as it disguises its taste. Its diuretic effect is greatly increased by the use of diluents, and by a combination with other diuretics. It passes through the kidneys unchanged. It is frequently used in the form of effervescing draughts, thus:—gr. xx. of the Carbonate saturates gr. xvij. of Citric Acid, gr. xviij. of Tartaric Acid, or fl. drs. iv. of Lemon-juice. The salt requires to be kept in well-stoppered bottles, as it deliquesces on exposure to the air. The ill effects of its long-continued use, are the same as those of Liquor Potassæ (*q.v.*)

Dose, gr. x.–xxx. freely diluted.

1687. *Therapeutic Uses. In Acidity of the Primæ Viæ*, a draught, originally proposed by Dr. Prout, containing grs.

[1] Practitioner, March, 1869.

x.–xxx. of the carbonate, and grs. iv.–v. of the nitrate of potash, taken 4 or 5 hours after a meal, is often useful.

1688. *In Calculous Affections*, when the urine has an acid reaction, alkalies may be given with advantage. Soda was long employed in these cases, but recent authorities advocate the carbonate of potash, as the lithate of soda, which is formed when soda is exhibited, has been found occasionally to constitute a considerable portion of the urinary calculus. The intense pain attendant on the presence of a stone in the bladder, is often strikingly relieved by this and the other alkalies. It may be given in doses of gr. x.–gr. xxx. in mucilage, with fl. drm. j.–fl. drs. jss. of tincture of hyoscyamus. Like the bicarbonate, it may be prescribed with advantage where there is an *excess of Uric Acid in the urine*.

1689. *In Diseases of the Skin*, the local application of alkaline lotions and ointments was first proposed by Devergie,[1] and has been found very useful. *In the chronic forms of Eczema, Herpes, and Pityriasis*, Dr. Neligan[2] advises an ointment composed of Carbonate of Potash gr. xx., and Lard ʒss. This is to be lightly smeared over the eruption, which should be also washed every morning with a weak solution of potash (ʒss., Water Oj.) When thick crusts exist, they should be first treated with emollient poultices, and the scabs removed. The ointment will then act more powerfully and readily. He directs soap and water never to be applied to the scalp in these affections. In addition to the means proposed by Dr. Neligan, he speaks highly of the utility of local alkaline baths (Potas. Carb. ʒss.–ℨj. ad Aq. Oiv.)

1690. *In Buzzing in the Ears, &c., produced by accumulations of hardened wax in the ear*, M. Triquet[3] recommends the ears to be syringed with a solution of Potassæ Carb. (grs. iij.–xx. ad Aq. fℨj.), the ears being stopped at night with cotton, in order that a portion of the liquid may be retained.

1691. POTASSÆ CHLORAS. CHLORATE OF POTASH. $KClO_3$. Obtained by passing a stream of chlorine gas (generated by the action of hydrochloric acid on black oxide of manganese) through a solution of carbonate of potash and slaked lime; subsequent boiling, filtration, and evaporation to crystallization.

Med. Prop. and Action. Refrigerant and diuretic. It was formerly considered that this salt was useful in affording oxygen to the system; but Wöhler obtained it in an unchanged state in the urine of a person who had taken it, showing that it undergoes no chemical change in passing through the system. O'Shaughnessy found it a powerful restorative and stimulant when injected into the veins; and Dr. Stevens ascertained that

[1] See Ann. de Thérapeutique, 1846.
[2] Diseases of the Scalp, 8vo, 1848.
[3] Ranking's Abstract, xxxv. p. 49, 1862.

it communicates an arterial colour to venous blood. He also found that it rapidly caused soreness of the gums. It forms an important article in what is called the saline treatment of diseases.

Dose, gr. x.–xxx. in solution. As a refrigerant drink in fevers, gr. lx. ad Aq. Oj.

1692. *Therapeutic Uses. In Continued and Typhoid Fevers*, Chomel recommends the internal use of the chlorate. Sir T. Watson (ii. p. 777) states that he gives to all his fever patients ʒj. of this salt dissolved in Oj. of water, as a daily drink, and that it appears to exercise a favourable influence upon the general character and course of the disorder. *In Scarlet Fever*, he states that he employs this drink with manifest advantage. Under its use, the tongue, from being furred and brown, or dry, becomes clean and moist. Dr. Copland also speaks highly of its efficacy in the advanced stages of this class of diseases. His estimate of its value is very high. *In Anasarca supervening on Fever*, it often proves very serviceable.

1693. *In Ulcerative and Gangrenous Stomatitis* (*Cancrum Oris*), no internal remedy is more generally effectual than the chlorate, first proposed by Mr. Hunt,[1] who regarded it, in daily doses of grs. v.–xx. for children and grs. xx.–xxx. for adults, as a specific in these affections. Subsequent experience has corroborated Mr. Hunt's views of its efficacy. *In Ulcerative Stomatitis*, Dr. West (p. 531) states that he relies upon it almost exclusively, and that there seems to be no form nor any stage of the affection in which it is not useful. Marked improvement seldom fails to be observed in two or three days, and within ten days a cure is generally effected; grs. iij. in sweetened water every four hours suffice for a child æt. 3 years; grs. v. every four hours appear to answer as well as a larger dose for a child æt. 8 or 9 years. The bowels require to be regulated and the constitution supported. *Inflammation of the Gums* (*Odontitis*) *arising from teething* will, according to Dr. West (p. 525), generally yield to the chlorate, grs. ij. every four hours for a child æt. 1 year. *In Aphthous Inflammation and Ulcer of the Tongue*, arising from anything which irritates the alimentary canal, Mr. Bryant[2] successfully employed the chlorate internally (gr. v.) and locally (ʒj.–ʒij. ad Aq. Oj.)

1694. *In Diphtheria*, Dr. Hillier (p. 146) remarks that the chlorate in full doses combined with liq. cinchonæ seems in some cases to be of service, though not so obviously so as in ulcerative stomatitis. Occasionally he has used it advantageously with iodide of potassium (gr. j–ij.) A strong solution may be used as a gargle. Dr. Squire (i. p. 406) states that when there is much tenacious secretion, the chlorate in coarse powder, or small crystals of it, may be taken into the mouth from time to time, with benefit. *In Croup*, after the

[1] Med.-Chir. Trans., xxvi. p. 142. [2] Braithwaite, 1862, xlv. p. 100.

operation of an emetic, the chlorate, in doses of gr. v. every three or four hours, freely diluted in milk or water, has been recommended.

1695. *Phagedenic Ulcerations, and those of Secondary Syphilis.* Some very interesting cases illustrative of the beneficial effects of the chlorate in these cases are recorded by Mr. Sayle.[1] He employed the following formula:—℞ Potas. Chlor. gr. xx., Infus. Gentianæ f℥jss., M. ft. haust. ter in die sum. In each case in which it was given, it effected a cure in a few weeks. Mr. Alison[2] also testifies to its efficacy. Dr. Drysdale[3] details an interesting case of *Infantile Syphilis* cured by the chlorate without the aid of mercury or iodine:—℞ Potass. Chlor. ℥j., Aq. Oj., M. Dose, a teaspoonful four times a day. Mr. Allingham[4] also has published a number of cases of *Syphilis in Infants* cured by the administration four times a day of one or two teaspoonfuls of a saturated solution of chlorate of potash, with from ♏iij.–v. of dilute hydrochloric acid. The mothers, when the infants were suckling, took daily an ounce of the same solution. *To Cachectic Ulcerations*, the chlorate, finely powdered and locally applied with the finger, proved very serviceable in the practice of Mr. Hutchinson.[5] It produces a sharp smarting for a short time, but this soon subsides. The cases for which it seems best suited are *Ulcers of the Leg*, *Open Buboes*, *Simple Sores on the Skin of the Penis*, and *Cracked Nipples*. It may likewise be given internally. In *Fœtor of Breath*, a good mouth wash is a solution of the chlorate (gr. xc.) in sweetened water (fl. oz. iv.)

1696. *In Chronic Mucous Diarrhœa*, with whitish, greyish, or mucilage-like stools, arising from the absence of bile, &c., Dr. Copland states that he has prescribed the chlorate, conjoined with pulv. tragac. co. and aromatics, with great benefit. *In Infantile Cholera*, when it passes into a dysenteric state, when the exhaustion is great, and the stools offensive, he also administered the chlorate in the same combination, with advantage. *In Chronic or Asthenic Jaundice*, accompanied by a torpid state of the liver, he also advises the chlorate, which may, in this case, be advantageously conjoined with the carbonate of soda, or with other substances.

1697. *In Chronic Bronchitis*, particularly when it occurs in persons advanced in life, and in children when it has assumed a chronic form after hooping-cough, or the exanthemata, Dr. Copland (i. p. 264) states that he has occasionally seen benefit from the internal exhibition of the chlorate of potash in doses, for adults, of from gr. ij. to gr. vj., three or four times a day.

1698. *In Phthisis*, the chlorate has been advised by Dr.

[1] Med. Times, vol. xviii. pp. 39, 96.
[2] Ibid.
[3] Dub. Med. Press, Dec. 3, 1862.
[4] Med. Times and Gaz., Oct. 31, 1863.
[5] Lancet, Dec. 26, 1857.

Fountain, of Iowa,[1] Dr. Harkin,[2] and others. A favourable opinion of its efficacy is expressed by Dr. Symonds;[3] though regarding it as inferior to cod-liver oil, he states that six years' experience in its use has been such as to afford him increased confidence in it as a promoter of the drying up of vomicæ. Even in cases in which the oil was duly taken, but in which, though the patient gained flesh and strength, the cough, sputa, and auscultory signs showed no abatement of the ulceration, he has found marked improvement from the chlorate in gr. xv. doses twice or thrice daily in solution in water or barley water. In some advanced cases, however, in which it was tried by Dr. A. Flint,[4] of New York, it failed to afford relief. *For the rawness of the Tongue and painful deglutition in advanced Phthisis*, Dr. D. Powell[5] finds the greatest benefit from the following:— ℞ Potas. Chlor. gr. xl.–lx., Glycerini fl. oz. ½, Morphiæ gr. j½.–ij., Syrup ad fl. oz. iv., M. A teaspoonful swallowed slowly acts locally on the parts affected and relieves the cough.

1699. *In Scrofula*, Dr. Harkin (op. cit.) speaks highly of it when given in doses of gr. v.–xx. four times daily, dissolved in pure water. He states that ten or fifteen days generally suffice to heal extensive *Ulcerations of the Cervical and Submaxillary Glands;* and that *Scrofulous Enlargements* and *Strumous Ophthalmia* yield rapidly to its use. *For Tumours* and *Enlarged Scrofulous Joints*, he applies locally, in addition to its internal administration, an ointment containing ℥ij. of the powdered salt to ℥j. of lard.

1700. *In Erysipelas supervening upon Anasarca, or if there be any tendency to Gangrene, or if the temperature of the surface be low, and the colour deep or dark*, Dr. Copland (i. p. 829) advises the internal use of the chlorate with the tincture of cinchona or camphor, or both. *In Urticaria*, Mr. Erasmus Wilson (p. 159) states that he has sometimes succeeded in quelling the pruritus of this and other eruptions, by the use of a lotion containing the chlorate of potash.

1701. *In Leucorrhœa and Ulceration of the Os Uteri*, injections of the chlorate (℥j.–Aq. Pluv. f℥viij.) have been successfully employed by Dr. Bedford Brown.[6] *In Gonorrhœa*, Dr. Irvin[7] speaks highly of injections of a solution of the chlorate (℥j. ad Aq. f℥viij.), employed hourly for twelve hours. On the second or third day the disease is generally cured, without the aid of medicine beyond a mild saline aperient.

1702. *In Chronic Cystitis*, when the urine is putrid, Dr.

[1] Amer. Jour. Med. Sci., Sept. 1860.
[2] Dub. Quart. Med. Journ., Nov. 1861.
[3] Brit. Med. Journ., June 13, 1868.
[4] Amer. Quart. Journ. of Med., Oct. 1861.
[5] Lancet, Dec. 19, 1868.
[6] Amer. Journ. of Med. Sci., July, 1857.
[7] Braithwaite's Retrospect, xliv. p. 216.

Braxton Hicks[1] found great benefit from injections into the bladder of a solution of the chlorate (grs. iv.–v. ad Aq. ℥j.)

1703. *Ovarian Disease.* Mr. W. Craig,[2] of Ayr, cites some cases of *Ovarian Tumours* which either notably diminished in size or disappeared altogether, under the persevering use of a saturated solution of the chlorate, in doses of a dessert-spoonful thrice daily. The results are very encouraging.

1704. *In Ptyalism*, it is highly spoken of by Mr. Alison, who states that he has seen it exercise the most beneficial influence in these cases. It may also be used in the form of gargle.

1705. *In Scurvy*, it was successfully employed by Dr. Ferriar,[3] and the statements of Dr. Garrod respecting the influence of the salts of potash generally in scorbutic affections, render it probable that it is a remedy of some value.

1706. *In Cholera*, the chlorate of potash forms an important part in the so-called saline treatment; but how far it contributes to the efficacy of that treatment, is uncertain. (See Sodii Chloridum.)

1707. *In Pregnancy*, the chlorate has been apparently successful in the hands of Mr. Grimsdale,[4] in those cases where the fœtus in several successive pregnancies has been carried to only a certain period, and is either still-born or very weakly, and where no external or other cause can be assigned to explain the circumstance.

1708. Potassæ Citras. Citrate of Potash. $K_3C_6H_5O_7$. A very deliquescent salt. It may be prepared extemporaneously, by combining Bicarb. of Potash gr. xxv. in solution, with Citric Acid gr. xvij. also in solution, or with fl. oz. ss. of Lemon-juice. To be drunk whilst effervescing.

Med. Prop. and Therap. Uses. The citrate acts mildly on the skin, bowels, and kidneys, and promotes their secretions. It is an excellent refrigerant, soothing or sedative diaphoretic *in Fevers*, and is less apt to act upon the bowels than the acetate or tartrate. It is particularly valuable when the stomach is irritable; and when there is a tendency to diarrhœa, it may be advantageously combined with an opiate, unless otherwise contra-indicated. This, in common with other vegetable salts of potash, when taken internally, becomes absorbed and decomposed in the system, appearing in the urine in the form of a carbonate. Acting on this principle, the citrate of potash is advised by Dr. O. Rees,[5] in those cases where the urine is acid, and it is desirable to render it alkaline. It is more especially to be used when it is not desirable to purge the patient. It is valuable in affections connected with *Lithiasis*.

Dose, gr. xx.–gr. lx.

Potassæ Hypophosphis. See Sodæ Hypophosphis.

[1] Lancet, 1867.
[2] Edin. Med. Journ., Nov. 1865.
[3] Med. Hist., vol. iii. p. 250.
[4] Liverpool Med.-Chir. Journal, July, 1857.
[5] Med. Gaz., July 4, 1851.

1709. Potassæ Liquor. Solution of Potash. Obtained by boiling slaked lime with carbonate of potash dissolved in water. Sp. gr. 1·058.

Med. Prop. and Action. Antacid, blood-alterant, and diuretic. Dr. Parkes has shown that the action of liquor potassæ on healthy subjects varies according to whether it be taken before or after meals. If taken after meals, it acts as an antacid; it combines with the hydrochloric or lactic acid, and passes into the circulation without increasing the water, the solids, or the sulphuric acid of the urine. If liquor potassæ and other alkaline preparations, administered soon after meals, do not appear in the urine, we may conclude that they improve digestion and the crasis of the blood. Dr. Parkes and Dr. K. Chambers have shown that when liquor potassæ is taken before meals it has the power of reducing obesity. From thirty to ninety minutes after the liquor potassæ has entered the circulation, there is an increased flow of slightly acid urine, which contains the whole of the potash and organic matter, and a relatively large proportion of sulphuric acid. In other words, an albuminous compound, either in the blood itself or in the textures, becomes oxidized; its sulphur, under the form of sulphuric acid, unites with the potash, and possibly with the changed protein compound, and is eliminated by the kidneys. The amount of albumen or fibrine thus destroyed by a few doses of liquor potassæ is doubtless small; but as the remedy can be taken for a considerable time, and its oxidizing effects can be assisted by exercise, and by copious draughts of water, there is a possibility of removing superfluous matter from a patient without risk. (Dr. Tilt, p. 147.) Continued for too long a period, it is apt to induce a cachectic condition of the system. As it possesses the power of impairing or destroying the activity of henbane, belladonna, and stramonium, they should not be prescribed together.

Dose, ℥x.–xl.–lx., freely diluted. Milk is a good vehicle.

1710. *Therapeutic Uses. In Scrofula*, liquor potassæ was formerly held in high repute, and though not deserving of the encomiums passed upon it by Brandish, Farr, and others, it appears in some instances to be productive of good. According to Dr. Ranking,[1] given in doses of ℥xxx.–lx. thrice daily, it occasionally produces a rapid diminution of glandular tumours, but it does not appear to have the least effect in correcting the scrofulous diathesis. As a general remedy, it is vastly inferior to cod-liver oil. *In Phthisis*, it was specially lauded by Dr. Campbell.[2] From trials instituted with it by Dr. Cotton,[3] he draws the following conclusions:—1. Liquor potassæ in moderate doses (gutt. xv. thrice daily) rarely disagrees with consumptive patients, but is quite as rarely productive of any good effect. 2. That the so-called tubercular crasis is very much more likely to be relieved by the mineral acids than by the alkalies.

1711. *In Chronic Bronchitis, Bronchial Congestion*, and *the advanced stages of Pneumonia*, when the sputa is scanty, thick, and viscid, the addition of ℥x.–xv. of liquor potassæ to an

[1] Trans. of Lugol, p. 244.
[2] On Consumption, 1841.
[3] Med. Times and Gaz., April 13, 1861.

ordinary expectorant mixture is often attended with good effect. Alkaline baths, conjointly used, prove useful.

1712. *In Calculous Affections, and in some Diseases of the Bladder, when the Urine is acid, and there is much irritability of the Urinary Organs*, liq. potassæ, in doses of fl. drm. ss., combined with laudanum, is productive of much benefit. Dr. O. Rees[1] states that he has often used it with the best effect; but, owing to the small quantity of potash which we may venture to exhibit in the caustic state, the urine is not rendered alkaline by this remedy so speedily as when the tartrate or citrate of the base is used. *In Chronic Cystitis*, when the urine is acid, Sir H. Thompson (p. 153) speaks highly of a combination of Liq. Potass. and T. Hyoscyami. It may be an unchemical, but it is a useful formula. *Ardor Urinæ, attendant on Gonorrhœa*, or arising from other causes, is greatly relieved by the addition of liq. potassæ to mucilaginous drinks, &c.

1713. *Acidity of the Primæ Viæ, Cardialgia, and many anomalous affections arising from this cause*, will often yield rapidly to liq. potassæ, in doses of ♏x.–xv., in milk, or mild bitter infusion. Its effect is not so transitory as that of the carbonated alkalies.

1714. *In Acute Rheumatism*, the internal exhibition of liquor potassæ has been favourably noticed by Sir T. Watson (ii. p. 682) and others; but it possesses no advantage over the bicarbonate of potash (*q.v.*), which, from the mildness of its operation, is preferable in most cases. Fomentations of the affected joints with a diluted solution (fl. drm. j.–iv., Aq. Oj.) have been recommended. *In Gout*, it often proves a valuable adjunct to colchicum.

1715. *In Malignant Diseases of the Ovaries*, Dr. Seymour[2] states that liquor potassæ, given in as large doses as the stomach will bear, has appeared to him to produce more alleviation than any other remedy, particularly in those tumours which are not attended by acute pain, or any considerable symptomatic fever.

1716. *Obesity*, occurring in young and robust subjects, is, according to Dr. Chambers,[3] best treated by liq. potassæ, in doses of f℥½, gradually increased to f℥j.–f℥j½., thrice daily. Milk is the best vehicle. The chemical affinity of alkalies for fat, points them out as appropriate alteratives in this complaint; and experience has fully established their value. A rigid low diet, and active exercise, should be conjoined with their use. It is not a new remedy, having been pointed out by Dr. Flemyn,[4] in 1780.

1717. *In Dropsical Affections*, liquor potassæ proves a valuable adjunct to other remedies, particularly to digitalis and squill,

[1] Med. Gaz., July 4, 1851.
[2] Dis. of Ovaria, 1830.
[3] Lancet, 1850, p. 128.
[4] On Corpulency, Lond. 1780.

but by itself the influence which it exerts appears to be inconsiderable. *In Chronic Hydrocephalus*, it has occasionally seemed useful.

1718. *Diseases of the Skin. In Lepra and Psoriasis*, especially when occurring in gouty subjects, or when much acidity of the primæ viæ co-exists, liquor potassæ, ℥xv.–xxx. thrice daily, is a remedy of considerable value. *In Eczema*, under the same conditions, it proves valuable: it may also be used as an external application. Dr. McCall Anderson[1] recommends the eruption to be painted with liquor potassæ night and morning by means of a large brush. Excessive smarting may be relieved by the application of cold water. *In Ephelis* or *Freckles*, arising from exposure to the sun, Dr. Todd advises the following lotion:—℞ Liq. Potassæ fl. drm. j., Aq. Rosæ fl. oz. ij., M. ft. lotio. *In Acne*, its internal use is favourably spoken of by Mr. Milton,[2] especially if there is much thickening of the skin. Although he regards it as inferior to arsenic, he believes that in time it will produce considerable absorption of the matter around the follicles, making the skin much thinner and softer, and sometimes also paler.

1719. *To In-growing Nail*, Mr. Norton,[3] of St. Mary's Hospital, has found the painful operation of evulsion in all cases avoided by the local application of diluted liq. potassæ (fl. drm. ij., Aq. fl. oz. j.) A piece of cotton wool saturated with this solution is pressed gently down between the upper surface of the nail and the soft tissues, which latter are generally in the form of a fungous mass of granulations. The solution permeates the substance of the nail, and softens and pulpifies the superficial cells. The wool is kept continually moist with the lotion, and the softened nail-tissue is wiped away each morning. The nail in a few days becomes thin and flexible, and if desired can be pared away without pain, or it may be allowed to remain for a few days longer, when it becomes entirely removed by the solution. It is essential that the lotion be continued until all ulceration has disappeared, otherwise the too early hardening of the epithelium becomes again a source of irritation, and promotes a return of the disease, or rather prevents a cure from being effected. This treatment appears well worthy of trial.

1720. Potassæ Nitras. Nitrate of Potash. KNO_3. Nitre. Saltpetre.

Med. Prop. and Action. The effects of the nitrate of potash depend, in a great measure, upon the state in which it is given, and upon the quantity of fluid in which it is dissolved; thus oz. j., either given in powder or dissolved in a small quantity of water, has produced inflammation of the

[1] Med. Times and Gaz., July 11, 1863.

[2] Med. Circular, May 3, 1865.

[3] Lancet, May 29, 1869.

bowels, and even death; whilst the same quantity, given in one or two quarts of water, acts as a safe diuretic, and efficient refrigerant and diaphoretic. The physiological effects of this salt have been closely observed by Dr. Basham. He observes—1, that in the majority of cases, nitre produces no obvious effect upon the force and frequency of the pulse, the digestive functions, or the quantity of urine secreted; 2, that the urine always acquires a high specific gravity, 1030–1040, and that the nitrate may be detected in it; 3, that blood, which before the exhibition of nitre is cupped and buffed, loses much of those characters after its administration; and the salts, which were previously deficient, are found afterwards greatly increased in quantity. Other observers find that it exercises a powerful sedative action on the heart and vascular system. As a vascular sedative, it should be given in doses of gr. xx.–gr. xxx. Dr. Stevens observed that it communicates a bright arterial tint to venous blood, and that, when added to fresh-drawn blood, it impedes coagulation. It is not improbable that it produces the same effect in blood in the living body. Dr. Flint found that under its use there was a considerable augmentation of the solids of the urine. Its diuretic effect is increased by copious dilution; its diaphoretic, by the addition of tartar emetic. Externally, it forms with the hydrochlorate of ammonia (oz. x. of the mixed salts to Oj. of water) an excellent cold lotion. It is employed in solution as a gargle, linctus, and in the saline treatment of cholera.

Dose, gr. v.–gr. xx.–gr. xxx.

1721. *Therapeutic Uses.* *In Acute Rheumatism*, large doses of nitre (℥x.–℥ij. daily) were employed and advised by Brocklesby, in 1764; but the practice fell into disuse till about 1839, when it was re-introduced by the French physicians. Amongst others, Martin Solon, Forget, Aran, and Gendrin, warmly advocated its use. In England it has also met with many advocates. Dr. Bennett,[1] who witnessed the practice of Gendrin with it, speaks highly of its efficacy; and Dr. Basham[2] instituted a series of experiments in order to ascertain its real value. Amongst other conclusions he arrives at are—1, That it is a most valuable and efficacious remedy in rheumatism, when given in doses of ℥ij.–℥iij., in Oiv. of barley-water, daily. 2. That it acts by restoring the saline constituents of the blood, and by lessening the excess of fibrine. 3. That there is a certain amount of exemption from cardiac complication, and that cardiac inflammation, when it supervenes, is more amenable to remedies. 4. That the tendency to collapse is much diminished, and the acute or inflammatory symptoms usually give way on the third or fourth day. Dr. Fuller's (p. 105) experience is unfavourable to this mode of treatment. Any value which it may possess is due, he considers, not so much to its power of curing the disease, as to its preventing those complications which render it so formidable. A saturated solution of the nitrate, as a lotion, kept constantly applied to the affected joints, affords in many instances great relief.

1722. *In Chronic Rheumatism*, treatment by nitre has been

[1] Lancet, Feb. 10, 1844. [2] Ibid., Dec. 30, 1848.

advocated, especially by Dr. Cargill,[1] whose report was highly satisfactory, but subsequent experience does not appear to have supported its claims in this disease. The usual commencing dose was grs. xl. thrice daily, increased to grs. lx.–xc.–cxx. thrice daily, the vehicle in each case being warm barley-water, in doses of not less than fl. oz. viij. This is a point of importance; in one case in which it was neglected, serious ill effects followed its use.

1723. *In Scurvy*, the potash salts have been deemed especially useful, and the reports of Dr. Patterson, Dr. Cameron,[2] and others, of the conjoined use of nitre and vinegar, were very favourable. From the more recent experiments of Sir A. Bryson,[3] however, it appears certain that nitre *per se* is destitute of anti-scorbutic properties, and that, by its nauseous taste, and its injurious effects on the system generally, it is worse than useless.

1724. *In Purpura Hæmorrhagica, Purpura Simplex, and Passive Hæmorrhage*, nitre has been employed with great success by Dr. Carlyon.[4] In ordinary cases of purpura simplex, gr. x. thrice daily was found sufficient; but in more severe cases, gr. x.–ʒj. every two or three hours was required. He advises its exhibition with an equal quantity of sugar, in cold water. The diet should consist chiefly of gruel, farinaceous food, barley-water, &c.

1725. *In Hæmoptysis, and other internal Hæmorrhages accompanied by vascular excitement*, nitre has been found a valuable resource, diminishing the arterial excitement and fever, but it should not be relied upon solely for the cure of the disease. Dr. Gibbon[5] relates numerous cases in which it produced unequivocal benefit. It may be given in doses of gr. viij.–x. several times daily, largely diluted, or combined with tartar emetic or digitalis.

1726. *In Febrile and Inflammatory Affections*, nitre, largely diluted in the form of lemonade, proves an excellent refrigerant and diuretic; from one to two drachms may thus be taken in the course of the day. Thus given, it proves highly serviceable in *Influenza*. Free dilution is indispensable. A popular remedy, sometimes successful in mild cases of *Incipient Inflammatory Sore Throat*, is a small piece of nitre allowed to dissolve slowly in the mouth.

1727. *In Dropsical Affections*, nitre proves of great service as a diuretic, particularly when combined with squill and other remedies of the same class. Dr. Delreyne[6] derived great benefit from the following mixture:—℞ Potas. Nit. ʒiij., Baccar. Juniper. ʒxv., Vin. Albi Ojss., M. Dose, ʒjss. daily.

1728. *In Spasmodic Asthma*, great temporary relief occa-

[1] Med. Gaz., Oct. 10, 1851.
[2] Med.-Chir. Rev., March, 1830.
[3] Med. Times, March 23, 1850.
[4] Prov. Med. Journ., Dec. 13, 1848.
[5] Med. Cases and Reports, pt. 2.
[6] L'Expérience, 1842.

sionally results from the inhalation of the fumes of burning nitre. For this purpose dissolve oz. iv. in Oss. of boiling water in an open vessel; immerse moderately thick blotting paper in it for a minute or two, and then dry it by the fire; cut it in pieces about four inches square, and burn one or, if required, two pieces in the bed-room, before retiring to rest, at bedtime. It may also be held near the face, so that the fumes may be more directly inhaled. Dr. Hyde Salter (p. 244) reports most favourably of its effects in innumerable instances. He considers it successful in proportion to the asthma being of a pure spasmodic type, and free from organic complications. On this point, I differ from him, having found it, in my own person, more effectual than any other remedy in the relief of *Bronchitic Cough*. It is a remedy well worthy of attention, where not hitherto tried, though its *modus operandi* is obscure. *In Acute Bronchitis*, Dr. Graves (ii. p. 10) speaks highly of a combination of nitre and tartar emetic, thus:—℞ Potas. Nit. ʒij., Ant. Tart. gr. j., T. Camph. Co. fʒss., Mist. Amygd. fʒxij. Dose, a tablespoonful every hour.

1729. *In Incontinence of Urine in Children*, Dr. Young,[1] of Chester, found nitre, in doses of ʒss. daily (for children seven years old), very efficacious. He considers that it acts as a stimulant to the bladder or its sphincter.

1730. *In Menorrhagia*, Dr. Waller[2] considers the nitrate a most effective depressant. After premising blood-letting and laxatives, he advises this salt, in doses of gr. xv.–ʒss., well diluted with barley-water. *In Dysmenorrhœa*, he also found it highly serviceable. *In Leucorrhœa*, Dr. Dewees (i. p. 75) states that in some obstinate cases he effected a cure with the following formula:—℞ Potas. Nit. gr. x., Alum gr. v., M. ft. pulv. ter in die sumend. *In Gonorrhœa*, it proves useful, when given largely diluted, in relieving the ardor urinæ.

1731. POTASSÆ PERMANGANAS. PERMANGANATE OF POTASH. $KMnO_4$. Occurs in the form of dark purple, slender, prismatic crystals, inodorous, with a sweet astringent taste, soluble in water.

Med. Prop. and Action. The action of the permanganate on the system, when taken internally, is undetermined, but it is supposed to act by oxidizing the blood. Locally applied, in substance or strong solution, it acts as a stimulant and mild escharotic, but, when largely diluted, it causes neither pain nor irritation when applied to mucous surfaces. It readily yields its oxygen to bodies having an affinity for that element, hence its great value as a deodorizer; but, in order to develope its powers in this character, it is requisite to place it in contact with the source of the offensive odour. As a general deodorizer, it is inferior to carbolic acid. Antiseptic powers have been assigned to it, but, from the experiments of Demarquay, it would appear that it possesses little or no power of preventing or arresting the putrefactive process; but that, when in contact with decomposing sub-

[1] Lancet, Dec. 10, 1844. [2] On Diseases of the Womb, p. 50.

stances, it has the power of seizing upon the products of decomposition in their nascent state, and combining with them, or oxidizing them, so as to prevent the usual effects of such emanations, and, among them, the disengagement of offensive smells. (Stillé.) Stains caused by it may be removed by a weak solution of sulphurous acid, or sulphate of iron, or hydrochloric acid in water. For internal use, it should only be given in solution.

Dose:—Of the Permanganate, gr. j.–iij., largely diluted. *Of the Solution* (gr. lxxx., Dist. Water Oj.), fl. drm. ij.–iv. This is half the strength of Condy's Disinfecting Fluid. (Squire.) For external application, fl. drm. j. of the solution ad Aq. fl. oz. v.–x.

1732. *Therapeutic Uses. In Acute Rheumatism*, the permanganate has been employed internally by Dr. J. F. Duncan,[1] with apparently good effects. According to his observations, it cleans the tongue, relieves pain, acts slightly on the bowels, and removes turbidity and fetor of the urine where this existed. The only drawback he found to it was its unpleasant taste. He employed a mixture containing 1 part of Condy's Fluid and 7 parts of water, and of this fl. oz. ½ was given every second hour. Whether this treatment has been tried by others, and with what success, I know not.

1733. *In Diabetes*, it was first used, on theoretical grounds, by Mr. Sampson,[2] but it failed to produce any good results in the hands of Dr. Basham[3] and Dr. Bence Jones.[4]

1734. *In Diphtheria*, attended with fetor of breath, diluted Condy's fluid (fl. drm. ij., Aq. fl. oz. vj.) makes a useful gargle. (Dr. Hillier.) Independent, however, of this condition, a solution of the permanganate (gr. x., Aq. fl. oz. xx.) has been extensively employed as a gargle by Dr. Watson Campbell,[5] and is reported of most favourably. He prescribed iron and port wine internally at the same time. Further testimony in its favour is also adduced by Dr. N. Evans[6] and Mr. J. W. Haward.[7]

1735. *In Cancerous, Gangrenous, and Ill-conditioned Ulceration*, a strong solution acts favourably, both as a mild escharotic and as a deodorizer. Dr. Leavitt,[8] acting on a knowledge of the benefit derived from it in *Sloughing Ulcers*, *Phlegmonous Erysipelas*, and *Hospital Gangrene*, during the American Civil War, was led to employ it in *Carbuncle*, with the best results. The solution (gr. xxx., Aq. fl. oz. j.) was applied by means of a brush, immediately after incision of the carbuncle, and dressings saturated with it were subsequently employed. It seems worthy of further trial.

1736. *In Fetid Discharges from the nasal, aural, vaginal and*

[1] Med. Press, May 16, 1866.
[2] Lancet, Jan. 8, 1853.
[3] Ibid., Jan. 21, 1854.
[4] Med. Times, Feb. 4, 1854.
[5] Edinburgh Med. Journal, Feb. 1867.
[6] Med. Times and Gaz., Oct. 27, 1866.
[7] St. George's Hospital Reports, vol. ii.
[8] Braithwaite's Retrospect, vol. vi., 1867, p. 300.

other passages, the diluted solution forms an excellent injection. To remove *Fetor of Breath, arising from local causes*, e.g., *smoking, carious teeth, &c.*, the diluted solution is an effectual deodorizer. It also forms a useful gargle in *Ulcerated Sore Throat*. In incipient and mild cases of the latter affection, I have seen on several occasions ♏v.–viij. of Condy's fluid, taken internally, in a wineglassful of water, at bedtime, effectual in relieving the symptoms or removing them altogether.

1737. POTASSÆ SULPHAS. Sulphate of Potash. K_2SO_4.

Med. Prop. and Action. In doses of gr. xv.–gr. lx., it is a safe and efficient aperient, particularly when combined with rhubarb (Pot. Sulph. gr. xxx.–gr. lx., Pulv. Rhei gr. v.–x.), but in large doses, as oz. j.–oz. ij., it appears to act as a violent irritant; so much so, that death has followed its incautious use. In France, it is stated to be used popularly as an abortive. The French physicians attribute to this salt the power of *repressing the secretion of milk*. It is an ingredient in Pulv. Ipecac. Comp.

Dose, gr. xv.–lx.

1738. *Therapeutic Uses. In Dyspeptic and Hepatic Affections*, the sulphate of potash is a safe and efficient aperient, acting in most cases mildly, and without hypercatharsis. It may be advantageously combined with rhubarb or aloes. Dr. A. T. Thomson (p. 1100) says that he has found it more useful than the other saline purgatives, in *Jaundice and Dyspeptic Affections*. It is an eligible aperient in *Hæmorrhoidal* cases.

1739. *In the Constipation of Children*, and in other cases where a mild aperient is required, it acts efficiently. Dr. Hillier gives a good formula for its exhibition:—℞ Potas. Sulph. gr. xl., Syrup Rhei ʒss., Aq. Carui ad ʒij., M. Dose, a tablespoonful for a child æt. 6 years. Dr. West's is also a useful form:—℞ Potas. Sulph. grs. xij., Infus. Rhei ʒvss., T. Aurant. ʒ½, Aq. Carui ʒij., M. Dose, fl. oz. ½, for a child æt. 3 years.

1740. *In Gastric Remittent Fever*, when it assumes a chronic form, the sulphate is peculiarly adapted to meet the indications, by relieving the fever, improving the secretions, and quickening the action of the bowels and kidneys. The quantity must, of course, depend upon the age and strength of the patient; but from two to three evacuations daily will be desirable. It may be combined with, or followed by rhubarb or other mild aperients. (Sir C. Locock.[1])

1741. POTASSÆ TARTRAS. Tartrate of Potash. $K_2C_4H_4O_6$.

Med. Prop. and Therap. Uses. In doses of gr. lx.–oz. ½, it is purgative, producing watery evacuations; in smaller doses (gr. lx.–gr. cxx.), diuretic. It acts on the whole intestinal canal, operates rapidly without much griping, is mild and efficient, and lessens the griping quality of senna and scammony. (Thomson.) When taken internally, it is absorbed into the circu-

[1] Lib. of Med., vol. i. p. 285.

lation, and has been detected in the urine, in the form of a carbonate. It is chiefly used as a mild purgative in *Dyspeptic and Hepatic Affections, attended with some slight increased or febrile action*, and as a means of rendering *acid urine alkaline*. *In Gonorrhœa*, during the acute stage, Mr. Bryant,[1] of Guy's Hospital, prescribes with success grs. xx.–xxx. of the tartrate, three or four times a day; and after the acute stage has passed, he combines it with potassio-tartrate of iron.

1742. Potassæ Tartras Acida. Acid Tartrate of Potash. $KHC_4H_4O_6$. Called also Bitartrate of Potash, and Cream of Tartar. An acid salt, obtained from crude tartar, which is deposited during the fermentation of grape juice.

Med. Prop. and Action. In doses of gr. xx.–gr. lx., largely diluted and frequently repeated, it acts as a refrigerant and diuretic, communicating alkaline properties to the urine, in which it has been detected in the form of carbonate. In doses of gr. lx.–gr. cxx., it acts as a mild aperient; and in larger doses as a hydragogue cathartic. From its hydragogue purgative action, it is advantageously prescribed in dropsical affections. If its use be continued for too long a period, it induces emaciation and derangement of the digestive organs. *Post-mortem* examinations of persons who have died from over-doses show extensive inflammation of the stomach and intestines. When its purgative action is desired, it is best given combined with other purgatives; of these, jalap, in the form of Pulv. Jalapæ Co., is the best which can be employed. Dissolved in water and flavoured, it makes a good refrigerant drink in fevers, &c. Gr. clxxx. of the acid tartrate, and gr. cxx. of the carbonate of soda, both in solution, and mixed, form an agreeable effervescing aperient. It is an ingredient in Conf. Sulphuris and Pulv. Jalapæ Comp.

1743. *Therapeutic Uses. In Dropsical Affections*, the acid tartrate, either alone or combined with digitalis, squill, &c., is a very valuable remedy. It increases the quantity of urine, produces copious watery stools, and, in some instances, lessens the dropsical swelling in a marked manner, in a few days. In others, this effect is not seen for three or four weeks. It is often associated with juniper berries in infusion (Potas. Acid. Tart., Juniper. Bacc. Contus. āā oz. ½, Aq. Ferv. Oj.), and in the idiopathic forms of general dropsy, few combinations are more efficient. (Stillé). *In Scarlatinal Dropsy*, it may be advantageously combined with tartarated iron. Given in such doses as to purge freely, it has been thought useful in *Albuminuria*.

1744. *In Fevers and Inflammatory Attacks*, an agreeable refrigerant drink is formed by dissolving gr. lx.–gr. xc. of acid tartrate in a pint of boiling water, and flavouring with lemon-peel and sugar. It may be used as a common drink.

1745. *In Beriberi*, Dr. Malcolmson[2] observes that, "of all diuretics, none is so generally successful and universally useful as cream of tartar, which has generally been adopted by experienced practitioners in beriberi. Its laxative effect, grateful

[1] Lancet, March 16, 1867. [2] On Beriberi, p. 274.

taste, and soothing qualities, are powerful recommendations, in addition to the direct benefit from its diuretic powers." He advises its exhibition in any simple bland vehicle, and to make it a common drink. Mr. Ridley, who strongly advocated this salt, advises its exhibition in punch or gin.

1746. *In the advanced stage of Acute Dysentery, and in Chronic Dysentery*, when laxatives are indicated, especially when the stools abound with thick viscid mucus, the acid tartrate appears to be especially indicated. It may be given with equal parts of sulphur, or with jalap, in the form of P. Jalapæ Co. It seems in these cases to exercise a special influence in diminishing the mucous intestinal secretion, and of unloading the portal system.

1747. *In Piles*, a popular and very useful remedy is a combination of equal parts of the acid tartrate and sulphur, given either in milk or confection of senna. *In Prolapsus Recti*, the same formula proves very serviceable.

1748. *In Acute Rheumatism*, Mr. Hartshorne[1] found the acid tartrate, in doses of grs. xv.–xx., every four hours, produce uniformly marked and decided improvement. In some cases, he combined it with tincture of hyoscyamus (♏xxx.–xl.), in others he gave it in simple mint-water.

1749. *To the Ulceration of Rupia*, Rayer regarded finely powdered cream of tartar one of the best local applications. A strong aqueous solution has been favourably spoken of as a local application in *Epithelial Cancer*. It is stated not only to afford relief to the pain, but to modify the character of the ulceration. Its action is probably analogous to that of acetic and citric acids (*q. v.*)

1750. Potassii Bromidum. Bromide of Potassium. KBr.

Med. Prop. and Action. Stimulant, anaphrodisiac, and antispasmodic. When administered internally, it is absorbed into the system, and has been detected in the blood and in the urine. Its *mode of action* is yet undetermined. It appears certain—1, that even when taken for a long period, and in large doses, it does not lessen the force or frequency of the normal pulse; 2, that, taken in health, it does not reduce the temperature of the body below the normal standard, but where there is slight pyrexia, a diminution of the abnormal temperature has been observed; 3, that in therapeutic doses, it does not notably affect any of the secretions; occasionally the amount of urinary water is increased; 4, that it does not interfere with the reproductive functions of either sex; 5, that in very rare cases, by moderate doses, and in a larger number of cases by greater quantities, it induces *Bromism* (*v.* Bromine). Its action is apparently directed mainly or chiefly upon the system of vaso-motor nerves, and it acts upon that system as a sedative. (Dr. Russell Reynolds.)[2] As an anaphrodisiac its powers are unequivocal. It is perhaps one of the most powerful agents of that class. It also exerts an anæsthetic influence over the mucous membranes generally, but especially over those of the pharynx and larynx—a

[1] Brit. Med. Journ., May 16, 1868. [2] The Practitioner, July, 1868.

circumstance which has been taken advantage of in preparing patients for laryngoscopic examinations and operations. As an instance of its power to produce anæsthesia of a mucous surface, M. Riemslagh[1] cites the case of a man whose eyes had been injured by the discharge of a pistol. Under the use of the bromide, the insensibility of the conjunctiva became so perfect that the membrane was partially removed, and particles of powder, &c., extracted from the sclerotic itself, without the least manifestation of pain. To obtain this effect, it requires to be given in large doses, gr. xv.–xxx., in two or three doses, at intervals of an hour. Some persons whilst taking it experience a peculiar dryness of the throat and neighbouring parts. Externally, it is applied in the form of ointment (gr. xx.–cxx., Adipis oz. j.)

Dose, gr. v.–xxx., in solution, or in the form of pill.

1751. *Therapeutic Uses. Diseases of the Nervous System. In Epilepsy*, the bromide takes precedence of all other remedies; it absolutely cures very many, and it rarely fails to diminish notably the number of attacks in those whom it does not cure. It is most successful in recent cases, but it is also of service in those of long standing, and it most certainly is as useful in those cases where the fits are frequent and severe, as it is in others where they are of rare occurrence and of milder type. In some rare instances, however, it fails, but these should not be allowed to detract from the reputation of so useful a medicine. The cases most benefited by it are those in which the attacks are of the severer type—*le haut mal*—in which the rate of recurrence has been rapid, and in which the fits have occurred mainly in the day; whilst those which have resisted its action have been marked by a predominance of slight or abortive seizures—*le petit mal*—or have exhibited the severer attacks at rare intervals, or have suffered from them only during the night. (Dr. Russell Reynolds.) Cases illustrative of its efficacy are recorded by Sir C. Locock, Drs. Radcliffe, Ramskill, G. Johnson, Duckworth Williams, and others. The commencing dose may be gr. x.–xv. thrice daily, but it may often be increased to double or even treble this quantity with safety and advantage. In all cases it is worthy of a fair trial.

1752. *Epileptiform Convulsions*, occurring during the course of chronic or acute disease of the brain, are often completely removed by the bromide, the other symptoms of such diseases being in some cases relieved, in some removed, in others unaffected. *Convulsions not epileptiform* are sometimes benefited, but not with the same uniformity as the former. *Hysterical Convulsion and Spasm* are slightly influenced by the bromide, and the same may be said of *Chorea*, though cases are recorded in which it appeared to act beneficially: in some it is, apparently, prejudicial. (Dr. Russell Reynolds.) In some cases of *Chorea* in which it was tried by Dr. Ramskill (ii. p. 137), it proved a failure.

[1] Medical Circular, Oct. 15, 1862.

1753. *Disturbances of the Vaso-motor system* in other parts of the body than the head (epilepsy, vertigo, &c.) The symptoms of these disturbances or changes vary much, according to the regions affected. Such symptoms are, for example, *sudden numbness, coldness, deadness, or pricking sensations in one or more limbs; sudden distressing but undefinable feelings in the abdomen, epigastrium, or hypogastrium;* or *sensations akin to rigor, with much "anxiety" and palpitation or "fluttering" of the heart.* In such cases it may be observed that the local circulation is interfered with: *e.g.*, the pulse in one arm becomes faltering, irregular in force and rhythm, occasionally intermitting, while that in the other arm may remain unaltered, and the beat of the heart may maintain its normal character. These distressing symptoms may often be diminished or entirely removed by the bromide, gr. v.-x. twice or thrice daily. (Dr. Russell Reynolds.)

1754. *In Sleeplessness*, the bromide often exerts remarkable power, especially in that arising from over-taxed mental energy or emotion. When opium and other narcotics, observes Dr. Begbie[1], have failed to procure sleep, or when they have succeeded only at the expense of sickness, headache, &c., the bromide will often tranquillize and secure repose. In the sleeplessness which occurs during convalescence from fever, and at the termination of acute diseases, or after surgical operations, the bromide will be found safe and efficacious; gr. xx.-xxx. in fl. oz. j½. of water, or orange-flower water, at bedtime, repeated in the morning, and then persevered in for days or weeks, will often effect what the most powerful narcotics have failed to accomplish. *In Acute Mania*, especially when there is much heat of head and redness of conjunctivæ, Dr. Reynolds (op. cit.) states that he has repeatedly seen refreshing sleep follow a full dose of bromide. In some cases no good results follow, and in the wakefulness of *Melancholia* it apparently aggravates the symptoms. *In Hypochondriasis*, its effects are variable, affording great relief in some—none in others. *Acute Alcoholism with Insomnia* is often most beneficially treated by it. It frequently induces sleep when opium has failed to do so, and there is no prejudicial effect produced by it on the processes of secretion or excretion. (Dr. Russell Reynolds.)

1755. *In Delirium Tremens*, the bromide is often of conspicuous benefit by removing the delusion, by calming the delirium, and by procuring sleep. Its usefulness is most apparent in the earlier stages of the disease, before the delirium has become furious; and is also of very great service in removing any delusions that may remain after the attack has

[1] Edin. Med. Journ., Dec. 1, 1866.

been partially subdued; gr. xx.–xxx., or even more, may be given every two hours till sleep ensues. (Dr. Ringer, p. 72.) Its beneficial operation is not equal in all cases; sometimes it entirely fails.

1756. *In the Convulsions of Childhood* which recur once every day, every other day, or once a week, the cause being obscure, unassociated with debility, teething, &c., Dr. Hughlings-Jackson[1] advises the bromide in doses of gr. $\frac{1}{4}$ for a child under six weeks of age; gr. $\frac{1}{2}$ under three months; gr. j. above that age, and gr. j. additional for every year. The bromide, he adds, is a most useful drug in *Chronic Convulsions from any cause*, and in most cases, excepting temporary and acute states like anæmia, it should be prescribed when other remedies fail, whatever is the state of the child.

1757. *Vertigo*, especially when it occurs paroxysmally, without the co-existence of obvious spasm, or organic disease of the brain, often yields to the bromide; and *Headache* of a paroxysmal character, with heat of the head and flushing of the face, is often rapidly relieved by it. (Reynolds.)

1758. *Some forms of Neuralgia* are effectually relieved by full doses of the bromide when other remedies have failed. It also in many instances relieves the pain and irritability of *Chronic Arthritis*.

1759. *In Hysteria*, it is occasionally useful as a sedative. It was first employed in this class of cases by Sir C. Locock.[2] A case of *Hysterical Dysphagia* benefited by it is mentioned by Dr. J. Turnbull, who has published some valuable remarks on this drug in nervous affections.[3]

1760. *In Affections of the Genito-urinary Organs*, the bromide exercises special influence as a sedative; hence it has been employed with satisfactory results in *Nymphomania*, *Priapism*, and some forms of *Spermatorrhœa*. *In Gonorrhœa*, M. Riemslagh[4] found the bromide an effectual cure in doses of gr. xv.–xxx., taken in two or three doses at intervals of an hour. It effectually relieved the *Chordee* in these cases.

1761. *In Menorrhagia*, it is a remedy of considerable power. The rules which should guide us in its administration are thus laid down by Dr. Ringer (p. 74):—If the loss of blood occurs only at the natural menstrual period, it will be sufficient to begin the medicine about a week before the discharge is expected, and when this has for a time ceased it should be discontinued till the next attack is about to begin. If, on the other hand, the loss of blood occurs every fortnight, or oftener, it should be given without any intermission till the disease is

[1] Reynolds's System of Med., ii. p. 240.
[2] Lancet, May, 1857.
[3] Liverpool Med. Surg. Rep., Oct. 1868.
[4] Med. Circular, Oct. 15, 1862.

well controlled ; and when the discharge has been brought to its right period and amount, a few doses should be given for a short time before each monthly period. Over *Uterine Hæmorrhage*, due to tumours of the uterus, it has less control than ergot and other remedies.

1762. *In Fibrous Tumours of the Uterus*, Dr. Graily Hewitt (p. 558) speaks favourably of a conjoined use of bromine and iodine ; gr. x. of the bromide being taken internally twice or thrice daily, whilst iodide of potassium ointment is applied over the lower part of the abdomen. At the same time, other measures, baths, &c., should not be omitted. He mentions a case, where a very large fibroid growth was present, in which the bromide and iodine, as directed above, was persevered in for nearly a year, and a marked diminution in size was effected. When practicable, the mineral waters of Kreuznach should be resorted to.

1763. *In the Vomiting of Pregnancy*, the bromide (gr. xv.–xx. every two or three hours) has proved successful in the hands of Drs. Packard and Hickson.[1]

1764. *In Spasmodic Asthma*, in two long-standing cases which had resisted all ordinary remedies, Dr. Begbie (op. cit.) obtained excellent results from full doses of the bromide night and morning. In two other cases, in adults, it failed in the hands of Herr Sondahl,[2] but it proved eminently successful in a case of *Spasmodic Asthma of Childhood*, after all manner of narcotics, expectorants, and anti-spasmodics had failed. It was given in gr. vj. doses, in syrup, every two hours.

1765. *In Laryngismus Stridulus and Spasmodic Croup*, it has been employed at Dr. Begbie's suggestion, and in some cases with manifest advantage. As a local application in croup, a solution of the bromide in an atomized state was first employed by Dr. Schwitzler, and reported favourably of. Dr. Beigel[3] also tried it (gr. x., Aq. fl. oz. j.) in an early stage of the attack, and found the symptoms arrested. It should be applied in the form of spray by means of a suitable apparatus.

1766. *In Hooping Cough*, Dr. Begbie states that he has found the bromide to possess powers not inferior to any narcotic in subduing the nervous element which forms so conspicuous a part of its phenomena. It appears to be successful in proportion as the affection is simple and uncomplicated. It is chiefly adapted to the advanced stages of the affection.

1767. *The Spasmodic Affections of the Bowels, and Colic of Infancy and Childhood* will, according to Dr. Ringer (p. 70) mostly yield at once to the bromide. He also has found it effectual in the *Nightmare* of children as well as of adults.

[1] Practitioner, Sept. 1868.
[2] Ibid., Feb. 1869.
[3] Practitioner, Aug. 1868.
[4] Elements of Med., i. p. 336.

1768. *In Enlargements of the Spleen*, Dr. R. Williams[1] employed the bromide succesfully in four cases. He commenced with gr. j. thrice daily, and gradually increased the dose to gr. iv. He considers that in these cases it is possessed of unusual, if not specific powers. In other hands it has occasionally failed. *In Enlargement of the Liver*, it was also found serviceable.

1769. *Tumours of the Breast.* Dr. H. Osborn[2] records two cases in which marked diminution of size followed the local application of the bromide in acetous solution: *e.g.*, Potas. Bromid. drm. ij., Vinegar fl. oz. vj., applied twice daily by saturating a piece of flannel with the lotion, and covering it with oiled silk. It should be used warm, especially in the winter. Dr. Osborn suggests the use of the bromide solution locally in *Acute and Chronic Orchitis.*

1770. *In Painful Hæmorrhoidal Affections, Fissures of the Anus, &c.*, M. Ferrand[3] has found compresses saturated with a solution of the bromide (4 parts) in glycerine (20 parts) locally applied, give immediate relief. It seems worth a fair trial.

1771. *In Scrofulous Eruptions and Ulcerations*, the bromide internally has been found serviceable in allaying pruritus, &c.; but as a general remedy in *Scrofula* it is inferior to iodine and cod-liver oil. Dr. Garrod substituted it for the iodide with complete success in *Syphilitic Psoriasis and other Syphilitic Eruptions.* In persistent *Urticaria*, occurring independently of local causes or constitutional derangement, Dr. M'Call Anderson[4] advises the bromide in full doses.

1772. Amongst other diseases in which it has been employed are *Diabetes and Cholera* (Begbie), *Amenorrhœa and Hypertrophy of the Ventricles* (Magendie), *Carbuncle* (Bennett), and *Incontinence of Urine in Children* (Hewson), but evidence of its utility is inconclusive. The bromide is apparently deserving of more attention than has been awarded to it in *Inflammatory and Painful Affections of the Eye.* (See sect. 1750.)

1773. POTASSII IODIDUM. Iodide of Potassium. KI. Called also the Ioduret of Potassium, and Hydriodate of Potash.

Med. Prop. and Action. Are closely analogous to those of iodine. Like it, it occasionally produces headache, flushing of the face, and gastric irritation; and when taken in too large doses, it produces coryza, and, in some cases, salivation and emaciation of the testes and mamma, but these latter effects are rare. M. Dorvault,[5] who has examined closely the action and properties of the iodides, observes, that if the animal fluids (blood, lymph, semen, and milk), or their proteine elements (albumen, fibrin, and

[1] Elements of Med., p. 366.
[2] Med. Times and Gaz., April 16, 1870.
[3] Practitioner, Aug. 1868.
[4] Lancet, March 19, 1870.
[5] Iodognosie, Paris, 1852.

casein) be subjected to the action of a solution of iodide of potassium, it will be seen to prevent their coagulation, and will dissolve them. In producing this effect, the salt remains unaltered; it acts, therefore, by what chemists have called the *catalytic* force. The same result may be shown to have been obtained when employed in certain pathological cases. The salt may be detected unaltered in the blood, or urine, or other secretions. These facts have been observed by many other investigators, and all have found practically, that the iodide of potassium promotes secretion, and increases the function of the mucous glands of the alimentary canal, of the liver, kidneys, skin, pancreas, parotid, &c. It is rapidly eliminated from the animal fluids. Dr. Scharlau found that a patient to whom he gave 53 grammes daily, eliminated 51 by his urine; the other two by the saliva, sweat, and tears. Dr. Kramer satisfied himself by his experiments, that six days sufficed for the complete elimination of this salt, after its exhibition during fifty days. *As a lactifuge*, the iodide is stated by M. Rousset[1] to prove very effectual. In order to obtain this effect, it requires to be given in full doses, within the first or second day after delivery. The dose has been a matter of dispute; some exhibiting it in very small quantities (gr. ij.–iij.), whilst others have given as much as gr. lx. or even gr. cxx. for a dose. Further remarks on the dose, and the combinations which are supposed to increase the efficacy of the iodide, will be found in Art. Syphilis (*infra.*) Opium appears to interfere considerably with the development of its action. Externally, it may be advantageously applied in the form of ointment, which is mildly stimulant, discolours the skin, and, in some instances, causes much irritation; it should be used freshly prepared, as if kept long it is apt to spoil. (See also IODUM.)

Dose, gr. ij.–x. in solution. Prep. for external use: *Ointment* (Iod. o Potassium gr. lxiv., Carb. of Potash gr. iv., Water fl. drm. j., Lard oz. j. Dissolve the iodide and carbonate in the water, and mix with the lard.) *Liniment of Iod. of Potassium and Soap* (Hard Soap, Iod. of Potassium āā oz. j½., Glycerine fl. oz. j., Oil of Lemon fl. drm. j., Water fl. oz. x. Dissolve the soap in water fl. oz. vij., and the iodide and glycerine in the remaining fl. oz. iij. Mix the solutions, add oil of lemons, and mix thoroughly.

1774. *Therapeutic Uses. In Scrofula and Scrofulous Affections*, the iodide, given uncombined with other remedies, does not appear to exercise any great influence; but when conjoined with iodine, it is essentially useful, apparently increasing the activity of the latter remedy, in addition to rendering it more easily soluble. It should be employed both externally and internally. Lugol found that baths, holding in solution the iodide alone, produced no sensible effect on the skin, or on the constitution. Given in combination with quinia, it often proves most serviceable in *Scrofulous Ophthalmia*.

1775. *In Chronic Hydrocephalus*, the iodide internally, and iodine lotions to the scalp, have been advocated by Trousseau, and when more active measures may not appear justifiable, some hope in the way of arrest of the further progress of the disease may be entertained from the use of these remedies. Great additional assistance is derivable from the syrup of iodide of iron, cod-liver oil, and bone-earth. (Dr. Ramskill, ii. p. 404.) Dr. Barlow[2] recommends the following formula:—

[1] Gaz. Hebd. de Méd., Sept. 17, 1858.

[2] Pract. of Med. p. 538.

℞ Potas. Iod. gr. iv., Spt. Æther. Nit. ʒj., Liq. Potass. ♏xxiv., T. Hyoscyam. ʒj., Syr. Aurant. ʒij., Aq. ad fl. oz. ij. Dose ʒj., thrice daily for a child æt. 1 year. In the acute form, when the disease is declared, the iodide is recommended by Dr. Hillier (p. 172), the other measures being ice or cold lotions to the head, mercurial aperients, and absolute rest in a quiet darkened room. It may be given to young children, in doses of gr. j. every four hours. Dr. Coldstream[1] bears witness to its value in subduing the symptoms indicative of a tendency to hydrocephalus, especially when occurring in scrofulous subjects. *In the Convulsions attendant on Dentition*, which, amongst ill-fed children, are often followed by hydrocephalus, he found great advantage from its use. He gave gr. ½–gr. iij. every three or four hours in some carminative water; blisters to the scalp were used at the same time.

1776. *In Syphilis*, the value of the iodide is universally recognised, but it is in the secondary and tertiary, or constitutional forms of the disease alone that its full powers are displayed; in the primary form it exercises little or no influence. *In Syphilitic Affections of the Bones*, e.g., *Nodes*, *Caries and Necrosis*, *and Periostitis*, it holds the first place in our list of remedies; and though its effects are not so immediately manifest, it exercises no less certain an influence on *Syphilitic Affections of the Skin*, especially when these appear on the scalp. It may also be given with great advantage in *Affections of the Nervous System of Syphilitic origin*, and in *Syphilitic Cachexia*. It is alleged against the use of the iodide in these cases, that the cures effected by it are not permanent, and that relapses often occur when the remedy is discontinued. In such cases it may be doubted if the remedy has been given in sufficiently large doses, or been sufficiently long persevered in. The dose has been very variously estimated, some exhibiting it in very small doses (grs. ij.–iij.), others, the majority, using medium doses (grs. v.–vj. thrice daily), whilst a third class prescribe it in doses of grs. lx.–lxxv. Amongst those who advocated the last-named doses, is Sir H. Thompson,[2] who after extensive experience draws the following conclusions: 1. The iodide in large doses (grs. xxx.–lxxv. daily) is almost a specific for the cure of *large spreading tertiary, or late secondary ulcerations of the skin*, such as those so common and generally so intractable, affecting all parts of the body, and which often follow an eruption of rupia. 2. For those late *syphilitic eruptions which affect the nose* so disastrously, and often so rapidly, these same doses are equally valuable. 3. Iodism is exceedingly rare in the presence of tertiary syphilis, and large doses do not, as a general rule, occasion loss of flesh. If they cure the syphilis,

[1] Edin. Med. Journ., Dec. 1859. [2] Lancet, Dec. 28, 1867.

the patient usually gains weight under their influence. The observations of Dr. J. Pollock, Dr. Sisson, and others, tend to prove not only the safety, but the efficacy of large doses of the iodide in this class of cases. Its failure may doubtless be sometimes traced to its having been exhibited in too small doses. Various combinations have been proposed to increase its efficacy; thus Mr. Paget[1] advises ammonia:—℞ Potass. Iod. gr. iij., Spt. Ammon. Arom. ♏xxx., Aq. fl. drm. iv., ft. haust. ter in die: in exceptional cases he increases the iodide to grs. xv.–xxx. daily; a dose to be taken soon after a meal. Dr. Sisson[2] advises its being combined with carbonate of potash, which prevents iodine being set free in the stomach, and Dr. Peter Eade[3] advises the citrate of iron and quinine (āā gr. x.) Thus given, he states that he has repeatedly found it effectual, whilst the same dose of the iodide alone has exerted little or no power over the progress of the disease. Dr. Sisson (op. cit.) considers that in susceptible persons, in order to avoid catarrhal symptoms, the dose should be small, much diluted, and taken on an empty stomach.

1777. *In Chronic Gout*, the iodide proves of service. It undoubtedly possesses great power in controlling inflammation of fibrous tissues; its action on the periosteum is very marked in cases of *Nodes*, also in *Painful Neuralgic Affections dependent upon an inflammatory state of the nerve coverings;* it is more especially useful when the pains are increased at night, and by the heat of bed. It is also useful in removing the recent thickening of the tissues around joints; but proof is still wanting of its possessing any power of causing the absorption of urate of soda. In gouty inflammation, when fluid has been effused into the cavities of the joints, and has been slow of absorption, the iodide often appears to act with great advantage. (Dr. Garrod.[4])

1778. *In Rheumatic Gout, in weakly and cachectic constitutions*, Dr. Fuller (p. 354) recommends the following mixture:—℞ Potass. Iod. gr. v.–x., Liq. Potass. ♏xlv., T. Cinchon. Co. ℥jss., Decoct. Sarsæ Co. ℥iij., M. ter die sumend. When the skin is inactive, and the circulation languid, it is best combined with guaiacum. *When connected with a syphilitic taint*, it seems insufficient of itself to arrest the mischief, but when conjoined with corrosive sublimate (Liq. Hydrarg. Perchlorid. ℥j.–℥ij.), it speedily produces a beneficial effect. It has been repeatedly observed, that the disease which had previously resisted these remedies exhibited separately, has yielded to them when given in combination (p. 397). *In Chronic Rheumatism, when the periosteum is implicated*, no remedy is more generally serviceable

[1] British Medical Journ., May 9, 1868.
[2] Lancet, Dec. 29, 1866.
[3] Lancet, Jan. 18, 1868.
[4] Reynolds's Syst. of Med., i. p. 862.

than the iodide, especially in conjunction with mezereon (*q.v.*) The same treatment has been found of great service in *Gonorrhœal and Mercurial Rheumatism*. *In Chorea occurring in children subject to chronic rheumatism*, Dr. Hillier (p. 236) considers that the iodide may prove useful.

1779. *In Sciatica and Lumbago*, when of a sub-acute or chronic character, and the patient has to follow his out-door avocations, Dr. Graves (i. p. 496) strongly advises the iodide, in doses of ʒj. daily, dissolved in decoction of sarsaparilla. In his own person, and in many other cases, he found it most efficacious.

1780. *In Face-ache*, partaking more of a rheumatic than a neuralgic character, Sir T. Watson (i. p. 717) found the iodide, in doses of gr. v.–vj., work a speedy and permanent cure. I have found it very serviceable in numerous cases.

1781. *In Hemiplegia*, it occasionally proves effectual. M. Briquet relates a case of two years' standing, in which there was complete loss of feeling over the whole of one side, and which yielded in two months to the iodide, in doses of gr. x.–xviij. daily. In an instance of that form of *Paralysis* named *Paralysie Musculaire Atrophique*, the iodide was successfully prescribed by Mr. F. Taylor.[1] It was given in doses of gr. v. three times a day, and muscular power began to return soon after it was commenced, other treatment having previously failed.

1782. *In Chronic Inflammation and Enlargement of the Liver*, the iodide, given in combination with taraxacum, exercises a beneficial influence. Dr. Copland (ii. p. 746, 758) observes that it is chiefly when enlargement, obstruction, or torpor of the liver occurs after periodic fevers, or in the scrofulous diathesis, that he has found the iodide of potassium, employed externally or internally, or both, and in conjunction with other deobstruents, as liq. potassæ, or alternated with purgatives, the most serviceable. Mr. Beckford[2] records a case of *Hydatid Tumour of the Liver*, which disappeared under the use of the iodide, in doses of grs. xxx. daily. *In Dropsy connected with Disease of the Liver*, he regards it as a most valuable deobstruent and diuretic, and more to be depended upon than any other medicine. *In that form of Dropsy which occurs after Scarlet Fever*, Dr. Graves (i. p. 352, 452) also states that he can speak with the greatest confidence of the iodide; and that he has employed it with signal benefit in *Hypertrophy of the Liver*. Dr. Mackenzie[3] found the iodide, internally administered, very effectual in curing *Muscæ Volitantes depending upon hepatic derangement*. *In Tabes Mesenterica*, the internal use of the iodide, in small and repeated doses, has a marked influence in

[1] Med. Times, July 11, 1863.
[2] Practitioner, Nov. 1868.
[3] Edin. Med. Surg. Journ., July 1, 1845.

reducing the tumid state of the abdomen, in improving the appetite and the state of the stools, and in establishing the general health. Dr. Barlow[1] recommends the following formula:—℞ Potass. Iod. gr. iij., Liq. Potass. ♏xxiv., Spt. Æther. Nit. ʒj., Decoct. Sarsæ Co. ad fl. oz. iij., M. Dose, a tablespoonful thrice daily for a child æt. 3 years.

1783. *In Chronic Bright's Disease*, the iodide has sometimes proved of signal service, even when the dropsy has been extensive and the urine very scanty. In these cases, together with an increase of the urine, and the disappearance of the dropsy, there has been improvement in the general health. Possibly in these instances the affection was of syphilitic origin. (Dr. Ringer, p. 65.)

1784. *In the advanced stages of Pneumonia, Pleurisy, and Bronchitis*, the iodide variously combined, according to circumstances, appears to aid in restraining inflammatory action, and in promoting the absorption of effusions and indurations. *In Emphysema of the Lungs*, it also exercises a favourable influence, but it is not to be depended upon alone. With regard to its use in *Phthisis*, Dr. Cotton[2] draws the following conclusions:—1. Iodide of potassium, given in moderate doses to consumptive patients, occasionally produces dyspeptic symptoms, but more commonly is unattended by any marked result, either in one direction or the other. 2. Under its use the weight is seldom increased, but either remains stationary or is diminished, the latter effect being of the most frequent occurrence. In that form of *Phthisis which is associated with Syphilitic taint*, it is a valuable remedy, and may be given in conjunction with iron and cod-liver oil.

1785. *In Asthma*, the iodide, according to Dr. Hyde Salter (p. 307), entirely fails in a great many cases, while those in which its success is complete are comparatively few. Sometimes, however, the most striking results attend its use. Being satisfied of its occasional great value, he urges the propriety of its use in any case in which it has not been tried. It often requires to be continued for some time before it begins to manifest its effects.

1786. *In Chronic Pericarditis*, the iodide, in doses of gr. iij.-v. thrice daily, has sometimes been administered advantageously; appearing to favour the absorption of effused fluid. *In Hypertrophy of the Heart*, also, the long-continued use of small doses of the iodide appears, in some cases, to exercise a beneficial influence. It requires to be persevered in for a considerable length of time. *In Aneurism of the Aorta*, M. Bouillaud found the iodide produce the best effects in diminish-

[1] Pract. of Med., p. 561.
[2] Medical Times and Gazette, Dec. 24, 1859.

ing the size of the tumour. He gave gr. xv., and subsequently gr. xxx. daily for two months. In two cases in which he employed it, the results were most satisfactory. Dr. Balfour,[1] of Edinburgh, mentions 15 cases of *Aneurism* in which the iodide was employed, and in 12 of these there was observed undoubted diminution in the size of the sac. The results were on the whole very satisfactory. The object is to saturate the system with the iodide, without on the other hand inducing iodism. The doses require to be carefully regulated in each case. Dr. Waters (p. 409) states that his experience in its use does not enable him to say much in its favour.

1787. *In Saturnine Affections*, M. Melsens[2] advises the use of very small and cautiously-increased doses of the iodide of potash, in cases of chronic poisoning by lead. The theory of its action is, that it renders soluble, metallic substances, which might otherwise remain in the system, by associating them with another substance that is readily eliminated by the organs of secretion. This theory, if correct, shows the necessity of caution in the use of the remedy; which, if given in large doses, would favour the absorption into the system of a powerful poison. *In Mercurial Palsy and Tremors*, the iodide, acting on these principles, was found beneficial. Some facts have been adduced by Dr. Schneider,[3] of Vienna, which are opposed to the views of M. Melsens. *In violent Mercurial Salivation*, the iodide in decoction of cinchona often proves serviceable.

1788. *In Flatulent Dyspepsia*, in which, whether from a too starchy diet, deficient or hasty mastication, decayed teeth, the abuse of tobacco, or other causes, the salivary secretion seems either deficient in quantity or faulty (*e.g.*, acid) in quality, Dr. Brinton (p. 331) states that a small dose of the iodide (gr. j.–ij.) with bicarbonate of potash (gr. vij.–x.) will suffice sometimes to effect a marked change after two or three administrations.

1789. *In Diphtheria*, the iodide given largely diluted, is said by Dr. Wade invariably to prevent renal mischief; but Dr. Hillier (p. 146), who employed it thus, found it sometimes depress the patient, without always preventing the accession of, or arresting albuminuria.

1790. *Diseases of the Eye. In Syphilitic Iritis*, the iodide is ordinarily inferior in efficacy to mercury, but in obstinate cases Mr. Soelberg Wells[4] states that great benefit is derivable from the iodide in large doses. *In Catarrhal Ophthalmia*, it proved signally useful in the hands of Mr. Ostrey.[5] Dr. Copland (i. p. 61) employed it successfully in *Amaurosis;* two of the

[1] Edinburgh Med. Journal, July, 1868.
[2] Bull. de l'Acad. Roy. de Méd., 1849.
[3] Edin. Med. Surg. Journ., 1861–2, p. 394.
[4] Lancet, Sept. 18, 1869.
[5] Dublin Journ., xxi. p. 417.

cases in which it proved effectual were consequent upon apoplectic seizures. *In Opacities and Ulcerations of the Cornea*, a saturated solution of the iodide in glycerine, is recommended by Dr. Castorani,[1] but the intense pain it is said to cause is a great objection to its use. (See also IODINE.)

1791. *Looseness of the Teeth, depending upon Periostitis of the Alveolar Processes*, known by the great pain, swelling, and sponginess of the gums, is often effectually cured by the iodide. Dr. Graves[2] relates a case cured by it, in doses of gr. x. thrice daily.

1792. *In Engorgement of the Breasts in Puerperal Women*, Dr. Billi,[3] of Milan, prescribed it with success. He gave from gr. vij.–gr. ix., in divided doses daily.

1793. *In Chronic Skin Diseases*, especially when of a syphilitic origin, or occurring in persons of scrofulous diathesis, the iodide in large doses often proves most useful. Amongst other diseases, *Sycosis*, *Pemphigus*, and *Erythema Cachecticum* have been found to improve under its internal administration. *In Scabies*, it has been advised locally in the form of ointment (gr. xxx., Ung. oz. j.) or lotion (grs. lx., Aq. fl. oz. viij.–xvj.), but it has never come into general use. *In Simple Ulcers of the Legs*, Drs. Tige and Trastour[4] advocate the internal use of the iodide in doses of gr. xv.–xx. in water thrice daily before meals. It is to be used in addition to local applications, the operation of which it seems to facilitate.

1794. *In Lupus of the Limbs*, Mr. Milton[5] regards the iodide as the most efficient remedy; gr. lx. gradually increased to gr. cxx., in a bitter infusion weekly, generally suffices. When it cures the disease, it always acts soon, and the action goes on till the part is healed. When improvement comes to a stand-still, augmented doses will generally have no effect; calomel should then be employed (*q.v.*)

1795. PRUNUM. PRUNE. The dried Drupe of the Plum, Prunus domestica, *Linn.* *Nat. Ord.* Rosaceæ. *Source*, S. Europe.

Med. Prop. and Action. Laxative; officinal only as an ingredient in Confectio Sennæ (*q.v.*)

1796. PTEROCARPI LIGNUM. RED SANDAL WOOD. The wood of Pterocarpus santalinus, *Linn.* *Nat. Ord.* Leguminosæ. *Hab.* India. Officinal only as a colouring agent in Tinct. Lavandulæ Comp. Mildly astringent; of no therapeutic value.

[1] Practitioner, Sept. 1868.
[2] Dubl. Med. Journ., xviii. p. 238.
[3] Med. Times and Gazette, Oct. 3, 1863.
[4] Ranking's Abstract, xxx. p. 236.
[5] Journ. of Cutaneous Med., July, 1867.

1797. PUNICA GRANATUM, *Linn.* Pomegranate. *Nat. Ord.* Granateæ. *Hab.* Southern Europe, the East and West Indies, &c.

Med. Prop. and Action. The flowers, named *Balaustion* by the ancients, are astringent, and are still used as such by the natives of India. The rind of the fruit is a very useful astringent, and is best exhibited in the form of decoction (oz. ij., Water Ojss., boil to Oj.), in doses of fl. oz. ss.–fl. oz. j. The bark of the root (*offic.*) is, however, the part chiefly valued, from its powerful anthelmintic properties. (See *infra.*) The decoction is useful as an astringent application in relaxed conditions of the mucous membrane of the throat, intestines, &c. All the above parts of the plant are rich in tannin.

Dose:—Of Decoction of the Root-bark (oz. ij., Water Oij., boiled to Oj.), fl. oz. j.–ij. *Of Decoction of the Rind* (oz. ij., Cloves bruised gr. lx., Water Oj.), fl. oz. j.–j½.

1798. *Therapeutic Uses. Against Tænia or Tape-worm*, the bark of the root is almost a specific, if it be employed fresh and in a proper manner. Its efficacy was known long before the age of Celsus,[1] but it fell into disuse. Its re-introduction in 1805 is due to Dr. Buchanan,[2] of Calcutta; and its efficacy is now generally admitted. Of the decoction (*ut supra*), fl. oz. ij. should be administered fasting, and repeated every half-hour, until four doses have been taken. It should then be followed by a dose of castor oil. Dr. Elliotson[3] prefers the root-bark in powder, in doses of grs. xx.–xl. every two hours, until six doses have been taken; the next day, twelve similar doses are advised, and then an aperient. The decoction, however, is preferable. The shortest period in which the worm has been expelled under the use of this remedy is three hours; the longest, twenty-five; and the average, about twelve hours.

1799. *In Chronic Diarrhœa and Dysentery*, when unattended by inflammatory action, the decoction of the rind of the fruit (*ut supra*) occasionally proves highly serviceable. I have seen it arrest the discharge in some instances, when other astringents had previously failed. It is particularly useful in *Diarrhœa consequent on debilitating diseases.*

1800. *In Cancer of the Uterus*, Dr. J. Clarke advises the following injection, when the discharge is so profuse as to cause great debility:—℞ Decoct. Cort. Granati Oj., Alum ʒss., M. *In Leucorrhœa*, the same injection, or with a smaller proportion of alum (gr. lx.), may be used with advantage.

1801. *In Relaxed Sore Throat*, the decoction, with the addition of alum (gr. lx. ad Decoct. Oj.), proves very useful as a gargle.

1802. PYRETHRI RADIX. PELLITORY ROOT. The root of Anacyclus Pyrethrum, *D.C. Nat. Ord.* Compositæ. *Source*, The Levant.

[1] De Medicinâ, lib. iv. cap. xvii.
[2] Edin. Med. and Surg. Journ., vol. iii. p. 22.
[3] Med.-Chir. Transactions, vol. xi. p. 301.

Med. Prop. and Action. Irritant and sialogogue. It is extremely acrid, and when rubbed on the skin, it causes much irritation, and even inflammation. When chewed, the taste is at first insipid, but after a few seconds it causes a hot, pungent, pricking sensation in the tongue and lips, with a copious secretion of saliva. Its activity appears to depend on an acrid oil, and a compound resin, *Pyrethrin*. It is rarely employed internally; its chief use is that of a masticatory. A tincture (oz. iv., Rect. Sp. Oj.) is officinal in B. Ph.

1803. *Therapeutic Uses.* *Toothache* is sometimes relieved by chewing slowly a piece of pyrethrum root, or by applying the tincture on a piece of cotton to a carious tooth. It has also been thought useful in *Paralysis of the Tongue* and *Muscles of the Throat, and in Nervous Aphonia.* In each case it acts as a powerful local stimulant and sialogogue. *In Relaxed Sore Throat*, the following is a useful stimulant gargle:—℞ T. Pyrethri f℥iij., Aq. ℥viij., M. O'Shaughnessy (p. 414) found it effectual in two obstinate cases of *Spontaneous Salivation.* It is a remedy of very minor importance.

1804. Quassiæ Lignum. Quassia Wood. The wood of Picræna excelsa, *Lindl.* *Nat. Ord.* Simarubeæ. *Hab.* West Indies.

Med. Prop. and Action. Bitter tonic and stomachic. Its activity appears to reside in a bitter neutral principle, *Quassine.* It has many advantages over most other vegetable tonics; it does not increase the animal heat, it produces no sensible arterial excitement, it causes no constipation, and may be administered in infusion, in combination with the salts of iron, and of all other metals, with the exception of the nitrate of silver and acetate of lead. An increased flow of urine often follows its exhibition. It acts as a powerful narcotic poison on flies and other insects; the alcoholic extract introduced subcutaneously kills small animals with obscure narcotic symptoms. (Christison.) In large doses it has been stated to produce narcotic symptoms in man, but none such have ever fallen under my observation. It is said to be used by brewers as a substitute for hops.

Dose:—Of Quassia Wood in Powder, gr. x.–xx. *Of the Extract*, gr. iij.–v. *Of the Infusion* (Quassia Chips gr. lx., Cold Water fl. oz. x., infused for half an hour and strained), fl. oz. j.–ij. *Of the Tincture* (Quassia Chips oz. ¾, Proof Spirit Oj.), fl. drm. ½–ij.

1805. *Therapeutic Uses.* *In Intermittent Fevers*, quassia has been highly extolled. It was first introduced into notice in 1756, as a successful remedy in the treatment of the severe fevers of Surinam; and in the West Indies, even up to a very recent period, it was considered to possess considerable febrifuge power; thus Dr. Thomas[1] states that during his residence in the West Indies he met with many cases of intermittent fever, which, after resisting the powers of cinchona, gave way to the use of quassia—"indeed," he adds, "so sovereign a remedy was this found in intermittents, and so easy was it to be obtained, that it was pretty generally substituted by all

[1] Practice of Physic, p. 14.

practitioners." He advises it in the form of infusion (℥ij. ad Aq. Oss.) *In low Remittent and Nervous Fevers*, it was a favourite remedy of Dr. Lettsom, but it merits little or no confidence. There is, however, no doubt that it is an excellent tonic, especially with the mineral acids, in *Convalescence after Fevers and other debilitating diseases.*

1806. *In Dyspepsia*, attended by acidity of the stomach, sour eructations, and marked especially by vertigo and a tendency to syncope, a combination of carb. of soda and infusion of quassia has been found of signal use. (Trousseau and Pidoux, ii. p. 380.) The same may be said of other more evidently *Nervous and Hysterical Affections, arising in connection with Dyspepsia.* (Stillé.) It has been found peculiarly adapted for the *Dyspepsia of Drunkards.* Dr. Lettsom thought highly of it in the advanced stages of *Diarrhœa.*

1807. *Against the Round Worms or Lumbrici*, occurring in children, the infusion taken for three or four days in succession, and followed by a brisk purge, is sometimes very effective. In the treatment of *Thread Worms*, Sir T. Watson (ii. p. 539) states that he has found the infusion, in the form of enema, very effectual.

1808. QUERCUS CORTEX. OAK BARK. The dried bark of the small branches and young stems of Quercus pedunculata, *Willd. Nat. Ord.* Cupuliferæ. *Source*, England.

Med. Prop. and Action. Astringent. It is best given in decoction. It has been regarded as anti-periodic, and its astringency depends upon the presence of tannic and gallic acids. It is principally used as an external application, injection, &c.

Dose:—Of Powdered Oak Bark, gr. xxx.-gr. lx. *Of the Decoction* (Oak Bark oz. j¼., Water Oj.), fl. oz. j.-ij.

1809. *Therapeutic Uses. In Chronic Diarrhœa*, the decoction proves occasionally useful, and it has been advised in the advanced stages of *Dysentery.* Acorns, roasted and powdered, have also been employed.

1810. *In Atonic Menorrhagia and Leucorrhœa*, the decoction with or without alum (gr. lx. ad Decoct. Oj.) is a safe and efficacious injection.

1811. *In Cancer of the Uterus*, Dr. Ashwell advises the following injection:—℞ Infus. Quercûs f℥iv., Pulv. Gallæ ℥ss., T. Catechu f℥ij., M. He found it a useful palliative.

1812. *In Prolapsus Uteri vel Recti, and in Piles*, decoction of oak bark forms a useful astringent local application.

1813. *In Relaxation of the Uvula, Tonsils, &c.*, the decoction may be advantageously used as a gargle.

1814. *In Gangrene, and to indolent and ill-conditioned Ulcers*, poultices of the powdered bark have been applied with advantage. Bigelow advises the decoction as an astringent wash.

1815. QUINIA. QUININE. $C_{20}H_{24}N_2O_2$. An alkaloid obtained from Yellow Cinchona Bark, and from the bark of Cinchona Lancifolia, *Mutis*. It exists also in other Cinchona barks.

QUINIÆ SULPHAS. SULPHATE OF QUINIA. SULPHATE OF QUININE. The sulphate of the above alkaloid. $(C_{20}H_{24}N_2O_2)_2H_2\,SO_4.\,7H_2O.$)

Med. Prop. and Action. Valuable tonic and anti-periodic, possessing in an eminent degree the properties for which cinchona has for so long a period been justly celebrated. From the small space it occupies, it is preferable in the majority of cases to the crude bark, which, from the quantity required to obtain its full effects, is apt to overload the stomach, occasioning dyspepsia and other derangements of the alimentary canal. Its physiological effects have been carefully examined by M. Briquet, whose statements in an abridged form we follow. Grs. iij.–iv., or an equivalent portion of cinchona, increase the activity of the circulatory, respiratory, and nutritive functions. An agreeable warmth is felt at the epigastrium, and extending thence to the neighbouring organs; the pulse rises, perspiration occurs, and all the functions, including those of the brain, are rendered more active. These effects are more distinctly produced by bark than by its alkaloids. If the administration of bark be continued, the blood becomes richer and nutrition more active. Larger doses, *e.g.*, gr. xij. of quinia, give rise to a different order of phenomena. Within the first two hours a marked cerebral excitement occurs, with tension and throbbing headache, morbid sensibility of the eyes to light, buzzing and ringing in the ears, vertigo, unsteadiness of gait, and some palpitation of the heart, muscular quivering, a sense of internal agitation, and general excitement; the face is flushed, the skin is warmer, and the pulse and respiration are more frequent. These symptoms, in the aggregate, constitute the condition designated Cinchonism. If the dose be excessive, or too frequently repeated, these symptoms may be followed by delirium or convulsions. This excitement is one of the ill effects of the medicine in large doses; but it can be restrained within due limits by prolonging the intervals between the doses. After it has passed, the sedative influence on the nervous system becomes manifest. Muscular movements are performed languidly, or there is a complete inability to execute them; the sight and hearing grow dull, taste and smell are impaired, aphonia results from paralysis of the vocal muscles, and dyspnœa from impaired energy of those which move the chest. The heart and pulse become feeble, and the temperature of the body falls. The local action of cinchona and its preparations on the stomach is that of a stimulant within the physiological limits, but of an irritant beyond the latter. Hence, if the gastric mucous membrane is already inflamed, these medicines, and especially the salts, in large doses, may occasion violent reaction, pain, and even ulceration and gangrene. Effects similar in kind may be produced in the urinary passages by the absorption and elimination of quinia. Finally, the prolonged use of quinia may cause a diminution of the red globules, and increase in the proportion of fibrine and water in the blood. From these considerations it follows that the salts of quinia, in large doses, are irritants in their local, and nervous sedatives in their general operation, somewhat like ether, chloroform, and even prussic acid. In those preparations of bark, on the other hand, which contain the largest amount of extractive matters, the tonic and astringent properties predominate. (Stillé, i. p. 454.) Dr. Ranke[1] found in some experiments, made by administering quinine to three healthy individuals, that in each case there was a diminution in the amount of

[1] Medical Times, May 30, 1857.

uric acid in the urine, and he suggests that this may afford an explanation of the *modus operandi* of quinine in ague, where there is, according to all observers, a considerable increase of uric acid in the urine. Mr. R. Walker[1] has published some interesting remarks to show that quinine does not act as a tonic, as is generally supposed, but as a sedative to the efferent nerves of the sympathetic.

Dose, of Sulphate of Quinia:—As a tonic, gr. j.–gr. iij.; as an anti-periodic, gr. iij.–gr. x., or even gr. xx. *Of the Tincture* (Sulph. of Quinia gr. clx., Tinct. of Orange Peel Oj.), fl. drm. ½–ij. *Of the Wine* (Sulph. of Quinia gr. xx., Citric Acid gr. xxx., Orange Wine Oj.), fl. oz. ½–j. *Of the Pill* (Sulph. of Quinia gr. lx., Conf. of Roses gr. xx.), gr. ij.–x.

Other Preparations of Quinine. Quinoidine is a supposed uncrystallizable form of quinia contained in the mother liquors from which sulphate of quinia has been crystallized. According to Van Heijningen, it may be resolved into ordinary quinia, cinchonia, quinidina, and a resinous substance. (Pereira.) From it Liebig obtained his Amorphous Quinine, which he considers bears the same relation to crystallizable quinia that barley-sugar does to sugar-candy. Dr. Garrod thinks amorphous quinine is closely allied to *Quinicine*, a substance isomeric with quinine, into which Pasteur found that the latter is changed when carefully heated in the form of a salt, as the tartrate. (Garrod.) The dose of Amorphous Quinine is gr. j.–gr. x.

Quiniæ Arsenias. Arseniate of Quinia. A salt supposed to combine the anti-periodic properties of arsenic and quinine. Dose, gr. ¾–gr. jss. in twenty-four hours, in divided doses.

Quiniæ et Ferri Citras (*offic.*) (See Ferri et Quiniæ Citras.)

Quiniæ Valerianas. Valerianate of Quinine (Ph. D.) Anti-periodic and anti-spasmodic. Especially useful in *Intermittent Neuralgia*. Said to produce less disorder of the nervous system than the sulphate. Dose, gr. j.–gr. iv., in pill or mucilaginous mixture. It is readily decomposed by acids.

Tartrate, Phosphate, Citrate, Tannate, Acetate, Ferrocyanate, Nitrate, Chlorate, and Hydrochlorate of Quinine have also at various times been proposed as medicinal agents, but they do not appear to possess much advantage over the Sulphate.

1816. *Remarks on the Administration of Sulphate of Quinia.* 1. In all cases previous to its administration, it is advisable to give a purgative or emetic, or both, so as thoroughly to remove all crude matters or biliary accumulations from the alimentary canal.

2. The fluid form is the best, and its activity and certainty of operation are greatly increased by the addition of a few drops of Acid. Sulph. Dil. (one drop to each grain). Mr. Squire, however, recommends that when a large dose (gr. x.) is to be taken, it be merely suspended in water and not dissolved, as the bitterness is not then so intense.

3. Its action is rendered more certain and speedy by being given on an empty stomach.

4. When the bitter taste is objectionable, as in the case of young children, amorphous quinine, which is insoluble in saliva, but readily soluble in gastric juice, may be advantageously substituted.

5. To disguise its taste, it may be given in Infus. Rosæ Acid., which, although it produces a turbid and unsightly mixture, does not interfere with its operation. The same remark applies to strong coffee, which is a good vehicle for its exhibition.

6. When, from irritability of the stomach, it cannot be given by mouth, it may be advantageously administered in the form of enema, in two or three ounces of any bland fluid. Or it may be effectually applied endermically or hypodermically.

7. Combination with other remedies, particularly with opium, arsenic, or the sulphate of iron, appears greatly to increase its efficacy.

[1] Medical Times, February 21, 1863.

8. If under its continued use, fulness of the head, or a buzzing noise in the ears, be experienced, the medicine should be discontinued.

9. When quinia fails, cinchona will sometimes prove effectual; or it may be advantageously replaced by arsenic, sulphate of iron, or some other anti-periodic.

10. It is advisable to continue its administration some time after the disease appears to be cured.

1817. *Therapeutic Uses.* *In Intermittent Fevers*, quinia may be regarded almost as a specific. In no other disease does any other single medicine act with the same degree of certainty and uniformity. Still it occasionally fails; and when it does so, it will generally be found, on examination, that there exists hepatic or splenic congestion, or gastric derangement, all of which states, experience has repeatedly shown, interfere materially with the kindly operation of this remedy. In such cases an active purgative, mercurial or otherwise, followed by taraxacum, with small doses of podophyllin, should be had recourse to, together with the free use of the potash salts, especially the acetate or citrate, or the hydrochlorate of ammonia, or other appropriate salines. When by the use of these means the complication is removed, the full powers of quinine will speedily manifest themselves. There is another class of intermittents over which quinia has little comparative influence, viz., those of long standing—chronic cases, where the malarious poison has become, as it were, engrained into the system, and manifests its presence periodically, week after week and month after month, uncontrolled by change of air and other measures. Here arsenic often succeeds where quinia fails in effecting a cure. The two conditions essential to the success of quinia in intermittents are, 1, that they should be uncomplicated; and 2, that they should be of recent origin. These two conditions being obtained, there is no remedy equal in efficacy to quinia. Great differences of opinion have been expressed as to the best mode and period of its administration. One class advocates the plan of giving it in a single large dose (grs. xv.–xx.–xxx.) immediately before an expected paroxysm; a second class, a similar dose immediately after a paroxysm, or towards the termination of the sweating stage; a third class advocates it in large doses, not only during the intermissions, but also during the hot stage of the fever; whilst a fourth limits its use to small repeated doses (grs. iij.–v.) during the intermissions alone. The last-named plan is the one followed out by the majority of practitioners (the compiler amongst others) with satisfactory results, but whether with a success equal or superior to the other methods, or with a less or greater expenditure of the drug (by no means an unimportant point) it is difficult to say. The mode of treatment advocated by Dr. Maclean (i. p. 64) appears very judicious, and in his hands has for years proved very

successful. It consists in administering grs. xxx. in three equal doses during the period of intermission; the first dose in solution, with a few drops of diluted sulphuric acid, should be given towards the close of the sweating stage, and the last about, as far as can be calculated, an hour before the next anticipated paroxysm. Should there be much irritability of the stomach, it should be given in enema in doses of grs. xv. in place of grs. x. After the paroxysm has by this means been arrested, a moderate degree of cinchonism should be maintained for some days, by giving grs. iij.–iv. in solution every four hours. In cases where the fever returns at the first lunar period, as it is apt to do, the patient, a day or two previously, should be brought under the influence of quinia, which should be maintained till the time is past. Should it fail to influence the fever, attention should be directed to the state of the viscera, &c. (*ante*). When from any cause it cannot be given internally, trial may be made with it applied endermically; the experiments of Dr. Guastamacchia[1] and others tending to prove that it becomes absorbed into the system through the skin, and operates as an anti-periodic almost as certainly as when given internally. He dissolved gr. viij. in f℥ss. of spirit, and rubbed first one-half, and after the interval of a quarter of an hour, the second half, along the spine. When this was done at the commencement of the cold fit, it very often prevented even a single recurrence. Dr. Daunt[2] also bears testimony to this method in the fevers of South America. The hypodermic plan will probably be found more effectual. Dr. Chasseaud[3] found that one or two grains of quinine in alcoholic solution, injected into the cellular tissue of the arm, are equally if not more efficient in arresting fever than large doses given internally. Mr. W. J. Moore,[4] of the Bombay Medical Service, also states that he has treated thirty cases of intermittent fever, and several cases of remittent, with invariable success, by the subcutaneous injection of quinine. He uses from fl. drm. ss.–fl. drm. j. of the following solution: —℞ Quiniæ Sulph. gr. xxx., Acid. Sulph. Dil. gutt. viij.–x., Aquæ fl. oz. ss. The time at which the injection should be made in intermittents is before the expected cold fit. He believes that four or five grains thus used are equal in their effects to five or six times that amount taken into the stomach. The bulk required for injection is a great objection to this formula. The question of combination has in a great measure been overlooked in practice, yet it is certain that a combination of quinia and arsenic will sometimes succeed where each singly has previously failed; and I have sometimes

[1] Edin. Med. Surg. Journ., lix. p. 473.
[2] Med. Times, xvii. p. 476.
[3] Med. Times and Gaz., Aug. 2, 1862.
[4] Lancet, Aug. 1, 1863.

thought that I have derived greater benefit from a combination of quinia and antimony than when the former has been given alone; and the same remark applies to its combination with sulphate of iron. In all cases the induction of cinchonism should be taken as a certain sign that the full physiological effects of the drug have been obtained; and if after its establishment the disease does not yield, to persist in its administration will be useless, and may prove injurious or even dangerous.

1818. *In Remittent Fevers*, quinia is a remedy of the highest value, but its exhibition requires more caution and discrimination than in simple intermittents. The plan propounded in 1847 by Mr. Hare, of the Bengal Medical Service, of administering it in scruple doses in all stages of the fever, even during the height of the exacerbations, has attracted much attention, and has had able advocates, but it has been condemned by Sir Ranald Martin, Dr. K. Mackinnon, and other experienced tropical authorities; and as Dr. Morehead (p. 146) justly observes, the adoption of such a routine practice would certainly tend to favour superficial clinical observation. A more rational, and probably more successful mode of treatment is that advocated by Dr. Maclean (i. p. 77). After premising, in most cases, a cathartic (*q.v.*), immediately on the first signs of remission, he administers a full dose of quinia, grs. x., often gr. xv., sometimes gr. xx., never exceeding that dose, and not deterred by the presence of headache or a foul tongue, nor because the remission is slight or imperfectly marked; and this dose he repeats every second hour until grs. xxx. or xxxv. have been taken before the hour of the expected exacerbation. Should the stomach be too irritable to bear it, it should be given in enema in large doses (grs. xx.) As soon as the second remission appears, it must be given as before until full cinchonism or distinct abatement of the disease occurs. During the remission the patient should have mild farinaceous diet, milk, chicken-broth, &c.; as soon as gastric irritability subsides, beef-tea should be given, and on the first sign of exhaustion, nourishment, and stimulants should be resorted to at short intervals. With regard to the administration of quinia during exacerbations, Dr. Maclean is of opinion that in the adynamic forms of fever, as met with in some parts of India, and in neglected or mismanaged cases, where depletion has been carried too far, and the fever assumes more of a low, continued type, it may be given at any period irrespective of remission. Here it requires to be conjoined with the assiduous use of support and stimulants at short intervals.

1819. *As a prophylactic of Malarious Fevers*, the power of quinia has been variously estimated, but the facts adduced by

Sir. A. Bryson[1] and Mr. L. J. Hayne[2] with regard to its employment in one of the most intensely malarious portions of the globe, viz., the Western Coast of Africa, must be regarded as conclusive as to its possessing undoubted power in this respect. Further evidence to the same effect has been adduced by medical officers serving in the Crimea, and in various parts of the United States, and there can be no doubt that it should be resorted to by all who are exposed to malarious influence. Even if it fails, which it rarely does, no harm can result from employing it. The usual dose employed on the African station was grs. iv. in an ounce of wine daily during the period of exposure, and it is essential that it should be continued for at least fourteen days after quitting the malarious locality.

1820. *In Bilious Remittent, or Yellow Fever*, the *abortive* treatment, as it has been termed, which consists of the administration of one large dose (gr. xxx.–xl.) of quinia with morphia or opium at the outset of the disease, was introduced in 1837 by Dr. Thévenot, of Guadaloupe, and met with supporters in Dr. Blair, of Demerara, Dr. Harrison, of New Orleans, &c. Notwithstanding the lavish praises of these physicians, it failed in the hands of Drs. Van Buren, Fenner, and others. Dr. Stillé (i. p. 517) sums up the evidence *pro* and *con* in the following words :—" 1. That quinia is not a specific for yellow fever, as it is for periodical fevers of every type. 2. That in mild cases, which would probably recover under good nursing and the expectant treatment, the medicine may sometimes hasten recovery. 3. That, on the whole, the results depending upon quinia are no better, if indeed they are as good as those of the treatment of symptoms sanctioned by general experience." This is perhaps a little too low an estimate of the powers of the drug, some of the evidence in favour of its powers being very strong.

1821. *In Typhus Fever*, cinchona was introduced in 1770 by Dr. Miller, and was subsequently recommended by Dr. J. Clark, &c. In 1851, Dr. Dundas, from a fancied analogy between typhus and intermittent fever, proposed the treatment of the former by large doses of quinine. Much difference of opinion has been expressed as to its powers. That it failed in the typhus of the Crimean war, where it was tried largely, is undisputed; and Dr. Murchison (p. 262), who is unfavourable to its use, observes: " One thing is certain, that there is no proof that quinine can arrest the course of true typhus." The ill effects occasionally observed have been increase of coma and delirium, and great depression of the vital powers. *In Typhoid (Enteric) Fever*, Dr. Murchison (p. 571) speaks very favourably of

[1] Med. Times and Gaz., Jan. 7, 1854.

[2] Ibid., March 24, 1855.

quinine given as follows:—℞ Quiniæ Sulph. gr. ¼–gr. j., Acid. Sulph. Dil. vel Acid. Hydrochloric. Dil. ♏ xv.–xxx., Syr. Aurant. f℥ss., Aq. Carui f℥j., M. ft. haust. tertiâ vel quartâ horâ sumend. Though it has no power to cut short the fever, yet, under its use, the febrile exacerbations become reduced in severity, the appetite improves, and the strength increases. Much of the benefit is probably due to the acid. *In the Typhoid Fever of Children*, Dr. Hillier (p. 341) states, that in moderately large doses quinine appears to be useful in reducing the intensity of the fever. It is recommended by Barther and Rilliet. In *Relapsing Fever*, quinine has been used with the view of warding off a relapse, but, like all other medicines, it has proved inoperative.

1822. *In Puerperal Fever*, Dr. Cabanellas[1] employed quinine in several cases with the best results. He premises the use of emetics and poultices to the abdomen, and then prescribes quinine in doses of ten or fifteen centigrammes every hour, day and night. It is to be hoped that further trials with this remedy will be made in epidemical forms of the disease.

1823. *In Scarlet Fever*, Dr. P. Hood has found the greatest service from the systematic administration of quinine from an early stage, its use being preceded by an emetic and a purgative. His testimony in favour of this treatment is very strong; he considers not only that it saves life, but that it prevents the occurrence of secondary affections, particularly renal dropsy. To act thus, however, its use must be commenced early.[2] *In Scarlatinal Albuminuria*, it proved more successful than any other remedy, in the hands of Dr. Hamburgher.[3] *In Otorrhœa and Ozæna following Scarlet Fever*, after the subsidence of all acute symptoms, quinine with sulphuric acid is advisable. In the former, warm-water injections and counter-irritation behind the mastoid process may also be employed. (Dr. Hillier.) Dr. Mouser[4] considers that he has seen great benefit in *Small-pox* from the exhibition of quinine (gr. ij. every three hours) from the commencement of treatment until all febrile symptoms have subsided and desiccation is fully established.

1824. *In Influenza*, cinchona was formerly condemned in the early stages, but in some of the late epidemics quinine appears to have been useful throughout. It seems clear, however, that immediately the acute stage is passing off, quinine should be freely given. It does good service against the neuralgic pains which are often troublesome during convalescence. (Dr. Parkes.)

1825. *Periodical or Intermittent Diseases.* When any affection assumes a periodical type or character, particularly if there be reason to suspect a malarious origin or influence,

[1] Med.-Chir. Rev., July, 1862.
[2] Practitioner, Feb. 1869.
[3] Archiv. Gén. de Méd., April, 1861.
[4] Ranking's Abst., xxxvii. p. 41, 1863.

quinine is indicated, and will be found efficacious, even when other circumstances might appear to warrant some other mode of treatment. *In Intermittent Angina Pectoris*, Dr. Forbes[1] advises its employment. *In Spasmodic Asthma assuming a periodical character*, it often proves effectual. *In Intermittent Hemicrania, Headache, Brow Ague, Tic Douloureux, and other Neuralgic Affections*, it holds a foremost place in our list of remedies. *In Intermittent Hiccough*, it has also been used with success.[2] Dr. Lohman[3] mentions a case of *Intermittent Ophthalmia* which yielded to its use; and Sir B. Brodie (p. 40) found it effect a cure in a case of *periodical Stricture of the Urethra*. *In Intermittent Hæmaturia*, large doses of quinine, with the use of occasional mercurials, have proved successful in the hands of Drs. Harley and Lionel Beale.[4] *In Painful Uterine Neuralgic Affections*, when the pain is periodic, bark is of sovereign efficacy, but it appears to do good in numerous cases where no such periodicity is observed. (Dr. Graily Hewitt, p. 380.) *Hay Fever or Hay Asthma*, when it assumes a periodic form, usually yields rapidly to the exhibition of quinine. In all these cases the medicine should be administered during the intermissions in the manner indicated in Art. INTERMITTENT FEVERS, the dose being regulated by the severity of the symptoms. See also next section.

1826. *In Neuralgias* of malarial origin, there can be no doubt of the value of quinine. It may be given in full doses (gr.v.–xx.) shortly before the time at which the attack of pain is expected; but if after three or four doses a decided improvement is not effected, the probability is great that the neuralgia is not malarial. In a certain number of non-malarial cases also, quinine produces good effects: here, gr.ij.–iij. thrice daily, is the largest quantity which is likely to be of any use. Dr. Anstie (ii. p. 745), from whom this is quoted, adds, that he knows of no circumstances which indicate beforehand that quinine will be useful in non-malarial cases, except that it seems always more effective in neuralgia of the ophthalmic branches of the fifth, than in other non-malarial neuralgias.

1827. *In Acute Rheumatism*, the use of cinchona, introduced in 1772 by Dr. Haygarth, was followed by Dr. Lettsom, Dr. Heberden, Sir W. Farquhar, and others; but it fell into disuse till a recent period, when the French physicians Drs. Briquet[5] and Devergie[6] re-introduced the mode of treatment, substituting quinine for the crude bark, prescribing the alkaloid in doses of ʒj.–ʒjss., in divided doses daily from the commencement of the attack. The results were stated to be highly satisfactory. It never appears to have been generally adopted in England.

[1] Cyc. Pract. Med., vol. i. p. 35.
[2] Med.-Chir. Rev., Jan. 1842.
[3] Med. Times, vol. xviii. p. 89.
[4] Practitioner, Aug. 1868.
[5] Gaz. des Hôpitaux, Nov. 17, 1850.
[6] Gaz. Médicale, Dec. 30, 1852.

Dr. Fuller (p. 99) altogether condemns cinchona early in the attack; and even at a later period, while the tongue has continued furred and the pulse excited, he observed its use so constantly followed by a fresh accession of mischief, that he has been deterred from administering it until the urine has cleared, the pulse become soft, and the tongue moist and almost clean. Then, he adds, more especially in cachectic states of the constitution, or in persons who have been exhausted by the attack, it is often of essential service; but even then it must be carefully watched and at once abandoned, should any increased heat of skin, acceleration of the pulse, coating of the tongue, or loading of the urine indicate a recurrence of fever. In the majority of cases, quinine is earlier and more readily tolerated than bark, and as it is quite as efficient, it should have the preference when a tonic is indicated. It should be used as a corrective and restorative of the process of assimilation when the febrile paroxysm is beginning to abate, rather than as a cure during the active stages of the disease. (Dr. Fuller.) Dr. Winn[1] details a case of *Rheumatic Pericarditis attended with delirium*, in which marked benefit was derived from quinine (grs. ijss. every 4 hours), combined with bicarb. of potash gr. xx. in mucilage. Dr. Nevins[2] speaks highly of a combination of quinine (gr. ij.) and iodide of potassium (gr. v.) in the treatment of *Rheumatic Fever* from the outset of the attack, together with the use, twice weekly, of the vapour bath and subsequent cold douche.

1828. *In Enlargement of the Spleen*, especially when of malarial origin, or co-existing with intermittent fever, one of the most effectual remedies we possess is the sulphate of quinine, in doses of grs. xv.–xx. or more daily. M. Piorry advocated a theory that enlargement of the spleen was the proximate cause of intermittent fever, but this has been satisfactorily disproved by Dr. G. Smith,[3] of the Madras Medical Service, who out of 4,000 cases of well-marked ague was unable to detect any affection of the spleen, except in a few rare instances. Dr. Smith carefully examined the action of quinine in 17 cases of enlarged spleen: of these the remedy failed in 6, and proved beneficial in 11; of the latter the effect was permanent in 7, and temporary in 4, the spleen in these last regaining its previous volume. It may be advantageously combined with sulphate of iron, and associated with active purgation.

1829. *In Phthisis*, cinchona long enjoyed the reputation of a specific. This opinion was supported by Morton, Sedillot, and De Metternich, while by others it has been prescribed only

[1] Lancet, Nov. 14, 1868.
[2] Brit. Med. Journ., Sept. 8, 1866.
[3] Madras Med. Reports, 1850, p. 103.

to answer particular indications. The supposition that it exerts any specific influence on the progress of phthisis is now entirely abandoned. Quinine is, however, a valuable tonic in that disease. It is advantageously given in doses of gr. j.–gr. ij. in combination with sulphuric acid and the sulphate of iron, or in the form of citrate of iron and quinine. Cod-liver oil may be administered at the same time.

1830. *In the advanced stages of Pneumonia and Pleurisy*, when the patient is old, the constitution debilitated, and the case assumes a typhoid character, sulphate of quinine, in combination with sulphuric acid, may be given with great advantage. *In Gangrene of the Lungs* also, it often proves a valuable adjunct to other remedies. *In Asthenic Pneumonia*, the value of quinine is forcibly pointed out by Sir D. Corrigan.[1] The general dose is gr. v. every third hour; under its use the pulse becomes slow and steady, and the respiration free. If the patient be young, with evidence of capillary congestion generally over the system, its use should be preceded by local depletion.

1831. *In Laryngismus Stridulus*, Dr. Merei[2] states that, in six out of twelve cases in which he administered quinine, the effect was equally sudden and satisfactory. "It is chiefly useful," he observes, "in those weak and obviously nervous infants, who suffer for weeks or months from fits, but who, during the intervals, are free from all disease." It should be given in the largest doses that the child can bear, and during the intervals of the paroxysms. *In Asthma*, Dr. Hyde Salter (p. 312) regards quinine as the best of all tonics, and next to this iron. He commonly uses, with the best effect, a combination of these two drugs, and a mineral acid. *In Hooping-Cough*, when the disease is protracted, and assumes an intermittent or periodic type, quinine or cinchona should never be omitted. (Dr. Copland.) In the second or spasmodic stage of hooping-cough, Dr. Lecarde[3] speaks highly of the modifying influence of quinine. He gives it in powder from gr. iij.–gr. x. daily, according to the age of the child, each dose administered immediately after a paroxysm. The treatment of *Croup* by this agent is advocated by Prof. Eastman.[4] He employs it in large doses, as there appears to be a great tolerance of the medicine. The only other measures he advocates are a full dose of calomel and a warm bath. *In Diphtheria*, the tonic generally employed by Dr. West (p. 397) is a combination of quinine, tinct. of bark, and hydrochloric acid, at short intervals.

1832. *In Erysipelas*, cinchona should be given in all cases as soon as the tongue becomes clean and the skin moist; but it

[1] Dub. Hosp. Gaz., December 15, 1857.

[2] Ed. Monthly Journ., November, 1850.

[3] Journ. de Méd. et de Chir. Prat., July, 1855.

[4] New York Journ. of Med., Sept. 1859.

should be resorted to without delay if the pulse is soft, tremulous or very rapid, the heat moderate, and the delirium low and muttering, or if suppuration or sloughing has commenced. (Druitt.) A combination of quinine and tincture of perchloride of iron seems to offer special advantages in these cases.

1833. *In Erythema Nodosum*, Sir T. Watson (ii. p. 836) states that he has invariably found the disease yield to the exhibition of quinine preceded by an active aperient. Rest and the horizontal posture should be enjoined.

1834. *In Urticaria*, quinine often proves serviceable. I have found benefit from the following pills:—℞ Quiniæ Sulph. gr. xij.; Pulv. Rhei gr. xxiv., M. ft. pil. xij., cap. j. ter in die. It proves especially useful when the disease assumes an intermittent form. For the relief of intense *Pruritus accompanying Skin Diseases*, Mr. E. Wilson[1] has found quinine, in doses of gr. x., afford manifest relief. In one case it proved most beneficial given in a glass of sherry, every night at bedtime. It seems well worthy of a trial in obstinate cases.

1835. *In Scrofulous Ophthalmia*, the value of quinine is undoubted, and the earlier it is resorted to, the greater will be the prospect of its success. Dose for a child gr. j., for an adult gr. ij.-iij. thrice daily. Careful regulation of the bowels, and nutritious diet, are at the same time requisite. *In Catarrhal Ophthalmia*, Mr. H. Hancock[2] speaks highly of the value of cinchona and ammonia or quinine, with or without opium, according to the intensity of the pain and irritability of the patient, associated with mild alterative aperients. He restricts local applications to warm water or poppy-head fomentations, to the exclusion of all local stimulants or astringents, which only serve to keep up the irritation. *In Nyctalopia and Hemeralopia*, Mr. Howard,[3] of Montreal, states that the treatment which he has found most effectual is, after the exhibition of a cathartic and emetic, to administer quinine in as large doses as the stomach can bear. *In Acute and Chronic Iritis*, he speaks highly of the value of the combination of calomel and quinine, the former being omitted when the gums become sore, but the latter to be continued.

1836. *In Insanity*, in cases where tonics seem to be demanded by the state of the bodily health—and they are the majority of cases at one period or other of their course—iron and quinine may be given, and one of the best ways of giving them is in a mixture containing quinine, tincture of perchloride of iron, and chloric ether. (Dr. Maudsley, ii. p. 61.) Prof. Van der Kolk, however, prefers arnica root in these cases; with this he considers cinchona superfluous. *In Puerperal Insanity*,

[1] Journ. of Cutaneous Med., Jan. 1870.

[2] Brit. Med. Journ., June 24, 1865.

[3] Pathol. of the Eye, p. 503.

if the skin be relaxed and there exist a disposition to free and copious exudation, quinine with mineral acids in considerable doses will be of service. (Dr. Prichard.[1]) *In Delirium Tremens*, the nervine tonic on which Dr. Anstie (ii. p. 87) reposes the greatest confidence is quinine, in doses of gr. j. twice or thrice daily. It should be given from the very first, if possible, and this may be done when the stomach is very irritable, by administering it in effervescence, with bicarb. of potash and citric acid. Nothing, Dr. Anstie adds, has been more marked in his experience than the superior efficacy of direct tonics, and especially of quinine, in producing that nervous tranquillity which makes sleep possible. When this fails, he advises sulphuric ether ♏xxx. thrice daily, or a single dose of ♏lx. at bedtime, with ♏xxx. of tinct. of sumbul. *In Headaches, associated with Hysteria and Anæmia*, Dr. Graily Hewitt (p. 385) regards bark, in the form of liquor cinchonæ, as a valuable remedy.

1837. *In Epilepsy*, cinchona was prescribed by Home,[2] and others; and, in *Chorea*, it has also been employed in some instances with advantage. It has been conveniently replaced by quinine, which may prove serviceable when judiciously administered. It is chiefly indicated when the disease is of a purely nervous character, or when it assumes a periodic character, when the powers of life are much depressed, and there is much exhaustion of the nervous energy. In these cases Dr. Brown-Séquard[3] prescribes quinine in large doses (grs. v.-x.-xv.) at intervals, just before the fit is expected. By this means, he states, the fit is frequently prevented, and the patient goes on to the next or even to a longer period. It is inadmissible until the bowels have been freely evacuated, when there is much gastric irritation, or a plethoric condition of the brain, or of the system generally. Under the circumstances above indicated, it may be advantageously combined with the sulphate of iron. Some cases of *Tetanus* are on record,[4] which apparently yielded to quinine, but the evidence of its utility is very inconclusive, and as far as is known it is less effectual than calabar bean and many other remedies.

1838. *In Gangrene and Mortification*, cinchona has long been held in high esteem, and when these states are attended with great prostration of the vital powers, a debilitated state of the constitution and general cachexia, or typhoid symptoms, its internal exhibition is followed by the best effects. It is not applicable to all cases, particularly when the digestive organs are much deranged. As a general rule, the decoction of cinchona, with a small portion of the mineral acids, has a better effect than quinine; but there are exceptions to this rule, as,

[1] Lib. of Med., vol. ii. p. 142.
[2] Clinical Experiments, &c., p. 194.
[3] Med. Times, Oct. 27, 1860.
[4] Lancet, June 28, and July 5, 1851.

for instance, when the digestive organs are impaired, and unable easily to bear the quantity of bark which it is necessary to exhibit in order to produce a constitutional effect. Quinine may then be advantageously substituted.

1839. *In Cancrum Oris*, the constitution requires tonics and stimulants, in order to support the strength. Dr. Graves (ii. p. 520) strongly recommends quinine, either in the form of enema, or made into a syrup, and flavoured with diluted sulphuric acid. *In Aphthous Ulcerations*, when the constitution is much debilitated, it also proves highly serviceable.

1840. *In Scurvy, attended with much prostration*, quinine may be given with great advantage. Much evident improvement follows its use, particularly when given with the mineral acids. It need not interfere with the use of lemon-juice, or other anti-scorbutics. A decoction or the diluted tincture of cinchona forms a very useful gargle; myrrh or the chlorates may be conjoined with it.

1841. *In Pyæmia*, in childhood, Dr. Hillier (p. 215) states that he knows nothing in the way of drugs that will do good except quinine, in large doses carried to cinchonism. Plentiful nourishment, with wine and good ventilation, are points not to be neglected.

1842. *In Malarial Dysentery*, quinine in full doses should be given, not less than a scruple in solution, some time before commencing ipecacuanha, which should be given as laid down in that article, and it should be repeated until cinchonism is induced: the two drugs should then be given in alternate doses until the characteristic effects of both are produced. (Dr. Maclean, i. p. 122.) *In Diarrhœa*, of malarial origin, or when it assumes a periodic type, quinine is indicated, and in such cases is best given in combination with an excess of sulphuric acid, and with opium. *In Infantile Cholera*, the citrate of iron and quinine has often been found of the greatest service. *In Cholera*, quinine has been advocated by Dr. Bell and others, both as a curative and as a prophylactic, but it does not appear to be a remedy on which reliance is to be placed. It is, however, a valuable tonic in convalescence after this as well as other exhausting diseases.

1843. As an *Anthelmintic*, especially in cases of *Ascarides lumbricoïdes*, the value of quinine has been pointed out by Dr. Delvaux.[1] For children between two and ten years, the dose ranges from grs. iij.–vj.; for adults, grs. ix. in the twenty-four hours. Injections containing the sulphate, every evening, he found effectual in removing thread-worms from the rectum; and he likewise mentions two cases in which tænia were expelled under its use. As far back as 1764, Van Doeveren,

[1] Presse Méd. Belge, April, 1855.

of Gröningen, pointed out the anthelmintic properties of cinchona.

QUINIDIA. See CINCHONIA.

RED GUM OF AUSTRALIA. See EUCALYPTUS.

1844. RESINA. Resin or Rosin. The residue of the distillation of the turpentines from various species of Pinus and Abies.

Med. Prop. and Action. It is never given internally; finely powdered, it is occasionally applied as a styptic *to recent wounds*. It is a component in many plasters and cerates. The Ointment (Resin oz. viij., Yellow Wax oz. iv., Simple Ointment oz. xvj.) is useful in cases of *Foul and Indolent Ulcers and Carbuncles*. Under the name of Colophania, resin has been proposed as an anti-periodic, but on insufficient grounds.

1845. RHAMNUS CATHARTICUS, *Linn.* Common or Purging Buckthorn. *Nat. Ord.* Rhamneæ. *Hab.* Europe.

Med. Prop. and Action. Hydragogue cathartic. The expressed juice of the ripe berries is officinal in B. Ph. as the basis of a syrup, which in drm. j. doses is sometimes used as an adjunct to purgative mixtures. In large doses (fl. oz. ½–j.) its operation is brisk and sometimes severe, occasioning griping, nausea, vomiting, dryness of the mouth and throat, and leaving a thirst of long duration. It should always be given in conjunction with carminatives. The syrup is sometimes given to children in doses of fl. drm. ss.–fl. drs. ij.

Therapeutic Uses. It was formerly highly esteemed in *Rheumatic, Gouty, and Dropsical Affections*, but it has no advantage over other purgatives, is more offensive, and operates more severely. It is now rarely employed.

RHATANY ROOT. See KRAMERIA.

1846. RHEI RADIX. RHUBARB. The dried decorticated root of one or more undetermined species of Rheum, *Linn. Nat. Ord.* Polygonaceæ. *Source*, China, Chinese Tartary, and Thibet.

Med. Prop. and Action. Stomachic: primarily carthartic, secondarily astringent. As a cathartic it operates more by increasing the muscular action of the intestines than by augmenting their secretions. It is usually considered to act upon the whole course of the intestinal canal, and especially upon the duodenum. By some it is also thought to increase the biliary secretion, but this is very doubtful. Its cathartic action is followed by a considerable amount of astringency and constipation, so much so, as to have acquired for rhubarb the reputation of being secondarily a calmative, as well as directly a stimulant of the intestinal canal. At the same time it exercises a tonic action on the stomach, indicated by improved appetite and digestion. In the course of its operation it is absorbed into the system and communicates a red colour to the urine which might be mistaken for hæmorrhage, but it may be distinguished by the application of heat, which coagulates blood, removing

the red colour, but does not affect the tint communicated by the drug. (Christison, p. 787.) The milk of a nurse under the operation of rhubarb, is rendered purgative. That it exercises a specific action on the intestines is proved by the fact, that a rhubarb cataplasm applied to the abdomen produces a brisk purgative effect. (Alibert.) Its cathartic operation is increased, and its subsequent astringent effects apparently diminished, by combining it with the carbonated alkalies. Its purgative principle has not been isolated. From the mildness of its operation, it is well adapted as an aperient in childhood and the puerperal state.

Dose:—Of Powdered Rhubarb, grs. iij.–vj. as a stomachic; grs. x.–xxx. as a carthartic. *Of the Extract*, grs. iij.–viij. as a stomachic; grs. x.–xx. as a cathartic. *Of the Infusion* (Rhubarb oz. ¼, Boiling Water fl. oz. x.), fl. oz. j.–ij. *Of the Tincture* (Rhubarb oz. ij. Cardamom Seeds; Coriander Fruit; Saffron āā oz. ¼; Proof Spirit Oj.), fl. drm. j.–ij. *Of the Wine*, (Rhubarb oz. j½., Canella alba Bark gr. lx., Sherry Oj.), fl. drm. j.–ij. *Of the Syrup*, fl. drm. j.–iv. *Of the Compound Pill*, (Rhubarb oz. iij. Socotrine Aloes oz. ij¼., Myrrh, Hard Soap āā oz. j½., Oil of Peppermint fl. drm. j½., Treacle oz. iv.), gr. v.–x. *Of the Compound Powder—Gregory's Powder* (Rhubarb oz. ij., Light Magnesia oz. vj., Ginger oz. j.), gr. v.–x. for children, gr. xx.–lx. for adults.

1847. *Therapeutic Uses. In Dyspepsia*, rhubarb proves highly serviceable, being warm and carminative in its nature, speedy in its action, and neither stimulant nor drastic. It was highly esteemed by the late Dr. M. Baillie,[1] who advised gr. viij., made into pills with soap, to be taken every night at bedtime, together with some mild bitter infusion, and an alkali in the daytime. This, he states, if persevered in, proves more beneficial than any other remedy he knows of. Dr. Todd[2] states that he has derived great benefit from the following mixture:—℞ Aloes ℥j., Rad. Rhei, Rad. Glycyrrh. āā ℥ss., Spt. Lavand. Co. f℥ss., Aq. Calcis f℥viij., M. Infuse for twelve hours, and strain. Dose, two tablespoonfuls two or three times daily. Where acidity of the primæ viæ is a prominent symptom, the following will often prove useful. ℞ Rhei Rad. Contus. oz. j½., Potass. Carb. drm. iij., Aq. Ferv. fl. oz. xij., M. Macerate for twelve hours, strain and add T. Cinnam. Co. fl. oz. ij. Dose fl. oz. ½–ij. An old plan of administration, but one which often proves highly useful, is for the patient to chew a piece of solid rhubarb. By this means no more is swallowed than what is dissolved in the saliva, and this is sufficient to keep the bowels regular, and to impart a tone to the digestive organs without producing any subsequent constipation.

1848. *In the Constipation of Children*, rhubarb, conjoined with magnesia, is a popular aperient; but it is objectionable on account of its subsequent astringency. *In Habitual Constipation*, a pill of moderate strength (Pil. Rhei Co. vel Pil. Coloc. Co. vel Aloes grs. ij.–iij., Pulv. Capsici. gr. j.) *taken with the food*, and repeated daily as occasion may require, produces the best effect. (Dr. Pavy, p. 210.) *In the Puerperal*

[1] Posthumous Works, p. 194. [2] Cyc. Pract. Med., vol. ii. p. 618.

state, gr. xx.–gr. xxx., in some aromatic water, with or without a few drops of laudanum, is a good aperient if castor oil be objected to. *In the Constipation of Anæmic Females*, Dr. Ashwell advises the following:—℞ Pulv. Rhei, Mag. Carb. āā ʒss., Conf. Arom. gr. xx., Aq. Cinnam. fʒix., T. Card. Co. fʒj., M. ft. haust. To be taken at bedtime, every three or four days.

1849. *In Diarrhœa*, rhubarb often proves highly useful. After removing any crude or irritating matters from the intestines by its purgative property, it acts as an astringent and tonic, and is often by itself sufficient to effect a cure. A good formula for general use is the following:—℞ Pulv. Rhei Co. ʒj., Sodæ Carb. gr. xx., T. Opii ♏ x.–xv., Aq. Menth. Pip. vel Aq. Anethi ʒx., M. ft. haust. After its operation, should the diarrhœa continue, chalk mixture and opium may be given. *In the Diarrhœa of Children*, Dr. West (p. 602) states that he has found the following more generally useful than any other remedy:—℞ T. Rhei ʒij., Magnes. Sulph. ʒj., Syr. Zingib. ʒj., Aq. Carui ʒix., M. Dose ʒj. thrice daily for a child æt. 1 year. In the diarrhœa attendant on dentition he prefers ipecacuanha (*q. v.*) The astringency of rhubarb is increased, and its purgative power decreased, by the process of roasting; and in this state it is strongly advised by Mr. Hoblyn.[1] He directs it to be burnt in an iron crucible, until it loses two-thirds of its weight, and then to be given in doses of gr. v.–x. when necessary. He states that, in the *Diarrhœa of Phthisis*, he found it more useful than chalk or opium.

1850. *In Gout*, rhubarb, taken regularly between the intervals, proves highly serviceable; often, apparently, warding off an attack. At the period of an impending paroxysm, Sir H. Halford states that he has had incomparably the most satisfaction in giving a few grains of rhubarb, and double the quantity of carbonate of magnesia, every day, either at bedtime or early in the morning; or, under evident weakness of the powers of digestion, fl. oz. ½ of the compound tincture, with gr. xv. of carb. of potash in some light bitter infusion daily, before the principal meal. For the same purpose, Dr. Graves advises the following mixture:—℞ Aurant. Cort. ʒij., Pulv. Rhei ʒj., Pulv. Aloes c. Canellâ (D. Ph.) ʒij., Spt. Vin. Gallici Oiv., M. Dose, a tablespoonful of the strained liquor in water, night and morning.

1851. *In Urticaria*, rhubarb, from its carminative property, is the aperient which is most indicated, particularly when the disease occurs in young females. The following draught is an eligible form of administration:—℞ Pulv. Rhei, Mag. Carb. āā gr. x.–xv., Spt. Ammon. A. ♏ xx., Aq. Cinnam. fʒjss., M.

[1] Lancet, 1840–41, vol. i. p. 790.

ft. haust. *In the Aphthæ of Children*, a similar formula, in small doses, proves highly serviceable.

1852. *In Dropsy*, Dr. Copland (i. p. 624) considers that the diuretic action of rhubarb is deserving of notice. When given, he observes, either in small doses, or in infusion as a vehicle for other substances of the same nature—as the saline diuretics and the preparations of squill, of juniper, or of colchicum—it is a useful medicine in dropsies. He also (i. p. 514) speaks highly of its value in *Diabetes*, not only as an aperient, but as a promoter of the digestive and assimilating processes. He quotes several authorities in its favour.

1853. *To foul and indolent Ulcers*, the application of finely-powdered rhubarb was first proposed by Sir E. Home. It has since been occasionally employed. Mr. Alfred Markwick[1] relates a case of *Sloughing Syphilitic Ulcer*, which speedily yielded to its use. It causes great constitutional irritation.

1854. RHIGOLENE, a product of the distillation of Petroleum. It is a hydrocarbon, wholly destitute of oxygen, the lightest of all known liquids, having sp. gr. 0·625. Boils at 70° F. It is extremely volatile, and both the liquid and the vapour are highly inflammable.

Med. Prop. and Action. Rhigolene has been proposed by Prof. Bigelow,[2] of Massachusetts, as a local anæsthetic, and from its low boiling point and extreme volatility, it seems well adapted for this purpose. Being quick in its action, inexpensive and comparatively odourless, he considers that it is calculated to supersede chloroform and other anæsthetics when only local anæsthesia is required. For the opening of abscesses, the removal of small tumours, small incisions, &c., he states that it may be used with admirable ease and certainty; but for large operations, he adds, it is obviously less convenient than general anæsthesia, and will never supersede it. "Applied to the skin, a first degree of congelation is evanescent; if protracted longer, it is followed by redness and desquamation, which may possibly be averted by the local bleeding of an incision; but if continued or used on a large scale, the dangers of frost-bite and mortification must be imminent." (Bigelow.)

RHŒADOS PETALA. See PAPAVER RHŒAS.

1855. RICINUS COMMUNIS, *Linn.* Castor Oil Plant. *Nat. Ord.* Euphorbiaceæ. *Hab.* Tropics of both hemispheres.

Med. Prop. and Action. The seeds are powerfully acrid and purgative; and in large doses, an acro-narcotic poison, twenty of them having proved fatal. They abound in a fixed oil (*infra*). In appearance they closely resemble the tick; hence their name, *Ricinus*, the Latin name for that insect. They are not used in medicine in their natural state. *The leaves*, according to Dr. McWilliam,[3] are used by the women of Western Africa *to increase the secretion of milk*. He states that a decoction is made by boiling a handful of the plant in Ovj.–Oviij. of water; with this the breasts are bathed

[1] Med. Gaz., July 29, 1842. [2] Boston Med. Journ., April 19, 1866.
[3] Lancet, Sept. 7, 1850.

for fifteen or eighteen minutes; part of the boiled leaves are also spread over the breasts; a copious flow of milk generally follows in a few hours. This statement is verified by Dr. Tyler Smith,[1] who also found it act successfully as an emmenagogue, in a case of *Amenorrhœa*. Dr. Routh[2] prescribes a decoction of the leaves internally, as a lactagogue, and states that, when thus taken, it has the effect of increasing in a marked degree the secretion of milk.

1856. OLEUM RICINI. Castor Oil: the oil expressed from the seeds of Ricinus communis (*ante*).

Med. Prop. and Action. Castor oil is one of the most valuable purgatives in the materia medica. The cold-drawn oil is particularly mild, and is well adapted for children, for *the Puerperal state, Inflammatory conditions of the Alimentary Canal, or of the Genito-urinary Organs, and after Operations.* In doses of fl. oz. ss.–fl. oz. j., it produces two or three stools in the course of three or four hours, without griping or uneasiness. The great objection to it is its nauseous taste; to disguise this it is best given floating on strong coffee, milk, or some aromatic water. Made into an emulsion with mucilage, flavoured with the juice of a lemon and 3ss. of T. Cardam. Co., its taste is effectually disguised. It may be administered in capsules. One of the great advantages of castor oil is, that it leaves very little, if any, subsequent constipation. That it acts specifically upon the mucous membrane of the intestines is shown by the fact that, when injected into the veins, or rubbed on the abdomen, it acts as a purgative. In some persons it causes vomiting, but this is more the effect of its nauseous taste than of any inherent emetic property. The dark-coloured oil, commonly prepared by decoction by the natives of the East and West Indies, is more active in its operation than that obtained by expression, and should be given in smaller doses. In the absence of the expressed, or so-called "cold-drawn oil," it may be had recourse to, though it is more nauseous to the taste, and causes more griping.

Dose, fl. drm. j.–fl. oz. j. or more.

1857. *Therapeutic Uses.* *In Dyspepsia*, attended with inflammation or vascular excitement of the pylorus and duodenum, there are some medicines which appear to exercise a direct antiphlogistic effect upon the mucous membrane of the intestines. At the head of these, Dr. T. J. Todd[3] places castor oil, in doses of 3j. daily. If its soothing and antiphlogistic effect be desired, it is best given at bedtime; if its aperient action, in the morning. "In the above cases," Dr. Todd observes, "castor oil is a most valuable remedy, often, by its soothing effect, acting like an opiate, and it has the most direct and remarkable power of allaying and relieving a heated state of the mucous membranes of the pylorus and duodenum. No medicine is more eminently endowed with this property. In obstinate cases of this disease, I have known," he states, "a small teaspoonful of castor oil, taken every night as long as the stomach could easily bear it, attended with the most signal success." The effects of castor oil upon the stomach afford a very good test of the nature of the morbid condition of its mucous membrane. In atonic dyspepsia, it is borne with the

[1] London Journ. of Med., October, 1850.

[2] Med. Times, June 4, 1849, p. 574.

[3] Cyc. Pract. Med., vol. ii. p. 652.

greatest difficulty, producing nausea and vomiting; in purely irritable dyspepsia, a small dose of castor oil acts severely, and with much griping; but if there be any degree of vascular excitement of the mucous membranes, it soothes and quiets, and it is often most useful in this way when it has no aperient action. Its good effects will not be frustrated by administering it in any mild carminative water, in emulsion, in coffee, or by combining it with a little liq. potassæ. It is one of the most eligible aperients in *Gastric Ulcer*, when this class of medicines is required. A moderate dose (℥vj.–℥viij.) can often be taken in the ordinary way, without at all increasing the pain or vomiting; but when the latter is of frequent occurrence, it is better to administer it in the form of enema. (Dr. Brinton, p. 179.)

1858. *In Colic*, when the stomach is not too irritable to bear it, castor oil is often productive of great benefit. In doses of fl. drm. j.–fl. drs. ij., with gutt. j.–ij. of Ol. Menth. Pip. and ♏x.–xx. of T. Opii, it generally affords great relief; even in *severe Ileus, and in the dry Belly-ache of the West Indies*, it has been found of great service. A full dose, fl. oz. j.–fl. oz. jss., may also be given as a purgative, with or without the oil of turpentine.

1859. *In Cholera*, "the evacuant system," introduced by Dr. G. Johnson,[1] consists in the administration in the early stage of the attack, of a mild purgative, castor oil *par excellence*, with the view of aiding the existing diarrhœa, which he regards as the mode adopted by nature for removing from the system the irritant or morbific matter. To this end he administers as early in the premonitory diarrhœa as possible, a tablespoonful of castor oil in a mixture of orange or lemon juice and water, or cold water, or other convenient vehicle; should this be vomited, it should be immediately repeated, and the patient directed to lie still and take no more liquid for half an hour, by which time the oil will have passed from the stomach into the bowels. Within an hour or two the oil will usually have acted freely. Then a tablespoonful of brandy is given in thin arrowroot or gruel, and if there be much feeling of irritation with a sense of sinking, gutt. v.–x. of tincture of opium in cold water. These means, it is stated, will suffice for the speedy arrest of most cases of *Choleraic Diarrhœa*. If objections exist to castor oil, gr. xv. of powdered rhubarb, or fl. oz. ½ of tincture of rhubarb, or a teaspoonful of compound rhubarb powder may be substituted for it. If with the diarrhœa there be vomiting, it is directed to be encouraged and assisted by copious draughts of tepid water; if there be nausea without vomiting, especially if the stomach is supposed to contain

[1] Med. Times and Gaz., Sept. 9, 1854.

undigested or unwholesome food, or morbid secretions, an emetic is advised, *e.g.*, ipecacuanha gr. xx. or a teaspoonful of mustard, or a tablespoonful of common salt. The theory on which the whole of the treatment is based, is that nature, by the operation of purgation and emesis, is endeavouring to eliminate from the system the morbific matter, and the more effectually we aid this, having regard, of course, to the patient's strength, the greater will be the chances of cure. To this theory there are many grave objections, but the success reported to have attended the practice in the hands of Drs. M'Cloy and Robertson,[1] and the public adhesion given to it by Sir T. Watson,[2] in addition to Dr. Johnson's own testimony,[3] cannot fail to have weight with many. Those, however, who have had most experience of the disease in India, continue to regard the astringent as more effectual than the evacuant system. It should be added, that when the diarrhœa has continued for some hours, and there is reason to suppose, according to Dr. Johnson's view, the morbific agent has already purged itself away, the castor oil is not given, but recourse had at once to the brandy in arrowroot and laudanum as above directed; but Dr. Johnson lays it down as a rule not to give opium until the morbid poison and its products have for the most part escaped.

1860. *The Diarrhœa of Phthisis* sometimes appears to depend upon some irritating matters in the intestinal canal; in these cases the following laxative advised by Dr. Barlow[4] may prove serviceable:—℞ Ol. Ricini, T. Rhei āā drs. ij., T. Opii ♏iv., Aq. Cinnam. ℥iv., M. ft. haust.

1861. *In habitual Constipation,* there is no purgative equal in efficacy to castor oil. It operates speedily, without much griping, and causes less subsequent constipation than any other purgative to remedy this state. It is well adapted for children, and for women during pregnancy.

1862. *To Bed-sores occurring in Typhus and other Fevers,* an excellent application is composed of two parts of castor oil and one of balsam of Peru spread on pieces of lint, which are laid on the sore, and covered with a linseed poultice, to be changed three or four times a day. (Murchison, p. 286.)

1863. ROSÆ CANINÆ FRUCTUS. HIPS. The ripe fruit of the Dog-Rose, Rosa canina, *Linn.*, and other indigenous allied species. Officinal only as the basis of a confection used in preparing pillular masses, &c. Almost inert.

ROSÆ CENTIFOLIÆ PETALA. CABBAGE-ROSE PETALS. The fresh petals of Rosa centifolia, *Linn.* The distilled

[1] Med. Chir. Trans., vol. l. 1867.
[2] British Med. Journ., July 18, 1868.
[3] Loc. cit.
[4] Pract. of Med., p. 309.

water (Aqua Rosæ) prepared from them (*off.*) is used as an agreeable vehicle for collyria, &c. It is an ingredient in Mist. Ferri Co. and Troch. Bismuthi.

Rosæ Gallicæ Petala. Red-Rose Petals. The fresh dried unexpanded petals of Rosa gallica, *Linn.* Mildly astringent, containing a small proportion of tannin. They form an ingredient in a confection used in preparing pillular masses, in a syrup only of value as a colouring and flavouring agent, and in an acid infusion, Infusum Rosæ Acidum (Red-Rose Petals oz. ¼, Diluted Sulphuric Acid fl. drm. j., Boiling Water fl. oz. x.), which in doses of fl. oz. j.–ij. forms an excellent vehicle for quinine, and saline purgatives.

1864. Rosmarinus officinalis, *Linn.* Common Rosemary. *Nat. Ord.* Labiatæ. *Hab.* Europe and Asia Minor.

Med. Prop. and Action. The tops are stimulant and carminative, which qualities depend upon the presence of a volatile oil (*off.*), which, in doses of ℥j.–v., is the best form for internal administration. In addition to this they contain tannin and a bitter resin. The Spirit (Oil of Rosemary fl. oz. j., Rect. Spirit fl. oz. xlix.) is chiefly employed for the sake of its odour in lotions and other external applications.

1865. *Therapeutic Uses. In Hypochondriasis, Nervous Headaches, and Hysteria*, infusion of rosemary was formerly held in high esteem. As a mild stimulant, it may occasionally prove beneficial. It was also employed in *Amenorrhœa and Chlorosis*, but it appears to exercise no specific action on the uterus.

1866. *In Alopecia or Baldness*, the volatile oil, diluted with some bland fixed oil, has been advised as a stimulant liniment. I have seen apparent benefit from the daily use of an infusion, *in preventing the hair falling off after fevers and debilitating diseases.*

1867. Ruta graveolens, *Linn.* Common Rue. *Nat. Ord.* Rutaceæ. *Hab.* Southern Europe, &c. Cultivated in England.

Med. Prop. and Action. The leaves are stimulant, narcotic, and irritant. They contain a volatile oil (Oleum Rutæ), which renders them so acrid, that when they are rubbed on the skin they cause great irritation and inflammation. Internally, they may be given in infusion, or the oil may be substituted. From the experiments of Dr. Helie,[1] rue appears to exercise a direct influence on the uterus, independent of its irritant and narcotic effects on other parts of the body; and also to have a remarkable power of diminishing the activity of the heart and arterial system, the pulse in one instance falling thirty beats in a minute. The belief in its emmenagogue properties is very ancient, being mentioned by Hippocrates. At the present day it is regarded among Oriental nations as prejudicial to the

[1] Med.-Chir. Rev., vol. lviii. p. 604.

fœtus, if given to pregnant women; and in England it is still occasionally used with a view to produce abortion. Anthelmintic virtues are also assigned to it.

Dose:—Of the Powdered Leaves, gr. x.–gr. xxx. *Of the Volatile Oil*, ♏ij.–v.

1868. *Therapeutic Uses. In Amenorrhœa, Chlorosis, and other Uterine Affections*, rue has been held in high esteem for many centuries, but its efficacy is very doubtful. It is generally prescribed with other emmenagogues, and how far rue contributes to effect a cure is uncertain.

1869. *In Convulsions of Children arising from Flatulence and other Intestinal Irritations*, Dr. A. T. Thomson (p. 712) states that he has found a strong infusion of rue, as an enema, of very great service. From the acrid quality of the leaves, it requires to be used with caution.

1870. *In Hysteria and Flatulent Colic*, the volatile oil (♏ij.–v. on sugar), or an infusion of rue, is a popular and efficacious remedy.

1871. SABADILLA. Cevadilla. The dried fruit of Asagræa officinalis, *Lindl. Nat. Ord.* Melanthaceæ. *Source*, Mexico.

Med. Prop. and Action. Acrid poison, its activity residing principally in the alkaloid *Veratria*, of which it is the officinal source. It likewise contains another principle, *Sabadillina*, which differs from veratria in being insoluble in ether, and according to Dr. Turnbull,[1] who has paid much attention to this drug, it is inferior to it in activity. It proves rapidly fatal to pediculi—hence one of its vulgar names, "lice seeds" It has also been well reported of by Dr. Cazin[2] and others as a tænicide, but there are other safer and more effectual remedies of the same class. Even applied externally it is objectionable, in consequence of the danger of its active principle, veratria, becoming absorbed into the system. Every benefit which could be expected from it may be derived with greater certainty and safety from veratria (*q.v.*) Dose of the powdered fruit, for an adult, gr. ij.–viij.

1872. SABINÆ CACUMINA. SAVIN TOPS. SAVIN. The fresh and dried tops of Juniperus sabina, *Linn. Nat. Ord.* Coniferæ. *Hab.* Central and Southern Europe.

Med. Prop. and Action. Stimulant and emmenagogue. They may be given in infusion, but the essential oil, upon which the activity of the plant depends, is the most certain and efficacious form for internal use. Savin appears to operate powerfully on the uterus, and has been frequently employed criminally for procuring abortion. When thus taken in large doses, it has caused inflammation and death. Great caution is necessary in its exhibition. The bruised leaves, in the form of ointment, are much employed in keeping open blistered surfaces, setons, &c. For these purposes it should be freshly prepared, as it soon spoils in hot climates. It has been considered vermifuge.

Dose:—Of Savin Tops, gr. iij.–x. in the form of infusion; rarely thus employed. *Of the Volatile Oil*, ♏j.–v. *Of the Tincture* (Savin Tops oz. ij½., Proof Spirit Oj.), ♏xx.–lx. *Prep. for external use only: Ointment* (Savin Tops oz. viij., Yellow Wax oz. iij., Lard oz. xvj.)

[1] Med. Prop. of Ranunculaceæ, p. 7. [2] Dublin Quart. Jour., May, 1850.

1873. *Therapeutic Uses. In Amenorrhœa*, the influence of savin has long been known. Dr. Home,[1] of Edinburgh, who employed it successfully in four instances, observes that it is chiefly useful in those cases which are unattended by fever, and in which the circulation is languid; but that it is inadmissible in plethoric states. Dr. Tilt (p. 218) speaks of savin as "the most reliable of a very uncertain set of remedies," and he states that he has never seen ill effects, though he has given gutt. xx. of the oil twice daily. He advises (p. 408) the following mixture:—℞ Ol. Sabinæ ℥j., Sp. Æther. Nit. ℥iij., Mucilag. ℥j., Aq. ad ℥vj., M. Dose, a teaspoonful every two hours, the bottle having been previously shaken. He likewise advises a plaster containing the oil to be worn over the ovarian region. The testimony of Dr. Pereira (ii. p. 332) in its favour is very strong; but, on the other hand, Prof. Van der Kolk (p. 145) states that he has not in a single case seen a definitive result from its use.

1874. *In Menorrhagia, Leucorrhœa, and Uterine Hæmorrhage*, savin was first employed by Wedekind, in 1799. M. Aran,[2] after numerous experiments, came to the conclusion that savin is one of the most powerful and valuable remedies we possess, not only against sanguineous discharges, leucorrhœa, &c., which exist independent of pregnancy, and are characterized by the names of atony, asthenia, deficient contractility, &c., but also against the *Hæmorrhage which indicates approaching Abortion*, in women of lax fibre. In these cases he employed the dried powder of the leaves, in doses of gr. xv.–xx., thrice daily.

1875. *In habitual Abortion, depending upon diminished vitality of the Uterine System*, Dr. Metsch[3] speaks highly of the value of savin. He advises an infusion (℥ij.–℥iv. ad Aq. Ferv. f℥vj.), of which the dose is a tablespoonful, twice daily, taken during the intervals of the menstrual period. Caution in its use is necessary.

1876. *In Rigidity of the Joints from Extravasation, in Marasmus of the Muscles, and in Chronic Rheumatism*, savin is highly spoken of by Dr. Chapman[4] (U.S.) He states that he has seen great benefit from its use, when it has been persevered in until warmth and itching of the parts occur.

1877. *To Warts and Venereal Vegetations*, powdered savin was recommended by Cullen. M. Vidal de Cossis[5] advises a combination of one part of savin and two of finely-powdered alum; the parts to be well sprinkled over with this daily.

1878. Saccharum Purificatum. Refined Sugar. $C_{12}H_{22}O_{11}$.

Pure cane sugar, prepared from the stem of the Sugar

[1] Clinical Experiments, p. 387.
[2] Medico-Chir. Rev., July, 1844.
[3] Brit. & For. Med. Rev., April, 1850.
[4] Elements of Therapeutics, &c.
[5] Ann. de Thérap., 1846.

Cane, Saccharum officinarum, *Linn.* Cultivated in the tropics of both hemispheres.

THERIACA. TREACLE. SACCHARI FÆX. L. Ph. The uncrystallized residue of the refining of sugar.

Med. Prop. and Action. These articles, the products of Saccharum officinarum, are of great importance in medicine, pharmacy, and domestic life. The following are some of their medicinal uses:—*In poisoning by the Salts of Copper, Mercury, Silver, Gold, Lead, and Arsenic*, sugar proves useful, partly, according to Orfila, by acting chemically, and partly by increasing the peristaltic motion of the bowels. Dr. Pereira (ii. p. 1023) regards it solely as a mechanical antidote. 2. *In Burns*, Dr. Payne,[1] of Nottingham, states that he has employed treacle for above twenty years, and with great success. It is applied pure to the injured surface, and at the natural temperature, folds of well-aired linen being laid over it, and the dressing allowed to remain on for three or four hours at first; the dressings subsequently require to be removed once or twice daily. Dr. Payne considers it the best application we possess; and adds, that it acts by effectually excluding the air, and by abstracting the morbid heat of the part, thus proving at once sedative, refrigerant, and healing. 3. *In the Stings of Wasps*, it is a common practice with the labourers at sugar manufactories in the East to apply immediately a little brown sugar to the spot. It is stated to afford almost immediate relief. 4. *To exuberant Granulations and Indolent Ulcers*, a little finely-powdered white sugar, sprinkled over the surface, is occasionally used with advantage, but it causes much irritation. 5. *As an article of Diet in Diabetes Mellitus*, sugar has been advised by Dr. W. Budd,[2] who furnishes a case illustrative of the benefit to be derived from it; but it signally failed in the hands of Drs. Williams, Burd, and Bence Jones,[3] and is condemned by Dr. Pavy (p. 267). 6. Drs. Behrend and Sieber[4] recommend sugar as of great value in *Diarrhœa and other affections of children*, and they relate two cases of diarrhœa in which oz. ½ of powdered white sugar given every hour soon gave a favourable turn to the symptoms, which had long resisted all the ordinary means of cure. In some cases, when there is an evident putrefactive tendency in the alvine secretions, it promises to be a remedy of great value. 7. *As an article of diet in Phthisis*, Dr. Symonds[5] speaks favourably of the action of sugar taken to the extent of ½ lb. or more daily. He mentions a case in which marked temporary benefit followed its use. He regards it, with eggs, a succedaneum for cod-liver oil, when from any cause the latter cannot be taken. 8. *As a collyrium in "Granular Lids,"* Mr. Tait[6] has obtained excellent results from dropping between the eyelids occasionally, as often as they felt uneasy, a little simple syrup made of the best sugar and filtered quite clear. It was of such a strength that it did not deposit sugar, about drms. iij.–iv. to water fl. oz. j. In some cases it seems to aggravate the symptoms, but the benefit is not generally long in being manifested. In pharmacy it is used in the preparation of syrups, confections, and as a medium for administering the volatile oils, and of disguising the taste of nauseous medicines.

1879. SACCHARUM LACTIS. Sugar of Milk. $C_{12}H_{24}O_{12}$. A crystallized sugar obtained from the whey of milk by evaporation.

[1] Med. Times, vol. xvi. p. 475.
[2] Brit. Med. Journ., Nov. 14 and Dec. 19, 1857.
[3] Ranking's Abstract, 1858, vol. xxvii. p. 110.
[4] Ranking's Abstract, 1858, vol. xxvii. p. 357.
[5] Brit. Med. Journ., June 13, 1868.
[6] Lancet, Feb. 12, 1870.

Med. Prop. and Action. It is chiefly used as a vehicle for medicinal powders. Dr. Garrod (p. 323) observes, that "probably milk sugar might be advantageously employed as a substitute for cane sugar in the diet of infants. Cow's milk diluted with water, with the addition of milk sugar, forms a good substitute for the milk of the human female.

Dose, ad lib.

1880. Salicis Cortex. Willow Bark. The bark of Salix alba, *Linn.*, and other allied species. *Nat. Ord.* Cupuliferæ. *Hab.* Europe and North America.

Med. Prop. and Action. Tonic, astringent, and antiperiodic. It is best administered in the form of infusion (oz. j. ad Aq. Oj.) in doses of fl. oz. j.–iij. Its tonic and antiperiodic powers reside in a crystalline principle, *Salicine:* its astringency is due to a small proportion of tannin which it contains. It is a remedy of minor value. A solution of salicine is an excellent vehicle for cod-liver oil.

1881. *Therapeutic Uses. In Intermittent Fevers*, salicine has been extolled by Dr. Blom,[1] Dr. Pleischl,[2] and others, but experience has shown that it is vastly inferior to quinine. The dose is about gr. v., repeated until gr. xxx.–xl. are taken during an intermission. All that can be said of it is that it is of occasional service. It, as well as the infusion of the bark (*ante*), proves serviceable in *Convalescence after fevers* and in *General Debility*. Dr. Blom found it diminish in a marked degree *the Profuse Perspirations of Hectic Fever. In Dyspepsia and Neuralgia*, and *in Chronic Skin Diseases*, the infusion has been well reported of, but it is rarely used, and is inferior in efficacy to many other remedies. Dr. Christison (p. 817) places salicine, as a tonic stomachic in dyspepsia, on a par with quinine, remarking that it is not apt, like the latter, to cause congestion of the head when taken in large doses.

1882. Sambucus nigra, *Linn.* Common Elder. *Nat. Ord.* Caprifoliaceæ. *Hab.* Northern Europe and the United States.

Med. Prop. and Action. The berries and the inner bark are hydragogue, cathartic, and, in large doses, emetic. The recent flowers only are officinal, and from them is obtained a distilled water, used for flavouring medicines, &c.

Dose:—Of Elder Bark, gr. x.–gr. xxx. *Of a Decoction of the Bark* (oz. j., Water Oij. boiled to Oj.), fl. oz. ij.–fl. oz. iij., three or four times daily. *Of the Distilled Water*, fl. oz. j.–ij.

1883. *Therapeutic Uses. In Dropsical Affections*, the juice of the inner bark has been advised by Sydenham, Boerhaave, Martin Solon, Copland, Delens, and others. The testimony in favour of its efficacy is very strong. More recently, the fresh

[1] Edin. Med. Surg. Journ., Oct. 1, 1837.

[2] Brit. and For. Med. Rev., April, 1835.

juice of the root has been advised by Dr. René Vanoye,[1] as a remedy of still greater power. The results of his trials with this plant are as follows:—1, it may be administered in all serous accumulations requiring the use of drastic purgatives; 2, it acts with greater energy and rapidity than the most active purges; 3, it should be uncombined with other remedies of the same class; 4, the first doses should be pretty strong; if vomiting occurs, the medicine may be discontinued, or the dose diminished; 5, it is rarely necessary to give more altogether than 120 or 150 grammes (℥iij.–℥iv.) by mouth, in spoonfuls; 6, it occasionally cures dropsies when all other remedies have failed; 7, no serious dangers are connected with its employment. From the statements of various writers, it appears to be particularly serviceable in dropsy connected with disease of the liver.

Sandal-wood Oil. See Santali Oleum.

1884. Sanguinaria Canadensis, *Willd.* Blood Root. *Nat. Ord.* Papaveraceæ. *Hab.* Canada and Northern States of America.

Med. Prop. and Action. The root is an acrid emetic with narcotic properties. It is a local irritant of considerable power, producing inflammation when kept in contact with the skin, exciting violent irritation when snuffed up the nostrils, and operating like a caustic upon fungous surfaces. Taken internally, in moderate doses it excites the stomach, increases somewhat the frequency of the pulse, and stimulates the secretions, especially that of the lungs, and, as some suppose, the hepatic also. More largely taken, it occasions nausea, reduces the force of the circulation and the frequency of the pulse. Eberle[2] considers its sedative influence on the heart and arteries to be quite as certain as that of Digitalis, if not more so; but this was rarely observable until the medicine had been regularly continued for periods varying from five to ten days. In a full dose it produces vomiting; in over-doses it acts as a poison, causing burning in the stomach, excessive thirst, violent vomiting, faintness, vertigo, dimness of vision, and great prostration. (Wood.[3]) Emmenagogue properties are also assigned to it. Its activity appears to depend upon a peculiar principle, *Sanguinarine.* The seeds and leaves are said to partake of the qualities of the root.

The *dose* of the powdered root as an emetic is gr. x.–xx. suspended in water. Combined with ipecacuanha, it is said to be a prompt and easy emetic for children and old persons. As a nauseant and stimulating expectorant, the dose is gr. j.–v.; as a diaphoretic and sedative, gr. j. every one or two hours. A compound Powder (Rad. Sang. Pulv. gr. xl., Opii Pulv. gr. xx., Potass. Sulph. ℥ij., M.) is recommended by Dr. Gibb as the least irritating of all the preparations of sanguinaria. Externally it is used in the form of ointment (gr. lx. ad Ung. oz. j.) Many other formulæ are furnished by Dr. Gibb[4] in his excellent paper on this plant.

It is contra-indicated in all states of high general excitement, or in active local inflammations; in these states it cannot but prove injurious, for what-

[1] London Journ. of Med., April, 1849.
[2] Therapeutics, ii. p. 96.
[3] Therapeutics, ii. p. 440.
[4] British Med. Journ., Feb. 4 and 11, 1860.

ever may be its ulterior effects, it is always actively stimulant in its primary operation. (Dr. Francis.[1])

1885. *Therapeutic Uses. In Diseases of the Lungs*, it appears to exercise a marked influence. *In Typhoid Pneumonia*, according to Dr. Ives,[2] when respiration is very difficult, the extremities livid, and the pulse full, soft, and compressible, it does more to obviate these symptoms and remove the disease than any other remedy. In such cases, he observes, the dose must be large in proportion to the violence of the disease, and be often repeated until it excites vomiting or relieves the symptoms. He likewise reports very favourably of its effects in *Phthisis, Hooping-Cough, Influenza, &c. In Protracted Catarrhal Affections assuming the character of incipient Phthisis*, the regular employment of small doses of this root in tincture has, in the practice of Eberle,[3] not unfrequently afforded complete relief. He regards it as undoubtedly one of the most valuable agents we possess in this class of cases; but in order to obtain its full effects, it requires to be persevered in for two or more weeks. Dr. Francis[4] relates a case of severe *Chronic Pneumonia* in which it proved of essential benefit. In *Asthma* and *Hydrothorax*, it has also been used with the best effects.

1886. *In Croup*, it was first proposed by Dr. Ives, and has since been advocated by Dr. Branch,[5] who, after many years' experience in its use, prefers it to any other single remedy. He considers that, by persisting in it till emesis is induced, it prevents the formation of the diphtheritic membrane. He advises grs. xxx. of the powdered root to be infused in a teacupful of boiling water, allowing it to steep for ten minutes over the fire, when it may be given in teaspoonful doses, frequently repeated till vomiting is induced; after which it is to be continued at intervals of one or two hours, as the symptoms require. If the skin is hot and dry, the addition of a few grains of ipecacuanha is advised.

1887. *In Torpor of the Liver and Jaundice*, sanguinaria has been used by Dr. Macbride with evident advantage. In these cases the powder (gr. ij.–v.) or infusion was found preferable to the tincture. (Bigelow.) Dr. Mothershead[6] also speaks highly of its value as an excitant of the liver when given in alterative doses. *In Dyspepsia*, where stimulant tonics are indicated, the infusion in small doses (f℥j.–f℥jss.) is said to have proved effectual by many practitioners. (Bigelow.)

1888. *In Rheumatism*, it is likewise said to have proved

[1] New York Med. Phys. Journal, vol. i.
[2] Bigelow, American Med. Bot., i. p. 81.
[3] Therapeutics, ii. p. 97.
[4] Op. cit.
[5] Porcher, Trans. of American Med. Association, ii. p. 691.
[6] Wood's Quarterly Abstract, ii. p. 80.

signally beneficial. Dr. Francis[1] mentions a "formidable case of acute rheumatism," occurring in a person of gouty habit, in which a saturated tincture (f℥ss. thrice daily) proved of the greatest advantage. According to Dr. J. Allen,[2] an infusion of the root powerfully promotes diaphoresis in inflammatory rheumatism.

1889. *Other Diseases. In the Sore Throat of Scarlatina*, Dr. Jennings[3] found an acetous infusion (Fresh root ℥ss., Vinegar Oj.) more effectual as a gargle than any other application. *In Coryza*, the powdered root, conjoined with cloves and camphor, and employed as snuff, proved effectual as a sternutatory in the hands of Dr. Stevens.[4] As a means of curing *Soft Polypus of the Nose*, it has been used in the same manner, but with doubtful benefit. *To Foul and Ill-conditioned Ulcers*, the root, either in powder or ointment, proves a good stimulant application, best adapted for ulcers with callous edges and ichorous discharge. *In Ulceration of the Umbilicus*, Eberle[5] found the powdered root an excellent escharotic. It formed one of the ingredients in the nostrum vaunted of late years by Dr. Fell for the cure of *Cancer;* but as chloride of zinc formed another ingredient, it is manifest that sanguinaria must have played a very subordinate part, if indeed it had any effect at all. The acetous infusion has been found of benefit as a local application in *Obstinate Skin Diseases*. *In Chlorosis*, it has been used with alleged success by Eberle; but as it was given conjoined with iron, any benefit observable was probably derived from the mineral.

1890. Santali Oleum. Sandal-wood Oil. The oil obtained by distillation from the wood of Santalum album, *Linn.* (Sirium Myrtifolium, *Linn.*) *Nat. Ord.* Santalaceæ. *Source*, India.

Med. Prop. and Action. Stimulant. Attention has recently been called to it by Dr. T. B. Henderson,[6] of Glasgow, as a remedy in *Gonorrhœa*, he having employed it in above 100 cases with the most satisfactory results. He prescribes ♏xxx.–xl. thrice daily, diluted with 3 parts of rectified spirit, and flavoured with oil of cinnamon. He regards it as equal, and frequently superior, to copaiba and cubebs, having found it sometimes succeed when these had previously failed. Its comparatively pleasant taste and smell also give it a great advantage over copaiba. Mr. Berkeley Hill[7] tested its powers in 19 chronic cases: in 13 there was marked benefit; in 6 it failed: in 4 of the latter, the dose, however small, caused nausea and disturbance of the stomach; in the remaining two it had no effect whatever, though taken in large doses. In several cases it arrested the discharge by the third day, and when taken for seven days prevented any further return. Of the 13 favourable cases, cubebs and copaiba had been employed pre-

[1] Op. cit.
[2] Quoted by Porcher, op. cit.
[3] The Stethoscope, ii. p. 182.
[4] New York Journ of Med. iv. N.S. p. 358.
[5] Diseases of Children, p. 97.
[6] Glasgow Med. Journal, April, 1865.
[7] Brit. Med. Journal, July 6, 1867.

viously in 7 without any advantage. The dose he found best was ℥xv. thrice daily, with a little liquor potassæ in peppermint water. It seems well worthy of further trial.

1891. SANTONICA. SANTONICA. WORM-SEED. The unexpanded flower-heads of an undetermined species of Artemisia, *Linn.* Imported from Russia.

Med. Prop. and Action. Anthelmintic. In the round and long worm (*Lumbricus teres*) they are especially useful. Their action is heating and stimulant. The dose, gr. lx. or more, finely powdered, should be given in electuary or diffused through milk, and taken on an empty stomach. In infusion or decoction the bitterness is disgusting. Cathartics should follow or accompany their use. Their vermifuge properties depend upon a volatile oil and a peculiar principle, *Santonin* (*q.v.*)

1892. SANTONINUM. Santonin. $C_{15}H_{18}O_3$. A crystalline neutral principle obtained from Santonica. When pure, it occurs in brilliant, colourless, rhombic, flat prisms, inodorous, of a feeble bitterish taste, scarcely soluble in cold water, sparingly in boiling water, but abundantly in chloroform, boiling rectified spirit, and volatile and fixed oils. The crystals become yellow on exposure to light. On account of the difficulty of procuring it pure, M. Gaffard suggests its use in an impure state, designated Brown Santonin, which is almost equally efficacious and much cheaper than the pure article. It was first obtained by Köhler, of Dusseldorf, in 1830, but was not known in England as a vermifuge till 1844.[1] Four years subsquently, Mr. Spencer Wells[2] published a paper on its use, and since that time its reputation has gone on steadily increasing, until, by the general consent of most of those who have recorded their experience, it may be pronounced to be one of the most certain, and probably one of the safest anthelmintics we possess.

Med. Prop. and Action. Unless given in large doses, santonin induces no marked physiological effects; but one which occasionally attends its use is very remarkable, viz., a yellow discoloration of the vision. M. Guépin[3] found that of one hundred persons three only exhibited no modification of vision; about fifty perceived objects yellow for a short time only about an hour after taking the medicine; whilst in the remainder the vision was more decidedly yellow, which continued for a longer period. In one case this continued for twelve days after leaving off the santonin. Where very large doses are taken, the yellow discoloration deepens to a red hue. The urine also assumes a peculiar yellow colour. Ill effects have occasionally, though rarely, resulted from its use. No case of death from its employment is recorded. One case indeed is mentioned,[4] in which a child, in Belgium, died after taking santonin, but it was proved that five-sixths of the fatal powders consisted of strychnia.

[1] Lancet, May 11, 1844, p. 226.
[2] Med. Gazette, July 16, 1848, p. 1035.
[3] Bull. de Thérap., lviii. p. 500.
[4] Med. Times and Gaz., Nov. 26, 1859, p. 553.

The *dose* for children under four years is gr. ij.–iv.; above twelve years, gr. vj.–viij., with an equal quantity of white sugar or in syrup. The Brown Santonin is best given in M. Gaffard's lozenges, each of which contains gr. $\frac{1}{3}$ of santonin. One of these is the dose for an infant of six months old; for older children, the dose is proportionately large.[1]

1893. *Therapeutic Uses. In cases of Ascarides Lumbricoïdes*, santonin is invaluable. Its efficacy has been attested by all who have recorded their experience in its use. My own experience with it, which has been very extensive, has been most satisfactory. Kuchenmeister[2] states that the worm perishes more rapidly and certainly in an oleaginous solution of santonine than in any other vehicle; hence he directs it to be given in castor oil. Dr. Brisbane[3] employed this formula with the best effects, but Dr. Chipperfield[4] did not find it, when thus exhibited, more effectual than when given rubbed up with about thrice its weight of sugar. In many cases no aperient is needed, one or two stools succeeding its exhibition containing the worms, if any were present; still it is the safer plan to administer an aperient a few hours after the last dose of santonin. Dr. Chipperfield judiciously advises an interval of six or eight hours between any two doses of the medicine, and not to administer more than three doses in succession, allowing a space of three or four days to elapse before employing the medicine again. In cases of *Ascarides Vermiculares* (Thread Worm) its effects are often very striking, though it does not exercise a curative power without the aid of constitutional treatment by salts of iron, &c.

1894. *In Chorea, Epilepsy, Hysteria*, and *in many Nervous and Convulsive affections in Women and Children*, santonin has very frequently been found to disclose the unsuspected cause of the affection, viz., worms; and the cause being removed by the medicine, the effect has ceased. As an aid to diagnosis in doubtful and anomalous cases, it is of great value. Bouchardat[5] considers that it possesses incontestable efficacy as an antiperiodic in *Intermittent Fevers*, when given in doses of gr. iv.–v. daily. No other testimony in its favour in this character is recorded.

1895. *In Diseases of the Eye*, the peculiar effect which santonin exerts on the coloration of vision (termed Chromatopsy) led M. Martini[6] to employ it in *Amaurosis*, and the results obtained were so satisfactory that M. Guépin[7] was induced to extend its use to other eye diseases; and he concludes that santonin, given to the extent of gr. xxx. divided into ten doses,

[1] Annales de Thérap., 1850, p. 82.
[2] Archiv. Gén. de Méd., 4th series, xxix. p. 206.
[3] Medical Times, June 9, 1860, p. 589.
[4] Madras Quart. Med. Journal, Jan. 1861, p. 78.
[5] Ann. de Thérap., 1851, p. 147.
[6] Comptes Rendus, March, 1860.
[7] Op. cit. and Med. Times and Gaz., Sept. 1, 1860, p. 219.

taken in a period of five days, produces good effects in the latter stages of *Iritis*, *Irido-Choroïditis*, and *Choroïditis* with plastic exudation, when the inflammatory condition no longer persists. In other diseases of the eye, the results were either negative, trifling, or mischievous. It may often be advantageously combined with atropia and other medicines, as may be required.

1896. SAPO DURUS. Hard Soap. A combination of olive oil and soda. Composed of oleate and margarate of soda.

SAPO MOLLIS. Soft Soap. A combination of olive oil and potash. Composed of oleate and margarate of potash.

Med. Prop. and Action. Soap, in its operation, is very similar to the alkalies generally, but milder. It is rarely administered singly, as an internal remedy, as the liberation of the fatty acids entering into its composition renders it objectionable, but it is often advantageously combined with aloes, and other purgatives, the operation of which it renders more speedy and mild. It is also a common constituent of suppositories, rendering them more soluble and efficient. It enters into a variety of liniments, embrocations, &c., and proves useful in some cutaneous diseases. The Linimentum Saponis (Hard Soap oz. ij½.; Camphor oz. j¼.; Oil of Rosemary fl. drs. iij.; Rect. Spirit fl. oz. xviij.; Water fl. oz. ij.) has long been held in popular esteem under the name of Opodeldoc. Hard soap is also an ingredient in Emp. Saponis, and many officinal pill masses.

1897. *Therapeutic Uses. In Poisoning by the strong Mineral Acids*, soap is an efficacious antidote; and being generally at hand, it is doubly valuable. It cannot be used too soon, and must be given in strong solution, of which a teacupful should be drunk at short intervals. *Burns with the strong Acids, or with Phosphorus*, should be bathed with a solution of soap.

1898. *Dyspepsia attended with Acidity of the Primæ Viæ* is often benefited by the internal use of soap, in combination with rhubarb and an essential oil. *In Pyrosis*, Dr. Mason Good speaks highly of the value of soap, either alone or with opium. *Habitual Constipation*, when the fæces have become hardened and impacted, is often relieved if not altogether removed, by an enema of a strong solution of soap.

1899. *In Tinea Capitis, and many Cutaneous Diseases*, the daily application of soft soap and warm water contributes materially to a speedy cure. Dr. Neligan, however, objects to it in diseases of the scalp.

1900. *In Syphilitic Eruptions*, Dr. Fricke observes that soap-baths (in the proportion of a pound of yellow soap to each bath) always constituted the first step in the treatment in every form of eruption. In all instances they exercised, in the commencement at least, a favourable influence; and they were

found sufficient, in many cases, to effect a cure without any other remedy. Some forms required from six to eight, and others from twelve to sixteen, baths, to effect a cure. (Dr. Graves.)

1901. *To Abscesses*, to hasten the suppurative process, a popular sailor's application is a plaster, composed of equal parts of common yellow soap and brown sugar, beaten together into a paste, spread on a bit of linen, and placed over the part. I have used it myself, and seen others use it in a great number of cases; it greatly eases the pain, and appears to hasten the suppurative process more than any other application. Its simplicity is a great recommendation to its use.

1902. *In Sprains, Bruises, Chronic Rheumatism, &c.*, Soap Liniment (*ut supra*) diligently rubbed in for fifteen or twenty minutes, two or three times a day, affords great relief. A portion of laudanum (fl. drm. j. ad fl. oz. j.) may be advantageously added.

SAROTHAMNUS SCOPARIUS. See SCOPARII CACUMINA.

1903. SARSÆ RADIX. JAMAICA SARSAPARILLA. The dried root of Smilax officinalis, *H. et B. Nat. Ord.* Smilaceæ. *Hab.* Central America; imported from Jamaica.

Med. Prop. and Action. Alterative-tonic and diaphoretic. It is best administered in simple or compound decoction. Some practitioners doubt the medicinal properties of Sarsaparilla altogether, but the weight of evidence is in favour of its therapeutic value; and this view is supported by the fact observed by Palotta,[1] that *Smilacin*, its peculiar crystallizable principle, produces in a concentrated degree, some of the effects which have been ascribed to the drug in its crude state; thus, in small doses, it causes nausea and diaphoresis, and in larger ones it exercises a sedative action on the heart and arterial system. In common with other alterative-tonics, its effects are not very obvious, and its *modus operandi* is as yet obscure. As an alterative-tonic it is particularly serviceable in cachectic states produced by syphilis, or by long-continued courses of mercury. These properties are not confined to officinal sarsaparilla, but are possessed likewise by the roots of several other species of Smilax, for a complete account of which the reader is referred to Pereira's Mat. Med., vol. ii. pt. i. p. 270, *et seq.*

Dose:—Of the powdered root, gr. xxx.–lx. *Of the Liquid Extract*, fl. drm. ij.–iv. *Of the Decoction* (Sarsaparilla oz. ij½., Boiling Water Oj½.; macerate for an hour, boil for ten minutes, when cool strain), fl. oz. ij.–iv. *Of the Compound Decoction* (Sarsaparilla oz. ij½., Sassafras chips, Guaiacum Wood turnings, Liquorice Root āā oz. ¼, Mezereon Bark gr. lx., Boiling Water Oj½. Prepare as Decoction (*ante*), fl. oz. ij.–iv., three or four times daily.

1904. *Therapeutic Uses. In Syphilis*, sarsaparilla was formerly esteemed a specific; but the trials of it by Mr. Pearson (p. 24) pointed out the fallacy of the opinion. In constitutional syphilis, however, particularly when repeated courses of

[1] Journ. de Pharm., lx. p. 542.

mercury have been taken for the cure of the disease, he speaks favourably of it. It is supposed to act chiefly by inducing a healthy tone of the biliary and digestive organs. It may be given to the extent of Oj. of the decoction, or more, daily, and may be advantageously combined with nitric acid (Acid. Nit. Dil. ɱx. ad Decoct. Sarsæ Co. fl. oz. ij.) or with the iodide of potassium. *In Syphilitic Sore Throat, with Phagedæna*, the combination with the acid proves the most useful. Opium may, at the same time, be given in liberal doses.

1905. *In Mortification or Gangrene of the Extremities in Old Persons*, the compound decoction is frequently easily borne when cinchona is rejected by the stomach. It is best given with dilute nitric acid (ɱx. ad Decoct. fl. oz. iij.) three or four times daily. The adjuncts required are a generous diet, great cleanliness, charcoal poultices, and Dover's powder (gr. x.) or opium (gr. j.–ij.) at night.

1906. *In Chronic Affections of the Liver*, sarsaparilla is highly spoken of by Dr. Wilson Philip.[1] He considers that it is chiefly serviceable where the languor of the secreting vessels has become permanent. Dr. Venables[2] also speaks favourably of it, and affirms that, in these cases, the liquid extract is the best form for administration.

1907. *In Chronic Rheumatism consequent on Syphilis, or attended with much debility*, the compound decoction proves highly serviceable. It may be combined with nitric acid, the iodide of potassium, or opiates. How far the benefit is due to the sarsaparilla is doubtful.

1908. *In Chronic Coughs* occurring in debilitated constitutions, attended with redness and relaxation of the mucous membrane of the fauces, and elongation of the uvula, Prof. Graves (ii. p. 32) speaks highly of the following formula:— ℞ Decoct. Sarsæ Oj., Acid. Nit. dil. f℥j., M. sumat. ter. part. ter in die. He states that it improves the general tone of the system, and that the cough will generally subside under its use. In some cases it is necessary to apply solutions of nitrate of silver or sulphate of copper to the tonsils; and the patient should take nutritious diet and daily exercise. It will be found particularly useful when syphilis, or a long mercurial course, has been the cause of the debility; but its utility is by no means confined to these cases.

1909. *In Chronic Diseases of the Skin*, the compound decoction or liquid extract may be given with evident advantage, particularly when they are of syphilitic origin, or when the digestive organs are evidently deranged. Local applications at the same time should not be neglected.

1910. Sassafras Radix. Sassafras Root. The dried root of

[1] On Indigestion, p. 203. [2] Cyc. Pract. Med., vol. iv. p. 616.

Sassafras officinale, *Nees*. *Nat. Ord.* Lauraceæ. *Source*, North America.

Med. Prop. and Action. Alterative-tonic and diaphoretic. Its activity depends upon a volatile oil, which is dissipated by boiling; it is, consequently, best given in infusion (oz. j. ad Aq. Oj.) The volatile oil (♏ij.–v.) is the best form for internal use. It is rarely used alone, but chiefly in combination with sarsaparilla or guaiacum. It is inadmissible in all sthenic inflammatory states. It contains about nine per cent. of a peculiar principle, *Sassafrin*, and five per cent. of tannin.

1911. *Therapeutic Uses. In Constitutional Syphilis, Scurvy, and in Cutaneous Affections*, it has been employed; but its utility is very doubtful. It is rarely given alone, but in combination with powerful diaphoretics, guaiacum, &c.

1912. *In Chronic Rheumatism* it has long been held in repute. When the circulation is languid, the skin dry, and the kidneys, liver, and bowels inactive, the greatest benefit frequently results from its use either alone or with other appropriate remedies. It is stimulant and sudorific in its action, and in certain instances appears to exercise a curative influence, which is not possessed by guaiacum, nor by any other remedy of the same class. Moreover, it is not purgative like guaiacum, and consequently is available in many instances in which the latter drug is inadmissible. ℞ Sassafras Rad. concis. ʒjss., Mezerii ʒiv., Taraxaci Rad. concis. ʒiij., Aq. Ferv. Oj., M. Dose, ʒj.–ʒjss. Its use should be conjoined with a plentiful use of diluents. (Dr. Fuller, p. 416.)

1913. Scammonium. Scammony. A gum-resin obtained by incision from the living root of Convolvulus Scammonia, *Linn.* *Nat. Ord.* Convolvulaceæ. *Hab.* Greece, Asia Minor, and Syria.

Scammoniæ Resina. Resin of Scammony. Obtained by means of rectified spirit from Scammony or from the dried root of the Scammony plant, Convolvulus Scammonia, *Linn.*

Med. Prop. and Action. Drastic purgative, particularly adapted for persons of a phlegmatic temperament, and for cases of constipation depending upon torpor of the colon. M. Rayer,[1] with the view of testing the value of scammony, administered it in 210 cases, and the following are the results of his observations:—1. The scammony of Aleppo, in doses of gr. xviij., usually occasions three or four motions; if administered in gr. xxvij. doses, its action is seldom equal to, and sometimes weaker than, that resulting from the smaller dose of the medicine. 2. The addition of acids or alkaline fluids to scammony does not increase or diminish its power in any evident manner. 3. The resin of scammony, in doses of gr. ix., produces a purgative action equal to that occasioned by gr. xviij. of common scammony. 4. The resin is to be preferred, as it acts with certainty and uniformity, and the scammony of commerce is always more

[1] Med. Times, vol. xvii. p. 9.

or less impure. Scammony occasionally causes severe griping; but this may in a great measure be obviated by reducing it to a very fine powder, and giving it in conjunction with the sulphate of potash. The operation of scammony, observes Dr. Nevins,[1] is chiefly irritant, and affects the whole of the bowels; on this account, it acts most effectually when there is a deficiency of intestinal mucus, indicated by hard dry fæcal evacuations, in which case, however, it is very liable to gripe, an effect which may be diminished by the means described above. When there is copious mucous secretion, it has less efficacy, and is, therefore, not so well adapted as a purgative to remove intestinal worms as gamboge or colocynth. It is stated by Dr. Christison never to become poisonous in an over-dose. The compound powder is a good form for internal use, and is particularly adapted for children.

Dose:—Of pure Scammony, gr. v.–x. *Of the Resin*, gr. iij.–viij. *Of the Mixture* (Resin of Scammony gr. iv., Milk fl. oz. ij.), fl. oz. ½–ij. for a child. *Of the Confection* (Scammony in fine powder oz. iij., Powdered Ginger oz. j½., Oil of Caraway fl. drm. j., Oil of Cloves fl. drm. ½, Syrup fl. oz. iij., Honey oz. j½.), gr. x.–xxx. *Of the Compound Powder* (Scammony oz. iv., Jalap oz. iij., Ginger oz. j., all in powder), gr. x.–xx. for adults; gr. vj.–viij. for children; gr. iij.–v. for infants.

1914. *Therapeutic Uses. In Dropsy and Dropsical Affections*, scammony is sometimes advantageously exhibited as a hydragogue cathartic, and may be given in combination with the acid tartrate or acetate of potash. It is, however, inferior in efficacy to elaterium, croton oil, or gamboge.

1915. *In Cerebral Affections*, it proves useful not only as a purgative, but as a revulsive and derivative. Dr. A. T. Thompson considers that it is well adapted in maniacal cases for removing the scybala which often accumulate and remain for a long time in the cells of the colon.

1916. *Against Lumbrici and Ascarides Vermiculares*, the compound powder, in combination with calomel, acts with certainty and rapidity. It may be safely given to children in doses of gr. viij.–x., and to infants in doses of gr. iij.–v.

1917. Scilla. Squill. The sliced and dried bulb of Urginea Scilla, *Steinheil*. *Nat. Ord.* Liliaceæ. *Hab.* The shores of the Mediterranean.

Med. Prop. and Action. Expectorant and diuretic in doses of gr. j., gradually increased until slight nausea is produced. In larger doses, it is powerfully emetic and purgative. Its diuretic effect is seldom observable if purging or emesis be produced, and, consequently, when the first of these effects is desired, the medicine should be given in small doses, and discontinued on the occurrence of nausea. When it fails to occasion diuresis, which it occasionally does, it increases the cutaneous secretion. Its diuretic operation is rendered more certain by combination with other remedies of the same class. As an expectorant, it is said to attenuate the mucus, and also to excite a more copious excretion of it from the lungs, thereby lessening the congestion upon which the difficulty of respiration depends. As an emetic, it is objectionable on account of the uncertainty of its action; large doses, in some instances, having a very slight effect, whilst, in others, a small dose acts with extreme violence. In excessive

[1] Trans. of Lond. Ph., 1851, p. 277.

doses, its operation is that of an acro-narcotic poison, gr. xxiv. having proved fatal. When recent, the bulbs are very acrid, and applied to the skin in this state, cause inflammation and vesication; but, by long keeping, this property is either greatly diminished or altogether dissipated. Their activity depends upon two principles: 1, an acrid resin; 2, a bitter principle, *Scillitine* or *Scillitite*. Squill spoils by exposure to the air, and consequently requires to be kept in closely-stoppered bottles.

Dose:—Of Powdered Squill, gr. j.–iij., as an expectorant and diuretic; gr. x.–xv. as an emetic. *Of the Tincture* (Squill, bruised, oz. ij½., Proof Spirit Oj.), ♏x.–xxx. *Of the Vinegar* (Squill, bruised, oz. ij½., Diluted Acetic Acid Oj., Proof Spirit fl. oz. j½.), ♏xv.–xl. *Of Oxymel* (Vinegar of Squill Oj., Honey lb. ij.), fl. drm. ½–j. *Of the Syrup* (Vinegar of Squill Oj., Refined Sugar lb. ij½., dissolve with heat), fl. drm. ½–j. *Of the Compound Pill* (Squill oz. j½., Ginger oz. j., Ammoniacum oz. j., Hard Soap oz. j., all in powder, Treacle fl. oz. ij. or q.s.), gr. v.–x.

1918. *Therapeutic Uses. In Asthma*, benefit is often derived from squill, in combination with hemlock or henbane. The following formula of the late Dr. Bree has been found highly serviceable:—℞ Ext. Hyoscyam. gr. iij., T. Scillæ gutt. xv., Acid. Nit. dil. ♏xxx., Aq. f℥jss., M.

1919. *In Chronic Bronchitis, Coughs, and Catarrh*, squill proves highly useful, by promoting a more copious secretion from the mucous follicles, unloading the air-passages, and relieving the congestion and dyspnœa. It should never be employed until all active inflammation has subsided. Dr. C. J. B. Williams[1] observes that squill is principally useful in mild cases unattended with purulent expectoration, and advises its being combined with an alkali and with a small portion of opium, in order to prevent its passing off too rapidly by the kidneys.

1920. *In Croup*, Dr. Copland (i. p. 465, 470) speaks highly of squill, and prefers it as an emetic to antimony, as causing less depression, but the verdict of experience is not in favour of its use except in exceptional cases. It forms, however, a valuable adjunct to carb. of ammonia and senega (*q.v.*) in the advanced stages of the disease.

1921. *In Dropsy, Anasarca, &c.*, squill given singly appears to exercise inconsiderable influence, but in combination with other remedies it proves of the greatest service. The following is Dr. Baillie's formula:—℞ Pulv. Scillæ gr. j., Pil. Hydrarg. gr. iij., Pulv. Digitalis gr. j.–jss., M. ft. pil. ter quaterve in die sumend. It may also be advantageously combined with the acid or tartrate of potash. It is inadmissible in dropsy connected with granular disease of the kidney, or whilst any acute inflammatory action is present. It is principally indicated in asthenic cases.

1922. *In Dysuria*, a combination of Acetum Scillæ and Sp. Æther. Nit., in equal parts, is often productive of the best effects. Of the mixture, ♏xxx. in aniseed water, fl. oz. ij., may be repeated every hour or oftener.

[1] Cyc. Pract. Med., vol. i. p. 321.

1923. *In Hydrocele of young subjects*, a radical cure has occasionally been effected by the local external application of acetum scillæ; it causes desquamation and subsequent absorption of the fluid. It cannot be depended upon, even in young subjects; in adults it almost always fails.

1924. Scoparii Cacumina. Broom Tops. The tops of the common Broom, Sarothamnus Scoparius, *Wimmer*. *Nat. Ord.* Leguminosæ. *Hab.* Europe, Great Britain.

Med. Prop. and Action. Diuretic in small, cathartic and emetic in large doses. These properties also reside, even in a more manifest degree, it is thought, in the seeds. Their activity apparently resides in a neutral principle, *Scoparine*, but it may be partly due to a volatile liquid alkaloid, *Spartia*, and to the salts, of which the tops contain a large proportion.

Dose:—Of the Dried Tops, gr. xx.–xxx. in infusion. *Of the Juice* (*Succus Scoparii*, B. Ph.), fl. drm. j.–ij. *Of the Decoction* (Broom Tops dried oz. j., Water Oj.), fl. oz. ij.–iv.

1925. *Therapeutic Uses. In Dropsy*, the common broom was held in high esteem by Sydenham, Mead, and Cullen. In more recent times its powers as a valuable diuretic in this class of cases have been maintained by Drs. Darwell,[1] Pereira,[2] and Pearson,[3] and it appears certain that in some instances, especially in dropsy connected with heart disease, it exercises a beneficial influence. Dr. Pearson advocates the use of the seeds in the form of tincture:—Broom Seeds oz. ij., Proof Spirit fl. oz. viij., macerate for ten days. Dose, fl. drm. j.–ij. thrice daily. If it produce diarrhœa, T. Opii ♏ v.–vj. may be added; if much debility be present, it may be combined with iron or quinine. He pronounces it eminently serviceable in all dropsies except ovarian, and in hydrothorax, and states that it improves the appetite and invigorates the system, at the same time that it increases the urinary secretion. *In Bright's Disease*, when the renal secretion is very deficient, Dr. Barlow[4] advises the combination of the decoction and nitric ether.

Seidlitz Powders. See Soda Tartarata.

1926. Senegæ Radix. Senega Root. The dried root of Polygala Senega, *Linn.* *Nat. Ord.* Polygalaceæ. *Hab.* North America.

Med. Prop. and Action. Stimulant, expectorant, diuretic, and emmenagogue, in doses of gr. x.–xl., every three or four hours; in larger doses it proves emetic and cathartic. It is a powerful stimulant of the absorbent system; it increases all the secretions, particularly the urine and saliva; indeed, in some instances, a copious and troublesome salivation occurs

[1] Cyc. Pract. Med., i. p. 166.
[2] Mat. Med., vol. ii. pt. ii. p. 316.
[3] Obs. on Broom Seed, 1835.
[4] Pract. of Med. p. 501.

during its prolonged use. It diminishes irregularity of the heart's action, renders the pulse slower and firmer, and imparts a tone to the digestive organs, and to the general system. Its activity depends upon *Senegin* or *Polygalic Acid*, which, in doses of gr. viij., has proved fatal to dogs in three hours. It was formerly esteemed in the treatment of the bites of snakes; but its use in this character is now discontinued. It is contra-indicated in all active inflammatory states, particularly of the lungs.

Dose:—Of the Powdered Root, gr. x.–xx. *Of the Infusion* (Senega Root oz. ½, Boiling Water fl. oz. x.), fl. oz. j.–ij. *Of the Tincture* (Senega Root oz. ij½., Proof Spirit Oj.), fl. drm. ½–ij.

1927. *Therapeutic Uses.* *In Pneumonia*, when the inflammatory symptoms have subsided, and any amount of debility, with weak pulse, cool skin, cough, and dyspnœa remains, Dr. C. J. B. Williams[1] recommends the use of the decoction of senega. He considers that, besides its tonic property, it acts specifically upon the lungs and absorbent system. He states that he has seen cases of this kind, which had resisted other remedies, almost immediately improved by its use. In a few hours the pulse has become slower, the breathing more free, the tongue cleaner, and the strength improved. *In Chronic Catarrh*, it has also been found highly serviceable; and in *Chronic Bronchitis*, Dr. Stokes prefers it to all other remedies, particularly when given in combination with carbonate of ammonia. This combination proves also highly useful in all *Lung complications of Typhoid and Typhus Fevers.* The tincture is a valuable adjunct to expectorant mixtures.

1928. *Croup.* In the second or advanced stage, stimulant expectorants are often required, and when repeated emetics are indicated in the decline of the disease, a stimulant, *e.g.*, ammonia, should be combined. Senega, as Dr. Squire observes (i. p. 265), is here of the greatest value, either in large repeated doses as an emetic, or with ammonia, squill, &c., as an expectorant. Dr. West (p. 315) furnishes an excellent formula:—℞ Decoct. Senegæ ℥ij½., Ammon. Carb. gr. viij., T. Scillæ ♏xvj., Syr. Tolu ℥iij., M. Dose, ℥iij. every four hours for a child æt. 2 to 3 years. Sweetened with treacle or coarse sugar, and given with about a third of milk, children will seldom refuse it. "No other remedy or combination of remedies," adds Dr. West (p. 371), "has appeared to me to be so useful as a stimulant expectorant in the *advanced stages of Croup or Bronchitis.*" *In Diphtheria*, where emetics are indicated, senega may be resorted to with advantage.

1929. *In Gastro-enteritis, complicated with Disease of the Lungs*, senega is highly spoken of by Dr. Stokes.[2] He states, that if given before ptyalism is produced, its virtues are small; but that after this has been effected, it will seldom disappoint the practitioner. He advises the following formula:—℞ Decoct.

[1] Cyc. Pract. Med., vol. iii. p. 445. [2] Ibid., vol. ii. p. 339.

Senegæ f℥vij., T. Scillæ, T. Opii Camph. āā f℥j., Ammon. Carb. gr. v.–xx., M. capiat. coch. amp. j. secundis horis.

1930. *In Ascites and Dropsical Affections occurring after Fevers and other Debilitating Diseases*, the influence of senega is often very marked. It not only greatly increases the urinary secretion, but improves the tone of the digestive organs and the system generally. It may be given in doses of fl. oz. ij. of the infusion with squill, &c., three or four times a day; and in order to increase its diuretic effect, diluents should be employed, and the surface of the body kept cool.

1931. *In Valvular Disease of the Heart*, Dr. Barlow[1] observes that for promoting the action of the kidneys, and at the same time relieving the palpitation, a combination of senega with some other diuretic will prove eminently serviceable. The *modus operandi* of the senega under such circumstances, he remarks, is not quite obvious, but it is certainly specially useful in *Palpitation arising from Aortic Disease*, though it has not the same good effect in disease of the mitral valve. He advises the following formula:—℞ Spt. Æther. Nit. ℥ij., T. Hyoscyam. ℥j½., Decoct. Senegæ ℥iij., Mist. Camph. q.s. ad ℥iv., M. sumat. part. ¼ ter die. He advises the same combination in *Aneurism of the Aorta*, with the view of allaying excitement without depressing the vital powers. *In Hysterical Palpitations*, a combination of senega with henbane and ammonia often proves very useful.

1932. *In Amenorrhœa and Dysmenorrhœa*, senega, as an emmenagogue, was first recommended by Dr. Hartishorne, of Philadelphia. He found it chiefly useful in recent cases, and began to administer it a fortnight before the expected appearance of the discharge; giving a pint of a saturated decoction daily, until the medicine disagreed, or the discharge appeared. Dr. Chapman[2] found it particularly useful where a membrane was habitually discharged; he speaks of it as the most active, certain, and valuable of emmenagogues.

1933. Senna. Sennæ Folia. Senna Leaves. Two kinds are officinal in B. Ph. 1. Alexandrian Senna, consisting of the leaflets of Cassia lanceolata, *Lam.*, and Cassia obovata, *Colladon*, imported from Alexandria; and 2, Indian or Tinnevelly Senna, consisting of the leaflets of Cassia elongata, *Lemaire*, from plants cultivated in Southern India. Other varieties are met with in commerce.

Med. Prop. and Action. Valuable cathartic, holding a mid place between mild laxatives and drastic purgatives. It acts chiefly on the small intestines, increasing their mucous secretion, as well as their peristaltic

[1] Pract. of Med., p. 351. [2] Mat. Med., vol. ii. p. 7.

motion, and producing loose brown evacuations. It does not depress the circulation or cool the system like many other cathartics, but it has rather a general stimulating effect, which, however, is by no means so well marked as to forbid its use in any circumstances of general excitement or re-action. (Christison.) Its use is attended by little, if any, subsequent constipation. Its activity was for a long time considered to reside in a peculiar principle, *Cathartine*, but the experiments of M. Heerlein disprove the idea, eighty grains producing no sensible effect. Senna generally operates under four hours, and in some persons its operation is attended with griping; this may be in a great measure obviated by combining it with carminatives. *Its efficacy is increased* by drinking plentifully of diluents, by the addition of pure bitters, of camphor, or of the decoction of guaiacum; also by the sulphates of magnesia and soda, and some other saline purgatives. *Its efficacy is decreased or destroyed* by boiling, by being kept long ready-made, by the carbonates of alkalies, and by rhubarb. *Its nauseous taste is disguised* by giving it in strong coffee, or by the addition of milk and sugar, when it much resembles common tea. That it exercises a specific action on the bowels is shown by the experiments of Petit,[1] who found fomentations of senna leaves placed over the abdomen produce a brisk cathartic operation. If given to a woman during lactation, it communicates a purgative property to the milk.

Dose:—Of Senna Leaves, gr. xx.–cxx. *Of the Infusion* (Senna oz. j., Ginger gr. xxx., Boiling Water fl. oz. x.), fl. oz. j.–iij. *Of the Compound Mixture* (Sulphate of Magnesia oz. iv., Ext. of Liquorice oz. ½, Tinct. of Senna fl. oz. ij½., Comp. Tinct. of Cardamoms fl. drm. x., Infusion of Senna q.s. ad Oj.), fl. oz. j.–j½. *Of the Tincture* (Senna oz. ij½., Raisins oz. ij., Carraway oz. ½, Coriander oz. ½, Proof Spirit Oj.), fl. drm. j.–iv. *Of the Syrup*, fl. drm. j.–iv. *Of the Confection*, "*Lenitive Electuary*" (Senna oz. vij., Coriander oz. iij., Figs oz. xij., Tamarind Pulp oz. ix., Cassia Pulp oz. ix., Prunes oz. vj., Ext. of Liquorice oz. ¾, Sugar oz. xxx., Water q.s.), drm. j.–ij.–iv.

1934. *Therapeutic Uses. In Habitual Constipation, in the Constipation of Pregnancy, and in the Puerperal State*, senna, particularly in the form of the confection (the old Lenitive Electuary), proves a mild and efficient purgative. It is of an agreeable flavour, leaves no subsequent constipation, and causes very slight excitement. It is a very eligible laxative in all *Hæmorrhoidal Affections.*

1935. *In Bilious Derangements and Visceral Obstructions*, the infusion of senna, in doses of fl. oz. j.–fl. oz. iij., either alone or combined with sulphate of magnesia (gr. cxx.–gr. ccclx.) or tartrate of potash (gr. lx.–gr. cxx.), forms an efficient purgative. It is best given in the morning, a mild mercurial being taken the previous night. The routine practice of "Blue Pill and Black Draught" is now, happily, almost discarded; but when judiciously given, it proves, in many instances, a safe and efficient plan of treatment. The habitual use of these remedies cannot be too strongly condemned.

1936. *In Atonic Dyspepsia*, particularly when attended by constipation, a mixture of equal parts of the infusions of senna and gentian proves eminently serviceable.

[1] Quoted by Dr. Copland, art. Constipation.

1937. SERPENTARIÆ RADIX. Serpentary Root. The dried rhizome of Aristolochia Serpentaria, *Linn.* *Nat. Ord.* Aristolochiaceæ. *Hab.* North America.

Med. Prop. and Action. Stimulant, tonic, and diaphoretic. In large doses it causes nausea, griping with watery stools, headache, and disturbance of the cerebral functions, with greatly increased arterial action. In its operation it has been compared to camphor, but its effects are more permanent. (Stillé.) Active principles: 1, a volatile oil; 2, a resin; 3, a bitter extractive. It is contra-indicated in acute inflammatory affections occurring in plethoric subjects.

Dose:—Of Serpentary Root, gr. x.–xxx. *Of the Infusion* (Serpentary Root oz. ½, Boiling Water fl. oz. x.), fl. oz. i.–ij. *Of the Tincture* (Serpentary Root oz. ij½., Proof Spirit Oj.), fl. drm. j.–ij.

1938. *Therapeutic Uses.* *In Typhus and Typhoid Fever*, serpentaria is occasionally administered, with a view of exciting diaphoresis, and supporting the powers of the system. Cullen speaks favourably of its efficacy; and Dr. Nevins[1] states that it is extensively used at Guy's Hospital. It had formerly some repute in *Intermittent Fevers*, but no reliance is now placed on it.

1939. *In Dyspepsia*, when the skin is hot and dry, serpentaria has been found an excellent remedy. (A. T. Thomson.)

1940. *In Cynanche Maligna*, a strong infusion is stated to form an eligible gargle.

1941. *In Urticaria*, serpentaria has obtained some repute; it may be combined with gr. xx. of carbonate of magnesia or soda. (Watson, ii. p. 838.) Mr. Erasmus Wilson (p. 158) mentions one case in which it proved completely successful.

1942. SEVUM PRÆPARATUM. Prepared Suet. The internal fat of the abdomen of the sheep, Ovis Aries, *Linn.*, purified by melting and straining.

Med. Prop. and Action. Emollient. It is sometimes added to poultices. It is also occasionally given internally as a nutrient. Suet boiled in milk and taken in the morning is a popular remedy *in Phthisis*. It is an ingredient in Emp. Cantharidis and Ung. Hydrargyri.

1943. SINAPIS. MUSTARD. The seeds of Sinapis alba, *Linn.*, and Sinapis nigra, *Linn.* *Nat. Ord.* Cruciferæ. *Hab.* Europe.

Med. Prop. and Action. Mustard, in small doses, is stimulant; it improves the tone of the digestive organs, promotes the digestibility of many articles of food, and increases the appetite. Under its continued use, the secretion of urine becomes greatly augmented. In doses of from one to three teaspoonfuls it is emetic, effectually clearing out the stomach, without producing any great amount of subsequent depression. Externally applied in the form of poultice, it is irritant, and if left in contact with the skin for a long period, causes vesication. (See SINAPISMS.) The activity of Black Mustard depends upon an acrid volatile oil, which does not exist

[1] Trans. of Lond. Ph., 1851, p. 321.

in the seed, but is formed by the action of a peculiar albuminous substance, *Myrosine*, on an acid named *Myronic Acid*, both of which are contained in the seed, the latter in combination with potash. Alcohol, vinegar, and too hot water interfere with the production of the volatile oil, and therefore should not be used in the preparation of mustard poultices. This oil (Ol. Sinapis, B. Ph.) has an intensely penetrating odour, and very acrid burning taste, and applied to the skin, produces almost instant vesication. It is an ingredient in Lin. Sinapis Co., prepared by dissolving Ethereal Ext. of Mezereon gr. xl., and Camphor gr. cxx., in Rect. Spirit fl. oz. iv., and then adding Oil of Mustard fl. drm. j., and Castor Oil fl. drm. v.; a useful stimulant embrocation. White Mustard contains a crystallizable compound, *Sulphosinapism*, which gives rise to an acrid principle. Both kinds contain from 25 to 35 per cent. of a fixed oil. Flour of Mustard, as usually met with, is composed of two parts of black and three of the white seed, with a portion of wheat flour and turmeric. It is an effectual and ready emetic in narcotic poisoning.

1944. *Therapeutic Uses. In Ebrietas, Paralysis, Epilepsy, in Apoplexy* from over-distention of the stomach, and, indeed, in all cases when it is desirable to produce full emesis, with little expense to the strength or depression of the vital powers, the flour of mustard, in doses of a tablespoonful or less, is a speedy and efficacious remedy. *In Cholera*, it has been employed as an emetic, and in this character it is favourably noticed by Drs. M'Cloy and Robertson. (See EMETICS, Part ii.)

1945. *In Dyspepsia, and in the torpid state of the bowels which accompanies Paralysis*, white mustard seeds, to the amount of two or three teaspoonfuls, two or three times a day, have been advised, but their utility is doubtful.

1946. *In Dropsical Affections*, mustard, from its diuretic and stimulant quality, occasionally proves useful. It is best administered in the form of whey, made by boiling oz. ss. of the bruised seeds in Oj. of milk, and straining. This quantity may be taken daily in divided doses.

1947. *In Amenorrhœa*, Dr. Ashwell (p. 109) states that he has often seen the mustard hip-bath useful, the patient remaining in it for an hour each time. Sinapisms to the mammæ a short time previous to the usual catamenial period have been advised, but the success of this treatment is very doubtful, and its safety may be questioned. *In Dysmenorrhœa*, the mustard hip-bath is well spoken of by Dr. Ashwell. It should be repeated three or four times a day, the patient remaining in it from thirty to sixty minutes, or even, if the pain be very severe, until faintness is induced. *In Uterine Discharges arising from Ulcerated Carcinoma*, Dr. Ashwell found much benefit from the following vaginal injection :—℞ Pulv. Sinapis ʒij., Aq. Ferv. fʒxvj., M. This should be employed once a day, or two or three times a week, and should be of a strength to excite only a little tingling. It is particularly useful when the discharge is thin and ichorous.

1948. *In Insanity*, Dr. S. Newington[1] has derived great benefit

[1] Lancet, June 10, 1865.

from mustard baths (five or six handfuls of crude mustard to an ordinary warm bath), mustard fomentations, and large sinapisms. In cases where there is determination of blood to the head, with sleeplessness, restlessness, and anxiety, he directs the whole of the legs and the lower part of the abdomen to be enveloped in cloths steeped in mustard and hot water, a wet towel being at the same time applied round the head. Dr. Newington's suggestions are well worthy of attention.

1949. *Sinapisms, or Mustard Poultices*, are excellent counter-irritants, producing a certain and rapid effect. They are usually made with flour of mustard, mixed to the consistence of a poultice with water or vinegar. There are a few points of importance to be noticed in their preparation. M. Faure has shown that the stimulating properties of the powdered seeds are not disengaged in hot water (190° F.), and that they are readily so in cold water; hence it follows that a sinapism, to be efficacious, should be made with cold water, and that in foot-baths the mustard should be first mixed with some cold water, to which the hot water can be afterwards added. All liquids which coagulate albumen should also be avoided in the preparation of sinapisms and baths. (For the explanation of the action of hot water, &c., see *ante*.) These results agree nearly with those of Trousseau and Blanc.[1] They found that vinegar very much impaired the stimulant property of the common brown mustard, in which the husk is mixed with the flour; that the English flour of mustard was equally efficacious if mixed with water or vinegar; that it was less active if mixed with alcohol; and that cold water was the best and most efficacious fluid for its composition. Dr. Paris advises its mixture with the oil of turpentine; but if it be desired simply to increase the stimulating effect of the poultice, the surest way is to add a small portion of bruised capsicum. In persons of delicate skins, as in women and children, it is advisable to place a piece of muslin between the poultice and the skin. If a sinapism is allowed to remain in contact with the skin above twenty or thirty minutes, it may cause vesication; this should always be avoided, as the ulcers which result are extremely difficult to heal, and sometimes assume a gangrenous appearance. It should be removed when it causes great pain.

1950. In all *Inflammations of Serous and Mucous Membranes*, where the inflammatory action is not severe, or where the patient will not bear more active treatment, sinapisms, or poultices of linseed meal, or bread containing mustard, are valuable counter-irritant applications. In the treatment of inflammatory attacks in children, they often prove of the greatest service.

[1] Archiv. Gén. de Méd., Sept. 1830.

1951. *In Apoplexy, Delirium, Coma, Paralysis, Congestive Headaches, and in Cerebral Affections occurring in the course of Fevers*, sinapisms, to which have been added powdered capsicum or oil of turpentine, may in most instances be applied with evident advantage to the soles of the feet and the inner parts of the calves and thighs. Their action is that of a speedy and powerful derivative.

1952. *In Cholera, Colic, Colica Pictonum, Ileus, and in Spasmodic Affections of the Bowels unattended by Inflammation*, a sinapism over the whole surface of the abdomen affords, in most cases, a great amount of relief. *Gastrodynia* is also often much benefited by its application.

1953. *In continued and other Fevers, when they assume a Typhoid character*, and particularly when complicated with head affections, the application of sinapisms to the extremities, acting as a revulsive and stimulant, often proves of service, sometimes restoring the vital powers in a remarkable manner. *In Puerperal Typhus*, Prof. Osiander[1] states that the application of large sinapisms to the mammæ, so as to excite a powerful revulsion from the uterus, has in several instances seemed to act more beneficially than any other means.

1954. *In Gout*, the application of a sinapism to the inflamed part sometimes affords speedy relief. Prof. Graves[2] mentions three cases in which it proved successful. *In retrocedent Gout*, a sinapism placed over the originally affected part, or to the extremities, is occasionally effectual in causing the disease to reappear in its former, or in a less dangerous locality.

1955. *In Coughs attended with much Dyspnœa*, a sinapism to the chest often affords relief. *Hooping Cough* is often benefited by sinapisms to the spine. *In the Bronchitis of Typhus Fever*, an emetic of mustard, observes Dr. Murchison (p. 283), is said to act sometimes like a charm, by promoting copious expectoration, and allowing free ingress of air into the bronchial tubes, so as to save the patient from impending suffocation. *In the Pneumonia and Broncho-pneumonia* of children, when there is severe pain, sinapisms are favourably spoken of by Dr. Hillier. He condemns the use of blisters in these cases.

1956. *In Inflammation of the Tonsils*, sinapisms to the throat are very useful in removing the inflammation.

1957. *In Toothache, Faceache, and Neuralgic Affections of the Head and Face*, a sinapism over the seat of pain often affords great relief.

1958. *In removing symptoms indicative of a congested state of the Spinal Meninges*, sinapisms to the spine, repeated every night for several weeks, are very effectual.

1959. *In Uterine Affections*, a severe, sharp, acute pain is best

[1] Med.-Chir. Rev., vol. lx. N. S. [2] Dub. Journ., Jan. 1839.

met by the application of a strong mustard poultice over the hypogastric region, or round the loins; to be repeated at intervals. (Dr. Graily Hewitt, p. 378.)

1960. SODA CAUSTICA. Caustic Soda. Hydrate of Soda, NaHO, with some impurities. Made by boiling down Solution of Soda to a fluid of an oily consistence, pouring it, in this state, on a clean silver or iron plate, and allowing it to solidify. It is then broken in pieces, and should be preserved in a green glass stoppered bottle.

Med. Prop. and Action. Caustic and escharotic. It is used in the same manner, and is applicable to the same cases as caustic potash. It is, however, less deliquescent, and therefore more manageable. Liquor sodæ possesses similar medicinal properties to liquor potassæ. It is antacid, and acts as a direct sedative to the stomach. There seems, however, to be good evidence that, whilst the preparations of potash affect the secretion of the kidneys, those of soda influence that of the liver. Hence, in the treatment of *certain forms of Dyspepsia connected with biliary derangement*, the liq. sodæ or the carbonates of soda may be advantageously substituted for the analogous preparations of potash. (Garrod.) Dose of Liquor Sodæ ℥x.–lx. freely diluted.

1961. SODÆ ACETAS. Acetate of Soda. $NaC_2H_3O_2.3H_2O$.

Med. Prop. and Action. In doses of gr. xx.–gr. lx., diuretic; gr. lx.–gr. ccxl., purgative. It is rarely used, but may be substituted for the acetate of potash, over which it has the advantage of not being deliquescent. According to Stillé it is milder in its operation than the corresponding salt of potash, and is less apt to derange the digestion, while it is even more powerful as a diuretic. Weak solutions injected into the bladder have been proposed by Dr. R. Willis and others, as a *solvent of phosphatic calculi*, but no reliance is to be placed upon them.

1962. SODÆ ARSENIAS. Arseniate of Soda. $Na_2HAsO_4.7H_2O$.

Med. Prop. and Action. The same as those of arsenious acid, or liquor arsenicalis, but less irritating. Arseniate of soda has been long used on the Continent, and a solution of it has been known and prescribed in this country under the name of Pearson's Solution, a preparation containing one grain of the arseniate to ten fluid drachms of water. Dr. Garrod observes that arsenic in its highest state of oxidation (AsO_5) is closely analogous to phosphoric acid (PO_5), a compound which exists largely in the body. We may therefore suppose that it is less likely to prove irritating than in the condition of arsenious acid, which is one of lower oxidation; that such is the case he found by clinical experiments. In several instances where liq. arsenicalis produced constitutional disturbance, evidenced by nausea, irritation, and swelling of the eyelids, &c., he found that the arseniate of soda in corresponding doses was borne without the slightest discomfort, whilst it appeared to exercise all the curative powers of arsenic. He concludes that the arseniate of soda is less irritating than the arsenite when the amount of arsenic given is the same.

Dose:—Of Arseniate of Soda, gr. $\frac{1}{10}$–$\frac{1}{5}$. *Of the Solution; Liq. Sodæ Arseniatis* (Arseniate of Soda, rendered anhydrous by a heat not exceeding 300°, grs. iv.; Dist. Water, fl. oz. j.), ℥v.–x.

1963. *Therapeutic Uses. In Intermittent Fevers, Chorea, Neu-*

ralgia, *Gastrodynia*, *Skin Diseases*, and other affections in which arsenic is indicated, and in which the other arsenical preparations are ill borne, the solution (*ante*) may often be resorted to with advantage.

1964. Borax. Sodæ Biboras. Biborate of Soda. $Na_2B_4O_7.10H_2O$. A native salt; also prepared by boiling together in proper proportions boracic acid and carbonate of soda.

Med. Prop. and Action. Refrigerant, diuretic, and emmenagogue. It has also been employed as a solvent for calculi. Dr. Binswanger,[1] who has examined the properties of this salt, draws the following conclusions:—1. Its action is very similar to that of the carbonate of soda; like it, it has an alkaline reaction, it acts as an antacid, and, when in solution, it absorbs carbonic acid, and dissolves fibrine, albumen, caseine, and uric acid. Swallowed in large doses, it occasions oppression of the stomach, nausea, and vomiting. It becomes absorbed into the system, and is afterwards eliminated by the kidneys, and other secreting organs. It was detected in the blood of the portal vein, in the bile, and in the saliva, and has, therefore, probably, an influence on the process of chymification. If taken in large and repeated doses, it produces the same injurious effects as the other alkalies—deranged digestion, a scorbutic condition of the body, and sometimes an impetiginous eruption. 2. It has no specific power of exciting uterine contractions, of promoting menstruation, or of curing aphthous ulceration: though, like the carbonated alkalies, it may, by relaxing muscular fibre, slightly relieve spasm of the uterus; or, by its liquefacient properties, promote evacuation of the menstrual fluid; or, by its mild alkaline qualities, improve the condition of the skin and mucous surfaces. Its power as a solvent of calculus is very great. Externally applied, it is a mild and efficient detergent.

Dose:—Of Borax, gr. v.–xl. *Prep. for external application:—Mel Boracis* (Borax in fine powder grs. lxiv., Honey oz. j.); *Glycerinum Boracis* (Borax in powder oz. j., Glycerine fl. oz. iv.)

1965. *Therapeutic Uses. In Aphthæ and Aphthous Ulceration of the Mouth*, the mel boracis is a popular and efficient application. Sir T. Watson (i. p. 802) advises equal parts of this linctus, incorporated with syrup of poppies, as a good form; antacids being given internally at the same time. *In the Aphthous Ulceration which attends the advanced stages of Phthisis*, he states that he has employed it with advantage. *In Cracked Tongue*, Dr. Brinton[2] found the following formula peculiarly serviceable:—℞ Sodæ Bibor. gr. xl., Glycerini f℥j., Aq. f℥iv., M. ft. applicatio.

1966. *In Uterine Affections*, borax has long been esteemed by the German physicians; but it was not employed in British practice until it was introduced a few years since by Dr. Copland, who placed much dependence upon its efficacy. Dr. Rigby[3] observes that it seems to possess a peculiar power in exciting the activity of the uterus, and that he has employed the following formula in *tedious Labours, where there is deficiency*

[1] Prize Essay, 1848, quoted by Pereira, vol. i. p. 572.

[2] Dublin Med. Press, April 22, 1857.

[3] System of Midwifery, p. 209.

of Uterine contractions, with the best effect:—℞ Ergotæ gr. xx.–xl., Sodæ Bibor. gr. x., Aq. Cinnam. fʒjss., M. ft. haust. Dr. Tyler Smith[1] speaks of it as a remedy of minor power in controlling *Uterine Hæmorrhage*. He considers that it is absorbed into the blood, and that through this channel it acts upon the spinal cord and the nerves of the uterus. *In Chlorosis*, Dr. Copland advises the following formula:—℞ Sodæ Biboratis gr. xl., Sulphur. Præcip. ʒj., Mucilag. Acac. q.s. ft. pil. xxiv., cap. iij. ter quotidie. *In Amenorrhœa*, he prefers the subjoined pills:—℞ Sodæ Bibor. ʒss., Aloes Socot., Pulv. Capsici āā gr. xx., Ol. Lavand. q.s. ft. pil. xviij., cap. ij. ter quotidie. *In Leucorrhœa*, when the discharge is acrid, giving rise to irritation externally, frequent ablutions are requisite, and the parts should be kept moist with a lotion of the biborate or carbonate of soda. (Dr. Graily Hewitt, p. 399.) *In Dysmenorrhœa*, it has also been given with advantage, combined with ext. belladonnæ. *In Puerperal Diarrhœa*, if the lochia be suppressed, and *in Puerperal Convulsions*, if the os uteri be rigid and undilated, Dr. Copland advises the borax, in doses of gr. xx.–xxx. It may, in these cases, prove a useful adjunct to other measures, but it should not be trusted to alone.

1967. *In Pruritus Pudendi Muliebris*, great and speedy relief often attends the application of a strong solution of borax. The following, advised by Dr. West, is a good form:—℞ Sodæ Bibor. ʒiv., Morphiæ Hydrochlor. gr. viij., Aq. Rosæ ʒx., M. *In Pruritus Scroti et Ani*, it also affords great relief.

1968. *Calculous Disease. As a solvent for Uric or Lithic Acid Calculi*, borax was advised by Dr. R. Willis in 1842. He found that a solution of gr. iv. in Aq. fl. oz. j. dissolves a larger quantity of uric acid deposits than the same quantity of the carbonates of other alkalies, whilst a more concentrated solution was less effectual. He considers that this circumstance, and its sedative effects upon mucous membranes generally, render it peculiarly suitable for injection into the bladder. This view is confirmed by the more recent observations of Binswanger (op. cit.), who considers that, though its solvent power is inferior to that of the carbonate of lithia, yet, from the rarity of the latter salt, it is more generally useful and available. It is supposed to act by yielding part of its soda to form a soluble urate of soda, which is readily eliminated by the secretions. It has no power to prevent the formation of this acid; it merely acts as a solvent for that which is already formed.

1969. *In Chronic Cystitis*, Sir H. Thompson (p. 150) speaks highly of the following soothing injection:—℞ Sodæ Bibor. ʒj., Glycerini ʒij., M. Of this two or three teaspoonfuls are to be added to 4 oz. of warm water, and employed as directed in Art. Injections.

[1] Lancet, Dec. 16, 1848.

1970. *In Gangrenous Bubo*, Dr. Effenberger[1] has successfully employed a solution of borax (ʒj.–ʒij. ad Aq. Oj.) Of fifty cases treated, not one died, although some were very severe. The solution was applied by means of charpie, so as to cover the edges of the sore. It is essential that the dressing should be renewed frequently by night and day.

1971. *In Gonorrhœa*, an aqueous solution of borax (gr. x.–xv. ad Aq. fl. oz. iij.) has occasionally been used as an injection with benefit.

1972. *In Dropsy*, Dr. Copland (i. p. 620) regards borax as a useful adjunct to other deobstruents and diuretics, and furnishes the following forms for its exhibition:—1. ℞ Antim. Pot. Tart. gr. j., Potass. Bitart. ʒjss., Sodæ Bibor. ʒss., Infus. Juniperi fʒxijss., Spt. Ether. Nit. fʒiij., T. Camph. Co. ♏xxv.–l., M. cap. coch. amp. j. 2dâ quâque horâ; or 2. ℞ Potass. Bitart. ʒj., Potas. Nit., Sodæ Bibor. āā ʒij., Pulv. Fol. Digitalis gr. xx.; mix well, and divide into xij. powders, one to be taken twice or thrice daily.

1973. *In Acne Simplex*, Dr. Copland (i. p. 30) states that the lotion from which he has derived the greatest benefit, and which he has found most generally applicable, is a solution of borax in rose or elder flower water, or in water which has been poured in the boiling state over sulphur, and allowed to infuse for ten or twelve hours. He advises the same lotion in *Ecthyma*. *In Ringworm of the Scalp*, Prof. Christison (p. 869) states that he has repeatedly used, with the best effects, a solution of borax (ʒj.) in distilled vinegar (fl. oz. ij.)

1974. *To Sore or Fissured Nipples*, a saturated solution of borax, or the following, advised by Sir Astley Cooper, is often beneficial:—℞ Sodæ Bibor. ʒj., Sp. Vin. Rect. fʒss., Aq. ad ʒiv., M. It should be applied to the nipple before and after suckling the infant.

1975. *To Chloasma or Liver-spots*, Dr. Pereira (i. p. 573) states that a solution of borax (ʒss. ad Aq. fʒviij., is a most valuable application; it should be applied by a sponge or rag to the affected spots. I have found a similar lotion very effectual in allaying the itching in *Urticaria*, *Psoriasis*, *Impetigo*, *&c.*

1976. *In Mercurial Salivation*, an aqueous solution with or without honey forms a useful gargle.

1977. Sodæ Bicarbonas. Bicarbonate of Soda. Sesquicarbonate of Soda. (The Carbonate of the shops.) $NaHCO_3$.

Med. Prop. and Action. Antacid, alterative, and lithontriptic. When taken in large and long-continued doses, it causes derangement of the digestive organs and of the assimilating functions, and induces a state of the constitution resembling that accompanying scurvy. It is frequently employed in making effervescing draughts; thus, gr. xx. of this salt satu-

[1] Lond. Journ. of Med., April, 1851.

rates about gr. xviij. of Tartaric Acid, or gr. xvij. of Citric Acid, or fl. drs. iv. of Lemon-juice. It may also be advantageously administered in the form of Effervescing Solution, B. Ph., prepared by saturating a solution of the bicarbonate (gr. xxx. ad Aq. Oj.) with carbonic acid: this is not to be confounded with ordinary "Soda Water," which is simply a solution of carbonic acid in water. The officinal lozenges contain gr. v. of the bicarbonate in each.

Dose of the Bicarbonate, gr. x.–gr. lx.

1978. *Therapeutic Uses. In Acidity of the Primæ Viæ*, great relief may be afforded by the administration of gr. x.–xv. of the bicarbonate of soda in some aromatic water, four or five hours after a full meal. *Neuralgia connected with acidity of the stomach* is often speedily arrested by a full dose of the carbonate. *In Cardialgia, Flatulence, and Vomiting*, arising from the same cause, it also proves very effectual. *In the Aphthæ of Children*, it often proves effectual combined with a few grains of rhubarb or grey powder.

1979. *Calculous Disease. In the Lithic or Uric Acid Diathesis*, alkalies are clearly indicated, and are often productive of great temporary benefit. As a rule, the bicarbonate of potash is a preferable remedy, as the urate of soda is a much less soluble salt than the urate of potash. The waters of Vichy, which have obtained great celebrity from their known solvent powers of calculous concretions, are almost entirely composed of soda. The French Codex gives a formula for this celebrated water; it is made of simple acidulous water, impregnated with twice its bulk of Carbonic Acid f℥xxss., Subcarbonate of Soda gr. xxxij., Sulphate of Soda, gr. xvj., Chloride of Sodium gr. iv., Subcarbonate of Magnesia gr. ½, Chloride of Iron gr. ¼, M.

1980. *Biliary Concretions. In the severe pain attendant on the passage of Gall Stones*, Dr. Prout (p. 257) states that he has seen more immediate alleviation afforded by large draughts of hot water containing the carbonate of soda in solution (℥j.–℥ij. ad Aq. Oj.) than by any other means. The alkali counteracts the distressing symptoms produced by acidity of the stomach, while the hot water acts like a fomentation to the seat of pain. The first dose or two will be rejected, but it should be persevered in, and a few drops of laudanum may be added if necessary. The practice is favourably noticed by Dr. Murchison (p. 350.)

1981. *In Cholera*, carbonate of soda forms one of the principal ingredients in what is called the saline treatment. Dr. Stevens's formula was—℞ Sodæ Carb. gr. xxx., Sodii Chlorid. gr. xx., Potas. Chlorat. gr. vij., M.; dissolve in half a tumblerful of water, and repeat at intervals of from fifteen minutes to an hour, according to circumstances. Salines were at the same time administered in enemas. Great expectations were formed of this treatment, but it does not appear to have answered as well as was anticipated.

1982. *In Dyspeptic Attacks*, and *in Diarrhœa* attended with colic and gastric irritability, flatulence, and especially when this is consequent on the ingestion of unwholesome food, few remedies are more generally useful than a full dose of bicarbonate of soda (gr. xl.–lx.) combined with T. Zingib. Fort. ℥xxx.–xl., and Sp. Ammon. Arom. ℥xl.–lx. In severe cases, a few drops (℥v.–x.) of laudanum may be added. It usually affords speedy relief. *For the Diarrhœa of Children and Infants*, a combination of the bicarbonate and Pulv. Cinnam. Co. āā gr. ij.–iv. often proves effectual.

1983. *The Vomiting of Pregnancy* may sometimes be arrested by the carbonate of soda (gr. x.–xv.) with a few drops of laudanum or compound tincture of cardamoms.

1984. *In Purpura Hæmorrhagica*, the following formula, proposed originally by Dr. Stevens (op. cit.), has been found very useful:—℞ Sodæ Carb. ʒss., Sodii Chlorid. gr. xx., Potas. Chlorat. gr. vj., M. ft. pulv. ter in in die sumend. ex aquâ.

1985. *In Diseases of the Skin*, particularly in those of a papular and scaly character, M. Devergie has extensively employed the alkalies both internally and externally. The bicarbonate of soda is the one chiefly used, the corresponding salt of potash being found more caustic and irritant. Internally, the dose is gr. xv. daily, in some bitter infusion, or in syrup (ʒss., Syr. Simp. fʒviij.); and this quantity is augmented gr. viij. every third day, until ʒj. is taken in the twenty-four hours. This is the maximum quantity. Externally, he advises lotions, baths, powders, and ointments. The baths are to contain each from ʒviij.–ʒxvj. of the carbonate, either of soda or potash. The lotions contain ʒij.–ʒiij. of the salt in Oj. of water, and are employed chiefly in *Eczema and Impetigo of the Scalp*. The alkaline powder (1 part of soda, 10 of starch) is used principally as a depilatory, in *Tinea and Sycosis Menti*. The ointments are of various strengths, according to the nature of the disease; thus, in *Lichen and its various forms*, the strength is gr. viij.–xv. to ℥j. of Lard; in *Lepra*, *Psoriasis*, *and Ichthyosis*, gr. xv.–ʒss. to ℥j.; and in *Porrigo Favosa*, ʒss.–ʒj. to ℥j. with a grain or two of quick-lime. In *Porrigo Larvalis*, lotions containing this salt have been found highly serviceable.

1986. *In Albuminuria*, Dr. Osborne[1] advises the internal use of the alkalies. He observes that alkalescence is a necessary condition of the blood, that the free alkali is soda, and that when this constituent fails, either from a deficient supply, or from want of power to decompose the chloride of sodium in the stomach, the result will be coagulation of the blood in the capillary vessels, and phenomena of inflammation in those parts in which such coagulation takes place; and that potash

[1] Dublin Quart. Journ., Aug. 1851.

or soda taken into the stomach, either uncombined or as carbonates, have the power of rendering the urine alkaline and of dissolving fibrine. On these grounds, he reasons that, when in any disease the kidneys contain fibrinous deposits, alkalies should be given. He employs the following:—℞ Sodæ Carb., Liq. Potassæ āā ʒij., Decoct. Chondri Crisp. fʒviij. Dose, a tablespoonful every two hours, in milk. When anæmia is very marked, he adds the tartrate of iron.

1987. SODÆ CARBONAS. CARBONATE OF SODA. $Na_2CO_3.10H_2O$. Obtained from the ashes of marine plants, or by chemical decomposition with chloride of sodium.

SODÆ CARBONAS EXSICCATA. DRIED CARBONATE OF SODA. Na_2CO_3. The carbonate deprived of its water of crystallization by the action of heat.

Med. Prop. and Action. Antacid and deobstruent; in large doses it is an irritant poison. It is more irritant than the bicarbonate of soda, and is more analogous in its effects to the carbonate of potash. It is sometimes used in making effervescing draughts; thus gr. xx. of the salt saturates gr. ixss. of Citric Acid, gr. xss. of Tartaric Acid, or fl. drs. ijss. of Lemon-juice.

Dose of Carbonate of Soda, gr. x.–gr. xxx. *Of the dried Carbonate*, gr. iij.–x.

Therapeutic Uses. Similar to those of Potassæ Carbonas.

1988. LIQUOR SODÆ CHLORATÆ. Solution of Chlorinated Soda. Labarraque's Disinfecting Solution of Soda. A mixed solution of hypochlorite of soda, chloride of sodium, and bicarbonate of soda. Sp. gr. 1·103. On the addition of an acid, it evolves chlorine freely.

Med. Prop. and Action. Stimulant, tonic, and antiseptic. Externally, it is a stimulant, astringent, and deodorizer; it is best applied in the form of lotion (fl. drm. j. ad Aq. fl. drs. x.–fl. drs. xv.) As a deodorizer it is of great value, and is eminently useful in correcting and destroying the unpleasant smells so common in sick rooms: it is also represented as a disinfectant, but it is far from satisfactorily proved that it possesses the alleged property of arresting the progress of any infectious disease. *It is an antidote in poisoning by Hydrosulphuric Acid, Hydrosulphuret of Ammonia, the Sulphuret of Potassium, and Hydrocyanic Acid.* A solution should, if possible, be administered by mouth, and a sponge soaked in the solution should be held to the nostrils. If a person, observes Dr. Pereira (i. p. 640), be required to enter a place suspected of containing hydrosulphuric acid, a handkerchief moistened with a solution of the chloride should be applied to the mouth and nostrils, so that the inspired air may be purified before it passes into the lungs. Locally, it may be applied in the form of poultice, prepared by adding fl. oz. ij. of the solution to an ordinary linseed-meal or other poultice.

Dose of Liquor Sodæ Chloratæ, ♏x.–♏xx., freely diluted.

1989. *Therapeutic Uses. In Aphthous Ulceration of the Mouth in Children*, when it assumes a sloughing character, the following is an excellent application:—℞ Liq. Sodæ Chlor., ℥.

Myrrhæ āā f℥ss., Aq. Rosæ f℥j., Aq. f℥vj., M. *In Mercurial Salivation, in the Ulcerated Gums of Scurvy, in fetid discharges from Carious Teeth, in the Sore Throat of Scarlatina, and in all affections of the Mouth attended with a fetid discharge*, and requiring a mild stimulant application, the diluted solution (fl. drs. vj. ad Aq. fl. oz. xij.) proves highly serviceable, not only correcting the fœtor, but establishing a healthy action. *In Diphtheria*, Dr. W. Budd[1] considers Beaufoy's solution of chlorinated soda superior to all other applications. He directs the throat to be thoroughly mopped with it, by means of a camel-hair brush, three or four times daily. He speaks strongly in its favour both as a curative and as a sanitary agent.

1990. *In Ozæna, Coryza, and Otorrhœa*, when the discharge is fetid, a diluted solution (♏ xv.–♏ xxx. ad Aq. fl. oz. j.) proves highly useful. It should not be used so strong as to cause pain. It may be conveniently applied as directed in Art. Injections, Part ii.

1991. *In fetid discharges from the Vagina, whether proceeding from an ulcerated state, from Cancer of the Uterus, or from other causes*, a diluted solution (fl. oz. j. ad Aq. fl. oz. xvj.) used tepid or cold, according to the sensations of the patient, forms an excellent injection. It should be of a strength to cause slight tingling without pain. It is equally applicable to *Fetid Discharges from the Rectum.*

1992. *When Ulcers assume a phagedenic or sloughing character, or when they are attended by a profuse and fetid discharge*, a diluted solution (fl. oz. j. ad Aq. fl. oz. viij.) may be applied with great advantage; or it may be applied in the form of poultice (*ante*).

1993. *In Typhus and Typhoid Fevers, in Scarlatina Maligna, and in the advanced stages of all Fevers and the Exanthemata, when they assume a Typhoid type*, chlorinated soda is valuable. "It may be given," observes Dr. Copland (i. p. 1333), "early in the putro-adynamic variety, when excitement is imperfect or low, and the skin discoloured, or petechiæ are appearing, and may be continued throughout the disease. But when vascular reaction is considerable, or local determination prominent, particularly in the nervous and exanthematous varieties, this medicine should be withheld until these states are subdued, or about to lapse into the nervous stage. At first, it ought to be prescribed in small doses, so as not to offend the stomach, in from x. to xv. drops of the solution, every three or four hours, in camphor water, or in an aromatic water. As the disease passes into a state of exhaustion, or of manifest putro-adynamia, or when there are a lurid skin, low muttering

[1] Brit. Med. Journ., June 1, 1861.

delirium, stupor, black sordes on the tongue and teeth, the supine posture, unconscious offensive evacuations, petechiæ, a disposition to gangrene in parts pressed upon, coma, &c., it should be given in larger doses or more frequently, with camphor, serpentaria, or other stimulants and tonics. It is productive of great benefit in such cases, but it should be commenced before these symptoms appear, and should be persisted in, as its good effects are seldom manifest in less than three or four days or more, and it should not supplant the use of wine, opium, suitable nourishment, and other means which the case may require.

1994. *In Scarlet Fever*, Sir T. Watson (ii. p. 822) advises a weak solution of chlorinated soda as a gargle ; and if the disease occur in a child that is not able to gargle, the solution may be injected into the nostrils, and against the fauces, by means of a syringe or elastic bottle. The effect of this application is sometimes most encouraging ; a quantity of offensive sloughy matter is brought away, the acrid discharge is rendered harmless ; the running from the nose and the diarrhœa cease, and the whole disease is rendered milder.

1995. *In the Mesenteric Affections of Children*, Dr. Nevins[1] states that he has found the solution, in doses of ♏ v.–x., with catechu or rhubarb, very effectual in correcting the diarrhœa, and the offensive character of the stools.

1996. *In Syphilitic Eruptions of the Scalp*, *Lepra*, *Psoriasis*, *Lichen*, *Eczema*, *and Impetigo*, a practice which has been found successful consists in first washing the parts with a diluted solution, then carefully drying the surface and sprinkling it with finely powdered calomel. *In the non-Syphilitic* forms of these affections, as well as in *Pruritus and Tinea Capitis*, the diluted solution (f℥vj. ad Aq. f℥xij.) has been found useful.

1997. Sodæ Citro-tartras Effervescens. Effervescent Citro-tartrate of Soda. *Prep.* Mix thoroughly, Bicarbonate of Soda oz. xvij., Tartaric Acid oz. viij., Citric Acid oz. vj. (all in powder), and place them on a dish or pan of suitable form heated to 200° or 220°, and when the particles begin to aggregate, stir them assiduously until they assume a granular form, and then by means of suitable sieves separate the granules and preserve them in well-closed bottles.

Med. Prop. and Action. An agreeable refrigerant and antacid in doses of gr. lx.–oz. ½.

1998. Sodæ Hypophosphis. Hypophosphite of Soda.

[1] Trans. of London Pharm., p. 537.

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Potassæ Hypophosphis. Hypophosphite of Potash.

Calcis Hypophosphis. Hypophosphite of Lime.

Med. Prop. and Action. These are the principal "Alkaline Hypophosphites" which have of late years been introduced into medical practice; and as they are closely allied in medical properties and uses, they may be conveniently considered together. They belong to the class of nervine tonics: in the words of Dr. J. F. Churchill, who has brought them prominently into notice, "they increase the nervous force, and are the most powerful hæmatogens, possessing all the therapeutic properties of phosphorus." The potash salt appears to act far more energetically as a liquefacient than the other two, so much so indeed, that Dr. Thorowgood[1] states that he has known great mischief result from its incautious administration to persons affected with tubercular deposit in the lung. As a gradual tonic and restorer of failing nerve force, he prefers the hypophosphite of soda or of lime to the potash salt, and either of these he considers will answer all the purposes of pure phosphorus as an internal remedy, while at the same time they are more manageable and agreeable medicines. According to Mr. Taylor,[2] who has carefully examined the properties of these salts, the soda hypophosphite is best adapted for blood diseases, and those of potash, lime, and ammonia for those of the secretory organs. They are all very soluble (more so, it is stated, than any other of the oxides of phosphorus) in the animal fluids, and are readily admitted into the circulation. Their assimilation is promoted by sugar, which has the additional recommendation of disguising the taste, which to many persons is very objectionable.

Dose of either of the Hypophosphites, grs. ij.–xv. in a bitter infusion, in sweetened water, or camphor water.

1999. *Therapeutic Uses.* *In Phthisis*, the alkaline hypophosphites were introduced by Dr. Churchill as *curative* in every stage; the word *palliative* would, according to Mr. Taylor, be more in accordance with fact. Mr. Taylor believes that in the earlier and middle stages they act as a respiratory excitant; as a pyrogenic, increasing animal heat and nervous force, and removing erratic pains; and as a hæmatogen, forming a nucleus for the rallying of red globules. He finds that they tend to increase the appetite and cheerfulness, and to control expectoration, night sweats, and diarrhœa. Even in the advanced stages of the disease, he states that their influence as a palliative is often very striking. Dr. Thorowgood (op. cit.) also regards the hypophosphites as valuable, especially in the premonitory and early stages of the disease; but the experience of Drs. Quain,[3] Risdon Bennett,[4] and Cotton,[5] each of whom gave them a fair trial, is adverse to their utility. Indeed, when tubercular softening has commenced, they seem in some cases to act prejudicially. *In Chronic Bronchitis*, however, they often act beneficially. In an obstinate case with thick fetid expectoration and tendency to congestion of the

[1] Practitioner, July, 1869.
[2] Lancet, Nov. 30, Dec. 7, and Dec. 14, 1861.
[3] Lancet, March 17, 1860.
[4] Med. Times, April 27, 1861.
[5] Lancet, April 25, 1863.

lung, in the practice of Dr. Thorowgood, the hypophosphite of potash (grs. v.) in camphor water, effected a complete cure without any other medication whatever. In other cases remaining after an acute attack, and not as a rule complicated with emphysema of the lung, he states that he has given the potash salt in camphor water with much advantage.

2000. *In cases of Nervous Depression and Torpor, with occasional shooting Neuralgic Pains, and in other cases of Numbness and Deadness of the Limbs, arising from feeble circulation*, the hypophosphites prove useful, and the lime or soda salt may be given according as the stomach will bear the one better than the other. When anæmia is present, the citrate of iron can be added to the soda salt, or else the syrup of hypophosphite of iron, or of iron and quinine, can be employed: either of these syrups will prove an active tonic, removing neuralgic pains, chest oppression, and languor of circulation in a very evident way. (Thorowgood.) Dr. Hayes Jackson,[1] in his own person, recovered from a severe attack of *Neuralgia of the back and thigh* of six months' standing, under drachm doses of hypophosphite of soda in beef-tea, thrice daily. Ten grain doses, as advised by Dr. Radcliffe,[2] as well as all other remedies, had previously failed. *In Chorea*, it is favourably spoken of by Dr. Radcliffe (ii. p. 142); he combines it with cod-liver oil (*q. v.*)

2001. *In the Remittent Fevers of Childhood*, Dr. Purdon[3] employed the hypophosphites with marked success. They seem, he remarks, to fulfil all the required indications in causing sleep, in relieving thirst, cleansing the tongue, increasing the appetite, and correcting any existing intestinal disorder, and this in a much shorter time than can be obtained by any other remedies. They have a marked effect in quieting the patient. The following formula is suitable for an infant, the dose being increased according to age:—℞ Sodæ Hypophos. gr. vj., Calcis Hypophos., Potass. Hypophos. āā gr. iv., Glycerini ℥ij., Aq. ℥j. Dose, gutt. xl. thrice daily in a little water.

2002. *In Tabes Mesenterica*, the hypophosphites act slowly but surely, according to Dr. Purdon (op. cit.) He considers that they act by dissolving the tuberculous matter deposited in the abdominal viscera, possibly by causing disintegration of fibrine.

2003. *In Psoriasis*, Dr. Thorowgood (op. cit.) employed the hypophosphites in two cases, with strikingly beneficial effects.

2004. *In Debility resulting from Prolonged Lactation, in some forms of Dyspepsia, in Anæmia and Leucocythæmia, in Catarrhal and Leucorrhœal Discharges, in Myalgia and muscular Pains simulating Inflammation*, Mr. Taylor resorted to the hypophos-

[1] Brit. Medical Journ., March 4, 1865.

[2] Brit. Med. Journ., Nov. 1863.

[3] Glasgow Med. Journ., Oct. 1865.

phites with more or less marked benefit; in fact, in all cases where there is reason to suppose the phosphates to be morbidly deficient, they may be prescribed with a good prospect of success. The demand for the phosphate of lime in the construction of the teeth contributes to the disturbing influence called the *Fever of Dentition:* in this also, whether it occurs in weakly, ill-fed children, or in the robust, Mr. Taylor employed these salts with marked success; in the former class he combined them with some tonic or aromatic tincture, in the latter with acetate of ammonia or syrup of rhubarb.

SODÆ HYPOSULPHIS. Hyposulphite of Soda. See SODÆ SULPHIS.

2005. SODÆ PHOSPHAS. PHOSPHATE OF SODA. $Na_2HPO_4.12H_2O$. Obtained chiefly from bone-ash.

Med. Prop. and Action. Purgative in doses of oz. ¼–oz. j., acting mildly and efficiently: it has the advantage of possessing a taste so similar to common salt, that it may be given in broth or soup, without being distinguishable from the latter. It is an important salt in the animal economy, and one often very deficient in the food of children. Dr. Marcet has pointed out that the fatty acids are converted into an emulsion by its agency, and that they thus become more easily assimilated. Dr. W. Stephenson,[1] who quotes this statement, remarks that this is certainly a point deserving of more attention at the hands of medical men than it has received. Acting upon it, he directed a "pinch" (grs. iv.–v.) of the phosphate to be added to each bottle of milk for a child being brought up by hand with signal benefit; it had the effect of rendering the motions, previously white, dry, and chalk-like, perfectly natural and healthy. Under its use, according to Prof. Parkes, the proportion of urea in the urine becomes diminished.

2006. *Therapeutic Uses. As a solvent of Lithic Acid deposits*, it was first proposed by Liebig, and it has been used in these cases with apparent benefit. Dr. Golding Bird[2] employed it in two cases, with the effect, in one of them, of rapidly causing the disappearance of the lithic acid deposit when many other remedies had previously failed. It (grs. xx.–xxx.) may advantageously be given in broth. *In Chronic Gout*, it has been given with advantage in some instances. Dr. Basham[3] speaks favourably of finely powdered bibasic phosphate of soda as a local application in *Gout;* he directs it to be sprinkled over moistened spongio-piline, and applied so as to envelope the whole of the affected part. In many instances he found it afford immediate relief.

2007. *In the Visceral Affections of Childhood*, Dr. Stephenson (op. cit.) has called attention to the value of the phosphate in small doses, grs. iv.–v. (a pinch) being given with each article of food. The class of cases for which it was ordered, were

[1] Edin. Med. Journal, October, 1867.

[2] On Urinary Deposits, p. 98.

[3] Med. Times, Dec. 2, 1848.

whenever from an unhealthy character of the motions the visceral secretions seemed to be abnormal. The first point that became apparent was, that in a great majority of cases where the colour of the stools was abnormal, the natural yellow appearance was restored. This was the only appreciable result in many instances, but at the same time it was observed that some forms of *Diarrhœa* at once yielded to its action. Several cases where the motions were copious but dry, and white like coarse white chalk and curdled milk, have been treated with the same beneficial effects, so much so, that Dr. Stephenson states that in this disorder he has now entirely discarded grey powder, and relies on the phosphate alone. He also cites two cases of *Jaundice in children* which speedily yielded to its use.

2008. *In Diabetes*, it has been recommended by Dr. Latham and others; and Dr. Prout (p. 49) regards it as one of the few saline purgatives admissible in this disease.

2009. SODÆ SULPHAS. Sulphate of Soda. $Na_2SO_4.10H_2O$. Glauber's Salt.

Med. Prop. and Action. Purgative, in doses of oz. ss.–oz. j.; but when dried so as to expel the water of crystallization, half these quantities are sufficient. Its unpleasant taste, which is a great objection to its use, may be partially disguised by the addition of lemon-juice. It is particularly adapted for febrile and inflammatory states, when it may be advantageously combined with cream of tartar. In small doses largely diluted it acts as a diuretic.

Dose:—As a purgative, oz. ss.–oz. j.; as a diuretic, gr. lx.–gr. cxx.

Therapeutic Uses. Similar to those of Magnesiæ Sulphas.

2010. *In Opacities of the Cornea*, Dr. H. Power[1] reports very favourably of the powdered sulphate locally applied. One or two grains should be introduced at one time into the eye, and the most convenient mode of application consists in everting the upper eyelid, and brushing the powder lightly over the surface with a camel-hair pencil. It may be repeated every morning or every other morning, or twice a week, according to the degree of reaction that follows. It causes, in all cases, much redness and pain, with lachrymation lasting half an hour or more. Should these be too violent, its action in subsequent applications may be lowered by adding a little starch, or by using a solution (gr. v. ad Aq. oz. iv.) After its use for some weeks the opacity becomes fainter and vision restored. Its action is apparently that of an irritant, not of a solvent. As a remedy for *Cataract*, Prof. Polli,[2] of Milan, suggests that a solution of this salt might be injected into the anterior cham-

[1] The Practitioner, Sept. 1868. [2] Ibid., Aug. 1868.

ber of the eye, with the hope of dissolving the nebulous matter of cataract.

2011. SODÆ SULPHIS. SULPHITE OF SODA.

SODÆ BISULPHIS. BISULPHITE OF SODA.

SODÆ HYPOSULPHIS. HYPOSULPHITE OF SODA.

Med. Prop. and Action. These salts, as well as the corresponding salts of magnesia and lime, which are all included under the general term "Alkaline Sulphites," have of late attracted considerable attention, mainly, in the first instance, on the recommendation of Prof. Polli,[1] of Milan, who asserts that the sulphites taken internally, in their passage and decomposition in the system, become possessed of all the properties of free sulphurous acid, with this advantage over it, that their action is more uniform, more constant, and even more intense; and further, that they may be given in large doses for a lengthened period without the slightest inconvenience. In his own person he took daily about 225 grains (15 grammes) of the sulphite of magnesia. The results were, that he lost all feeling of thirst, the excrements lost their usual fæcal smell, which was replaced by that of sulphuretted hydrogen, and the urine excreted during its use remained fresh, acid, and clear, and did not undergo ammoniacal fermentation for eight or ten days during the hottest Italian summer, whilst that excreted before, and some days after the sulphites had been discontinued, became ammoniacal, fetid, and covered with fungoid growths in from five to seven days. In another series of experiments he tried the effects of the sulphites as prophylactics, and as curative agents on animals in whom a septic disease had been artificially induced, by the injection into the veins of different animal poisons, such as putrid blood, fetid blood from unhealthy abscesses, and the discharge from glandered horses. The result of these experiments, practised on dogs, and variously conducted, proved that the sulphites had the power in some instances of entirely preserving the animal from the action of these morbific agents, and in others of enabling the animal, after a short illness, to regain its health; while in almost every instance of septic injection the sulphites sufficed to effect a more or less rapid cure of the induced fever. From the undoubted power of sulphurous acid to destroy all the lower forms of organic life, it is thought by many that the sulphites act by destroying the germs of the organic poisons, or ferments, as they are termed by Prof. Polli, in which zymotic diseases are supposed to have their origin. This view is opposed by Polli, who contends that they act by modifying the aggregation of the material components of the organism, rendering it, by their presence, incapable of being acted upon by those catalytic germs.

Taken internally, the sulphites are readily absorbed, and appear in the urine unchanged in about twenty minutes after they have been swallowed, but they are partially changed in the system into sulphates. The saliva and sputa contain them. They are not decomposed in the stomach ordinarily, but when they are so, there is a manifest production of sulphurous acid gas; when this is the case, a little magnesia should be added to the sulphite to neutralize the acids of the stomach. The sulphites of soda and magnesia are tolerated in large doses if dissolved freely in water; a concentrated solution is apt to lie heavy on the stomach, and cause a frontal headache. They are decomposed by all the vegetable acids, however weak; hence in fevers, &c., the ordinary lemonade and all acidulated drinks should be carefully avoided, as these destroy their efficacy.

The hyposulphite of soda is much more purgative than the sulphites of

[1] Brit. Med. Journ., Nov. 16, 1867.

magnesia and soda, which are commonly more diuretic than cathartic in their action. There are individuals, however, whose intestinal canal is very sensitive to their action, in which cases a carminative and sedative are required to be combined. The purgation, however, is commonly without pain or discomfort: the stools under the use of the sulphites lose all cadaveric or nauseous fœtor. The best mode of administering the sulphite of magnesia is in the form of powder, because of the large quantity of water it requires for solution, and because in that state it is least easily altered by the air. This sulphite has the least taste, and is the most active of all; and, since it undergoes in the dry state the least change, it is to be preferred to all others for medicinal purposes. Grs. xv.–xxx. may be prescribed in powder, to be taken in water or other vehicle, or it may be covered with gum or dextrine, and sugared, and taken as troches or jujubes. The sulphites are better than the hyposulphites when a rapid curative action is required, but the latter may be advantageously substituted when prophylaxis is aimed at. The great object in administering them curatively is to saturate the system with them, and for this purpose drms. iv.–v. daily should be the minimum quantity for an adult. Three or four times that quantity of the magnesia salt have, however, been given with advantage, and a third or fourth more (drms. v.–vij.) of the sulphite of soda will be borne well. Their long-continued use is apt to induce œdema and diseases of debility, by their deoxidizing qualities.[1]

Locally applied to ulcerated surfaces, &c., the sulphites in solution (oz. i.–ij. ad Aq. Oj.) act as a stimulant to healthy action, sedative, and deodorizer; for this purpose the soda salts are preferable to the magnesian, as being more soluble. Their powers as antiseptics are very marked. Prof. Polli states that corpses or viscera intended for anatomical use can be preserved for many weeks in solution of the sulphites of magnesia or soda, without change either in colour or density, or otherwise, and further, without acting upon the knife when dissection is made.

Doses:—See preceding section.

2012. *Therapeutic Uses. In Typhus Fever*, grand results were anticipated from the use of the sulphites; but the results obtained by Dr. Perry,[2] of Glasgow, and Dr. Miller,[3] of Dundee, tend to show that they are almost useless. *In Scarlatina*, the facts adduced by Dr. De Ricci[4] and Dr. Cummins[5] serve to establish the efficacy of the alkaline sulphites, both as curative and prophylactic agents. *In Smallpox, Measles, and Erysipelas*, Dr. Polli speaks of the sulphites as mitigating the febrile action, rendering the confluent and malignant forms benignant, shortening the course of the milder forms, and in all cases accelerating convalescence. *In Puerperal Fever*, they have been advised. How far they are beneficial when the fever is fully established is questionable; but there can be little doubt of their value as a prophylactic and curative in the early stages, when used in solution in the form of injections into the uterine cavity, so as to remove all noxious matters. A tepid solution of any sulphite or of hyposulphite of soda should be used every day or oftener. This treatment is advocated by Dr. Snow Beck,[6] who advises, at the same time, the internal use of the

[1] Med. Times and Gaz., May 5, 1866.
[2] Glasgow Med. Journ., Jan. 1866.
[3] Edin. Med. Journ., Sept. 1869.
[4] Glasgow Med. Journal, October, 1865.
[5] Dublin Quart. Journ., vol. lvii.
[6] Obstet. Trans., vol. vii. 1866.

sulphite of magnesia or lime (grs. xx.–xxx. every two or three hours). Cloths soaked in a solution of hyposulphite of soda and applied externally to the parts, are advocated by Dr. C. Paul,[1] as a means of preventing puerperal infection. In all these cases it appears essential to the success of the remedy that it should be given early in the attacks, the earlier the better, and all vegetable acids carefully avoided.

2013. *In Intermittent and other Malarious Fevers*, Dr. Polli adduces much evidence in favour of the curative and prophylactic power of the sulphites. They were found, it is stated, to cure a larger number of cases than quinine, to cure more completely, with less tendency to relapse, and to succeed when quinine failed. In other cases their conjoined administration effected a cure when neither cured singly. The sulphites do not, like quinine, cut short the fevers; they gradually diminish the intensity of the symptoms. The sulphite of magnesia is most effectual, oz. j.–j½. in divided doses daily in water or sugar. It may be taken during the accession as well as during the remission. As a prophylactic, Polli prefers the hyposulphite of soda in solution, taken every morning fasting in a cup of water. This treatment proved successful in the hands of Drs. Turner, Hampton, and other American physicians.[2]

2014. *In Pyæmia*, the sulphites, on the strength of Dr. Polli's recommendation, have been extensively tried, but they appear to exercise little influence on its course. During the late war in America they were tested, and the conclusions arrived at were adverse to the therapeutical utility of the sulphites and hyposulphites in this disease.[3]

2015. *In Gangrenous, Phagedenic, and foul Ulcerations*, a solution of the sulphite of soda (1 part to 5 or 10 of water), applied locally as a wash or kept in contact by compresses soaked in it, are said to be very useful in destroying the fetid odour, and establishing healthy action, whilst, at the same time, it soothes the pain. In mild cases a weaker solution (oz. j., Aq. Oj.) will suffice. Sulphite of magnesia (grs. xxx. every two hours) may be given internally.

2016. *In Diphtheria*, Mr. Maynard[4] found great benefit from hyposulphite of soda locally applied. In the very early stages he employs the following solution:—℞ Sodæ Hyposulph. ʒij., Glycerini ʒij., Aq. ʒvj., M. This, he states, generally removes the incipient exudation in 48 hours or less. In advanced cases he washes the throat out well with warm water by means of a flexible syringe, and then dresses the affected part with this solution, using at the same time a gargle: ℞ Sodæ Hyposulph. ʒj., Glycerini ℥j., Aq. Oj., M. The effect of this solution upon

[1] Edin. Med. Journal, January, 1867.

[2] Practitioner, July, 1868.

[3] Braithwaite's Ret., lv. p. 45, 1867.

[4] Med. Times and Gaz., Dec. 30, 1865.

the exudation, he observes, is most marked; it appears to solidify and dry up the false membrane, and when the syringe is again used, which it should be frequently, the force of the water will either wholly or partially wash it away. The exudation rarely reforms, and the patient makes a comparatively rapid recovery. Where there was much swelling, the extract of belladonna applied externally proved very useful. The constitutional treatment should be stimulant and nutritive.

2017. *In Dyspepsia*, Dr. Brinton (p. 331) observes that the hyposulphite appears to substantiate the claims made for it by Dr. (Sir W.) Jenner, as a remedy against flatulent dyspepsia; its efficacy seeming due to its powers of checking decomposition in the food, as well as to its effects on the stomach itself. It may be given in the same way as the alkaline carbonates, the effects of which, he remarks, are somewhat similar. A case of *Sarcina Ventriculi* of some years' standing, which yielded to the hyposulphite of soda (grs. x.–xv.) in infusion of quassia, is recorded by Dr. Neale.[1] It is worthy of further trials in these cases.

2018. *In Chronic Cystitis*, when the urine decomposes before it is eliminated, Mr. L. Wilcox[2] has found by the use of the sulphite all putridity disappear, and the urine become clear and odourless.

2019. *In all Diseases of the Skin of vegetable parasitic origin*, e.g., *Porrigo*, the local application of solutions of the sulphites is indicated. *In Tineæ or Ringworm*, Dr. Tilbury Fox[3] uses the following:—℞ Sodæ Hyposulph. ℥j., Aq. ℥xij., M. He states that *Chloasma* is easily curable by its means. He directs the skin to be first washed with yellow soap and water, and the lotion at once applied, the part being frequently dabbed with it. I is a good plan to sponge the skin just before using the lotion with a little weak vinegar. Dr. Frizell[4] (U.S.) relates a case of *Pruritus Pudendi* cured by the following:—℞ Sodæ Sulph. ℥j., Aq. ℥iij., Glycerini ℥j., M. It has also been found useful in *Sycosis*.

2020. Soda Tartarata. Tartarated Soda. Sodæ et Potassæ Tartras, B. Ph. 1864. Sodæ Potassio-Tartras. Tartarized Soda. Rochelle Salt. $NaKC_4H_4O_6.4H_2O$.

Med. Prop. and Action. Diuretic, in doses of gr. xxx.–gr. lx.; cathartic, gr. cxx.–oz. ss. It should be given largely diluted, and may be advantageously administered in the form of Seidlitz Powders (Sodæ Pot. Tart. gr. cxx., Sodæ Bicarb. gr. xl., in one powder, Acid. Tart. gr. xxx. in another; dissolve the Soda in Oss. of water, add the acid, and drink whilst effervescing). When taken in small doses it renders the urine alkaline, but this is not observed when the salt is given in sufficiently large doses to

[1] Med. Times, June 18, 1853.
[2] Practitioner, Oct. 1868.
[3] Practitioner, March, 1870.
[4] Braithwaite's Retros., lv., p. 343.

cause purging. It is particularly adapted to *Gouty and Rheumatic cases*, where there is a deposit of uric acid or urates; but it proves injurious when the phosphates are present. It is also well adapted as a purgative in *Febrile Affections and in the Puerperal state.*

2021. SODÆ VALERIANAS. Valerianate of Soda. $NaC_5H_9O_2$.

Med. Prop. and Action. Stimulant and anti-spasmodic. Applicable to the same classes of cases as Valerian (*q.v.*)

Dose, gr. j.–v.

2022. SODII CHLORIDUM. Chloride of Sodium. NaCl. Sea Salt. Common Salt.

Med. Prop. and Action. Chloride of sodium performs an important part in the animal economy. It enters largely into the composition of the blood, urine, &c.; and, as Liebig [1] justly observes, "The presence of free muriatic acid in the stomach, and of soda in the blood, proves beyond all doubt the necessity of common salt for the organic purposes. Deprived of it, all animals fade and die rapidly." In moderate quantities (gr. x.–gr. xx.), it improves the digestion and increases the appetite; in larger quantities, it occasions thirst; and in still larger ones (two or three tablespoonfuls) it acts as a powerful emetic. From oz. ss.–j. proves cathartic and emetic, and used in the form of enema it purges freely. In excessive doses it is an irritant poison, occasioning inflammation of the stomach and intestines. In many diseases it apparently acts by supplying deficient salt to the blood. It is a chemical *antidote in poisoning by the Nitrate of Silver.* Externally applied, salt is a rubefacient; and salt-water, natural or artificial, has long been employed as a general tonic and discutient, in *Scrofulous Glandular Enlargements, Diseases of the Joints, &c. When leeches have crept into the rectum, or have been accidentally swallowed*, a solution of salt will dislodge and kill them.

2023. *Therapeutic Uses. In Cholera*, a practice formerly in vogue, consisted in giving large draughts of cold water holding salt in solution, with the view of inducing emesis, and at the same time of supplying the blood with the saline constituents which were supposed to be carried out of the system in the evacuations; but both the theory and the practice are now exploded. So is also the practice of injecting solutions of salines (salt being one of the principal ingredients) into the veins. The success or even safety of the practice is very doubtful.

2024. *In Infantile Cholera*, Dr. Dewees (p. 420) states that no remedy is so prompt and so certain as an injection of warm water, in which is dissolved a large teaspoonful of salt. This strength is for a child of one year old; the quantity should be increased in proportion, according to the age of the child. Should it be frequently returned, he advises it to be repeated and persevered in, until it bring away a fæcal or bilious discharge, after which the vomiting, &c., will cease. So decided and effective is this simple plan, that Dr. Dewees states that

[1] Animal Chemistry, p. 161.

he has seen it above a hundred times relieve entirely without the aid of other remedies. Its use in *Bilious Diarrhœa* is also advocated by Trousseau, grs. x.–lx. three or four times a day.

2025. *In Fatty Degeneration of the Liver*, Dr. Murchison (p. 51) states that eating large quantities of common salt with food has sometimes appeared useful; and when circumstances permit, it may be advisable to recommend a trial of the alkaline or saline mineral waters of Carlsbad, Marienbad, Kissingen, Ems, or Vichy.

2026. *In Typhoid and other low Fevers*, Dr. Copland (i. p. 1032) calls attention to the injury which is likely to result from the sudden withdrawal and the consequent disuse of salt as an article of diet. The deprivation of this ingredient in ordinary food, not only in these, but in many other affections, may certainly exercise a prejudicial influence. Dr. Copland's remarks are very just, and the subject merits more attention than is ordinarily paid to it. No harm, and probably much benefit, might result from an allowance of salt with food, in all low febrile and other affections.

2027. *In Intermittent Fevers*, salt in large doses (drms. viij.–xij. in solution) during apyrexia has been employed with alleged success by several French and American physicians; it is stated not only to control the fever, but to exercise a marked effect in reducing enlargement of the spleen. As an antiperiodic, little reliance is to be placed upon it; the cases recorded show that it may occasionally be useful.

2028. *In the Coryza of Scarlet Fever*, a tepid solution of salt (℥j. ad Aq. Oj.), introduced into the nostrils in the manner advised in INJECTIONS (*q.v.*), sometimes proves beneficial.

2029. *In Hæmoptysis*, common salt is a popular remedy in some parts of Great Britain; and Dr. Law,[1] of Dublin, states that he has often witnessed its efficacy. Dr. Graves (ii. p. 142) also speaks favourably of it. It has been proposed as a remedy for *Phthisis*, but Dr. Cotton,[2] who examined its merits, states that it has no direct effect upon the disease when fully developed. Its tonic influence in phthisis, he remarks, may be fairly ranked with that of many other tonics, such as bitters.

2030. *In Ophthalmia*, Dr. Hays[3] recommends a saturated solution of salt as a collyrium. *In Chronic Granular Ophthalmia* in particular, he employed it in numerous cases with the most striking benefit. Dr. Rothmund[4] has successfully employed a sub-conjunctival injection of chloride of sodium (gr. xx., Aq.

[1] Cyc. Pract. Med., vol. ii. p. 407.
[2] Med. Times and Gazette, May 28, 1859.
[3] Amer. Journ. of Med. Sciences, Aug. 1840.
[4] Braithwaite's Ret., lv. p. 262.

oz. j.) for promoting the absorption of the diffuse *Corneal Opacities consequent upon parenchymatous inflammation.*

2031. *Against Worms*, salt proves very effectual. It was much employed against *A. Lumbricoïdes* by Dr. Rush, who states that, in the course of his practice, he administered many pounds of common salt, coloured with cochineal, in doses of ℥ss., and that, given on an empty stomach, it is an effectual means of destroying worms. It is said not only to expel worms, but to prevent their reproduction. M. Cazin[1] speaks very favourably of its efficacy, either given alone in large doses dissolved in water, and taken on an empty stomach, or in the form of enema (when *A. Vermicularis* is present) with brown sugar, linseed, or poppy oil, and a sufficient quantity of water. With children, he adds, it almost always succeeds.

2032. SODII IODIDUM. Iodide of Sodium. A deliquescent salt, prepared by decomposing iodide of iron by carbonate of soda in solution, and evaporating to crystallization.

Med. Prop. and Action. These have been examined by Dr. Gamberini,[2] of Bologna, who, after considerable experience in its use, draws the following conclusions:—1. Soda being a very common ingredient in the organism, the iodide of its base appears to be best suited to the human system. 2. Its taste is much less disagreeable than that of the iodide of potassium. 3. It is less likely to occasion iodism. 4. It is better borne than the potassium salt, and consequently its dose can be almost daily increased; it thus becomes a more efficient remedy. 5. It has sometimes succeeded where the iodide of potassium has failed. 6. It may be given daily in three equal doses, gr. xx. of the salt to ℥iij. of water, increasing the strength of the solution every two or three days by six grains. Some patients have in this manner been able to take ℥ij. daily without the slightest inconvenience. 7. It is admirably adapted to cases in which the corresponding salt of potassium is indicated. 8. It is the best substitute for mercury.

Dose, gr. v.–gr. xv., or more.

2033. *Therapeutic Uses. In Constitutional Syphilis*, Gamberini administered this salt in 116 cases; the results were, on the whole, highly satisfactory; and it was remarked that the greatest amount of benefit was derived by those who had previously undergone a protracted course of mercury without eradicating the disease. Like other remedies of the same class, it affords no security against relapses. In nineteen cases of *Secondary Syphilis affecting the bones and periosteum*, this salt was administered by Dr. Daveri,[3] who states that, compared with the iodide of potassium, it is equally beneficial, whilst it is far more palatable. From the larger doses in which it can be administered, the treatment was found to be much abridged.

[1] Dublin Quart. Journal, May, 1850.

[2] Corrispon. Scient. di Roma, 1852.

[3] Bull. delle Sci. Med., xix. p. 269.

2034. *In Lead Poisoning*, M. Rabuteau[1] regards this salt as safer than the iodide of potassium, and at the same time no less effectual.

2035. SODII SULPHO-CARBOLAS. SULPHO-CARBOLATE OF SODIUM. Prepared by neutralizing sodium with sulpho-carbolic acid, produced by the admixture of equivalent proportions of sulphuric and carbolic acids.

Med. Prop. and Action. This and the corresponding salts of other bases, as ammonium, potassium, and zinc, have been brought forward by Dr. Sansom[2] as a means whereby carbolic acid may be introduced into the system without the disadvantages which usually attend its administration in the uncombined state. When this salt has been administered to an animal, sulphate of sodium is found in the urine, and the carbolic acid which has been liberated in its passage through the system is evolved by the breath. By means of these salts we are enabled in effect to administer carbolic acid in an innocuous form, and in a quantity which it would be impossible to employ by other means. (Sansom.) It is freely soluble in water, has little taste, and is taken readily by children.

Dose, of Sulpho-carbolate of Sodium, gr. xx.–lx.

2036. *Therapeutic Uses.* Those of carbolic acid (*q. v.*) Amongst the diseases in which it has been successfully employed by Dr. Sansom, are *Phthisis*, *Ulceration of the Tonsils*, *Diphtheria*, *Scarlet Fever*, and *Erysipelas*. Its use in *Zymotic Diseases* is stated to have been "unexceptionably favourable."

2037. SPIGELIA. The dried root of Spigelia Marilandica, *Linn.* Carolina Pink. *Nat. Ord.* Loganiaceæ. *Hab.* North America.

Med. Prop. and Action. Valuable anthelmintic, especially efficacious against *Lumbrici* or *Round Worms* in doses of gr. x.–xx. for children, drm. j.–iij. for adults. My own experience with it quite corroborates the high testimony borne to its power by American physicians, with whom it appears to be a favourite remedy. In over-doses it is apt to cause vomiting and purging, and in extreme cases great disturbance of the nervous system, vertigo, with dilated pupil, and delirium, but these effects are rare, and generally soon disappear without leaving any after consequences. The best form of administration is as follows :—℞ Spigeliæ ℥ss., Sennæ Fœniculi Sem. āā ℥ij., Mannæ ℥j., Aq. Ferv. Oj., M. Dose, half a wineglassful thrice daily, for a child two years old. (Stillé.) A fluid extract of Spigelia and Senna, officinal in U. S. Ph., is an efficient preparation in doses of fl. oz. ½ for an adult, fl. drm. j. for a child.

2038. SPONGIA USTA. BURNT SPONGE. Common Sponge, Spongia officinalis, *Linn.*, calcined and reduced to powder.

Med. Prop. and Uses. Alterative tonic in doses of gr. x.–lx. in electuary or lozenge. In addition to a large proportion of carbon, it contains iodide of sodium, bromide of magnesium, phosphate of lime, and protoxide of

[1] Practitioner, July, 1868. [2] Ibid., July, 1869.

iron in small quantities; hence there is reason for supposing that it may possess some efficacy in *Scrofulous affections*, in which it was formerly held in high repute. It has been superseded by iodine and cod-liver oil, but perhaps it has fallen into unmerited neglect. *In Bronchocele*, it was formerly regarded as a sovereign remedy, lozenges containing it being allowed to dissolve slowly in the mouth, under the idea that in this manner it had a more direct influence on the disease. In this affection it is inferior to iodine, and the red iodide of mercury.

2039. STANNUM. Stanni Pulvis, seu Limatura. Tin-filings. It was formerly used as a vermifuge, but is now seldom prescribed, other much more effectual remedies having been discovered. It is usually used against *Lumbrici or Round Worms*. Its action is supposed by some to depend on the disengagement of hydrogen when the metal is brought into contact with the gastric juice; by others it is believed to act as a mechanical irritant. Although it has fallen into disuse, Dr. Graves (ii. p. 248) observes that with some persons it is an unfailing remedy.

Dose, from gr. xx. to gr. lx. in treacle, repeated three or four times a day for four successive days, followed by a brisk cathartic.

2040. STANNI CHLORIDUM. Chloride of Tin. SnCl. Called also the Muriate, the Proto-muriate, the Hydrochlorate, or Butter of Tin.

Med. Prop. and Action. Tonic and anti-spasmodic. In large doses it produces convulsive twitchings of the face, convulsions, and paralysis. Externally, it is used as a lotion (gr. j., Aq. fl. oz. j.)

Dose, gr. $\frac{1}{16}$–$\frac{1}{2}$, twice daily, in the form of pill.

2041. *Therapeutic Uses. In Chorea, Epilepsy, and other Nervous Affections*, it has been employed by Dr. Schlessinger,[1] in doses of gr. $\frac{1}{6}$ to $\frac{1}{4}$, three or four times a day, in pill or dissolved in hydrochloric ether. Sometimes he found it at first increase the symptoms, but this he regarded as a good omen. If its administration be followed by gastro-intestinal irritation, or dryness of the throat, the dose should be diminished, or the medicine be altogether abandoned. Several cases are related by Dr. Schlessinger and others in which it proved successful.

2042. *In Cutaneous Diseases of a Chronic and obstinate character*, Dr. Schlessinger found the hydrochlorate in the doses named in the last section of great service. Externally, he also applied it in the form of lotion (gr. $\frac{1}{6}$–gr. j., Aq. fl. oz. j.)

2043. *Against Tænia or Tape-worm* it has been advised; but its real value as a vermifuge is yet unascertained.

[1] Brit. For. Med. Rev., Oct. 1838, and April, 1846.

2044. STRAMONII FOLIA ET SEMINA. The dried leaves and ripe seeds of the Thorn Apple. Datura Stramonium, *Linn.* *Nat. Ord.* Solanaceæ. *Hab.* Europe and N. America. Other closely allied species, *e.g.*, D. alba, are common throughout India.

Med. Prop. and Action. Anodyne and anti-spasmodic. Active principle, an alkaloid, *Daturia*, which is closely allied to, if not identical with, atropia. In large or long-continued doses, stramonium causes dilatation of the pupil (an effect which is also perceived if the extract be applied to the eyebrow or temples), great disturbance of the cerebral functions, delirium, coma, and death. It will often act as a narcotic and anodyne where opium or belladonna fails. The best form for internal use is the extract; it is advisable to commence with a small dose (gr. ¼), and gradually to increase the quantity until it produces some obvious effect. It may also be smoked in a pipe, and the fumes inhaled; for this purpose gr. x.–gr. xxx. of the leaves is sufficient; but it should be used with great caution, and immediately discontinued if it cause vertigo, dryness of the throat, and dilatation of the pupils. Externally, the leaves, either in the form of fomentation or cataplasm, are a valuable anodyne. Caustic fixed alkalies affect its activity in the same manner as they do that of belladonna (*q.v.*)

Dose:—Of the powdered leaves, gr. j.–iij. *Of the Extract of the Seeds*, gr. ¼, gradually increased to gr. j. *Of the Tincture* (Stramonium Seeds oz. ij½., Proof Spirit Oj.), ♏x.–xxx.

2045. *Therapeutic Uses.* *In Asthma*, smoking stramonium, introduced in 1802 by General Gent, is a remedy of much value, though not uniformly so. "In some it is *the* remedy; in the majority of cases, as ordinarily used, it does some good; and in some few it is positively injurious. Its value in any case can only be ascertained by personal experience. When the leaves and stems fail, substituting the seeds may prove effectual. They appear to be more powerful in their action. The inhalation of the smoke, and swallowing the saliva, may be advantageously combined with the ordinary method of smoking. The earlier in a paroxysm it is had recourse to, the more likely will it be to relieve the spasm; over one that has been long established, it has but little power. As the great thing is to give it in time, an asthmatic should keep his pipe already filled, with the means of lighting it by his bedside, so that on awaking with dyspnœa he may immediately use it. A good plan is to adopt the habit of smoking a pipe of it the last thing at night, whether a paroxysm is threatening or not: the stramonium seems to leave, for some hours, a state of the nervous system in which the asthma is not likely to come on, and since the attack is almost always at night, it seems to conduct the patient through the critical time. The extract (gr. ¼, gradually increased to gr. j.) sometimes produces excellent effects, or the tincture (♏x.–xx. 4tis horis) may be substituted." (Dr. Hyde Salter, p. 233.) From gr. x. to gr. xx. of the dried leaves is sufficient for a time. Caution is necessary

in its use, and it should be at once discontinued if it produces any ill effects.

2046. *In Chronic Bronchitis* of the old, where there is great dyspnœa, accompanied by a dry state of the tubes, Dr. Headland[1] found the tincture (♏x.), combined with expectorants, very useful. *Chronic Coughs*, under the same circumstances, especially if of a spasmodic character, are often relieved by smoking stramonium. *In Emphysema of the Lungs*, Dr. Waters (p. 193) speaks very favourably of this practice for the relief of asthmatic symptoms; he states that he has very constantly found that smoking stramonium just before going to bed has had the effect of giving the patient a good night, and of preventing an attack of dyspnœa. *In the Dyspnœa of Phthisis*, Sir J. Clark derived great benefit from the extract, gr. ¼–gr. j. daily, when the dyspnœa is constant.

2047. *In Neuralgia*, stramonium was proposed by Dr. Marcet, who employed the extract (gr. ⅛–½ thrice daily) with success. Drs. Begbie, Rowland, and Elliotson have testified to its value, but the last-named regarded it as most useful in *Enteralgia*. Dr. Fuller's (p. 457) estimate of it is not high, but in some cases, where the symptoms shift from limb to limb, and probably are more strictly nervous than rheumatic, the extract produces decidedly good effects; but in no single instance in which the disease was obstinately stationary was it of the least service. Administered in doses of gr. j.–ij., its operation is sometimes remarkably sedative; but more generally its action is uncertain, and is accompanied now and then by excessive dryness of the throat and fauces. (Dr. Fuller.) It may be applied locally in the same manner as belladonna (*q.v.*)

2048. *In Insanity*, the extract (gr. j.) has been occasionally prescribed as a soporific, but its effects are uncertain, and, as a general rule, it is inferior to belladonna and many other remedies of the same class. It has likewise been employed in *Epilepsy* and *Chorea*, but the evidence of its efficacy is very unsatisfactory. *In Nervous and Rheumatic Headaches*, Dr. Copland (ii. p. 535) states that he has prescribed it with benefit.

2049. *In Dysmenorrhœa*, stramonium has been given internally by Dr. Ferguson.[2] He states that, in the severe forms of the disease, it has been productive of the most marked good effects.

2050. *In Diseases of the Eye, in Cataract, Iritis, deep-seated Ulceration of the Cornea, &c.*, the local application of an aqueous solution of the extract proves useful, from its power of dilating the pupil. It is an excellent substitute for belladonna, although it is generally regarded as inferior by British practitioners.

2051. *In Dracunculus or Guinea-worm*, Mr. Forbes recom-

[1] Lancet, Jan. 6, 1866.

[2] Lib. of Med., vol. iv. p. 312.

mends poultices of bruised stramonium leaves. He states that he has long employed them with decided advantage; leeches and fomentations only being had recourse to when inflammation exists in the neighbourhood of joints.

2052. *In Cancerous Ulcerations*, the following ointment, in use at the Middlesex Hospital, is very effectual in the relief of the great pain:—Take of fresh stramonium leaves lb. $\frac{1}{2}$, lard lb. ij.; mix the bruised leaves with the lard, and expose to a mild heat till the leaves become friable, then strain through lint. The ointment thus prepared is spread upon lint, and the dressing changed thrice daily.[1]

2053. *To painful Nodes and Rheumatic Swellings, particularly when they partake of a Syphilitic character*, a Datura leaf, moistened in spirit and bound over the painful part, often affords very great relief. Fomentations of the leaves (oz. j. ad Aq. Ferv. Oj.) may also be employed with benefit. *To painful and irritable Piles*, an ointment, composed of one part of the powdered leaves and four of lard, is a useful anodyne application, but its use requires caution.

2054. STRYCHNIA. STRYCHNIA. $C_{21}H_{22}N_2O_2$. An alkaloid obtained from Nux Vomica. It exists also in other species of Strychnos.

Med. Prop. and Action. Similar to nux vomica (*q.v.*) When taken in poisonous doses, the symptoms which ensue are more or less as follows:—If taken in solution it has an intensely bitter taste. After a certain interval, often without any warning, occurs suddenly a sense of suffocation, and the muscles of the head and limbs, if not of the entire body, are affected with tremblings and twitchings. In a little while longer, tetanic convulsions seize almost the entire frame, and the body becomes rigidly fixed, with the head bent backwards, the body also arched backwards (opisthotonos), the hands clenched, the soles of the feet incurved, the face congested, and the expression of the countenance, caused by the spasmodic contraction of the muscles, that of the *sardonic grin*. There is heat and dryness of the fauces, and sometimes frothing at the mouth, with fixidity of the jaws, and an anxious feeling of impending suffocation. The intellect is generally but little or not at all affected during the intermissions; on the contrary, the external senses are usually exceedingly acute. The fits last from half a minute to two or more minutes, and recur at shorter and shorter intervals, and are longer continued towards the end. In the intervals the patient feels exhausted and terribly anxious; he generally knows when a paroxysm is coming on, and cries out either to be held or that he will die. Very slight causes, even a sudden light touch, may produce a paroxysm, yet to be firmly held or to be rubbed is generally desired. Death either takes place by asphyxia during a paroxysm, or by exhaustion in the interval. These symptoms generally supervene within from five to twenty minutes after its ingestion, and in fatal cases death generally occurs within two hours. (Dr. Scoresby-Jackson.) The *post-mortem appearances* present nothing uniform or remarkable, some turgescence of the vessels of the brain, occasionally effusion, in some instances inflammation of the alimentary canal, and in a few, softening of the brain and spinal cord have been observed. For treatment of poisoning by strychnia, see ANTIDOTES, Part ii.

[1] Lancet, August 8, 1868.

2055. *Remarks on the Use of Strychnia.* 1. Some constitutions are peculiarly susceptible to its action; hence it should always be commenced in the smallest doses, and be gradually and cautiously increased, its effects being carefully watched.

2. Muscular stiffness or convulsive twitchings in the extremities is a certain indication that the remedy has been carried to its full extent. It should then be either suspended or discontinued.

3. Dangerous if not fatal results may supervene suddenly after it has been continued in ordinary doses for some time, especially when given in the form of pill. (Dr. Scoresby-Jackson.)

4. As a general rule, it is best exhibited in a liquid form—the officinal solution.

5. Its full effects are rapidly developed when introduced into the system hypodermically. For this purpose the proper form is a solution of the sulphate (gr. ij., ad Aq. dest. fl. oz. j.), and the proper commencing dose ♏ij. (gr. $\frac{1}{120}$). Unpleasant toxic effects result if the dose be carried beyond gr. $\frac{1}{60}$th. (Dr. Anstie.)

6. During a course of strychnia the use of tobacco in all forms should be abandoned, its operation on the system being antagonistic.

7. It may often be advantageously combined with iron, quinine, and cod-liver oil.

Dose:—Of Strychnia or its salts, gr. $\frac{1}{30}$–$\frac{1}{12}$. *Of the Solution* (in a mixture of diluted Hydrochloric Acid ♏vj., and Distilled Water fl. drm. iv., dissolve Strychnia in crystals gr. iv. by the aid of heat, then add Rect. Spirit fl. drm. ij., and Distilled Water fl. drm. ij.), ♏v.–x. For hypodermic injection, gr. $\frac{1}{120}$ (see *ante*.)

2056. *Therapeutic Uses. In Paralysis*, strychnia has been used with very different results by different practitioners. This may arise from three causes—1, the impurity of the drug; 2, the inability of the constitution to bear the remedy; 3, its injudicious application to all forms of paralysis. It is in those cases, as first pointed out by Andral, when, as if from habit, the paralysis continues after effusion has been absorbed, that the symptoms will improve under the use of strychnia; but when the brain is still in a disordered state, and sanguineous effusion exists, it will have the effect of exciting inflammatory action, and will prove injurious rather than beneficial. It is in those forms of paralysis not dependent upon disease of the nervous centres, that it is the most beneficial, as, for instance, *in Lead or Mercurial Paralysis, and in that resulting from Rheumatism.* Strychnia, observes Dr. Headland,[1] is only successful in cases where the injury to the nervous centre has healed up, and where the limb continues paralyzed, merely because the motor nerves have lost the power of transmitting the necessary impulse, from having been so long unaccustomed to discharge this office. On the other hand, when the lesion of the nervous centre is of recent occurrence, or when it has been of so serious or extensive a nature as to admit of no repair in the course of time, the remedy will be ineffectual. Sir T. Watson (i. p. 546) also judiciously observes that no good can reasonably be expected

[1] Action of Medicines, p. 367.

from it, but much harm, unless the cord be free from organic disease. It may be commenced in doses of $\frac{1}{32}$–$\frac{1}{16}$ of a grain, twice or thrice daily, and the quantity increased cautiously. After continuing the medicine for a few days or a week, slight convulsive twitchings, or a creeping sensation, will be experienced *in the paralytic limb*. The remedy should then be discontinued for two or three days, and resumed as before. Mr. C. Hunter[1] advocates its employment hypodermically, and he remarks that if after three or four injections improvement does not take place, it is almost useless to continue its employment. His remarks are well worthy of attention.

2057. *In Amaurosis arising from exhaustion of the optic nervous apparatus*, strychnia occasionally proves useful. It may be given internally, or applied endermically or hypodermically, but unless improvement speedily follow, it should not be continued, and even the improvement is often only temporary. *In Night Blindness*, its internal use in small doses gradually increased may prove of service. It deserves a fair trial in this affection.

2058. *In Chorea*, strychnia, on the authority of Trousseau, has been tried in many cases, in some with success. He dissolves gr. j. of the sulphate of strychnia in fl. oz. iij$\frac{1}{2}$. of syrup; of this he administers fl. drm. ij$\frac{1}{2}$. daily, divided into three doses, and gradually increases the dose until itching of the scalp and slight stiffness of the masseter muscles are observable. Its use requires the greatest caution, and it should not be resorted to till safer remedies have had a fair trial, and its employment should be restricted to purely chronic cases. Mr. Walter Tyrrell[2] strongly advocates the use of strychnia in *Epilepsy*. He considers it peculiarly adapted for that form of the disease in which anæmia and defective nervous control are prominent symptoms.

2059. *In Cardiac Neuralgia, including every variety of Angina Pectoris, i.e.*, every case marked by attacks of sudden and spasmodic cardiac pain, evident embarrassment of the heart's movements, and a sense of impending dissolution, Dr. Anstie[3] speaks highly of hypodermic injections of strychnia in doses of gr. $\frac{1}{120}$–$\frac{1}{60}$. He mentions instances in which remarkable benefit attended its use, in presence of a threatening paroxysm; the remedy being continued twice daily for several weeks. *In Gastralgia*, he also regards it as a remedy of the highest value.

2060. *In all cases of Nervous Exhaustion, whether the result of mental harass or sexual excess, and also in the threatenings of Epilepsy, and of some forms of Apoplexy*, Dr. Marshall Hall[4]

[1] Brit. and For. Med.-Chir. Rev., April, 1868.
[2] Brit. Med. Journ., Aug. 7, 1869.
[3] Brit. Med. Jour., Aug. 22, 1868.
[4] On the Threatenings of Apoplexy, &c., p. 63.

states that the acetate of strychnia is a remedy of great promise, and that he has seen benefit from its use. He advises the following formula:—℞ Strych. Acet. gr. j., Acid. Acet. ♏xx., Alcohol f℥ij., Aq. f℥vj., M. sumat. gutt. x. pro dos. This should be combined with a rigid system of mental discipline, of diet, &c.

2061. *In Intermittent Fevers*, strychnia has been employed as a substitute for quinine. Its powers were tested in the intermittents of the Lincolnshire fens by Mr. W. J. Marsh,[1] and his experience, he states, warrants him in asserting that the antiperiodic virtue of quinine is not superior to that of strychnia. He regards gr. $\frac{1}{40}$th (♏iij. of Liquor Strychniæ, B. Ph.) equal to gr. j. of sulphate of quinine. The value of strychnia in this class of cases is further shown by Dr. J. P. Nash,[2] of the Madras Army, in the fevers of Coorg, which quinine had failed to influence.

2062. *In Chronic Bronchitis and Emphysema of the Lungs*, small doses of strychnia or nux vomica with iron are well spoken of by Dr. Thorowgood,[3] especially when there is constant dyspnœa with prolonged expiration. Dr. Waters (p. 176), however, does not think favourably of it in emphysema, and he mentions its failure in the practice of Dr. Walshe.

2063. *In Obstinate Constipation, Ileus, and Colica Pictonum*, strychnia has occasionally been found beneficial, but its use demands great caution, especially in acute cases.

2064. *In Prurigo*, strychnia (gr. $\frac{1}{64}$–$\frac{1}{60}$ every 3 or 4 hours) is recommended by Mr. J. Milton.[4] It should be continued till a decided effect is produced on the disease, or till nervous symptoms appear, when it should be discontinued. He states that it sometimes acts like a specific upon the *Pruritus*. In obstinate cases which resist arsenic it is worthy of a trial.

2065. Strychnos Nux Vomica, *Linn.* Nux Vomica, or Poison Nut Tree. *Nat. Ord.* Loganiaceæ. *Hab.* Most parts of India and Ceylon.

Med. Prop. and Action. The seeds (Nux Vomica, *off.*) and the bark (formerly known as the false Angustura bark) are powerful stimulants of the nervous system and spinal cord. Their activity resides in the alkaloids, strychnia, and brucia; of the former principle, the seeds yield about 0·4 per cent. In doses of gr. j.–gr. iij. of the powdered nut, nux vomica is a tonic, improving the appetite and the tone of the digestive organs, without any increased arterial excitement; promoting the urinary secretion; occasionally acting as a laxative, and more rarely as a diaphoretic. In larger doses, it causes a feeling of weakness in the limbs, a slight trembling or stiffness of the muscles and joints, a staggering gait, much anxiety of mind, which is expressed in the countenance, increased nervous sensibility, and loss of appetite. It is also said to act as an aphrodisiac. The intellect remains unimpaired. Its effects in poisonous doses are the same

[1] Med. Times, Jan. 12, 1869.
[2] Lancet, March 14, 1868.
[3] Lancet, Nov. 13, 1869.
[4] Med. Press, March 11, 1868.

as those of strychnia (*q.v.*) The smallest dose which has proved fatal is gr. iij. of the alcoholic extract, or gr. xxx. of the powder; the shortest period, one hour; the longest, three or four days. Recovery has taken place after very large doses of the poison (Dr. Guy, p. 556). Habit, however (as in the case of opium, and other powerful medicines), blunts the sensibility, and allows of large quantities being taken with impunity. Mr. Baker,[1] a surgeon of the Bengal Service, states that the natives of Hindostan take Kuchila nut (nux vomica) morning and evening, continuously for many months, beginning with an eighth of a grain, and gradually increasing the dose to an entire nut, or about 20 grains. If taken immediately before or after meals, no unpleasant effect is produced; but if this precaution is neglected, spasms are apt to ensue.

2066. *Modus Operandi.* Dr. Pereira (vol. ii., pt. i. p. 643) enters into this subject at great length. From his observations it appears—1, that the operation of nux vomica is occasionally that of a local irritant; 2, that its active principle is absorbed into the system; 3, that the muscular contractions caused by nux vomica arise chiefly from changes effected in the nervous stimulus, and not from alterations in the contractility of the muscular fibre; 4, that the spinal cord is the part principally affected, although probably every part of the nervous system is specifically operated on; 5, that its action on the nervous system is that of an excitant or stimulant; 6, that no change is produced in the blood discs; 7, that death frequently results from a stoppage of the respiration, in consequence of spasm of the respiratory muscles, sometimes from exhaustion of nervous power. Dr. Harley's[2] experiments, however, seem to show that strychnia and brucia do not cause death by exhaustion, or by suffocation, arising either from closure of the glottis or from spasm in the walls of the chest, but by destroying the powers of the tissues and fluids of the body to absorb oxygen and give off carbonic acid. From the researches of M. Vella,[3] it appears probable that a direct antagonism exists between strychnia and the Woorara poison, and that they stand in the relative position of poison and antidote. According to the experiments of the Rev. S. Haughton, M.D.,[4] it is probable that a similar antagonism exists between strychnia and nicotine. (See TABACUM.)

Dose:—Of powdered Nux Vomica, gr. j.–iij. (a bad form of administration). *Of the Extract*, gr. ½–ij. *Of the Tincture* (Nux Vomica reduced to powder by aid of steam, oz. ij. Rect. Spirit Oj.), ℥x.–xx.

Remarks on the use of Nux Vomica. See STRYCHNIA.

2067. *Therapeutic Uses. In Obstinate Chronic Diarrhœa* which resists ordinary remedies, and in that form especially which accompanies exhaustion after fevers, nux vomica combined with opium and iron often proves very useful. Prof. Graves (ii. p. 218) speaks highly of its efficacy. *In Chronic Dysentery*, when there is much exhaustion, a similar combination is well worthy of a trial.

2068. *In Chronic Dyspepsia*, Dr. Wilson Fox (ii. p. 818) remarks that nux vomica or its alkaloid often proves most valuable, apparently improving the nervous energy of the stomach, as well as that of the system at large. Thus in many cases, by increasing the muscular contractility of the stomach and intestines, it aids in preventing *distention by flatus*, which is so common and distressing a symptom. He advises ℥ v.–x.

[1] See Bengal Dispensatory, p. 439.
[2] Lancet, June 7, 14, and July 12, 1857.
[3] Gaz. Méd. de Paris, Sept. 17, 1860.
[4] Proceedings of Roy. Irish Acad., Nov. 29, 1859.

of the tincture in infusion of orange-peel, or with the mineral acids. *In Pyrosis* and *Heart-burn*, he also speaks favourably of it, and there can be no doubt that in these cases, as well as in *obstinate Flatulence*, it proves very useful; the tincture (♏ v.–x.) may be given with hydrochloric acid, immediately before meals. Dr. Barlow[1] furnishes a useful formula in those cases:—℞ Ext. Nucis Vom. gr. j½., Argent. Nit. gr. ij., Ext. Lupuli gr. xij., M. ft. pil. vj. sumat. j. ter die.

2069. *In the Vomiting of Pregnancy*, the tincture is advocated by Dr. Wiltshire,[2] and Dr. Tilt (p. 326) states that in *Vomiting connected with Uterine Disease* he has used the following mixture with advantage:—℞ Strychniæ gr. ¼, T. Zingib. ʒvj., Aq. ℥iv., M. Dose, a teaspoonful every one or two hours. Dr. Douglas Powell[3] has also frequently found the tincture (♏ x.) arrest the *Vomiting of Phthisis*, and in some cases where there was little catarrh, he found strychnia efficient for this purpose. For the relief of *Vomiting connected with Malignant Disease of the Stomach*, Dr. Barlow[4] advises the following pills:—℞ Ext. Nucis Vom. gr. j., Ext. Conii gr. xij., M. ft. pil. vj. sumat. j. in ter die.

2070. *In Obstinate or Habitual Constipation*, equally as in diarrhœa where this is dependent upon loss of nervous and muscular power of the intestines, nux vomica often proves signally useful. In a very large number of cases, I have employed the following pills, originally proposed by Dr. Copland (i. p. 399), with almost uniform success:—℞ Ext. Coloc. Co. gr. xl., Ext. Nucis Vom. gr. iij., Sapon. Castil. gr. xij., M. ft. pil. xij. cap. ij. horâ somni. In habitual constipation, one of these pills, taken every other night for a few weeks, is a better form of administration. Dr. Copland found these pills very useful in *Torpor of the Colon*.

2071. *In Prolapsus of the Rectum*, Dr. Schwartz[5] speaks highly of the extract of nux vomica. He dissolves gr. ij. in fʒij. of water, and of this administers gutt. ij.–iij. for infants, and gutt. vj.–xv. to older children, according to their age. He adds that he has employed it extensively, and never saw any ill effects from it; still, it is too powerful a remedy to be used until milder measures have failed. M. Foucher[6] effected a cure in a case of *Prolapsus of the Rectum* occurring in a child æt. 4, by the hypodermic injection of strychnia. He injected ten drops of a solution containing gr. iij. of the sulphate in fʒv. of distilled water.

2072. *In Incontinence of Urine*, it proves occasionally useful. Mr. Solly[7] employed it in one case of incontinence of urine,

[1] Pract. of Med., p. 416.
[2] Brit. Med. Journ., Aug. 22, 1868.
[3] Practitioner, Nov. 1868.
[4] Pract. of Med., p. 400.
[5] Lond. Med. Gaz., vol. xvi. p. 168.
[6] Ranking's Abstract, xxxiii. p. 190.
[7] Med. Gaz., Feb. 2, 1849.

consequent on an operation of lithotomy, in doses of gr. $\frac{1}{8}$, twice or thrice daily, and by this means effected a perfect cure. M. Peterquin also successfully treated several cases of *Incontinence of Urine in children* with the tincture employed as an embrocation to the loins and perinæum. Dr. West (p. 658) states that on two or three occasions, he has seen most decided benefit from small doses of the extract. Sir H. Thompson (p. 183) advises a trial with it where belladonna has failed. *In Spermatorrhœa and in Impotence*, it has also been found of occasional benefit.

2073. *Tremor of the Limbs produced by habitual Intoxication* is stated by Dr. Pereira (part ii. p. 1492) to be much benefited by the use of nux vomica. He mentions one case in which its effects were very marked. Dr. Anstie (ii. p. 88) speaks favourably of strychnia in this class of cases. He commences with gr. $\frac{1}{48}$, and gradually increases the dose to gr. $\frac{1}{32}$ thrice daily. Larger doses, he remarks, have invariably seemed to do decided harm, especially increasing the tendency to vertigo, visual hallucinations, and noises in the ears. *In some forms of Neuralgia*, especially in *Sciatica*, nux vomica has been used with occasional success. It is inadmissible in acute or inflammatory states.

2074. *In Hay Fever*, Mr. Gream[1] states that he found it very effectual. He gave small doses, and applied Ung. Plumb. Acet., high up in the nostrils.

2075. *In Chlorosis*, Dr. Copland (i. p. 318) states that in a few obstinate cases he has prescribed, with marked advantage, small doses of the extract:—℞ Pil. Aloes c. Myrrh. ʒij., Ext. Nucis Vom. gr. x., M. ft. pil. xxxvj., cap. j.-ij. nocte maneque. He recommends (p. 839) a similar combination in *Amenorrhœa*, and also (p. 818) in *Epilepsy following the disappearance of the menstrual discharge*. Its employment demands extreme caution.

2076. STRYCHNOS TOXIFERA, *Bentham*. A native of British Guiana. The juice obtained from this tree is the basis of the Woorara, Wourali, or Ourari poison of the South American Indians. This poison produces paralysis, accompanied by convulsive movements, and death ensues from suspended respiration. It has been proposed as a remedy *in Hydrophobia, Tetanus, and some other nervous affections, and as an antidote to Strychnia.*

2077. STYRAX PRÆPARATUS. PREPARED STORAX. A balsam obtained from the bark of Liquidambar orientale, *Miller*. *Nat. Ord.* Hamamelideæ. *Hab.* Asia Minor. Purified by means of rectified spirit and straining.

[1] Lancet, June 8, 1850.

Med. Prop. and Action. Stimulant, expectorant, in doses of gr. v.–xx. in pill or emulsion. It exercises a powerful influence on mucous membranes, particularly on those of the respiratory and genito-urinary organs. It is stated by M. L'Héritier[1] to be an efficient substitute for copaiba. Its use, in consequence of the cinnamic acid it contains, increases the quantity of hippuric acid in the urine. (Pereira.) It is contra-indicated in all inflammatory states of the mucous membranes. The Pil. Styracis Co. (Ph. Lond.) (strained Storax 3vj., Opium 3ij., Saffron 3ij.) is a good form for internal use. It is an ingredient in T. Benzoini Co.

2078. *Therapeutic Uses. In Chronic Bronchitis, Catarrh, and Asthma*, the compound storax pill, in doses of gr. v.–x., occasionally proves useful. It was formerly held in high esteem, but is now rarely employed.

2079. *To indolent and ill-conditioned Ulcers*, storax has been applied locally with advantage, improving the character and quantity of the discharge, and apparently favouring the healing process. It has been employed also as an application in *Scabies* by Dr. Monti, of Vienna.[2]

2080. *In Leucorrhœa, Gonorrhœa, and some other Affections of the Mucous Membranes of the Genito-Urinary Organs*, styrax in emulsion, with a sedative, may be given internally with advantage.

SULPHITES, ALKALINE. See SODÆ SULPHIS.

2081. SULPHUR. S = 32. An elementary body existing extensively in the inorganic and organic kingdom.

SULPHUR SUBLIMATUM. SUBLIMED SULPHUR. Sulphur prepared from crude or rough sulphur by sublimation.

SULPHUR PRECIPITATUM. PRECIPITATED SULPHUR. Obtained by decomposing sulphuret of calcium by hydrochloric acid, and washing and drying the precipitate.

These varieties of Sulphur differ only in their various degrees of purity.

Med. Prop. and Action. Sulphur is diaphoretic and alterative in doses of gr. x.–gr. xxx. In doses of gr. lx.–gr. clxxx. it is a mild and certain aperient, producing solid, soft stools, of a light yellow colour, and smelling strongly of sulphuretted hydrogen. Dr. Paris considers that its action as an aperient is limited to the muscular coat of the large intestines; but Sundelin, perhaps more correctly, considers that it operates specifically on the mucous membrane of the intestines. When taken internally it is absorbed into the system, and has been detected by Eberhard in the chyle, the lymphatics, and the vessels of the mesentery; a large portion of it passes off by the bowels, part is oxidized, and converted into sulphuric acid, which is eliminated by the kidneys; and another portion passes off by the skin in the form of sulphuretted hydrogen. Under the continued use of small doses,

[1] Chem. Gaz., vol. i. 1842. [2] Practitioner, Nov. 1868.

it stimulates the various secretions, particularly those of the skin and mucous membranes. Internally, when its aperient action is desired, it may be given with confection of senna, or with the acid tartrate of potash in solution; but when its diaphoretic and alterative effects are desired, it may be given alone in milk, or in conjunction with guaiacum, &c. Externally, it is applied in the form of simple ointment, or of compound ointment (Pharm. Lond.) (Sulphur ℥iv., White Hellebore Powdered ʒx., Powdered Nitrate of Potash, gr. xl., Soft Soap ℥iv., Lard lb. j.) The addition of Oil of Bergamot, ♏xxx., to either of these ointments, conceals the objectionable odour. The sulphur vapour-bath is also a valuable means for external application. The apparatus required consists of a wooden or bamboo frame, of a conical shape, covered with wax-cloth or some other impervious material; it should be large enough to enclose the whole body (when the patient is in a sitting posture), and an aperture, with a loose frill attached, so as to tie round the patient's throat, should be left at the apex. The sulphur is placed on a heated plate on the ground within the apparatus, and the body is exposed to the fumes for fifteen minutes, or longer. It proves highly serviceable in cutaneous, rheumatic, and some other diseases. Another mode of application of sulphur, introduced by Dr. Dewar, is by fumigation. For this purpose, a little flour of sulphur should from time to time be sprinkled on a few red cinders placed in a kitchen shovel, so as to fill the room, not inconveniently, with the sulphurous fumes. Used in this manner, the vapour is thought to act as a prophylactic and disinfectant: its value in this character is strongly insisted upon by Dr. W. J. Cummins.[1]

Dose:—Of Sublimed or Precipitated Sulphur, gr. xx.–lx. *Of the Confection* (Sublimed Sulphur oz. iv., Acid Tartrate of Potash oz. j., Syrup of Orange Peel fl. oz. iv.), drm. j.–ij. *Prep. for external application—Ointment* (Sublimed Sulphur oz. j., Benzoated Lard oz. iv.) *Sulphur Baths*, see POTASSA SULPHURATA.

2082. *Therapeutic Uses. Skin Diseases. In Scabies*, sulphur is the best remedy we possess when used with discretion; but injudiciously applied, it is capable of doing harm. Dr. Tilbury Fox[2] furnishes some very useful hints on its employment:— 1. He considers the officinal ointment much too strong, and substitutes a far weaker one (gr. xxx. ad Ung. oz. j.) 2. In recent cases this should be applied freely and thoroughly to the interdigits and wrists *only*, soothing remedies being applied to the general surface, when required to allay irritation. In chronic cases, however, it may be applied to all eruptions of a discrete character. 3. Sulphur baths and the old compound ointment should be discarded. 4. Before using sulphur, the parts should be well washed with soap. 5. The application should not be continued longer than necessary; many practitioners do so, being misled by the continuance of the itching, which they are apt to regard as the continuance of the disease, whereas it is sometimes the result of the action of the sulphur, itself an irritant, and which, if applied to the apparently sound though irritable skin of a scabious patient, is apt to induce an eruption. 6. Being satisfied that the remedy has produced its specific effect on the acarus, it is advisable to leave off the sulphur treatment, give a bran bath, use freely an

[1] Dublin Quart. Journ., Aug. 1869. [2] Lancet, March 6, 1869.

oxide of zinc lotion, and the patient will soon get well. Dr. Fox prefers a three days' treatment of scabies, keeping on the same linen, and then having a thorough cleansing with soap and a clean change of clothes, to the more heroic and rapid modes of cure recommended by some. The great points to be borne in mind are, not to use too strong an ointment, not to apply it too extensively in recent cases, and not to continue its application too long. If these points be neglected, the remedy may act prejudicially.

2083. *In Acne, Eczema, Erythema, Impetigo, Favus, Pityriasis, Chloasma, and other Skin Diseases*, sulphur variously combined has been used, sometimes with success, as a local application. It is only admissible in chronic cases, where there is absence of inflammatory action. In the acute or active stage it does harm. When the diseases have become indolent and the skin needs to be stimulated, then sulphur is of use, and then only. (Dr. Tilbury Fox.) *In that form of Acne* (?) *common in young women at the menstrual period*, Dr. Ringer (p. 42) speaks highly of the following lotion, applied twice or thrice daily:— ℞ Sulphur ℥j., Glycerini fl. oz. j., Aq. O½, M. ft. lotio. *In Tinea*, Dr. Jenner's formula is said to be very effectual:—℞ Sulphur lb. ½, Hydrarg. Ammon.-Chlorid., Hydrarg. Sulphuret. āā oz. ½, Ol. Olivæ oz. iv., Adipis oz. xvj., Creosote ♏xx., M. This should be well rubbed into the patches of tinea. *In Chronic Eczema*, sulphur and starch in powder dusted over the part is occasionally useful in relieving irritation. (Dr. Frazer, p. 9.) *Pruritus Ani* is often relieved by sulphur taken internally. Sulphur ointment has been proposed as a local application to the pustules of *Small-pox, to prevent pitting*, but it has no special value: it has also been recommended by Dr. Myrtle,[1] as a dressing in *Burns and Scalds*.

2084. *Diseases of the Lungs. In Asthma*, M. Duclos[2] advocates sulphur in doses of about gr. viij. daily to be given while fasting, and persevered in for a long period. *In Chronic Bronchitis*, Dr. Graves (ii. p. 14) found benefit from a combination of sulphur and acid tartrate of potash. *In Phthisis*, Dr. Cowan[3] thinks sulphur is perhaps too much neglected. As a remedy for costiveness in this disease, he regards it as worthy of notice; and he considers that it might be advantageously employed against profuse perspirations. See also Sulphurous Acid.

2085. *Diseases of the Abdominal Viscera. In Cholera*, sulphur was proposed in 1848, by Dr. A. Blacklock, of the Madras Army, both as a curative and as a prophylactic agent. Its claims have more recently been set forth by Dr. J. Grove,[4] who, after

[1] Edin. Med. Journ., April, 1862.
[2] Bull. Gén. de Thérap., 1861.
[3] Louis on Phthisis, p. 378.
[4] On Epidemic Cholera in 1865.

extensive experience, expresses himself strongly in its favour, believing that "a fair and judicious use of the remedy will yield results as certain as any within the domain of medicine." He prescribes it thus:—Sulphur. Præcip., Sodæ Bicarb. āā oz. iv., Spt. Lavand. Co. fl. oz. xxiv., Aq. fl. oz. lxxij., M. ft. mist. The soda and sulphur are to be first thoroughly triturated together in a mortar, the spirit of lavender to be gradually added till the whole is well mixed, when the water is added. Of this the dose is two teaspoonfuls in a little water, every two, three, or four hours, in simple choleraic diarrhœa; but if the case is urgent, every ten or fifteen minutes. In sudden or severe attacks, ♏x.-xxx. of T. Opii or Liq. Opii Sed. is added to the first dose. This "Cholera Mixture" seems worthy of further trial. As a prophylactic during epidemics, Dr. Blacklock advises the sulphur internally, and a diet rich in sulphuretted ingredients.

2086. *In Hæmorrhoids and in Irritable States and Affections of the Rectum*, sulphur internally exercises a most soothing influence, more than can be fairly attributable to its aperient action. It should be taken with acid tartrate of potash, or confection of senna, in such doses as to produce one or two motions daily. *In Chronic Dysentery*, it seems also to exercise a favourable influence in some cases.

2087. *Against Tænia or Tape-worm*, it has been successfully employed. Dr. Tridenti[1] employed it in doses of ʒij. daily, in fifteen cases, and in each it proved effectual in causing the expulsion of the worm at the end of a few days. No other medicine was given.

2088. *Other Diseases. In Chronic Rheumatism*, sulphur often proves useful. The nostrum commonly known as "The Chelsea Pensioner," and which has long maintained a high repute as a remedy for the various forms of chronic rheumatism, appears to owe a great portion of its efficacy to the sulphur which it contains. It is thus formed:—℞ Flor. Sulphur. ʒij., Potassæ Bitart. ʒj., Pulv. Guaiaci ʒj., Pulv. Rhei ʒij., Spirit. Nucis Myrist. fʒij., Mellis q.s. ft. electuarium. Dose, ʒj.-ʒij. every morning and evening. Dr. Fuller (p. 418) observes, that in half-drachm doses, three or four times a day, its action being aided by a simple or sulphur vapour bath, sulphur is often extremely efficacious in removing chronic muscular pains, and that there are few remedies within the range of the Pharmacopœia on which so much reliance can be placed. Its use is restricted to muscular and neuralgic rheumatism; in the articular and periosteal form of the disease it is of little, if any, use. *Rheumatic Headaches, and those which occur in women about the period of the cessation of the menses*, are often much benefited

[1] L'Expérience, Sept. 5, 1844.

by the internal use of sulphur. Dr. Dewar strongly advocates sulphurous fumigation in *Gout and Rheumatism*. He likewise advises in these cases that the bed-clothes should be exposed to strong sulphur fumes before they are spread over the patient. By this measure, he states, copious perspiration is induced, and great relief afforded.

2089. *In Sciatica*, Dr. Fuller (p. 472) speaks highly of the external use of sulphur. He sprinkles a piece of new flannel thickly with precipitated sulphur, and in this the whole limb is encased from the foot upwards and covered with oil-silk or gutta percha, which has the effect not only of increasing the warmth and confining the vapour of the sulphur, but of obviating the odour annoying the patient. It should be kept applied night and day. Absorption takes place rapidly, and the breath, urine, stools, and perspiration unmistakably attest its presence in the system. This, perhaps, explains its *modus operandi:* be that as it may, Dr. Fuller states that nothing proves more generally efficacious. It is well worthy of a trial in every case, when all active symptoms have been subdued or are absent.

2090. *In Scrofula*, Mr. Bulley[1] advises the internal use of sulphur. "I have," he observes, "exhibited sulphur in almost all the cases of scrofula which have lately come under my notice, with a view to ascertain whether the restoration of this important element of the blood is capable of restoring the defective animal heat in these disorders; and the result of my observation is, that it seems either directly or indirectly to operate in this manner, and I have every reason to believe that when carefully and assiduously administered, in small doses, insufficient for an aperient effect, it is a most valuable and efficacious remedy for scrofulous diseases. The action of the heart, previously feeble, becomes altered in strength: the extremities and cutaneous surface, which before were habitually cold, recover a certain degree of permanent warmth, and the general tone of the system improves." The following is the formula which he recommends:—℞ Sulph. Pur. gr. v.–x., Syr. f℥j., Aq. f℥vij., M. ft. haust.; to be taken once or twice daily, in a tumblerful of milk. The employment of sulphur in the treatment of scrofula is not of modern origin; it was formerly held in high esteem, but has fallen into disuse.

2091. *In Paralysis of an Asthenic or Chronic character*, Dr. Graves (i. p. 566) places much confidence in sulphur. He commences with strychnia in small doses, and continues its use until some sensible effect on the system is produced; he then omits its administration, and has recourse to sulphur. He adds that he has seen very good effects from a perseverance in the

[1] Med. Times, vol. xviii. p. 53.

use of the sulphur electuary, and that much good will be accomplished by the external use of sulphur in the form of baths. *In Mercurial Palsy*, Dr. Lettsom regarded it almost as a specific. *In Locomotive Ataxy*, sulphur baths, according to Dr. Althaus,[1] will do much as adjuncts to other remedies in relieving the pain and diminishing the numbness. *In Chorea*, sulphur baths have, in some instances, been found of great value as adjuncts to internal remedies.

2092. *In Colica Pictonum and other forms of Lead Poisoning*, sulphur baths are of essential service, conjoined with the internal use of sulphuric acid (*q.v.*) *In Mercurial Salivation*, sulphur internally has been well spoken of, but it is less effectual than iodide of potassium.

2093. *In Diphtheria*, insufflation of sublimed sulphur had apparently a marked effect in arresting the development of the false membranes, and in aiding a cure, in the hands of M. Barbosa. It is recommended that the unwashed flower of sulphur should be applied, by means of a simple tube slightly bent, directly to the affected surfaces.[2]

2094. *Onanism not infrequently arises from hæmorrhoidal congestion:* under such circumstances, Van der Kolk (p. 142) has found benefit from the internal use of sulphur; leeches to the anus or perinæum, cold washings, sitz-baths, and a spare diet, are at the same tine to be employed. He mentions an obstinate case cured by these means. He advises the sulphur not to be given at night, as he has observed in some cases it causes sleeplessness. In the early stages of onanism, he has found dilute sulphuric acid act well. *In Nymphomania*, depending on the same cause, not apparently an infrequent one, this simple treatment is deserving of trial.

2095. *The Superabundance of Blood and nervous excitement after the cessation of the Menstrual discharge*, may be safely and effectually kept down by the habitual use of mild purgatives. Dr. Tilt,[3] for this purpose, generally administers the flour of sulphur alone; or else, to each ounce of it he adds a drachm of carbonate or biborate of soda; and sometimes from gr. v. to gr. x. of ipecacuanha. Of this, gr. xx.–xl., taken at night in a little milk, is generally sufficient to act mildly on the bowels. Sulphur is a very efficient remedy in many of *the disorders attendant upon the cessation of the menses.*

2096. In cases of *Granular Conjunctiva*, Mr. Wharton Jones[4] has used sulphur ointment as a local application with very good effects in several instances. It is applied much in the same manner as the red precipitate ointment.

[1] Lancet, Dec. 30, 1865.
[2] Practitioner, Nov. 1868.
[3] Prov. Journ., Oct. 1, 1851.
[4] Med. Times, Jan. 15, 1859.

2097. SULPHURIS IODIDUM. Iodide of Sulphur. Prepared by heating gently in a flask 4 parts of Iodine and 1 part of Sulphur until fusion is effected.

Med. Prop. and Action. Similar to those of iodine. It is used externally in the form of ointment (gr. xxx., Lard oz. j.)

Dose, gr. ½ gradually increased to gr. v. daily, in the form of pill.

2098. *Therapeutic Uses. In Cutaneous Diseases*, particularly those of a squamous and tubercular character, the iodide, externally applied, is strongly recommended by Alibert, Biett, and Rayer; Dr. Escolar,[1] of Madrid, also employed it internally, in doses of gr. j.–vj., with great advantage. *In Acne Indurata and Rosacea*, it is advised by Dr. Todd;[2] *in Prurigo Senilis, Lepra, and Psoriasis*, by Dr. Davidson;[3] and it has been found very effectual also in *Favus Confertus, Lupus, Tinea Capitis, Chronic Eczema, Lichen, Alopecia, &c.* Dr. D. Donovan[4] records three cases of *Porrigo Favosa* (*Scald-head*) cured by the iodide ointment (gr. lx. ad Ung. oz. j½.) Its application is attended with some heat and pain, and if applied to large surfaces it sometimes produces erysipelas. *In Sycosis*, the ointment (*ante*) is advised by Mr. E. Wilson.

2099. SULPHURIC ACID. ACIDUM SULPHURICUM. An acid produced by the combustion of sulphur and the oxidation of the resulting sulphurous acid by means of nitrous vapours. It contains 96·8 per cent. by weight of sulphuric acid, H_2SO_4, and corresponds to 79 per cent. of anhydrous sulphuric acid, SO_3. Sp. gr. 1·843.

DILUTED SULPHURIC ACID. ACIDUM SULPHURICUM DILUTUM. Prepared by diluting sulphuric acid fl. oz. vij. with distilled water fl. oz. lxxvij., and when the mixture has cooled to 60° adding more water ad oz. lxxxiij½. Sp. gr. 1·094.

AROMATIC SULPHURIC ACID. ACIDUM SULPHURICUM AROMATICUM. Prepared by gradually mixing sulphuric acid fl. oz. iij. with rectified spirit Oij., adding cinnamon oz. ij., and ginger oz. j¼. Macerate seven days and filter. Sp. gr. 0·927.

Med. Prop. and Action. The strong acid is a powerful escharotic; the parts touched with it first become white, but subsequently assume a brownish-black appearance. It is too corrosive for internal use. The diluted acid is refrigerant, astringent, and tonic, in doses of ♏x.–xx. properly diluted. It is used as a refrigerant in fevers, as an astringent to check hæmorrhage and passive mucous discharges, and as a general tonic to improve digestion.

[1] Med. Times, vol. xvi. p. 354.
[2] Cyc. of Practical Medicine, art. Acne.
[3] Lond. and Edin. Journ. of Med. Sciences, No. xii.
[4] Med. Press, July 15, 1868.

Given to women who are suckling, it is apt to cause colic in the child, although the milk is not coagulated by its presence; hence the necessity for caution in its use under these circumstances. It renders the urine acid, and proves useful in case of phosphatic deposit. Being injurious to the teeth, it should be sucked through a quill or glass tube, and the mouth carefully washed with an alkaline solution after each dose. The aromatic acid is a very useful and agreeable tonic.

Dose:—Of the Diluted or Aromatic Acid, ℥v.-xxx., freely diluted.

2100. *Therapeutic Uses. In Colica Pictonum, and Poisoning by Lead generally*, sulphuric acid is stated by M. Gendrin[1] to act both as a prophylactic and as a remedial agent. This opinion has been ably supported by Dr. H. Bennet. As a pupil of M. Gendrin, he saw in Paris a large number of cases of saturnine poisoning; and he states that, with the exception of one or two cases of chronic lead palsy, he does not remember one which proved refractory to the treatment adopted. Mild cases yielded generally in about three days, severe ones in six or seven. The treatment consisted in the administration of sulphuric acid, largely diluted with water (gutt. xliv. ad Aq. Oj.), of which Oij.-Oiij. were given daily. Sometimes the first dose or two was rejected; but it was persevered in, and the stomach soon became accustomed to it. When it was retained, the abdominal pains generally began to diminish after the first or second day, the constipation gradually giving way when the pains had become less intense. No other medicine of any kind was administered; but it was considered a point of the greatest importance to combine its use with repeated sulphur baths. The observations of Tanquerel and of Grisolle stand opposed to the alleged prophylactic powers of sulphuric acid in these cases; indeed, they rather tend to show that the workmen in lead who use sulphuric acid drinks are sooner attacked than those who abstain from them. (Stillé, i. p. 283.)

2101. *In Hæmorrhage*, diluted sulphuric acid, although less certain in its action than the acetate of lead, gallic acid, and other remedies, is a very useful adjunct to other treatment. Dr. W. Frazer states that in *passive Hæmorrhage from the Lungs, Bowels, and Uterus*, he frequently combines it in solution with gallic acid. *In Hæmatemesis*, it proves more useful than in the other forms, probably from the fact of its coming in contact with the bleeding surface. *In Uterine Hæmorrhage*, it has long been extensively prescribed in combination with tincture of opium and infusion of roses.

2102. *In Calculous Affections, in the Phosphatic Diathesis, and when the urine is of an alkaline character*, sulphuric acid has in many cases proved successful in correcting the alkalescence, but it is generally inferior in efficacy to nitro-hydrochloric acid. Dose, ℥xv.-xxx., three or four times daily.

[1] Lancet, April 4, 1846.

2103. *In Choleraic Diarrhœa and Summer Diarrhœa*, diluted sulphuric acid in full doses (♏xx.–xxx.), with or without a few drops of laudanum, is often effectual in arresting the discharge. In severe cases, this may be repeated every hour or oftener; in milder cases, every three or four hours. When the diarrhœa evidently arises from the use of crude indigestible food, a dose of castor oil should precede the use of the acid. The following draught, in use in the London Hospital, has been found beneficial:—℞ Acid. Sulph. Aromat. ♏xx., T. Camph. Co. ℥j., Spt. Choroformi ♏x., Spt. Menth. Pip. ℥ss., Syr. Rhœad. ℥j., Decoct. Hæmatox. ℥j., M.; to be repeated every four or six hours, according to the urgency of the case. *In Simple Infantile Diarrhœa*, it has also been recommended. Dr. West (p. 602) states that he has given ♏iv. of the dilute acid in Aq. Carui every four hours, and though successful in some instances, it is less uniformly effectual than the rhubarb mixture (*q.v.*) The only cases in which it seemed to possess a decided superiority over that remedy were those which were attended with frequent vomiting and great irritability of stomach. *In Puerperal Diarrhœa depending upon intestinal irritation*, Sir C. Locock[1] states that the diluted sulphuric acid, with a few drops of laudanum, sometimes effectually restrains the diarrhœa, and improves the character of the tongue, particularly if there are aphthous ulcerations. *In the Diarrhœa of Typhoid Fever*, Dr. H. Kennedy[2] states, after ample experience, that by far the best remedy is dilute sulphuric acid (f℥j.–f℥iij. ad Aq. f℥viij.) It is best to begin with a small dose and increase it as required; the diarrhœa should not be too suddenly checked. Opiate enemas to allay tenesmus are to be used.

2104. *In the profuse Perspirations of Phthisis*, no remedy, according to Dr. Christison (p. 49), equals diluted sulphuric acid. There can be no doubt of its utility in many cases, and it also serves occasionally to arrest the *Diarrhœa* so troublesome in the latter stages. Dr. Graves advises its combination with henbane.

2105. *In the advanced stages of Typhus and Typhoid Fever*, sulphuric, in common with the other mineral acids, is often of great service. Doses of ♏xv.–xx., with gr. j. of quinine, may advantageously be given every three or four hours, together with stimulants and nutritives. It is especially useful when diarrhœa is present. (See Acids, Part ii.) *In Confluent Small-pox*, a similar mode of treatment offers the best prospect of success.

2106. *In Scarlatina*, diluted sulphuric acid, with the addition of a little syrup and water, forms an excellent refrigerant medicine, particularly for children. *For the Sore Throat* which

[1] Lib. of Med., vol. i. p. 363. [2] Dublin Quart. Journ., Aug. 1862.

accompanies this disease, and also for *Cynanche Tonsillaris*, the infusion of roses, acidulated with sulphuric acid, forms an eligible gargle. The mouth should always be well washed out after its use.

2107. *In Syphilitic Eruptions of the Skin*, Dr. Schedel[1] states that he has seen the best effects produced by its internal administration; and Dr. Fricke states that sulphuric acid baths (f℥ij. of the strong acid to each bath) exert a favourable influence. *In Mercurial Ptyalism*, Mr. Pearson (p. 190) found great benefit from this acid, given internally and used as a gargle, in conjunction with decoction of cinchona.

2108. *In some Cutaneous Diseases*, the internal use of this acid proves highly beneficial. Dr. A. Thomson found it cure *Scabies* when other remedies had failed; and in *Pruritus* it has been used with good effects. *In Eczema, Scabies, Tinea Capitis, &c.*, an ointment composed of fl. drm. j. of the acid, and oz. j. of lard, proves highly useful. *In Ephelis*, the diluted acid (f℥j. ad Aq. f℥viij.) is advised as a lotion by Bateman.

2109. *In the Bites of Rabid Animals*, Dr. W. Frazer (p. 12) considers that the strong acid is the best caustic that can be employed.

2110. *In Paralysis, Chronic Rheumatism, Chronic Affections of the Joints, particularly in Morbus Coxarius*, great benefit is stated to have resulted from the persevering use of the sulphuric acid ointment (acid fl. drm. j., lard oz. j.); its action is that of a powerful irritant.

2111. Sulphurous Acid. Acidum Sulphurosum. Sulphurous acid gas, SO_2, dissolved in water, and constituting 9·2 per cent. by weight of the solution. Sp. gr. 1·04.

Med. Prop. and Action. Disinfectant and antiseptic; its action, whether given internally or applied externally, depending apparently on its power of destroying the parasitic vegetable growths which infest the human body. The so-called "Sulphur-cure," of late years brought so prominently forward by Dr. Dewar, of Kirkcaldy, consists mainly in the varied and novel application of sulphurous acid. He applies it in three ways:—1. In solution (equal parts of the acid B. Ph. and of water or glycerine.) 2. By fumigation: for this purpose a few drops of the acid may be added to boiling water and the fumes inhaled, or a small portion of sulphur may be sprinkled from time to time on a few red-hot cinders, so as to fill the room not inconveniently with the fumes. 3. In spray, by means of an appropriate apparatus, such as the Vulcanite Vaporizer devised by Dr. Dewar himself. For children the instrument should be held about three feet from the mouth, and the fine spray produced should be inhaled. This may be repeated according to circumstances; in acute cases every hour or oftener. For adults it is advisable "to hold the nozzle of the instrument about six inches from the patient's mouth, and administer three or four whiffs to begin with; then after a corresponding interval, during which a cough or two is given, the process is repeated; about twenty squeezes in all, which

[1] Lib. of Med., vol. i. p. 440.

represents the injection of ♏xl.–lx. of the acid." Great stress is laid on the acid being pure, otherwise it may give rise to much irritation and annoyance.

Dose:—Of Sulphurous Acid, ♏xxx.–lx. largely diluted.

2112. *Therapeutic Uses. Diseases of the Lungs, Throat, and Air-passages.* Amongst the affections of this class in which the sulphurous acid treatment by spray or fumigation is vaunted by Dr. Dewar, are *Phthisis, Chronic Bronchitis, Asthma, Croup, Tonsilitis, Laryngitis, Malignant Sore Throat scarlatinal or otherwise, and Clergyman's Sore Throat.* Subsequent experience, though it has failed to substantiate Dr. Dewar's lavish encomiums, serve to show that in some of these affections it is a useful remedy. Thus Dr. Adams,[1] of Glasgow, who has examined the claims of this treatment, states that in *Catarrh, Acute Bronchitis, and Chronic Cough*, it stimulates the exhalant vessels, and that under its use the tough viscid phlegm which collects in the bronchi is dislodged more freely and effectually than under the use of ordinary expectorants, but he doubts its advantage over chlorine or vinegar inhalations. *In Asthma*, however, he found in some cases it was not tolerated, and in others its effects were *nil. Individuals subjected to repeated Catarrhs*, otherwise in good health, seemed really benefited by its use. Cases of inflammatory sore throat were not benefited, but in *Hoarseness following the acute stage*, he states that he has seen improvement and relief from it. *In Phthisis*, Dr. C. J. B. Williams[2] states that the use of sulphurous spray in his practice is limited, and not very encouraging; but he adds that he has found it a most useful and agreeable remedy *in Affections of the Throat, whether Diphtheric or Aphthous*, and that it has proved cleansing and soothing in some cases of foul ulcerations of the throat affecting both larynx and fauces, generally syphilitic in origin, and sometimes ending in pulmonary consumption. Dr. Purdon[3] relates a case of *Syphilitic Ulceration of the Throat*, which yielded to sulphurous acid applied in the form of spray, after other ordinary means had failed.

2113. *Typhoid Fever* is another disease in which "the sulphur-cure" is lauded by Dr. Dewar. It is highly spoken of by Dr. R. Hamilton;[4] but the strongest evidence in its favour has been adduced by Dr. G. Wilks,[5] who claims for it a real antidotal power. He gives ♏ij½. to ♏xx., according to age, every four hours, and continues its use for a week, ten days, or more, until the patient complains of tasting, smelling, or feeling like sulphur or lucifer matches; or in case of infants, until they actually emit an odour of the gas from the skin and

[1] Glasgow Med. Journ., March, 1868.
[2] Lancet, Aug. 15, 1868.
[3] Brit. Med. Journ., May 9, 1868.
[4] Practitioner, Feb. 1869.
[5] Brit. Medical Journal, Dec. 3, 1870.

breath; this being taken as evidence that the system is saturated with the remedy, it is stopped. Where diarrhœa is present he adds sulphuric acid and laudanum. His usual formulæ are as follows:—*For Adults:* ℞ Acid. Sulphurosi ʒij., Syr. Aurant. ʒiij., Aq. ad fl. oz. vj., M., or Acid. Sulphurosi ʒij., Acid. Sulphuric. Dil. ʒij., T. Opii ♏xx., Syr. Aurant. ʒiij., Aq. ad fl. oz. vj., M. *For Infants:* ℞ Acid. Sulphurosi ♏xv., Syr. Aurant. ʒiij., Aq. ad fl. oz. j.; or ℞ Acid. Sulphurosi ♏xv., Acid. Sulphuric. Dil. ♏xv., T. Opii ♏ij., Syr. Aurant. ʒiv., Aq. ad fl. oz. j., M. A sixth part of either of these mixtures to be taken every four hours. The great success which appears to have attended the use of these remedies in Dr. Wilks's practice, fully justifies further trials with it. It is in this class of cases that Dr. Cummins[1] thinks so highly of sulphurous acid fumes (generated by burning sulphur) as a prophylactic.

2114. *In Sarcinæ Ventriculi*, sulphurous acid, from its power of destroying the lower forms of organic life, has been employed sometimes with success. Dr. Russell Reynolds[2] recommends the acid, prepared in the ordinary way, to be passed through water till the latter has absorbed as much as it will take up. This saturated solution is to be diluted until the fluid is no longer disagreeable to take, when fl. oz. j. should be taken before each meal. The sarcinæ may thus be destroyed, but they are apt to return until the conditions on which their presence depends have been removed. Dr. Drysdale[3] records an obstinate case of constant *Vomiting and Eructations* which yielded at once and permanently to sulphurous acid (♏xxx.) thrice daily. *In Pyrosis*, Dr. Lawson[4] obtained the best effects from this acid in doses of ♏xxx.–fl. drm. j. thrice daily, shortly before meals. Bitter infusions may be employed, but plain distilled water is the best vehicle. *In Aphthæ and Aphthous Ulceration of the Mouth*, the diluted acid has been well spoken of as a wash or gargle.

2115. *In Skin Diseases of vegetable parasitic origin*, sulphurous acid, with equal parts of glycerine, is an efficient application; or, diluted with two or three parts of water, it may be applied on a piece of lint to the affected part, and covered with oiled silk so as to prevent evaporation. This treatment, first introduced by Sir W. Jenner,[5] has proved successful in various forms of *Tinea*, *T. tonsurans*, *T. decalvans*, *T. favosa*, *T. sycosa* (*Sycosis*), *Chloasma*, *Pityriasis Versicolor*, &c. It will often succeed when all other remedies fail. *In Erysipelas*, according to Dr. Dewar, the application of sulphurous

[1] Dublin Quarterly Journ., Aug. 1869.
[2] Med. Times, July 27, 1867.
[3] Lancet, July 24, 1869.
[4] Practitioner, Sept. 1868.
[5] Med. Times, Aug. 20, 1853.

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acid and glycerine (equal parts) relieves the burning and arrests the spread of the inflammation.

2116. Amongst the other affections which yield, according to Dr. Dewar, to the acid either in solution or by fumigation, are *Chilblains*, *Sore Nipples*, *Chapped Hands*, *Bruises*, *Ulcers*, *and Wounds*, whether surgical or accidental. In the latter he regards it as superior in efficiency to carbolic acid, being less irritant, and having a less disgusting smell.[1]

2117. SUMBUL RADIX. Sumbul Root. The root of an undetermined Umbelliferous plant, introduced to the notice of the profession, in 1850, by Dr. Granville.[2] It is distinct from the Sumbul (*Valeriana Jatamansi*) of India.

Med. Prop. and Action. From its physical characters and physiological effects it appears to rank amongst the nervine stimulants, approximating probably more nearly to valerian than to any other drug. It is used by the Russian physicians in *Low Typhoid Fevers*, and in cases of *Asthenic Dysentery* and *Diarrhœa*. It has also been employed by them with alleged success in *Cholera*. Dr. Thielmann, of St. Petersburg, informed Drs. Wood and Bache that he depended mainly on this remedy in *Delirium Tremens*, having found it superior to opium in its composing influence over that complaint.[3] Dr. Granville recommends it in *Gastric Spasm*, *Hysteria*, *Chlorosis*, *Amenorrhœa*, *Dysmenorrhœa*, *Paralysis of the Extremities*, *Epilepsy*, and other *Nervous Disorders;* but its efficacy in these cases is far from being established. Dr. Murawieff,[4] a Russian physician, has employed a resinous extract from this root, which he regards as its active principle, in doses of gr. j.–ij. three or four times a day, and affirms its utility in *Chronic Bronchitis*, *Chronic Pneumonia*, *Moist Asthma of old anæmic and scorbutic patients*, in *Atonic Dysentery*, *Leucorrhœa*, *Hypochondriasis*, and *Hysteria*.

Dose, of Sumbul root, in powder, gr. x.–xx. *Of the Tincture* (Sumbul Root oz. ij½., Proof Spirit Oj.), ℥x.–xxx.

2118. TABACI FOLIA. LEAF TOBACCO. The dried leaves of Virginian Tobacco, Nicotiana Tabacum, *Linn.* *Nat. Ord.* Solanaceæ. *Hab.* Cultivated throughout the warmer portions of the globe.

Med. Prop. and Action. Sedative and antispasmodic; also purgative, emetic, and diuretic in a minor degree. When locally applied, it appears to be stimulant; thus, when it is used in the form of snuff, it causes violent sneezing, and when chewed, greatly increases the flow of saliva. When taken in small doses, by those unaccustomed to its use, it causes nausea, vomiting, vertigo, and a great depression of the vital powers; in larger doses, these symptoms increase in intensity; there is great prostration; a low, weak, trembling pulse; cold, clammy perspiration, obscurity of vision, and a tendency to faint. In extreme cases, convulsions, paralysis, and coma precede death. These symptoms evidence themselves whether tobacco has been taken by mouth, or in the form of enema, or

[1] Med. Times, Sept. 12, 1867.
[2] The Sumbul, &c., London, 1850.
[3] U. S. Disp., p. 1492.
[4] Dublin Quart. Journ., Feb. 1855.

even in some cases when the leaves have been applied to a large abraded surface. In its operation and effects it is closely allied to digitalis. Its activity depends upon a liquid alkaloid, *Nicotine* ($C_{20}H_{14}N_2$), and upon a concrete volatile oil, *Nicotianin*. Nicotine is an energetic poison, almost equalling hydrocyanic acid in potency. Nicotianin also possesses poisonous properties. According to the experiments of Sir B. Brodie, an aqueous infusion of tobacco causes paralysis of the heart, through the medium of the nerves; whilst the empyreumatic oil of tobacco was not found to produce this effect; thus, one drop of the oil applied to the tongue of a cat, caused convulsions and death in two minutes; and on opening the body immediately afterwards, the heart's action was unaffected. Tobacco is a remedy which should be used with great caution, as it causes such perfect prostration that the vital powers have not sufficient strength left to recover themselves, and a fatal termination follows. Fatal results from tobacco enemas are recorded by Sir A. Cooper, Sir C. Bell, Dr. Copland, and others. Gr. xxx. of the leaves in infusion is the smallest quantity which has proved fatal. Smoking tobacco and snuff-taking, when first commenced, cause nausea, vomiting, &c. Their moderate use does not appear to be injurious, but excessive indulgence in them induces dyspepsia and a cachectic state of the body. From its powerfully depressing action, it is very objectionable as an internal remedy, but a tobacco enema is still retained in B. Ph. (gr. xx., Boiling Water fl. oz. viij., infuse for half an hour and strain). It might well be dispensed with.

2119. *Therapeutic Uses. In Spasmodic Asthma*, smoking tobacco occasionally affords relief. In some, the ease it affords is remarkable; in others, it fails to produce any effect; whilst it sometimes appears to aggravate the symptoms. Experience in each individual case is the sole test of its utility. Asthmatic patients should avoid the habitual use of tobacco, as Dr. Hyde Salter (p. 196) remarks, "the habit of smoking has rendered powerless in a large number of cases, what may without any qualification be called its most potent remedy." He considers a pipe preferable to a cigar, and "bird's eye" to the stronger forms of tobacco. For ladies and children a few whiffs of a mild cigarette are quite sufficient. *For the relief of the Asthmatic symptoms occurring in Emphysema*, Dr. Waters (p. 193) speaks favourably of tobacco-smoking in those not habituated to it, but he does not think its influence as lasting as that of stramonium.

2120. *In Hay Asthma*, tobacco pushed *ad nauseam* gives more relief than any other remedy. (Dr. Hyde Salter, p. 189.) A patient bears the following testimony: "There is no remedy during a paroxysm that has anything like the effect of smoking tobacco; and though this is especially the case in the latter stage of the attack, when the asthmatic element is most developed, still, in the earlier stage, when the lachrymation, sneezing, and faucial irritation are most distressing, tobacco smoke has, in my case, a very marked influence in soothing and diminishing these symptoms. A hay asthmatic should never smoke tobacco but for his malady. When smoking becomes a habit, it ceases to be a medicine."

2121. *In Tetanus*, tobacco enemas have been advised and

successfully employed by Drs. O'Beirne,[1] Earle,[2] Curling,[3] and others; and although occasionally benefit, and even recovery, has resulted from their employment, yet they often fail to afford any amelioration of the symptoms. Such was the experience of Sir J. Macgrigor[4] during the Peninsular war. On this point, Dr. Todd[5] observes that tobacco is neither safe nor manageable; and adds, that he has seen more than one patient, *cured of tetanus*, die under the use of this remedy. When employed, the strength should never exceed gr. xxx. of the leaves in Oss. of water; and great care is necessary to prevent too great an amount of depression by the administration of ammonia, brandy, and other stimulants. Cases of tetanus recovered under the use of nicotine are recorded by Mr. Tuffnell,[6] and Mr. R. Harrison.[7] Prof. Haughton,[8] of Dublin, has also recorded two cases of traumatic and one of idiopathic tetanus treated by nicotine. Two of these cases recovered. The alkaloid had the effect of relaxing the muscles, causing a cessation of delirium, and producing profuse sweating, which exhaled a strong odour of snuff. The dose given was gutt. ss. to gutt. ij$\frac{1}{2}$. in sherry and water; which was repeated several times in the day. One patient who recovered took 44 drops or 26·4 grs. in eleven days. The other took in all 54 drops = 32$\frac{1}{2}$ grs. The patient who died was moribund when he began the medicine. Prof. Haughton remarks that nicotine should be employed, and not infusion of tobacco leaves, as in the latter the properties of the alkaloid are masked by two or more vegetable oils, the operation of which on the nervous system is unknown. Dr. John Ogle,[9] of St. George's Hospital, has since recorded a case of traumatic tetanus in which the nicotine treatment was unsuccessful. Mr. H. J. Tyrrell[10] has lately recommended the topical application of tobacco in tetanus. In *Traumatic Tetanus*, he applies a strong infusion of cavendish tobacco to the wound and surrounding parts, previously blistered. In the *Idiopathic form*, he recommends that the tobacco should be applied to a blistered surface over the spine. He has placed on record two cases successfully treated by this method. Another case in which the local application of tobacco appeared to exercise a good influence (recovery ensuing) is related by Mr. J. B. Jonor.[11] As a general rule, physostigma offers a better chance of recovery.

2122. *In Strychnia Poisoning*, tobacco has been employed with the view of controlling the spasms. Dr. O'Reilly[12] has

[1] Dub. Hosp. Reports, vol. iii.
[2] Medico-Chir. Trans., vol. vi.
[3] Treatise on Tetanus, 8vo., 1836.
[4] Medico-Chir. Trans., vol. vi.
[5] Clin. Lec., Med. Gaz., 1849, p. 766.
[6] Dub. Med. Press, Jan. 7, 1863.
[7] Lancet, Nov. 9, 1867.
[8] Dub. Quart. Jour., xxxiv. p. 172.
[9] Med. Times, March 12, 1864.
[10] Ibid., Sept. 24, 1864.
[11] Edin. Med. Jour., Feb. 1867.
[12] Dub. Med. Press, June 23, 1858.

recorded a case successfully treated by it. He prescribed it internally in infusion; the total quantity taken in divided doses during twelve hours, was one ounce and two drachms.

2123. *In Fevers*, tobacco-smoking has been advised as a preventive. It is universally regarded as such in Holland. Dr. M'Gregor[1] expresses his belief in its preventive power; a belief in which many medical men residing in the tropics fully coincide. Dr. M'Gregor adds, that the *Sleeplessness of Fever* will sometimes be most effectually removed by the application of a moistened tobacco leaf to the shaven scalp.

2124. *In Rheumatic Pains of the Joints and Bones, in Gout, and in painful Nodes and Sprains*, the application of a moistened tobacco leaf often affords great relief; I have repeatedly witnessed its efficacy. Dr. Fuller recommends it in *Rheumatic Gout;* the moistened leaf should be kept *in situ*, and covered with oiled silk or thin gutta percha.

2125. *Hæmorrhage from Leech-bites, &c.*, may sometimes be arrested by applying a piece of tobacco leaf over the bleeding surface.

2126. Amongst other diseases in which tobacco has been employed are *Dropsical Affections*, *Ileus*, *Colica Pictonum*, *Dysentery*, *Peritonitis*, and *Strangulated Hernia*, but in all these it has been superseded by safer and more efficient remedies. Tobacco fomentations have also been employed in the cure of *Scabies*, and *Tinea Capitis*, but they are inferior in efficacy and safety to many other means. They are useful in *destroying pediculi*, but care is required in their employment.

2127. TAMARINDUS. TAMARIND. The preserved pulp of the fruit of Tamarindus Indica, *Linn. Nat. Ord.* Leguminosæ. *Hab.* Tropical portions of both hemispheres.

Med. Prop. and Therap. Uses. Laxative and refrigerant. It is advantageously employed as a beverage *in Febrile and Inflammatory Diseases*, infused in warm water or milk (of the pulp oz. ij., water or milk Oij.), or a whey may be made by boiling it in milk. It has one great advantage in tropical countries, namely, that it is procurable at almost every village, and at a very small cost. Its purgative effect requires to be aided by the neutral salts, by senna, or manna, and the addition of a carminative obviates the griping and flatulence which it occasionally produces. It contains citric, malic, and tartaric acids, and bitartrate of potash.

Dose, oz. ½, or more. It is an ingredient in Confection of Senna.

2128. TANNIC ACID. Acidum Tannicum. Tannin. $C_{27}H_{22}O_{17}$. An acid obtained from galls; it exists largely in catechu, rhatany, and other vegetable astringents.

Med. Prop. and Action. Powerful astringent, in doses of gr. ij.–gr. iij. twice a day, in chronic cases; gr. v.–gr. xx. in urgent cases, such as acute

[1] Med. Surg. Journ. of the N. W. Provinces, 1845.

hæmorrhage. Dr. Alison[1] regards it also as a valuable peptic and nervine, and considers that it possesses the property of *retarding the growth of tubercle, and malignant disease.* Anti-periodic powers have also been assigned to it by M. Leriche.[2] It may be given either in pill or in solution. It possesses many advantages for administration, is not very bitter, is free from odour, does not induce nausea, is perfectly safe, may be continued for months without any ill effects, may be given at all hours, before or after meals, and may be employed at the same time with iron, cod-liver oil, and bitters. Dr. Bence Jones[3] points out that tannic as well as gallic acid is a strongly deoxidizing agent. When in contact with alkalies, as in the blood, these acids are, he remarks, capable of taking oxygen even from the blood-globules. He considers it probable that they have no action on the nerves or muscles, exciting no contraction of the muscular structure. The action of tannin in precipitating albumen, and in forming indefinite compounds with the skin, gives, he considers, no explanation of its action in astringing the small blood-vessels. Dr. Garrod, on the authority of Wohler and Frerichs, states, that when tannic acid is taken into the system it undergoes a change, and appears in the urine as gallic and pyro-gallic acids, and a humus-like substance ; and he consequently concludes that a given quantity of tannic acid must be inferior, as a remote astringent, to the same weight of gallic acid ; that the former acts more powerfully as a local astringent, and the latter is more effectual as a remote one. He states that, from the presence of the humus-like matter, the urine of patients taking tannic acid sometimes becomes quite dark coloured, especially after it has been exposed to the air for some time. Gelatine is not precipitated by the urine of patients taking tannic acid, showing the absence of that acid, but it strikes black with persalts of iron, from the presence of gallic acid. (Garrod, p. 286.) Externally, it may be applied in the form of lotion or wash (gr. ij.–gr. iij., Water fl. oz. j.), or ointment (gr. iv.–gr. v., Lard oz. j.), or in the form of fine powder.

Dose:—Of Tannic Acid, gr. ij.–x. The B. Ph. contains *Tannic Acid Suppositories*, each containing gr. ij., and *Lozenges* each containing gr. ½ of the acid ; also for external or local use, *Glycerine of Tannic Acid* (oz. j. ad Glycerine fl. oz. iv., dissolved by gentle heat), a very useful astringent application.

2129. *Therapeutic Uses. In passive and exhausting Hæmorrhage, whether proceeding from the lungs, the stomach, the uterus, or the kidneys*, tannin, internally administered in doses of gr. iij.–vj., three or four times a day, proves useful by its astringent and tonic properties. The sole contra-indication of its use is the presence of acute or inflammatory symptoms. *In Menorrhagia*, Dr. Porta,[4] who advises it in this class of cases in doses of gr. iij., every three hours, draws the following conclusions respecting its use :—1. That whenever the uterus is the seat of irritation, giving rise to active hæmorrhages, and also when this discharge depends upon chronic metritis, tannin acts specifically upon the uterus ; 2, that when the hæmorrhage depends upon acute metritis, the inflammation should be subdued by blood-letting, &c., previous to its use ; 3, that when the discharge depends upon organic disease of the uterus, it has no efficacy ; 4, that preference should always

[1] Lond. Journ. Med., Jan. 1, 1850.
[2] Journ. de Méd. et de Chir., Dec. 1861.
[3] Braithwaite, vol. liv. p. 326.
[4] Archiv. Gen., April, 1827.

be given to tannin, in the treatment of menorrhagia, as it is prompt in its effects, produces no unpleasant symptoms, and is well borne even by irritable stomachs. Dr. Alison finds it most serviceable when combined with a small portion of dilute nitric acid. In superficial *Hæmorrhage, as from the gums, Hæmorrhoids, &c.*, tannin, in fine powder dusted over the bleeding surface, proves an efficient styptic. *In Hæmaturia*, Dr. O. Rees[1] states that it is the best astringent he knows, when given in the form of pill. *In Hæmoptysis, in the Hæmorrhage of Dysentery, and in threatened Abortion*, it is strongly advised by Dr. Cummins,[2] to be given in combination with opium and ipecacuanha. *In Epistaxis*, tannin, finely powdered, is to be blown through a quill into the nostrils.

2130. *In Chronic Bronchial Catarrh*, occurring in weakly and elderly persons, unconnected with disease of the heart or great blood-vessels, and attended with copious and debilitating expectoration, the internal administration of tannin, in doses of gr. j.–ij.–iij., twice or thrice daily, has greatly and gradually abated the secretion, relieved the frequent cough, and improved the strength. (Dr. Alison.)

2131. *In Phthisis*, when softening has taken place, Dr. Alison considers tannin most useful in restraining weakening discharges, but it does not appear worthy of much dependence. He speaks of it as very effectual in checking *the Profuse Perspirations* when given with nitric acid, and here it is doubtless often very useful. Dr. Ringer[3] has found the *Cough of Phthisis* allayed by the application of the glycerine of tannin to the throat; and he adds that a good night's rest may often be obtained by applying it just before going to sleep. The addition of a small quantity of morphia greatly increases its efficacy.

2132. *In the Chronic stage of Hooping Cough*, tannin is recommended by M. Sebregondi.[4] He administered it every two hours in gr. $\frac{1}{4}$ doses, in conjunction with a sedative, as conium, or with a purgative, as infusion of senna. Under this treatment, the paroxysms entirely ceased. Dr. Durr[5] advises its combination with equal parts of benzoin and fifty parts of sugar; he found it very efficacious. Dr. Ringer (op. cit.) speaks highly, in these cases, of the local application of the glycerine of tannin to the pharynx; it should be carried low down, and be brought in contact with the neighbouring parts. It is only beneficial in uncomplicated cases, in the absence of inflammatory symptoms.

2133. *In many Throat Affections*, the glycerine of tannin is an extremely useful application. *On the subsidence of Acute*

[1] Med. Gaz., July 11, 1851.
[2] Brit. and For. Med.-Chir. Rev., Oct. 1851.
[3] Practitioner, July, 1868.
[4] Med. Zeitung, No. 1.
[5] Prov. Journ., April 3, 1850.

Inflammation, as the mucous membrane becomes less red and swollen, and more moist, and is covered with mucus or pus, it tends to hasten the restoration of the parts to their normal state. *Superficial Ulceration*, under the same circumstances, may also be speedily healed by its application. *Chronic Inflammation of the Throat*, also, is greatly benefited by it, and it serves in a marked manner to remove that frequent hacking *Cough* which depends upon a relaxed condition of the mucous membrane of the throat. Such a state of the throat also frequently causes slight *Deafness*, especially in children, and this may be removed, with the chronic inflammation of the pharynx, by the employment of this agent. (Dr. Ringer.) Dr. L. Sedgwick[1] has employed it with great advantage in "*Clergyman's Sore Throat.*" Dr. Hillier (p. 318) advises a tannin gargle, or wash, for removing a *Relaxed state of the Throat and Tonsils following Scarlet Fever*.

2134. *In Croup and Diphtheritis*, the inhalation of a solution of tannin (gr. ij.–x. ad Aq. fl. oz. j.), applied for 15 or 20 minutes, by means of an atomizer, has been successfully employed by Barthez and Trousseau. After several repetitions, large pieces of false membrane were rejected, and the breathing was relieved. (Dr. Beigel.)

2135. *In Chronic Diarrhœa*, which has resisted all ordinary treatment, and which is not dependent on obstructive disease of the heart or liver, tannin has proved, according to the experience of Dr. Alison, of surprising efficacy. In severe cases depending on an irritable weakly mucous membrane, he states that he has not known one failure; and of those examples connected with chronic inflammation and disorganization of the mucous membrane, only two proved beyond the influence of the remedy. It should be given with opium in the form of pill.

2136. *Diseases of the Genito-Urinary Organs. In Atonic Leucorrhœa*, Dr. Alison found tannin efficacious in restraining the discharge, and restoring the tone of the system. He prescribes an aqueous solution, combined with a small portion of dilute nitric acid. Dose, gr. ij.–iij., twice or thrice daily.

2137. *In Syphilitic Ulceration of the Cervix Uteri*, an application, first proposed by M. Ricord and strongly advised by Dr. Grandcourt,[2] is gr. xx. of tannin, dissolved in Oj. of light claret, in which some aromatic herbs have been previously macerated.

2138. *In Prolapsus Ani*, Dr. Alison speaks favourably of the injection of an aqueous solution of tannin. It is particularly indicated when there is much relaxation of the parts. Reduced to a fine powder and mixed with lard, it is advised as an

[1] Practitioner, Oct. 1868. [2] Rev. Med.-Chir., March, 1849.

application to *Hæmorrhoidal Tumours*, when free from inflammation. *In Fissure of the Anus*, Dr. Van Holsbek[1] has used the following with great advantage:—℞ Tannin ʒj., Glycerine fʒxvj., M., introduced on a tent, night and morning.

2139. *In Gonorrhœa and Gleet*, tannin is a valuable local application. Injections of an aqueous solution (gr. ij., Aq. fl. oz. j.), repeated every hour, were found by Mr. Bryant[2] to effect not unfrequently a rapid cure. He also speaks favourably of a concentrated solution of tannin in glycerine, introduced into the urethra on a bougie at short intervals. For a good method of preparing these bougies, see next section. Dr. Ringer (p. 223) and Mr. J. D. Hill[3] report very favourably of injections of the glycerine of tannin; but as a solution of the officinal strength is apt to give rise to much pain, it should be diluted thus:—Glycerine of Tannin fl. oz. iij., Olive Oil fl. oz. j., Mucilage fl. oz. j., M. Mr. Hill furnishes particular directions for the use of this injection; he recommends the fluid to be retained in the urethra for four or five minutes, so as to insure its thorough application, and the permeation of the tissues.

2140. *Urethritis in the Female.* The use of bougies covered with tannin is, according to Dr. Braxton Hicks,[4] one of the most efficient modes of treatment. The best plan, he remarks, is to cover a medium-sized gum elastic bougie with gum water, and then to dip it into powdered tannic acid. The superfluous quantity is then shaken off, and the film allowed to dry. Before using it, it should be gently passed through the fingers to remove any roughness which may be present, then dipped into gum water, and passed into the urethra, and left there for ten or fifteen minutes. This may be repeated once a week. There is generally but slight irritation; perhaps the next day some small increase; by three or four days the irritation will have much subsided, and then two or three applications at intervals of a week are sufficient to complete the cure. *Chronic Vaginitis, whether of adults or children*, is often manifestly benefited by the local application of the glycerine of tannin.

2141. *For Nasal Polypus*, Mr. T. Bryant[5] advocates the employment of finely powdered tannin as snuff. He relates six cases illustrative of its efficacy, and it certainly seems deserving of a fair trial; whilst it has apparently no effect on the healthy membrane, it causes the complete withering up of the polypus. It should be blown daily into the nostrils through a quill. The value of this treatment is further confirmed by Mr. W. M. Banks,[6] who regards it as specially adapted for the soft and gelatinous varieties of polypus. He also speaks of the

[1] Dublin Med. Press, Jan. 14, 1857.
[2] Lancet, March 16, 1867.
[3] Ibid., March 20, 1869.
[4] Lancet, Oct. 12, 1867.
[5] Ibid., Feb. 23, 1867.
[6] Brit. Med. Jour., March 21, 1868.

glycerine of tannin as one of the best applications for a *Chronically Swollen and Thickened condition of the Nasal and Palatal Mucous Membrane.* The glycerine of tannin is a very useful application in *Ozæna* and *Otorrhœa*, especially when occurring in children.

2142. *In Dyspepsia*, tannin proves very efficacious. The symptoms disappear under its use, the appetite increases, flatus and the sense of distention abate at the same time; and it has been found, in several instances, that the bowels, far from becoming constipated, acquired a more healthy tone, and actually became more free. It may be advantageously combined with dilute nitric acid. (Dr. Alison.)

2143. *In Rachitis*, Dr. Alison has the highest opinion of the internal use of tannin, in doses of gr. ½–j., twice or thrice daily. He states that he has employed it in numerous cases, both in hospital and in private practice, and he considers that it not only possesses the power of arresting the progress of the disease, but also of correcting the tendency to it. If it actually possesses this power, it must act by invigorating the general health, and by imparting a more healthy character to the formative processes, by virtue of which lime and other ingredients in the blood are more forcibly attracted to and fixed in the osseous structure. In the hands of Dr. Alison, it appears to have been signally beneficial; it deserves a further trial.

2144. *In Nervous Diseases, as Debility, Languor, Excitability, &c.*, tannin proves, according to Dr. Alison, a permanent nervine. Great caution is necessary in its use, as if any inflammation, even sub-acute, be present, the disease may be aggravated. It may be advantageously combined with camphor, hops, or henbane, and the use of the shower-bath. Dose, gr. ij.–iij., thrice daily.

2145. *In Mercurial Salivation*, tannin is a valuable local application. Sir T. Watson (i. p. 232) found that pure tannin, moistened and smeared upon the spongy gums, is remarkably efficacious in rendering them firmer and more comfortable. *In Idiopathic Hæmorrhage and Sponginess of the Gums*, it also proves most useful. *In Toothache*, Dr. Druitt states that tannin is the most effectual of all remedies; thus—℞ Tannin gr. xx., Gum Mastich. gr. x., Spt. Æther. Sulph. fl. oz. ½, M. It is particularly serviceable if the gum be flabby, or in case a bit of the gum grows in the cavity of a carious tooth.

2146. *In Anasarca accompanied with Albuminuria*, Dr. Garnier[1] considers that he derived great use from tannin in daily doses of grs. xxx.–lx.

2147. *To Sore Nipples*, a solution of tannin (gr. v., Aq.

[1] Archiv. Gén. de Méd., Jan. 1859.

fl. oz. j.) is a useful application. Mr. J. Martin[1] advocates the use of a saturated solution of tannin (grs. 600, Water fl. oz. j.) as a preventive of *Bed Sores*. To be effectual, he regards as essential—*a*, that the tannin be perfectly fresh; *b*, that *cold water* be employed; and *c*, that the solution be quite recent. The theory of its action is that it combines chemically with the gelatine of the skin, forming a contracted impermeable layer of tannate of gelatine; in short, tanning or converting into leather the superficial layer of the cuticle. It is worthy of a further trial; but to be successful it should be resorted to early, before the skin breaks. It may be applied by a layer of lint saturated with the solution, or by means of a brush. Mr. Martin advises this saturated solution in *Cutaneous Affections depending upon a local cause*, as the layer which it forms peels off after a short time, removing, when they exist, such parasites as *Pulex Penetrans* (*Chigres*), *Acarus Scabiei*, *Entozoon Folliculorum*, *&c.*

2148. *In Diseases of the Eye*, M. Hairion[2] speaks highly of the efficacy of a strong solution of tannin (one part of tannin and three of water) as a local application. Amongst other forms of disease in which it proved successful, are *Acute and Chronic Conjunctivitis*, *vegetating Granulations*, *Corneitis with or without Ulceration*, *Chemosis*, *and Pannus*. It is in this last form that it proved the most successful. He adds that a solution of the above strength produced no ill effects whatever; but in general a weaker solution is equally efficacious. One part of tannin to twenty, thirty, or fifty parts of water, is a sufficient strength for ordinary cases; thus diluted, it is a valuable astringent collyrium, and is much employed in modern practice. M. Hairion also employs it in the form of pomade, and in fine powder. The value of finely pulverized tannic acid in eye diseases is proved by Mr. R. Hamilton,[3] of Liverpool, who has employed it with great success in *Phlyctenular Ophthalmia*, *Acute and Chronic Granular Conjunctivitis*, *Pannus*, *&c.* He applies it in the form of spray or fine dust by means of a small india-rubber ball. In solution, tannin is regarded by Dr. Cummins (op. cit.) as preferable to all other applications *in the Purulent Ophthalmia of infants.*

2149. *To some obstinate Skin Diseases, and to Ulcers with copious discharge*, the application of tannin, either in solution (gr. iv.–v., Water fl. oz. j.), or in ointment (gr. iv.–v., Lard oz. j.), has been found of great service. *In Porrigo Decalvans*, it is particularly recommended by M. Cazenave. Dr. Ringer speaks highly of the value of the glycerine of tannin in the early stage of *Eczema*, in *Impetigo*, and in the *Intertrigo* of

[1] Brit. Medical Journal, March 20, 1869.

[2] Journ. de Pharm., Dec. 1850.

[3] Practitioner, June, 1869.

children. It should not be used to the exclusion of constitutional and other local treatment. In a case of *Vascular Tumour of the Orbit*, Mr. Haynes Walton[1] effected a cure by local injections of a saturated solution of tannin; and Dr. Quinlan[2] successfully treated by the same means (Tannin ℥j., Aq. fl. oz. j.) a case of *Nævus* in a child of nine months old. *In Osmidrosis*, Mr. E. Wilson (p. 367) states that in one case, where general means had failed to correct the fœtor of the perspiration, tannin effected a complete cure.

2150. *In Intermittent Fevers*, M. Leriche (op. cit.) speaks highly of the value of tannin in doses of grs. xx.-xxx., according to the intensity of the disease, taken three hours before the paroxysm. Two or three doses, he states, are usually sufficient to effect a cure, and it may be necessary to exhibit grs. lx., or even grs. lxxv. at once.

2151. Taraxaci Radix. Taraxacum, B. Ph. 1864. Dandelion Root. The fresh and dried roots of Taraxacum Dens Leonis, *D.C. Nat. Ord.* Compositæ. *Hab.* Europe and temperate Asia.

Med. Prop. and Action. Alterative-tonic and diuretic. It has been thought to act specifically on the liver, and to increase the biliary secretion; hence, under certain conditions, it has been employed as a substitute for mercury, but the recent investigations of Dr. Bennett[3] and others tend to prove that it is devoid of cholagogue properties. However this may be, experience has shown that it is useful in correcting biliary derangements, unaccompanied by organic disease. Its activity apparently resides in a bitter crystalline principle, *Taraxacin*.

Dose:—Of the Decoction (Dried Taraxacum Root oz. j., Water Oj.), fl. oz. ij.-iv. *Of the Extract*, gr. x.-xxx. *Of the Expressed Juice, Succus Taraxaci*, fl. drm. j.-iij.

2152. *Therapeutic Uses. In Dyspepsia*, taraxacum has obtained a high name, particularly in those cases where the liver is implicated, and in the indigestion of gouty subjects. Dr. Todd[4] speaks highly of it in duodenal dyspepsia, and recommends the following as an efficient formula:—℞ Ext. Tarax. ℥ij., Potass. Nit. ℥ss., Sp. Æther. Nit. f℥j., Inf. Aurant. f℥vj., M. coch. amp. bis terve die sumend. *In Infantile Dyspepsia*, Dr. West (p. 566) advises the following mixture:—℞ Sodæ Bicarb. gr. xxiv., Ext. Tarax. gr. xl., T. Rhei ℥j., Infus. Calumb. ℥xj., Aq. Carui ℥iv., M. Dose, ℥ij. bis die. *In Tabes Mesenterica*, he reports favourably (p. 632) of the subjoined formula:—℞ Ext. Tarax. ℥ij., Sodæ Bicarb. ℥j., Ext. Sarzæ ℥iv., Syr. Aurant. ℥iv., Decoct. Sarzæ Co. ℥v., M. Dose, ℥vj. in milk, thrice daily, for a child æt. 4 years.

[1] Ranking's Abs., xxviii. p. 199.
[2] Dublin Hosp. Gaz., Sept. 15, 1858.
[3] Brit. Medical Journal, May 8, 1869.
[4] Cyc. Pract. Med., vol. ii. p. 652.

2153. *In Chronic Inflammation of the Liver*, taraxacum is a valuable remedy. Dr. Wilson Philip[1] considered that where mercury is advisable, taraxacum renders it more efficient; and that under certain circumstances it might be advantageously substituted for it. Sir R. Martin (p. 285) states, that *in the indolent Enlargements of the Liver, accompanied with torpid action of the viscus, such as occur in Bengal*, he has found mercury of little service; and adds that he has derived more advantage from the following formula, a spare diet and the external application of cantharides being employed at the same time: —℞ Ext. Tarax. gr. xxxvj., Ext. Aloes gr. xij., Ext. Acet. Colchici, Pulv. Ipecac. Rad. āā gr. vj., M. ft. pil. xij., cap. ij. omni nocte. *In Incipient Scirrhus of the Liver*, Dr. Pemberton,[2] who warmly advocates the use of this remedy in *all Chronic Hepatic Affections*, successfully employed taraxacum in several instances, in half-drachm doses of the extract, twice daily. As a remedy for chronic affections of the liver generally, it is favourably spoken of by Sir T. Watson (ii. p. 548). *In Jaundice* depending upon hepatic disease, it may be advantageously combined with small doses of colchicum and other remedies.

2154. *In Rheumatic Gout*, especially when the liver is sluggish and the intestinal secretions are unhealthy, Dr. Fuller (p. 357) relies much upon taraxacum. He directs an infusion (oz. j$\frac{1}{2}$. of the finely sliced root, Aq. Ferv. fl. oz. viij.) to be taken before breakfast every morning, or the extract (grs. xxx.–lx.) thrice daily with alkalies and infusion of gentian, adding, when necessary, a little tincture of rhubarb or decoction of aloes.

2155. *In Phthisis*, Sir J. Clark[3] speaks of taraxacum as a very valuable remedy in tuberculous constitutions, from its power of diminishing abdominal plethora, and its especial influence on the urinary and biliary secretions. Hufeland also speaks highly of it in tuberculous subjects; and Zimmerman[4] considers that it is the best remedy for the dispersion of pulmonary tubercles.

2156. *In Dysmenorrhœa*, Dr. Rigby[5] considers that taraxacum proves highly useful, by keeping up a healthy action of the liver, and acting on the cutaneous surface. He directs half a teaspoonful of the extract to be taken in a little warm milk every night. Thus given, it is by no means disagreeable.

2157. *In many Chronic Cutaneous Diseases*, especially when connected with visceral derangement, it often proves a useful adjunct to other remedies.

[1] On Indigestion, p. 221.
[2] On Diseases of the Abdominal Viscera, p. 42, et seq.
[3] Cyc. Pract. Med., vol. iv. p. 335.
[4] Traité de la Malad. Scroph., p. 275.
[5] On Dysmenorrhœa, p. 59.

2158. Tartaric Acid. Acidum Tartaricum. $H_2C_4H_4O_6$. A crystalline acid prepared from the acid tartrate of potash.

Med. Prop. and Action. Refrigerant. Although cheaper, and consequently more used, than citric acid, it is inferior to it in many respects, being more apt to disorder the digestive organs, to produce colic, and to purge. In large doses it acts as an irritant poison. One ounce dissolved in half a pint of water caused violent inflammation of the alimentary canal and death in nine days. (Taylor.) When its employment in medicinal doses is followed by a red and dry tongue, it ought to be discontinued. (Dr. A. T. Thomson.) It is said by Annesley to be the best artificial solvent of mucus, and may be advantageously given when this exists largely in the bowels. It is often given in the form of "effervescing powders" (Sodæ Bicarb. gr. xxx., Acid. Tart. gr. xxv.)

Dose, gr. x.–gr. xx., dissolved in water and sweetened.

2159. *Therapeutic Uses. In Inflammatory and Febrile Diseases*, an agreeable refrigerant drink is made by diluting the acid largely with water, and sweetening with sugar to the taste. If it cause nervous irritability, or a dry red tongue, it should be discontinued (*ante*).

2160. *In Irritability of the Stomach, Nausea, Vomiting, &c.*, effervescing draughts (*ante*) sometimes succeed in allaying morbid gastric irritation. A few drops of tinct. of opium, or hydrocyanic acid, or tinct. of calumba, may be advantageously added. Its efficacy is partly due to the generation of carbonic acid gas, resulting from the mixture.

2161. *In Dyspepsia and other Diseases, attended with copious secretion of mucus*, tartaric acid, either alone or combined with a base, particularly the acid tartrate of potash, is stated by Mr. Morgan,[1] of Glasgow, to be of the highest service. It has been advised in *Dysentery*.

2162. *a.* Terebinthina Argentoratensis. Strasburg Turpentine. Obtained from Pinus Picea, *Linn.* Contains about 35 per cent. of volatile oil.

b. Terebinthina Canadensis. Canadian Balsam or Turpentine. Obtained from Abies balsamea, *Aiton.* Contains about 18 per cent. of volatile oil. *Source*, Canada. This is the only officinal article of this class.

c. Terebinthina Chia. Chian, or Chio Turpentine. Obtained from Pistacia Terebinthus, *Linn.* *Source*, Isle of Chio and Southern Europe.

d. Terebinthina Veneta seu Laricea. Venice Turpentine. Obtained from Larix Europæa, *Linn.* Contains from 18 to 25 per cent. of the volatile oil.

[1] Edin. Med. Surg. Journ. No. lv. p. 16.

e. TEREBINTHINA VULGARIS. Common Turpentine. Obtained from various species of Pinus. Contains from 5 to 25 per cent. of the volatile oil.

The above terebinthinates closely resemble each other in medicinal properties, being stimulant and diuretic, and exercising a powerful effect upon mucous membranes, particularly those of the genito-urinary organs. Their activity depends upon the volatile oil which they contain, those having the largest quantity being the most efficacious; but the Canada variety is often preferred on account of its less disagreeable flavour.

The Dose is gr. xx.–gr. lx., in emulsion with yolk of egg or mucilage; or the softer kinds may be solidified by the addition of calcined magnesia, and given in the form of a pill. They formerly entered into the composition of several officinal plasters and ointments.

Therapeutic Uses. Similar to those of Oleum Terebinthinæ, but much less certain and speedy in their operation.

2163. *In Chronic Gleet*, Chian turpentine has been sometimes given internally with excellent effect. *In Chronic Inflammation of the Prostate Gland*, it is spoken of in the highest terms by Mr. Adams,[1] who considers that it exercises a specific action on the prostatic part of the urethra, and on the gland itself.

2164. *Wounds.* As a dressing for wounds, M. Kerner,[2] of Mulhouse, after ample experience, pronounces the following a most valuable as well as a cheap application:—Venice Turpentine lb. ij. oz. viij., Bicarb. of Soda drm. vj½., Water Oxviij., imperial measure. This is to be digested for six days in a bath at a temperature not higher than 75° C., and then filtered. It constitutes a highly soluble turpentine soap, which is very cheap, and evaporates slowly. The cicatrization of even very large wounds, under its use, is said to be wonderfully rapid, at the same time that the application diminishes the secretion of pus and removes all fetid smell. A compress consisting of eight folds of linen well soaked in the solution is applied over the whole surface and left on, covered with oiled silk, for twelve hours, being moistened with a little additional solution every four or five hours. Granulation is speedily established.

2165. TEREBINTHINÆ OLEUM. Oil of Turpentine. The oil distilled from the oleo-resin (turpentine) obtained from Pinus palustris, *Miller*, Pinus Tæda, *Linn.*, and Pinus Pinaster, *Aiton*.

Med. Prop. and Action. Diuretic, astringent, and styptic, in doses of ♏viij.–♏xxx.; anthelmintic purgative, or as a revulsive, fl. drs. ij.–fl. oz. j. It is best given in emulsion with gum, or with the yolk of an egg, and Dr. Copland advises the addition of tincture of capsicum, which corrects the nausea which the oil occasionally produces. When swallowed, it causes a sensation of warmth in the stomach, at first acting as a stimulant, and afterwards as a depressant of the arterial system; it becomes absorbed into the circulation, and displays its presence in the urine, in the

[1] Dis. of the Prostate Gland, 1851. [2] Braithwaite's Retros., lii. p. 262.

cutaneous secretion, and in the breath. In whatever manner it is introduced into the system, it communicates a violet odour to the urine; when the vapour is inspired, it is perceptible in the urine in fifteen minutes; and when rubbed on the skin, in about twenty-five minutes. In large doses it produces nausea, vertigo, &c., and in some instances, a cathartic operation; this, however, is very uncertain, but when it does occur, it interferes with its action as a diuretic, its only effect then upon the urine being to convey to it the peculiar violet odour. It is chiefly in small or moderate doses that it seems to affect the urinary organs. In some persons, turpentine, in any form, or in any dose, produces very unpleasant effects; coma, intoxication, violent strangury, and eruptions of the skin. M. Bouchardt[1] found the following symptoms induced by his exposure for five or six hours to the vapour of turpentine:—Sleeplessness, constant restlessness, heat of skin, pulse increased from 65 to 86 beats in the minute, some difficulty in passing the urine, which smelt strongly of turpentine. On the following day, there was great lassitude, with weight and pain in the region of the kidneys; these symptoms did not pass off for two or three days. Dr. T. Smith cautions against giving it alone in cold weather, as under such circumstances it tends, like other hydrocarbons, to supply fuel for the evolution of animal heat, rather than to exhibit any therapeutic property; to insure its purgative effect, therefore, it should be conjoined with castor oil. Externally applied, it is a valuable counter-irritant, acting speedily and effectually; for this purpose, hot epithems or stupes are superior to all other modes of application; they may be applied in two ways:—1. By steeping a flannel in hot water, as hot as can be borne by the hand, wringing it out dry, and sprinkling the surface freely with oil of turpentine. 2. By steeping a layer of lint or linen in oil of turpentine, placing it over the affected surface, and immediately applying over it flannel heated as hot as can be borne. In either way it acts admirably, and is generally far more effectual than sinapisms. For the purpose of inhalation, Dr. Smith[2] advises the vapour to be diffused through an apartment by aid of a spirit-lamp. As a bath, he advises Soda lb. ij., Camphine Oss., Oil of Rosemary fl. oz. ½, Water q. s.; he states that it calms the pulse, softens the skin, and renders the respiration easy. When its internal use causes strangury, diluents and demulcents should be drunk plentifully, and opiate enemas employed.

Dose:—Of the Oil of Turpentine, ♏v.–xxx. as an astringent and diuretic; ♏xxx.–lx. as a stimulant and antispasmodic; fl. drm. j.–iv. as an anthelmintic purgative. It may also be given in *Enema* (fl. oz. j., Mucilage fl. oz. xv.) *Of the Confection* (Oil of Turpentine fl. oz. j., Powdered Liquorice Root oz. j., Honey oz. ij.), fl. drm. j.–ij. *Prep. for external use: Liniment of Turpentine* (Soft Soap oz. ij., Camphor oz. j., Oil of Turpentine fl. oz. xvj. Dissolve the camphor in the oil, then add the soap and mix thoroughly.) *Liniment of Turpentine and Acetic Acid* (Oil of Turpentine, Acetic Acid and Liniment of Camphor āā fl. oz. j., M.) *Ointment* (Oil of Turpentine fl. oz. j., Resin gr. lx., Yellow Wax, Prepared Lard āā oz. ½. Melt together with heat.)

2166. *Therapeutic Uses. Typhus and Typhoid Fever.* Although the oil of turpentine exercises no direct curative action in these fevers, it is of great value in meeting certain indications, and combatting certain symptoms; thus, for the relief of the *Abdominal Tenderness and Pain* in typhoid fever, turpentine epithems are of the greatest service; they also prove most useful in relieving *Tympanitis*, and their benefit is still further increased by the use of turpentine enemas, which may be repeated as often as required with manifest advantage. For

[1] Bouchardt's Annuaire, 1846. [2] Lond. Jour. of Med., April, 1850.

arresting *Intestinal Hæmorrhage*, the oil of turpentine (♏ x.–xv. every half-hour or hour) is often effectual. Dr. Harley (i. p. 632) regards it as especially useful in cases where there is a tendency to syncope. Again, in the advanced stages of either of these fevers, when there is great *prostration* with coma, stupor or delirium, with subsultus tendinum, turpentine, either by mouth or in the form of enema, often arouses the vital powers, and exercises a good influence. *In the Bronchitis of Typhus Fever and other Adynamic Fevers*, the effects of turpentine internally, to use the words of Dr. Murchison (p. 283), are sometimes marvellous. In extreme cases, when the tubes are filled with secretion, the face livid, and the patient has not the strength to cough, or when other remedies fail, recourse should be had to turpentine. It may be given as follows:— ℞ Ol. Terebinth. ♏ x.–xx., Spt. Æther. Sulphuric. vel Chloric. ♏ xv.–xxx., Spt. Juniper. Co. ♏ xxx., Mist. Acaciæ f℥jss., M. This may be repeated every two hours at first, until the desired effect is produced. After a few doses, the patient often begins to cough and to expectorate large quantities of viscid mucus, with great relief to the respiratory symptoms. Under its use the urine is increased. Next to turpentine, Dr. Murchison thinks the following worth a trial:—℞ Creasoti, Acid. Acetic. āā ♏ viij., Spt. Æther. Co. Syrup. āā f℥ss., Aquæ f℥vij., M., sumat. coch. mag. ij. 2â vel 3â qq. horâ.

2167. *In Puerperal Fever*, the treatment by oil of turpentine (oz. ½–oz. j. every 4 hours) introduced by Dr. Brenan, of Dublin, in 1814, was for some years held in considerable esteem, but it has fallen into disuse, partly perhaps on account of the unpleasantness of the remedy, and partly from the frequent failures which attended its use. Sir C. Locock[1] states that it is now and then successful; he adds, "But as a forlorn hope, after effusion has taken place, we have known it tried, and in two cases with success." Dr. Churchill,[2] after observing that he has never seen it exert any remarkable influence on the disease, judiciously observes, that it is certainly beneficial when the intestines are tympanitic, especially in the form of enema, and as a counter-irritant to the abdomen.

2168. *In Bilious Remittent (Yellow) Fever*, turpentine, both by mouth and in the form of enema, has been favourably reported of, but further evidence is required to support its claims to utility. Dr. Ward,[3] in the treatment of the *Malarious Intermittents of Ceylon*, found great advantage from the administration of f℥ss.–f℥j. of spirits of turpentine (with a sufficient quantity of castor oil to act as a cathartic) at the commencement of the cold stage. The remedy was repeated every suc-

[1] Lib. of Med., vol. i. p. 355.
[2] Midwifery, p. 471.
[3] Amer. Med. Times, Sept. 15, 1860.

ceeding cold stage, and he states that he frequently found no other treatment was required.

2169. *In Internal Inflammations*, few measures are more generally applicable or more serviceable than hot turpentine epithems. In thoracic inflammations (*Pneumonia, Pleuritis, Bronchitis and Pericarditis*), no less than in abdominal ones (*Enteritis, Peritonitis, Hepatitis, and Gastritis*) and those of the genito-urinary system (*Uterine, Ovarian, and Vesical*), they may be applied over the seat of the disease with manifest advantage. They may be had recourse to at a far earlier period than blisters, and they seem in many instances to aid materially the operation of internal remedies in arresting the inflammatory action, often giving immediate relief to existing pain and distress. *In Inflammation of the Brain*, they are best applied to the extremities; in these cases turpentine enemas are often productive of good. *In Nephritis*, large linseed-meal poultices are perhaps preferable to these epithems, as the absorption of the turpentine may serve to increase the action of the kidneys. As an internal remedy in inflammation, turpentine is lauded by Dr. Copland, but it is inferior in efficacy to many other remedies, and its nauseous taste is a great objection to its use. *In the advanced stages of Inflammation of the Brain*, however, it may be worth a trial. When this is attended by coma, rapid, irregular, and trembling pulse, and great prostration, he states that the following draught, given four hours after a full dose of calomel and camphor, has in his practice been productive of the best effects:—℞ Ol. Terebinth., Ol. Ricini āā f℥ij., T. Capsici ♏xij., Ol. Cajeput. ♏vj., Aq. Menth. Vir. f℥jss., M. *In Chronic Inflammation*, turpentine liniment is preferable to epithems.

2170. *In Internal Congestions, especially of the Lungs and Liver*, the effects of hot turpentine epithems are often most beneficial. They may also be used with advantage in *Congestion of the Spinal Meninges.*

2171. *In Hæmorrhage*, oil of turpentine has long been held in high esteem as a styptic; indeed, John Hunter regarded it as the best, if not the only true one. Although this is by far too high an estimate of its powers, yet in certain non-inflammatory cases it has been found to act speedily and efficiently, when given in doses of ♏x.-xx.-xxx. every two or three hours. Cases of *Hæmoptysis, Hæmatemesis, and Hæmaturia*, successfully treated by it are on record; but it may admit of a question whether it possesses any superiority as an hæmostatic over acetate of lead, perchloride of iron, and other less nauseous remedies. Should these fail in the first instance, turpentine is well deserving of a trial.

2172. *In Uterine Hæmorrhage*, Dr. Tilt (p. 229) characterizes turpentine as a reliable remedy; he considers that the purer and

less offensive taste of the kind now sold as "Fir-wood oil," will facilitate its exhibition. Dr. Wilks has borne testimony to its value, and Dr. Fordyce Barker reports favourably of it in the treatment of *Abortion;* given as an enema, he found it act as an effective oxytocic as well as hæmostatic. (Dr. Tilt.) *A severe case of Uterine Hæmorrhage*, occurring three days after confinement, which yielded to turpentine enemas (fl. oz. j. in mucilage), is recorded by Mr. E. Garraway,[1] who entertains a high opinion of the powers of turpentine, not only in this, but in other forms of hæmorrhage. In the above case, hot turpentine epithems to the abdomen were also employed. *In Hæmorrhage from Piles*, its internal exhibition, in doses of f℥ss. three or four times a day, according to Dr. Burne,[2] not only arrests the bleeding, but prevents its recurrence; in these cases it is a valuable remedy. *In Epistaxis and in Hæmorrhage from Wounds*, it may also be given internally, with great advantage; and *in that from Leech-bites, or following the extraction of a tooth*, it proves more effectual when locally applied.

2173. *Nervous and Spasmodic Affections. In Hysteria*, turpentine is useful in many ways. As a means of arresting a severe paroxysm, when ordinary means fail, a turpentine enema is often effectual; it also proves very serviceable in these cases when given internally. *In Hysterial and Nervous Headaches* of young women, Dr. Graves (ii. p. 313) places much reliance on this medicine, given in doses of f℥j. to f℥ij., and repeated according to its effects. "The best vehicle," he observes, "is cold water; some will bear and derive advantage from two or three doses of this medicine in the day, experiencing from its use a diminution of headache, the removal of flatulence, together with a moderate action on the bowels and kidneys." It may also be employed in the form of enema. From the dysuria which it occasionally causes, the medicine cannot, in some instances, be persevered in. *In the Neuralgic pain in the left side occurring in hysterical females*, hot turpentine epithems often prove signally useful. *In Catalepsy*, turpentine in enemas, and in embrocations along the spine, offers the best chance of obtaining a cessation of the paroxysm.

2174. *In Epilepsy*, turpentine has the recommendation of several high authorities. Sir T. Watson (i. p. 654) observes, that if he were called upon to name any single drug from which, in ordinary cases of epilepsy, he should hope for relief, he should mention turpentine. It is spoken of as valuable in these cases by Dr. Headland,[3] who prescribes it in half-drachm doses thrice daily, or in a single dose of fl. drm. iij. at occasional intervals, combined with an equal quantity of castor

[1] British Medical Journ., July 10, 1869.

[2] Cyc. Pract. Med., vol. iv. p. 594.

[3] Lancet, Jan. 6, 1866.

oil. Notwithstanding these testimonies, it has never come into general use, probably from its nauseous taste. The form of epilepsy to which it seems best adapted, is that dependent upon an over-loaded state of the bowels, or upon the presence of worms (a very common cause); in these cases it should be given in doses sufficient to prove cathartic. It may also partly act in other cases, as a stimulant and derivative. *In Chorea*, it has been given with the view of obtaining its anthelmintic, purgative, and stimulant effects; it is favourably spoken of by Dr. Radcliffe (ii. p. 138), but he has abandoned its use for cod-liver oil (*q.v.*)

2175. *In Puerperal Convulsions*, turpentine enemas prove of the highest service; they are advised by Sir C. Locock,[1] both in the active and in the atonic varieties. *In the Convulsions of Children*, Dr. Copland (i. p. 431) advises the use of turpentine liniment, to be rubbed on the epigastrium and abdomen or along the spine. Dr. Graves (i. p. 584) mentions a case in which the following mixture proved successful, when other remedies had failed:—℞ Ol. Terebinth. f℥j., Ol. Ricini f℥iv., Syr. Papav., Mucilag. Arab., Aq. Fœnic. āā f℥ij., M. cap. f℥j. 3tiis horis. *Puerperal Mania*, when it assumes a chronic form, is best treated by stimulants. Of these, Dr. Prichard[2] says, the oil of turpentine, when not offensive to the stomach, is the best we can employ. Dose, fl. drm. j. thrice daily, in cinnamon-water.

2176. *In Tetanus*, turpentine occasionally exercises a beneficial influence. Dr. Philips[3] details a case in which the jaw fell immediately after the administration of an enema containing it; and other instances are recorded in which it appears to have mitigated the severity of the symptoms. It is chiefly adapted for idiopathic tetanus. In a case under my care, relaxation of the spasms followed the exhibition of fl. oz. ij. of oil of turpentine with fl. oz. j. of castor oil; the patient soon afterwards passing six long worms (*Lumbrici*). It should not be trusted to alone, but it proves a valuable adjunct to other remedial measures.

2177. *In Apoplexy*, turpentine enemas, and counter-irritation by hot turpentine epithems to the extremities, are measures sometimes attended with beneficial results. When the patient can swallow, a full dose, with an equal quantity of castor oil, may be given internally as a purgative.

2178. *In Neuralgic Affections*, great benefit has been found in some cases, from freely unloading the bowels by active cathartics (*q.v.*), and for this purpose turpentine, were it not for its nauseous taste, is well adapted. Dr. Copland (ii. p. 891),

[1] Cyc. Pract. Med., ii. p. 482.
[2] Ibid., vol. ii. p. 872.
[3] Med. Chir. Trans., vi. p. 65.

whose estimate of it is very high, considers that a strong recommendation to it is that it is equally appropriate to the inflammatory and to the non-inflammatory states of the affection, and the further fact that relapses are less frequent after it than after any other remedy. Dr. Ducros[1] mentions having repeatedly seen cases of *Sciatica* which had resisted ordinary means, yield to turpentine enemas; in one instance the pain yielded to one enema containing fl. oz. j. of the oil, but generally it requires to be repeated several times. In the more obstinate cases of sciatica, Dr. Anstie (ii. p. 750) considers that its internal administration (♏x. thrice daily) is at least worth a trial, although, he adds, it is commonly very disagreeable to the patient.

2179. *In Lumbago*, of internal remedies, none, according to Dr. Fuller (p. 433), prove more useful, when the bowels are regular and the urine clear and abundant, than oil of turpentine, and few are less serviceable when the bowels are costive, and the urine is high-coloured and loaded. In doses of ♏xx.-xxx. it is an agent in which the greatest confidence may be placed, and is often effectual after guaiacum and other remedies have failed. The only serious objection to its use is the possibility of its giving rise to strangury and nephritic irritation; but if care be taken, no fear on this score need be entertained. It may be given as follows:—℞ Sp. Terebinth. Mucilag. Acaciæ, Mellis. āā fl. oz. ss. Dose, a teaspoonful thrice daily. (Dr. Fuller.) Much relief sometimes follows the application of hot turpentine epithems, and also from frictions with turpentine liniment.

2180. *In Chronic Rheumatism*, Dr. Fuller (p. 416) speaks highly of the oil of turpentine, in doses of ʒss.-ʒj. Were it not for its nauseous flavour, and for the strangury which often follows its use, he considers that it would be very generally adopted as a cure in obstinate and protracted cases. He found it sometimes particularly useful combined with bark. Its external application, as advised in the last section, sometimes affords manifest relief.

2181. *Diseases of the Abdominal Viscera. In Spasmodic Affections of the Bowels*, hot turpentine epithems often prove most serviceable, even when ordinary fomentations fail of affording relief. *In Flatulence and Flatulent Colic*, a turpentine enema is often productive of much good. *In Ileus*, Dr. Copland (i. p. 278) remarks, that notwithstanding constant or even fæculent vomiting, advantage will sometimes be derived from a full dose (fʒiv.-fʒx.) of the unrectified oil of turpentine, taken with aromatics, &c. He adds that he has seen the vomiting cease, and the distention of the abdomen rapidly subside, immediately after this draught, which should be

[1] Brit. and For. Med. Rev., vol. i. p. 569.

repeated if the former is rejected. *In Colica Pictonum*, it also proves of great service.

2182. *In Cholera*, hot turpentine epithems applied successively to the abdomen, over the cardiac region and along the spine, and to the extremities, appear often materially to aid other remedial measures in stimulating the system and raising the vital powers. Turpentine frictions and turpentine enemas may also be resorted to as aids to other treatment. Its internal administration, as advised in hæmorrhage (sect. 2171), promises to be a remedy of value, and is well worthy of further trials.

2183. *In the advanced stages of Acute Dysentery, and also in the typhoid and malignant forms of this disease*, Dr. Copland (i. p. 729) speaks highly of the value of turpentine epithems applied to the whole abdomen, and allowed to remain on as long as the patient will endure them. The most usual effects are a most copious perspiration, with burning heat of the skin where they are applied; and, consequent on these, a total remission of the tormina and tenesmus. *In Chronic Diarrhœa*, the same applications are often of great service.

2184. *As a solvent of Biliary Concretions or Gall Stones*, M. Durande, in 1790, proposed a mixture of two parts of sulphuric ether and three parts of oil of turpentine. It was advised in doses of about fl. drm. ½, repeated twice or thrice daily. It has also been highly spoken of by Ritcher, Soemmering, and other Continental physicians. Amongst British practitioners, the solvent power of this mixture is generally considered very doubtful; although in some instances it has been found useful in decreasing the frequency of the paroxysms attendant on the passage of these concretions, and also in allaying the pain when present. Dr. Copland (i. p. 396) speaks favourably of this remedy; and it has been employed, with apparent success, by Dr. Martin-Solon,[1] who advises the above mixture in two-drachm doses. Whatever virtue this mixture may possess is probably due more to the ether than the turpentine, the former being a ready solvent of chlorestine.

2185. *In Ulcer of the Stomach*, turpentine epithems and sinapisms to the epigastrium tend to relieve the pain; they are chiefly useful in chronic cases in which the strength is reduced. In comparatively recent cases in the young and well-nourished, blisters are preferable. When the powers of the system are exhausted by constant vomiting, and pain still forms a prominent symptom, dry-cupping is more effectual than turpentine. (Dr. Brinton, p. 167.)

2186. *Against Worms, particularly A. Lumbricoïdes, and Tænia*

[1] Gaz. des Hôp., March 10, 1849.

or Tape-worm, the oil of turpentine is very effectual. It appears to act specifically on the worms, as under its use they are generally expelled lifeless. Dr. Fenwick, of Durham, introduced it to notice in 1811, since which time it has been extensively employed. It is best given two or three hours after a meal; if taken on an empty stomach, it is apt to produce vomiting; the patient should remain quiet after taking it, the remedy being then less likely to disturb the stomach; broths and mucilaginous drinks should be taken during its operation. Dr. Mason Good places the dose for an infant at ℥xxx.-lx. in a little milk, and fl. oz. j. for a child of ten or eleven years old; that for an adult is generally placed at fl. oz. ij., but these doses appear to be unnecessarily large. Dr. Headland[1] finds it act effectually in doses of fl. drm. iij. combined with an equal quantity of castor oil; the latter, he observes, prevents those unpleasant head symptoms which are apt to arise when the turpentine is given alone. He regards this combination as superior to the oil of male fern. Dr. West (p. 638), while admitting it to be a very efficacious remedy, observes that the violent effects which it sometimes produces, as well as the temporary intoxication which follows its administration in a large dose, have withheld him from giving it to children. Still, he adds, it is to be borne in mind that it is a most energetic vermifuge; while the unpleasant symptoms that follow its use are not dangerous, and soon pass away, especially if it be given with an equal quantity of castor oil. For the removal of *Ascarides Vermiculares or Thread-worms*, a turpentine enema often proves effectual.

2187. *In Diseases of the Genito-urinary Organs*, the oil of turpentine exercises a powerful influence. *In Amenorrhœa*, turpentine enemas have been employed by Dr. Elliotson[2] with great success. He relates three obstinate cases (one of them was of eighteen months' standing) in which the use of an enema, composed of fl. oz. ½ of the oil and Oj. of barley-water, repeated once or twice a day, was attended with a speedy return of the catamenia.

2188. *In Cancer of the Uterus*, Dr. Dewees (p. 274) found the spirit of turpentine, in doses of gutt. xx., procure sleep, when it could not be obtained from opium.

2189. *Gonorrhœa, Gleet, and Leucorrhœa*, when chronic and unattended by inflammatory symptoms, often improve under turpentine, in small and repeated doses. Dr. Pereira (ii. p. 314) states that he has frequently employed it in the former affections as a substitute for copaiba; and considers that it acts by setting up a new kind of irritation in the affected membrane, which supersedes the previously existing disease.

[1] Lancet, Jan. 6, 1866. [2] Lectures on Medicine, &c.

2190. *In Suppression of Urine*, Dr. Pereira (op. cit.) found oil of turpentine succeed in reproducing the urinary secretion, when other powerful diuretics had failed. It has also been advised *in Ulceration, and some other Chronic Affections of the Kidneys and Bladder*, but though doubtless of great service in proper cases, it is far from being a remedy to be indiscriminately employed; so long as any acute inflammatory symptoms are present, there is danger of its increasing them by its stimulant properties. The milder terebinthinates are generally preferable.

2191. *When a Urinary Calculus is present in the Bladder, it often gives rise to intense agony;* this may be frequently relieved by an enema composed of fl. oz. ss. of oil of turpentine, mixed with the white of an egg, and Oj. of barley or rice water. It should not, however, supersede the use of the hip-bath, opium, and the internal administration of the fixed alkalies. (Dr. Cummin.[1])

2192. *Diseases of the Chest.* In cases of *extremely severe or neglected Bronchitis associated with Emphysema of the Lungs*, when the surface of the body becomes cold, and the pulse exceedingly small and feeble, and when, from the accumulation of fluid in the bronchial tubes, and the inability to expectorate, asphyxia is threatened, ordinary stimulants prove of little avail. In these cases Dr. Waters (p. 188) has been induced to try large doses of turpentine, on a plan originally suggested by Sir D. Corrigan, of Dublin. He records a case in which, under this treatment, the patient rallied, the expectorating power was increased, the dyspnœa became less, and recovery took place from a condition which had appeared hopeless. Valuable as it is, caution is necessary in its use; it should not be given in large doses at first, or it may produce great depression; the best plan is to begin with ♏xxx.–lx. every two or three hours, and then if necessary to give a larger dose (up to fl. oz. ½) less frequently. *In Chronic Bronchitis*, the following liniment, supposed to be an imitation of that used by St. John Long, is stated by Dr. Graves (ii. p. 21) to be highly serviceable:—℞ Ol. Terebinth. f℥iij., Acid. Acet. Fort. f℥ss., Vitel. Ovi j., Aq. Rosmar. f℥ijss., Ol. Limon. f℥j., M. This should be well rubbed in over the chest, the nape of the neck, also over the epigastrium, and in the course of the cervico-spinal and pneumogastric nerves generally. In *Gangrene of the Lungs*, Skoda[2] successfully employed terebinthinate inhalations prepared by pouring the spirit of turpentine on boiling water; the patient is directed to inhale the vapour for fifteen minutes every two hours.

2193. *In Asthma and Angina Pectoris*, hot turpentine epithems

[1] Cyc. Pract. Med., vol. i. p. 356. [2] Med. Times, April 15, 1853.

to the chest often seem to mitigate the severity of the paroxysms; they are especially useful in the old and debilitated. Applied over the cardiac region, they often mitigate in a marked degree *Nervous and Hysterical Palpitations*.

2194. *In various Throat Affections*, Dr. Symonds[1] speaks highly of a combination of equal parts of glycerine and oil of turpentine. Whether, he remarks, the throat be red and puffed, or pale and œdematous, or studded with superficial ulcers, or opaque yellow patches of epithelium, this combination is at once curative and comforting. He mentions a severe case of *Ulceration of the Tonsils*, which, after resisting nitrate of silver and other remedies, was cured by it. *In Diphtheria*, at the very commencement, or in slight cases, he also advises its application; in this affection, and also in *Croup*, the application of hot turpentine epithems often affords great relief to the local distress. *In simple Catarrhal Diseases*, Dr. Beigel[2] has derived benefit from turpentine inhalations.

2195. *Diseases of the Eye. In Syphilitic and Idiopathic Iritis, in Rheumatic Iritis, in incipient Gangrene of the Cornea, and in Chronic Choroiditis*, the internal exhibition of spirit of turpentine has been found serviceable. *In Iritis*, it was first recommended, in 1829, by Mr. Carmichael, in drachm doses thrice daily. Strangury may be obviated by the copious administration of linseed tea, and a few grains of the carbonate of soda will correct any acidity to which it may give rise. It is best given in emulsion, and proves particularly serviceable in arthritic cases, and in those in which mercury is contra-indicated. M. Trinchinetti[3] has published numerous cases of the above-named diseases of the eye, treated solely and successfully by the oil of turpentine, given in the manner advised by Mr. Carmichael. Speaking of its employment in iritis, Mr. Guthrie[4] reports that he found the oil in some cases succeed admirably; in others, it was of little service; and in some, unequal to complete a cure. *In Amaurosis*, Dr. Copland (i. p. 61) found it successful in two cases; and in this disease, as well as in *Hydrophthalmia*, Mr. Hocken[5] employed it with the best results. It has also been found effectual in some cases of *Hemeralopia* and *Nyctalopia*.

2196. *Dropsical Affections. In Ascites*, not connected with renal disease, with great gastric irritability, nor with inflammatory action, oil of turpentine is occasionally beneficial, when given in doses sufficient to act freely on the bowels and kidneys. *In Ovarian Dropsy*, it has been advised externally, but is of very doubtful efficacy. *In incipient Hydrocephalus*,

[1] Brit. Med. Jour., March 14, 1868.
[2] Practitioner, Aug. 1868.
[3] Journ. del Sci. Med. Chir., Aug. 1836.
[4] Lond. Medical Gazette, iv. p. 309.
[5] Lancet, May 8, 1841.

turpentine, in doses of ♏v.–x., with ♏xx.–xl. of castor oil, is advised by Dr. Copland (i. p. 681), who also speaks favourably of terebinthinate enemas; administered in the latter mode, it often proves serviceable.

2197. *In Purpura Hæmorrhagica*, Dr. Neligan[1] employed oil of turpentine with invariable benefit; he gave it in doses sufficient to purge freely, which object is more certainly attained by combining it with castor oil. To a child æt. six years he gave f℥ij., night and morning, for five successive days. Dr. Hillier (p. 350) mentions having employed it in several cases with good results, and Dr. Budd[2] relates a case in which its efficacy was unequivocal. Dr. Pereira (ii. p. 314), however, states that he has seen it act injuriously, while blood-letting has seemed to relieve; but these cases must be regarded as exceptions to the general rule.

2198. *In Melæna*, oil of turpentine has been successfully employed by Drs. Adair, Cheyne, Elliotson, Brooke, Copland, and others. Dr. Brooke's formula is as follows:—℞ Ol. Terebinth. gutt. xxv., Aq. Cinnam. f℥j., Syr. Aurant. f℥j., M. ft. haust. ter in die sumend.

2199. *Erysipelas.* Mr. Nunneley[3] observes, that "it is certain that in some instances where coma has been intense, the pulse sinking, the tongue dry and glazed, and the teeth imbued with sordes, after other remedies had been abandoned in despair, the administration of oil of turpentine has apparently saved the patient." Dr. Copland advises turpentine epithems to be locally applied.

2200. *In Chronic Enlargements of the Joints, and for Bruises and Sprains*, turpentine liniment is a serviceable application.

2201. *Irregular Gout.* When much flatulent distention and severe colicky pains attend the internal seizure, or remain after other medicines are employed, equal parts of oil of turpentine and of castor oil (f℥iv. to f℥vj. of each) may be given on the surface of an aromatic water, with or without a warm tincture; and an enema containing the same oil may be administered a few hours afterwards, to promote its operation. (Copland.)

2202. *Poisoned Wounds. When a wound is received in dissection*, Dr. Colles[4] advises the immediate application of caustic; but if this is objected to, he recommends plunging the finger, without delay, into a cup of oil of turpentine. The irritation, he thinks, may counteract the power of infection, or alter the mode of inflammation in the wound. Dr. Bland,[5] of Sydney, reports very favourably of the spirit of turpentine (℥ij.–f℥iv.),

[1] Dublin Med. Journ., xxviii., p. 189.
[2] Lancet, 1851.
[3] On Erysipelas, p. 244.
[4] Dublin Hosp. Rep., iii. p. 222.
[5] Ranking's Abstract, 1861, vol. xxxiii. p. 127.

given internally or in enema, in cases of *Bites of the Venomous Serpents of Australia;* the other usual measures—ligatures, excision of the part, prevention of sleep, administration of stimulants—to be used also.

2203. *In Burns*, turpentine has been much employed, on the recommendation of the late Dr. Kentish. In severe cases, he applied tepid spirits of turpentine over the whole of the injured parts, and immediately afterwards an ointment composed of Cerat. Resinæ oz. j., and Sp. Terebinth. fl. oz. ½, spread on cloth or lint. The first dressing was allowed to remain on for twenty-four hours, when the parts were washed with proof spirit, or, in a few instances, with tepid laudanum. Care was taken not to allow the surface to be exposed to the air, and the dressings were not changed more frequently than was absolutely necessary. The general treatment consisted of alcohol or ether given internally, in proportion to the degree of injury; the whole subsequent treatment was tonic and stimulant. This mode of cure is chiefly applicable to extensive and dangerous burns, where the vital powers are greatly depressed.

2204. *In Deafness depending upon deficient secretion of Cerumen*, much benefit attends the following application:—℞ Ol. Amygdalæ vel Glycerini f℥ss., Ol. Terebinth. gutt. xl., M. Of this, a few drops may be dropped into the meatus, or introduced on a small piece of cotton.

2205. *For Chilblains*, a liniment composed of equal parts of turpentine, camphor, and olive oil, or of equal parts of turpentine and copaiba, is stated to prove very serviceable.

2206. *Porrigo Decalvans*, according to Dr. A. T. Thomson, seldom resists the application, twice or thrice daily, of a liniment composed of one part of the spirit of turpentine and two of alcohol.

2207. *Ulcers of the Extremities.* The internal use of turpentine appears, in these cases, to hasten the healing process. Mr. H. Hancock,[1] of Charing Cross Hospital, relates a case illustrative of its efficacy. Water dressings were applied locally, and the following mixture was given internally:—℞ Sp. Terebinth. f℥vj., Pulv. Acaciæ ℥vj., Aq. Menth. Pip. f℥vij., M. sumat. f℥j. ter in die.

2208. Thebaia or Paramorphia, an alkaloid obtained from opium. It occurs in the form of minute, colourless, rectangular plates or prisms, of an acrid styptic taste, soluble in about 45 parts of alcohol, more soluble in ether, and still more so in chloroform, and separating from these solvents in silvery crystals of the original form.

[1] Med. Times, July 6, 1850.

Med. Prop. and Action. Thebaia may be regarded as the tetanic constituent of opium; its operation closely resembling that of strychnia. Dr. Harley (p. 182), after detailing some interesting experiments on animals by the subcutaneous injections of solutions of this alkaloid, concludes that it acts almost exclusively on the motor centres, inducing in them that highest degree of excitement which results in cramp, and which is only fatal to life because it arrests the respiratory movements. It exercises no direct action on the heart; and so long as the excitant action is moderate, only acceleration of the breathing and some distress from over-excitement of the vagus, together with general muscular twitches, result. In one of Dr. Harley's experiments on a dog, in which grs. ij. in acetous solution were injected, the intensity of the rigor or spasm was such that the stiffened and motionless body could be held straight out by one of the hind legs. Death, in this case, ensued 45 minutes after the administration of the poison. Unlike the soporific constituents of opium, the action of thebaia is comparatively transient. It does not appear to have been employed as a therapeutic agent.

2209. THEOBROMÆ OLEUM. OIL OF THEOBROMA. Cacao Butter. A concrete oil obtained by expression and heat from the ground seeds of Theobroma Cacao, *Linn.* *Nat. Ord.* Sterculiaceæ. *Hab.* Tropical America.

Med. Prop. and Action. Emollient. Employed chiefly for pharmaceutical purposes, in which it has the great advantage of not becoming rancid on exposure to the air. It is an ingredient in all the officinal suppositories. It has no special therapeutic uses.

THERIACA. See SACCHARUM.

2210. THUS AMERICANUM. Common Frankincense. The concrete turpentine of Pinus Tæda, *Linn.*; the Frankincense Pine, and Pinus palustris, the Swamp Pine. *Source*, North America.

Med. Prop. and Action. It is only used externally as a stimulant, with other ingredients, in the form of plaster. It is contained in the Emplastrum Picis. (See PIX BURGUNDICA.)

2211. TORMENTILLÆ RADIX. TORMENTILLA ROOT. The root of Tormentilla officinalis, *Smith.* (Potentilla Tormentilla, *D.C.*) *Nat. Ord.* Rosaceæ. *Hab.* Great Britain and other parts of Europe.

Med. Prop. and Action. A powerful astringent; one of the most active indigenous drugs of the class. (Christison, p. 927.) Its astringency depends principally upon tannic acid, of which it contains about 17 per cent. It is best given in the form of decoction (oz. ij., Water Oj½. boiled to Oj.) in doses of fl. oz. j.–iij. twice or thrice daily. The addition of a little cinnamon renders it more grateful.

2212. *Therapeutic Uses. In the advanced stages of Dysentery and Diarrhœa*, when inflammatory action has been subdued, the decoction of tormentilla may be given with evident advantage. *In the Diarrhœa of Phthisis*, it is said to be particularly useful.

2213. *In Ulceration and Sponginess of the Gums*, the decoction proves useful as an astringent wash or gargle.

2214. *In Leucorrhœa and Gonorrhœa*, Dr. Morries[1] states that he has seen very good results from the use of the decoction as an injection; it is a good vehicle for alum, gr. xxx.–lx. to the pint.

2215. TRAGACANTHA. TRAGACANTH. A gummy exudation from the stems of Astragalus verus, *Olivier*, and possibly other species. *Nat. Ord.* Leguminosæ. *Source*, Asia Minor.

Med. Prop. and Action. Emollient and demulcent; its virtues in this respect residing in two distinct gummy principles—*Arabin* (53 per cent.) and *Bassonin*, sometimes called *Tragacanthine* (47 per cent.)

Dose:—Of Powdered Tragacanth, gr. xv.–xx. in emulsion. *Of the Compound Powder* (Tragacanth, Gum Acacia, Starch āā in powder oz. j., Sugar in powder oz. iij.), gr. xx.–xxx. *Of the Mucilage* (Tragacanth gr. lx., Water fl. oz. x.), fl. oz. j.–iij.

2216. *Therapeutic Uses. In the Cough of ordinary Catarrh, in that of Phthisis, &c.*, the compound powder, in emulsion with syrup of poppies or other sedatives, proves very useful in allaying the irritation. With liquor potassæ and hyoscyamus, it is very effectual in allaying *Ardor Urinæ in Gonorrhœa*. Combined with ipecacuanha, it also proves useful in *Dysentery*. Prof. Miller[2] advises the application of a thick semi-fluid aqueous solution of gum tragacanth to *Granulating Surfaces*, in order to protect them from the action of the air. It creates no irritation.

2217. TREEAK FAROOK. A thick, soft, black electuary much used in India in many affections characterized by œdema. It is an imported article, and from a printed paper in Persian characters which accompanies each canister, it is professedly the Theriaca Andromachi of old writers, and is prepared at Venice, whence it is exported to the East.

2218. *Therapeutic Uses. In Beriberi*, it has been extensively used in doses of gr. v.–xv. in the form of a pill. Dr. Malcolmson[3] advises the following formula:—℞ Pulv. Rhei ʒij½., Treeak Farook ʒ½, Conf. Aromat. ʒ½, Mellis q.s., M. et divide in pil. xlviij. sumat. ij.–iij. nocte maneque. If it purges, the quantity of rhubarb must be diminished. It often fails in the acute stage, and has little influence on the paralytic symptoms. It is chiefly useful in chronic cases when œdema forms the principal feature. The sparing use of fluids favours its operation.

[1] Graves' Hort. Medicus, p. 144.
[2] Brit. and For. Med.-Chir. Rev., Jan. 1851.
[3] On Beriberi, p. 296.

2219. *In Œdema of the Face*, unconnected with beriberi, occurring in the natives of India, it often proves signally beneficial when persevered in for two or three weeks. *In the Chronic Rheumatism* of the natives of India, which is often attended with œdema, it also proves very serviceable.

2220. TRITICUM REPENS, *Linn.* Couch Grass. Dog's Grass. *Nat. Ord.* Gramineæ. *Hab.* Europe.

Med. Prop. and Action. The underground stem or "root" is demulcent and diuretic, and has been thought by some Continental writers to partake of the properties of sarsaparilla. It is given in decoction (oz. ij., Water Oj. boiled for 15 minutes and strained) to the extent of fl. oz. xij.-fl. oz. xvj. daily, in divided doses. The taste of this decoction is rather agreeable than otherwise, and it produces no nausea nor derangement of the stomach. Though long employed in a variety of affections requiring demulcents, by the people of Europe generally, especially in France, it was first brought prominently forward in England by Sir H. Thompson[1] in 1861. To be effectual, he believes that the plant should be gathered in the spring, shortly before the leaves appear; he directs the stem to be then slowly dried, without artificial heat, and cut in short lengths for use. The decoction obtained from this is superior to that made from plants gathered indiscriminately at any time, and also to that obtained from herbalists.

2221. *Its Therapeutic Uses* are thus spoken of by Sir H. Thompson:—"*In Vesical Irritability produced by Inflammation of the Prostate and Neck of the Bladder, in severe Gonorrhœa when the Inflammation extends backward, in the Pain and Spasm caused by Calculus, and by Aggravated Stricture of the Urethra, as well as in some cases of Obscure Disease of the Bladder*, the good effects of this remedy have been very marked, and it has proved more efficacious than buchu. In cases of *Prostatic Enlargement* in elderly patients it has been of service, but less frequently so than in the conditions above named. It has also afforded great relief in *Renal Calculus*. In short, wherever micturition is very frequent or painful, depending upon hyper-sensibility of any part of the urinary passages from acute or sub-acute inflammation, with the signs of its presence in the urine itself, the symptoms are most materially relieved and the urine becomes clearer under the use of this remedy. If improvement is produced at all, it is generally very soon after commencing the medicine; and if none can be observed in four or five days, it is not worth while continuing to employ it." Dr. Graily Hewitt (p. 678) bears testimony to the value of this remedy *in Chronic Inflammatory Affections of the Bladder in women.*

2222. ULMI CORTEX. ELM BARK. The dried inner bark of the Broad-leaved Elm. Ulmus campestris, *Linn. Nat. Ord.* Ulmaceæ. *Hab.* Europe and temperate Asia.

[1] Lancet, Oct. 12, 1861.

Med. Prop. and Action. Astringent, tonic, and demulcent; the latter property residing in the mucilage, of which it contains a large proportion. Diaphoretic and diuretic properties have also been assigned to it. It contains a peculiar gummy principle, *Ulmin*. The best form of administration is the officinal decoction (oz. ij½. ad Aq. Oj.), in doses of fl. oz. ij.–iv. thrice daily.

2223. *Therapeutic Uses.* It is now rarely employed; but it appears to exercise considerable influence in *Lepra*, *Psoriasis*, *Herpes*, and some other diseases of the skin. Lettsom[1] succeeded with it in *Ichthyosis;* but the experience of Willan[2] is unfavourable to its use. Collingwood[3] employed it successfully in *Diarrhœa*.

2224. Uvæ Ursi Folia. Bearberry Leaves. The dried leaves of Arcostaphylos Uva Ursi, *Spreng. Nat. Ord.* Ericaceæ. *Hab.* Europe, Asia, and N. America.

Med. Prop. and Action. Astringent and diuretic. Their astringency is due to the presence of tannic and gallic acids; of the former they contain about 36 per cent. As a diuretic they are highly spoken of by Sir B. Brodie in irritative states of the genito-urinary organs. When taken internally they are absorbed into the system, and have been detected in the urine forty-five minutes after they have been swallowed. The decoction (Ph. Lond.) (Uva Ursi oz. j., Water Oj½. boiled to Oj.) is a good form for internal use.

Dose:—Of the powdered Leaves, gr. x.–xxx. *Of the Infusion* (Bearberry leaves bruised oz. ½, Boiling Water fl. oz. x.), fl. oz. j.–iij.

2225. *Therapeutic Uses. In Leucorrhœa*, it occasionally proves useful. Dr. D. Davis[4] states that he has had several opportunities of observing that the powdered leaves, in doses of gr. xxx.–lx., twice or thrice daily, had the effect of greatly reducing the quantity of the discharge. *In Chronic Gonorrhœa and Gleet*, it may be given with advantage.

2226. *In irritable states of the Bladder, particularly when these are the consequence of Disease of the Kidneys*, Sir B. Brodie (p. 140) employed the uva ursi with much advantage. He considers that its influence is confined to these cases, and recommends it in larger doses than are generally given. Thus, from drm. j.–ij. of the extract may be given daily; or from fl. oz. viij. to f℥xvj. of the following infusion:—℞ Fol. Uvæ Ursi oz. j., Aq. Ferv. fl. oz. xviij.; macerate for two hours, boil down to fl. oz. xvj., and strain. It requires to be persevered in for a considerable period before its good effects appear. If lithic acid be present in the urine, small doses of potash or liq. potassæ may be added; and if the urine be highly alkaline, the mineral acids may be substituted. Dr. Prout considers it more particularly useful when the affection

[1] Med. Memoirs, p. 152.
[2] On Cutaneous Dis., i. p. 139.
[3] Edin. Med. Comment., xvi. p. 58.
[4] Obstetric Medicine, p. 280.

of the bladder partakes more of an irritative than an inflammatory character.

2227. *In Chronic Cystitis and Cystirrhœa*, when the discharge from the bladder is copious, the decoction often proves highly beneficial in doses of not less than half a pint daily.

2228. VALERIANÆ RADIX. VALERIAN ROOT. The dried root of Valeriana officinalis, *Linn.* *Nat. Ord.* Valerianeæ. *Hab.* Europe.

Med. Prop. and Action. Stimulant, anti-spasmodic, and vermifuge. Active principles, a volatile oil, and an acid fatty matter, *Valerianic Acid*, which forms soluble salts with bases. It ranks in efficacy next to assafœtida, and is said to be a useful adjunct to cinchona in intermittents. Its unpleasant taste is effectually concealed by combining it with cinnamon.

Dose:—Of the powdered Root gr. x.–xxx. *Of the Infusion* (Valerian Root gr. cxx., Boiling Water fl. oz. x.), fl. oz. j.–iij. *Of the Tincture* (Valerian Root oz. ij½., Proof Spirit Oj.), fl. drm. j.–ij. *Of the Ammoniated Tincture* (Valerian Root oz. ij½., Aromatic Spirit of Ammonia Oj.), ♏xxx.–lx. *The Volatile Oil* (not officinal), in doses of ♏ij.–v., is a good form for administration.

2229. *Therapeutic Uses.* *In Epilepsy*, the value of valerian has been variously estimated, being highly spoken of by Willis, Fothergill, Brisbane, Haller, and others; whilst Cullen, Heberden, and Home, regard it as a remedy of very inconsiderable power. Dr. Copland (i. p. 808) thinks very favourably of its action when it is appropriately exhibited, and depletions and evacuations have been premised in plethoric cases. The essential oil and the ammoniated tincture are the best forms for internal use. It may also be exhibited in enemata. The same remarks apply to *Chorea*, but in this affection Dr. Hillier speaks of it as useless. The efficacy of this remedy is greatly increased by a combination with zinc. (See ZINCI VALERIANAS.)

2230. *In Insanity*, Dr. Copland (ii. p. 533) states that the infusion and ammoniated tincture of valerian have proved, in some cases of *Mania*, *Monomania*, or *Melancholia*, of great service. When these affections are associated with hysterical symptoms, or when the patient entertains an idea of committing suicide, or has a disposition to indulge or to adopt any dangerous caprice, these preparations are often beneficial, particularly after appropriate evacuations, and in combination with the acetate of ammonia, or with alkaline carbonates, or with digitalis, and hyoscyamus. *In Delirium*, when the vital energies are greatly depressed, it often proves useful combined with camphor.

2231. *In Typhoid Fevers*, Dr. Copland (i. p. 1031) states that he has given the infusion of valerian with advantage, and that he has made it the vehicle for the chlorate of potash, camphor, &c. It is indicated in such states of fever as require

a gentle tonic and nervine stimulant, particularly when the nervous symptoms are prominent, although the head be cool and the pulse weak; under these circumstances, it may be advantageously conjoined with camphor or tonics. *In the Coma of Typhus*, the essential oil of valerian was employed by Barrallier in 172 cases: the remedy was successful in 135, the effects in some instances being very remarkable. Dose, ♏j. in syrup and water every half-hour until ♏v.–viij. have been taken. (Murchison.)

2232. *In Acute Rheumatism*, Dr. N. J. Butler[1] has found great benefit from baths containing valerian. He directs lb. j. of the root to be boiled for a quarter of an hour in a gallon of water, and the strained liquor to be added to an ordinary bath at 98°, the patient remaining in it for twenty or thirty minutes. For any remaining inflammation about the joints, he applies linseed-meal poultices prepared with a strong decoction of valerian. He considers that valerian is of extraordinary efficacy in subduing the pain and inflammation, especially in the arthritic form of the disease.

2233. *In Hooping Cough and Laryngismus Stridulus*, Dr. G. Hill[2] speaks highly of the value of valerian. In the former, especially, he found it serviceable in alleviating the cough; producing a marked diminution within forty-eight hours, not only in the frequency of the paroxysms, but in their severity. He does not mention the dose or form employed.

2234. *In Diabetes Insipidus*, valerian, in large and rapidly increasing doses, was found by Rayer of great service, and Trousseau relates cases cured by its means. Dr. Reith[3] details a case in which it proved serviceable given in doses of gr. lx., increased to gr. cxl. daily, during the eleven days the patient was under treatment.

2235. *In the advanced stages of Pneumonia*, the ammoniated tincture has been found useful combined with camphor, but it is inferior in efficacy to musk.

2236. *In Neuralgia, particularly when associated with Hysteria*, the ammoniated tincture, combined with guaiacum, sometimes exercises a favourable influence.

2237. *In Hysteria*, it proves highly serviceable, and may be advantageously given, both during the paroxysms and in the intervals. In some cases, its beneficial effects are immediate; in others, the remedy requires to be persevered in for a short period. *In Hysterical Headaches*, it is particularly serviceable. Dr. Conolly[4] advises the following formulæ:—℞ T. Valerian. Ammon., Sp. Æther. Sulph. Co. āā ♏xxx., Mist. Camph. f℥jss., M.; or ℞ T. Valerian. Am. f℥j., Acid. Sulph. Dil. ♏xv., Mist.

[1] Med. Press, Aug. 5, 1868.
[2] Brit. Med. Journ., April 11, 1868.
[3] Med. Times, March 24, 1866.
[4] Cyc. Pract. Med., vol. ii. p. 583.

Camph. f℥jss., M. ft. haust. bis terve in die sumend. Dr. Ashwell speaks highly of the following:—℞ T. Valerian., Sp. Æther. Sulph. Co., Sp. Lavand. Co. āā ♏xxx., T. Hyoscyam. ♏xx., Mist. Camph. f℥x., M. *In Hysterical Palpitations*, the use of valerian is often attended with benefit. Either of the preceding formulæ may be given advantageously.

2238. *Muscæ Volitantes*, according to the experience of Mr. Ware, often disappear under the use of the annexed formula:—℞ T. Valerian. Am., T. Castor. āā f℥ij., Mist. Camph. f ℥vj., M. cap. coch. amp. j.-ij. pro dos.

2239. VERATRIA. VERATRIA. An alkaloid obtained (not quite pure) from Sabadilla (*q.v.*) It exists also in the rhizomes of Veratrum album and Veratrum viride.

Med. Prop. and Action. Acrid and sedative; but from the violence of its action it is rarely administered internally. Externally, it is used in the form of embrocation (gr. lx., Proof Spirit, fl. oz. ij.) or ointment. Its action is directed chiefly on the spinal cord. After it has been swallowed the patient experiences a dull, burning pain in the sacral region, various uneasy feelings through the abdomen, increased watery and slimy evacuations from the bowels, but seldom any diuresis. If its use be continued, it causes dryness and a sense of burning in the mouth, intense thirst, nausea, vomiting, bloody stools, coldness of the limbs, trembling, syncope, delirium, and paralysis; the urine is generally scanty, thick, and of a deep red colour (Reiche[1]). "When rubbed on the cuticle," observes Dr. Turnbull,[2] "it produces a strong sensation of tingling, or rather a feeling similar to that caused by receiving a succession of small electric sparks on an uncovered part of the body; this feeling is transitory." It may be rubbed on the skin for a short time without producing any redness of the parts. Dr. Reiche observed that its endermic use on the epigastrium excited nausea, a sense of tightness of the chest, electric-like dartings through the chest and abdomen, and painful twitchings of the limbs. The commencing dose is gr. $\frac{1}{30}$-$\frac{1}{30}$ in the form of pill, gradually and cautiously increased to gr. $\frac{1}{6}$. For external use, the officinal ointment is a good form:—Rub Veratria gr. viij. with Olive Oil fl. drm. $\frac{1}{2}$, and then mix thoroughly with Lard oz. j.

2240. *Therapeutic Uses. In Neuralgia, Tic Douloureux, and Hemicrania*, Dr. Turnbull (op. cit.) speaks highly of the external application of veratria ointment, rubbed in diligently, until it causes a sense of heat and tingling. Occasionally it affords great temporary relief, but it often fails entirely; it is inferior in every respect to aconitia. It may be advantageously applied in the subjoined form:—℞ Veratriæ gr. xx.-xxx., Sp. Rect. ℥vj., Glycerini ℥ij. This should be applied with a camel-hair brush night and morning, and well rubbed in along the course of the affected nerve. (Dr. Fuller, p. 465.) Like aconitia, it proves useless so long as any active or inflammatory symptoms are present. *In Chronic Gout and Rheumatism*,

[1] Med.-Chir. Rev, No. lxvii. p. 232.

[2] Med. Prop. of the Ranunculaceæ, p. 115.

in the absence of inflammatory symptoms, veratria ointment (gr. xxx., Ung. oz. j.) is advised by Dr. Turnbull, and appears occasionally to be of service. *In Gout*, it has the recommendation of Sir Charles Scudamore.

2241. *In Pneumonia*, veratria has proved very effectual in the hands of Prof. Vogt,[1] of Berne. He commences with five milligrammes (a milligramme is ·0154 of an English grain) every two or three hours, until it produce vomiting or diminution of the pulse. It is generally given in pills, but, if necessary, it may be given in solution. If the stomach is too irritable, the dose is reduced, and the veratria is administered in an effervescing draught, or with a little opium: the action on the pulse is more slow in developing itself, but it appears at last. Under this treatment, the proportion of deaths in serious cases did not exceed 8 per cent.

2242. *In Paralysis*, the diligent use of veratria externally is occasionally followed by great improvement; but it often fails to effect any beneficial change; it should be persisted in till it produces the tingling sensation above described. Dr. Forcke[2] relates nine cases in which it was productive of the best effects. *In Incontinence of Urine in Adults*, Dr. Kennard,[3] of New York, found the following ointment, rubbed into the perinæum thrice daily, an effectual application:—℞ Veratriæ, Morphiæ Sulph. āā gr. x., Axung. ℥j., M. *In Dysmenorrhœa*, M. Vannaire[4] found that half a drachm of an ointment containing $\frac{1}{100}$th its weight of veratria, rubbed over the hypogastric region twice daily, greatly relieved the pain.

2243. *Diseases of the Eye.* Mr. Howard[5] places much confidence in veratria as an external application in many diseases of the eye, particularly in those in which the ophthalmic branch of the fifth pair of nerves is either primarily or secondarily affected. The solution which he generally employs is composed as follows:—℞ Veratriæ gr. x., Æther. Sulph. f℥ij., Sp. Vin. Rect. f℥j., M. This is brushed over the eyelids, eyebrows, and temples till a slight burning sensation is produced in the parts, and it is repeated every morning. Great caution is necessary in its application, lest any of it get on the conjunctiva, for such an accident is productive of great pain. If its use be found to produce twitching of the muscles of the face, it should be discontinued. *In Scrofulous Ophthalmia*, applied as above, he states that it is one of the most valuable adjuncts to other remedies with which he is acquainted; that its immediate effects are to remove the morbid irritability, the intolerance of light, and the profuse

[1] Bull. Gén. de Thérap., Jan. 1860.
[2] Med.-Chir. Rev., No. lix. p. 229.
[3] Amer. Journal of Med. Sciences, Jan. 1857.
[4] Braithwaite's Retrospect, vol. xlv. p. 278, 1862.
[5] Pathology of the Eye, p. 228, et var. loc.

lachrymation, and to aid the operation of other constitutional remedies. *In Amaurosis, depending upon Paralysis of the Retina; in Ptosis, from Paralysis of the Levator Palpebræ;* and in *Mydriasis*, he strongly advises the solution, as above, conjoined with the use of electricity. *In painful involuntary spasmodic Contraction of the Orbicularis Muscle*, he believes that brushing the lids once a day with the solution of veratria constitutes the most efficacious local application. Notwithstanding Mr. Howard's testimony, veratria has failed to obtain favour in the treatment of eye diseases amongst British practitioners.

2244. VERATRI ALBI RADIX. White Hellebore Root. The dried rhizome of Veratrum album, *Linn.* *Nat. Ord.* Melanthaceæ. *Hab.* Europe.

Med. Prop. and Action. Purgative and emetic in doses of gr. j., gradually increased to gr. v.: in large doses it acts as an acro-narcotic poison; it is an uncertain and dangerous remedy, and has justly been discarded as an internal remedy in British practice. Its activity resides in the alkaloid *Veratria*, in combination with an acid supposed to be *Veratric*. The only form in which it should be administered internally is that of Vinum Veratri (L. Ph.) (White Hellebore sliced oz. viij., Sherry Oij.), in doses of ℥x.-xx. Externally it has been used in the form of ointment (oz. ij., Lard oz. viij., Oil of Lemon ℥xx.) in *Ringworm*, *Scabies*, and other skin diseases, and also *for destroying Pediculi*, but its use is not devoid of danger, as the active principle is apt to become absorbed into the system and produce poisonous effects.

2245. *Therapeutic Uses.* Very limited at the present day. It formerly enjoyed high repute in *Insanity*, *Epilepsy*, and other nervous affections, but it has been superseded by safer remedies. In *Gout and Rheumatism*, it has been proposed as a substitute for colchicum; but Dr. Garrod (p. 308) states that its action completely differs from that of colchicum, producing a burning sensation of the œsophagus, parched mouth, and intense thirst, accompanied by great depression, without any alleviation of the gouty symptoms. Its use as an errhine in *Amaurosis* (gr. j.-ij., with gr. x.-xv. of some inert powder), once highly thought of, is now properly discarded.

2246. VERATRI VIRIDIS RADIX. GREEN HELLEBORE ROOT. The dried rhizome of Veratrum viride, *Willd.* *Nat. Ord.* Melanthaceæ. *Hab.* North America.

Med. Prop. and Action. In small medicinal doses it is a powerful arterial sedative, reducing the force and frequency of the pulse in a remarkable degree. In addition to this depressing effect on the arterial system, and often independently of it, it occasions nausea, together with a feeling of prostration and a sense of weakness, or want of due command in certain muscles. When carried so far as to produce nausea and vomiting, its depressing effects on the circulation and nervous system are often very remarkable. The pulse falls from 75 or 80 down to 35 or 40, and at the same time becomes small, feeble, and occasionally almost imperceptible. The surface is pale and covered with a cold sweat; the patient at the same

time experiencing a sense of chilliness, and sometimes of tingling and numbness. Headache, vertigo, dimness of vision, with dilated pupils, faintness, a feeling of stiffness of certain muscles and a want of command over them, are other symptoms evincing the sedative operation of the medicine; these are sometimes so great as to become alarming. This depressing operation is attended with stimulation of the secretory functions; the salivary, pulmonary, biliary, and urinary secretions are increased, it is said, by doses insufficient to occasion nausea or vomiting, whilst during the existence of the latter condition the same effect is produced on the function of the skin. Excessive action of any kind is easily controlled by opiates and alcoholic stimulants. With regard to the emesis produced by this agent, it is worthy of remark that its operation is very tardy, three-quarters of an hour or more often elapsing before this effect is produced. Locally applied, it is a powerful irritant; its powder snuffed up into the nostrils excites long-continued and violent sneezing, and applied to the skin in a moist state produces redness and burning. The presence of veratria in this root was detected by Mr. J. G. Richardson.[1] Its sedative action relative to other agents of the same class is fully examined by Dr. Cutter. Compared with venesection, he remarks, it has the advantage of not impairing the quality of the blood by a direct withdrawal of a portion of its solid and fluid constituents, whilst at the same time it equally lessens the force of the circulation, and exerts a sedative influence on the nervous system. Compared with digitalis, it is sure, prompt, and not cumulative. Dr. Ringer (p. 299), however, considers that in its action it is more nearly allied to aconite than to digitalis. Compared with antimony, its effects are not as permanent, but it does not seem to directly change the character of the blood, and it does not purge. No instance of fatal poisoning by it has been recorded; no doubt the vomiting produced is a great safeguard.

The *dose* of the powdered root is gr. j.–gr. ij. every third hour, and may be increased, if necessary, till it produces its physiological effects. In doses of gr. iv.–gr. vj. it generally acts as an emetic, but in this character it is very objectionable, from the prostration which accompanies its operation. The best form is the officinal Tincture (B. Ph.) (Green Hellebore Root in coarse powder oz. iv., Rect. Spirit Oj.), of which the dose is placed at ℥v.–xx. For ordinary cases, however, these doses are stated to be too large, ℥ij. every two hours being preferable.[2] On the development of any of its physiological effects, the dose should be diminished or the remedy discontinued, and if resumed it should be given in smaller doses. Its external application is inadvisable, from the liability of its absorption into the system.

2247. *Therapeutic Uses. In Inflammations*, observes Prof. G. B. Wood (ii. p. 155), the medicine acts only as a sedative, and not probably by changing the character of the blood; it should not, therefore, be used to the exclusion of the lancet and other measures calculated to meet the latter indication. But when the state of the system does not admit of depletion, it may sometimes, doubtless, be employed with advantage. This remark applies to the phlegmasiæ generally, excluding gastric inflammation.

2248. *In Pneumonia*, it has obtained considerable note from the writings of Drs. Osgood,[3] Norwood,[4] Cutter,[5] and many

[1] Amer. Journ. of Pharm., xxix. p. 204.

[2] Practitioner, Sept. 1868.

[3] Amer. Journ. of Med. Sciences, vol. xvi. p. 296.

[4] Southern Med. Surg. Journ., June, 1850.

[5] Amer. Journ. of Med. Sciences, Oct. 1858; and Med. Times and Gaz., June 28, 1862.

other American physicians. The plan recommended by Dr. Norwood is to commence with gutt. viij. of the tincture, repeated every third hour, with the addition of a drop to each successive dose, until the pulse is sufficiently reduced, or nausea supervenes; the dose to be subsequently regulated so as to sustain the depressed state of the circulation, with as little disturbance of the stomach as possible. Any excess of nausea may be controlled by a little morphia. The inflammatory symptoms decline with the reduction of the pulse, and the patient in due time enters into a very favourable convalescence. The experience of Dr. Kiemann,[1] of its remedial power in pneumonia, is strongly in its favour. He likewise employed it, with the same remarkable effect on the pulse, in *Valvular Disease of the Heart*, *Endocarditis*, *Pleurisy*, and *Bronchitis*. Dr. Waring-Curran[2] testifies to its value in *Pericarditis*. He prescribes an extract made by inspissating the juice of the root in doses of gr. ij. with gr. j. of calomel, in the form of pill, every two hours, and carefully watching its effects. Dr. C. Handfield Jones[3] derived great advantage from it in the treatment of *Croup*. He gave ♏ij. of the tincture every hour.

2249. *In Acute Rheumatism*, it is said to possess great powers, when employed with a due regard to the necessity of depletion. It may often be advantageously associated with opiates, and should be given in small doses so as to obtain its sedative without its nauseating effect, and the quantity can be increased as the stomach is found to tolerate it. It is especially recommended by Dr. Osgood. *In Chronic Rheumatism*, it has also been extolled, but it is not so effectual as in the acute form. It is thought to be particularly adapted for the *Neuralgic forms of Rheumatism*. Benefit has been derived from it in various forms of *Neuralgia*, especially when occurring in gouty and rheumatic patients. *In Gout*, according to Dr. Tully, it is sufficient in the majority of cases to effect a cure. He considers it better adapted for the gout of feeble constitutions than colchicum, because less apt to weaken by exhausting operation on the bowels.

2250. *In Typhoid or Enteric Fever*, it is strongly recommended by Drs. Norwood, Branch, and others; but as Stillé (ii. p. 349) justly remarks, it is difficult to believe that a disease eminently specific in character, and most dangerous when its type is most asthenic, can be profitably treated by a medicine which tends so directly to produce such depression of the pulse, and ultimately collapse of the whole system.

2251. *In Obstinate Constipation*, the tincture, in doses of gutt. iij. four or five times daily, is reported to prove useful.[4]

[1] Practitioner, Aug. 1868.
[2] Ibid., Aug. 1868.
[3] Lancet, July 19, 1862.
[4] Practitioner, Nov., 1868.

2252. The other diseases in which it is said to have been used with benefit are *Nervous Asthma*, *Dysentery*, *Puerperal Peritonitis*, *Aneurism*, *Palpitations of the Heart*, and *Jaundice*. Trustworthy evidence of its value in these affections, however, is still required.

2253. Vienna Powder and Paste. A powerful caustic, long celebrated by the French and German surgeons in the treatment of *Lupoid and Cancerous Ulcerations*. It is composed of equal parts of Quicklime and Potassa c. Calce. When it is to be used, a few drops of spirit of wine are added, to form a thin paste. A piece of adhesive plaster, with a hole cut in it the size of the intended eschar, should be placed over the diseased part. The paste should be left on from five to fifteen minutes, according to the depth of the eschar required. It creates violent constitutional irritation, and is rarely employed at the present day.

2254. Vinum. Wine. The fermented juice of the grape, the fresh fruit of Vitis vinifera, *Linn.* Although only one kind of Wine—Vinum Xericum, Sherry—is officinal, others, as Port, Claret, Madeira, Champagne, &c., are used as stimulants in several forms of disease: their value in this character is considered in detail in Art. Stimulants, Part ii.

2255. Vitis vinifera, *Linn.* The Grape Vine. *Nat. Ord.* Ampelideæ. Cultivated in most parts of the world.

Med. Prop. and Uses. The dried fruit, Raisins (Uvæ), enter into the composition of several formulæ. From the fresh fruit (grapes) is expressed a juice which under the process of fermentation yields Wine, Alcohol, and Acetic Acid. The lees of the wine yield large quantities of the impure Acid Tartrate of Potash (Cream of Tartar). Fresh grapes are a useful and agreeable refrigerant in *Fevers*.

2256. Warburg's Tincture. A secret formula which has obtained considerable repute as a remedy in *Intermittent and Remittent Fevers*. Its exact composition is unknown, but it is believed that quinine forms a principal ingredient. By some, barberry is thought to enter into its composition: be that as it may, it is a remedy of great power; it is sold at a high price, in small bottles containing two doses. After the operation of an aperient, one dose is given, all drink is withheld, and in three hours the second dose is taken. Within a period from one to three hours profuse diaphoresis sets in, and this goes on until the bedding is saturated. In a great

many cases there is no exacerbation after this sudorific action. So great is this action of the skin, and in some cases so exhausting, that the remedy used in the above manner would be highly dangerous in adynamic cases —a fact not adverted to in the printed directions which accompany each bottle. If used at all in such cases, it should be in much smaller quantities than those ordered, and support should be given as soon as the skin begins to act. Dr. Morehead speaks slightingly of this tincture; not so Dr. Maclean (i. p. 80), whose remarks we here quote; he expresses a high estimate of it, and recommends cautious trials to be made with it, for if given according to the printed directions, disastrous consequences may result.

WOURALI POISON. See STRYCHNOS TOXIFERA.

YEAST. See CEREVISIÆ FERMENTUM.

2257. ZINCI ACETAS. Acetate of Zinc. $Zn(C_2H_3O_2)_2.2H_2O$. Prepared by the action of acetic acid on carbonate of zinc.

Med. Prop. and Action. Astringent, chiefly used in collyria and in injections. In its medicinal properties it resembles the sulphate. In doses of gr. j.–gr. ij. it is tonic and anti-spasmodic; gr. x.–gr. xx. prove emetic, but it is rarely given internally.

2258. *Therapeutic Uses. In Gonorrhœa, Gleet, and Leucorrhœa,* unattended by inflammatory action, a solution of the acetate of zinc (gr. ij.–iv. ad Aq. fl. oz. j.) forms a useful injection. Sir Astley Cooper regarded the following formula as one of the best which could be employed:—℞ Zinci Sulph. gr. vj., Liq. Plumb. Diacet. ♏xxx., Aq. f℥iv., M. ft. injectio. In this formula decomposition takes place, and the acetate of zinc results.

2259. *In the Ophthalmia of Children and Infants,* I have seen the best effects from the above formula of Sir A. Cooper, still further diluted, according to the severity of the case.

2260. *In Typhoid Fever,* Dr. Heer[1] speaks favourably of the acetate of zinc; he does not trust to it alone, but conjoins it with stimulants, anti-spasmodics, and other remedies, as indicated.

2261. ZINCI CARBONAS. CARBONATE OF ZINC. $ZnCO_3(ZnO)_2.3H_2O$. Obtained by decomposing sulphate of zinc with carbonate of soda. A native or impure carbonate, Calamine, was formerly officinal in Lond. Ph.

[1] Med. Zeitung, 1855.

Med. Prop. and Action. Analogous, probably, to those of the Oxide (*q.v.*), but it is rarely administered internally. It is chiefly employed as an external application, either in powder or in the form of an ointment (drm. ij., ad Ung. drm. x.)

Dose:—From gr. ij.–viij. in pill or powder.

2262. *Therapeutic Uses. In Burns, Scalds, Excoriations, Chapped Hands and Lips, Broken Chilblains, and Bed Sores,* the ointment (*ante*) is a very useful application. It should be spread smoothly on lint, and applied two or three times daily. *Weak and Indolent Ulcers* also improve and heal under its use. As a means of *preventing Pitting in Small-pox*, Prof. Bennett[1] recommends, in preference to all other applications, the following ointment:—℞ Zinci Carb. oz. iij., Zinci Oxid. oz. j., Ol. Olivæ q. s., M. Dr. Gason,[2] of Rome, succeeded in this object by dusting the whole surface thickly with powdered calamine; it was found also to have a very soothing effect.

2263. ZINCI CHLORIDUM. CHLORIDE OF ZINC. $ZnCl_2$. Obtained by the action of hydochloric acid on granulated zinc, purifying the solution by the addition of solution of chlorine, and evaporating till it assumes a solid form.

ZINCI CHLORIDI LIQUOR. SOLUTION OF CHLORIDE OF ZINC. Prepared in the same manner as the chloride, but not submitting the solution to evaporation. It is popularly known as *Sir W. Burnett's Disinfecting Fluid.*

Med. Prop. and Action. The chloride is a powerful and penetrating escharotic. "Its local action as a caustic," observes Dr. Pereira (i. p. 773), "depends partly on its affinity for albumen and gelatine; so that when placed in contact with living parts, into whose composition these organic compounds enter, the chloride, exercising its affinity, destroys the life of the parts, and, uniting with the albuminous and gelatinous matters present, forms an eschar." As a ready mode of application, Mr. Weeden Cooke[3] directs a piece of lint to be soaked in a solution of this salt, which, being very deliquescent, requires scarcely more than exposure to the air to render it liquid—at least a very few drops of water will quickly produce this effect. The lint, thoroughly soaked in the liquid, is hung up to dry for a short time, and will preserve its active properties for weeks if kept in a wooden or pasteboard box, such as a seidlitz-powder box. An old pair of scissors should be kept for cutting it, and forceps coated with vulcanite employed in its application or removal. The great convenience of this chloride of zinc lint is, that the smallest piece may be used, even to a wart or pimple, or to parts such as the eyelids, to which it would be almost impossible to apply the old paste. There is also the advantage of confining the caustic effect absolutely to the part to be attacked. For uterine purposes it is also much to be commended. Passed through a speculum to the diseased part, and covered by a further plug of dry lint, it does its work, if

[1] Edin. Monthly Journal, April, 1854.

[2] Med. Circular, Dec. 18, 1861.

[3] Brit. For. Med.-Chir. Rev., Jan. 1866.

properly measured for the part to be destroyed, without injury to the healthy tissues. The solution is a valuable deodorizer, but taken internally in an undiluted state it acts as a corrosive irritant poison. Given largely diluted it is said to be a nervine tonic, but it is rarely administered, possessing no advantage over the milder zinc preparations. The chloride requires to be kept in well-stoppered bottles, as it rapidly deliquesces on exposure to the air.

Dose, gr. ½–gr. j. or gr. ij., largely diluted.

2264. *Therapeutic Uses. In Cancer*, the topical application of the chloride was proposed by Dr. Canquoin, in 1837, and was shortly afterwards employed in England by Mr. Ure.[1] Great expectations were raised at the time, that an effectual remedy for cancer had been discovered; it being asserted that its operation was not only that of an escharotic, but that it established a new action in the surrounding parts. It has, however, disappointed the anticipations of its warmest advocates. It is a valuable escharotic, but, like all other remedies of this class, it does nothing towards the eradication of the cancerous diathesis. The constitutional irritation to which it gives rise is a great objection to its use. Some valuable remarks on the chloride, not in cancer only, but in *Wounds*, whether operative or accidental, have been published by Mr. De Morgan[2] and Mr. Paget;[3] but as a general rule it is inferior to carbolic acid, for reasons stated in that article (*q.v.*)

2265. *In Lupus*, the chloride has been employed by Cazenave, and other French practitioners. Dr. Ranking[4] states that, in this disease, he has found no caustic application nearly so beneficial as the chloride of zinc. He mentions a case in which he had tried every other means for several months without effect, but which yielded to the use of this substance. *In stubborn Ulcers, with callous, hard, everted edges*, the chloride has been found to establish a healthier action, and rapidly to effect a cure. (Mode of application, see sect. 2263.)

2266. *In Gonorrhœa*, Mr. Lloyd[5] speaks highly of the efficacy of injections of a solution of the chloride (gr. j. ad Aq. fl. oz. j.) Half a small syringeful of this should be very gently injected every six or eight hours; saline aperients, warm fomentations, and strict antiphlogistic regimen, should form the remainder of the treatment. He relates five cases, recent and chronic, out of many, as illustrative of its efficacy. In some chronic cases, the strength of the injection was gradually increased to gr. iij. in Aq. fl. oz. j. Dr. Ringer (p. 177) reports highly of the injection every hour of a very weak solution (gr. j., Aq. Oj.), rest being at the same time strictly enjoined.

[1] Lond. Med. Gaz. vol. xvii. p. 371, and vol. xviii. p. 371.
[2] Lancet, May 5, 1866.
[3] Brit. For. Med.-Chir. Rev., Jan. 1866.
[4] Lugol on Scrofula, p. 218.
[5] Lancet, Dec. 1850.

2267. *Gonorrhœal Ophthalmia*, both in children and in adults, has been successfully treated by Mr. Lloyd (op. cit.) by a collyrium of chloride of zinc (gr. j. ad Aq. fl. oz. j.) Its use, he states, is attended with marked and almost immediate benefit. Mr. G. Lawson found a few drops of this collyrium, dropped into the eye twice daily, effectual in arresting the muco-purulent discharge remaining after the subsidence of *Purulent Ophthalmia*. Its value in these cases is further attested by Mr. J. Hutchinson,[1] who employed a solution of greater strength (grs. ij.-iv., Aq. fl. oz. j.) The weaker of these he states to be less painful than nitrate of silver, and may be used freely to the youngest infant. He mentions a case of threatened *Diphtheric Conjunctivitis*, in which it succeeded admirably. *In Pustular Ophthalmia*, he found it suit well where other astringents had done no good. "Often when nitrate of silver will do no more good, chloride of zinc will finish the cure, and *vice versâ*."

2268. ZINCI IODIDUM. Iodide of Zinc. Dr. Venables[1] advises the iodide in *Chronic Diseases of the Liver*, particularly when these occur in persons of weak, irritable, and leuco-phlegmatic habits. He found it less irritating than the iodides of iron or other metals. Dose, gr. j., thrice daily, gradually increased. *In enlarged Lymphatic Glands, and in some Scrofulous Affections*, it has been used externally, in the form of ointment (℥j. to lard ℥j).

2269. ZINCI LACTAS. Lactate of Zinc. Prepared by dissolving metallic zinc in dilute lactic acid, and evaporating to crystallization.

Med. Prop. and Action. It was introduced as a remedy in *Epilepsy* by Dr. Herpin,[2] in 1856. He regards it as equally efficacious with the oxide, over which it possesses the advantage of being more easily taken, and less liable to disagree with the stomach. He commences with gr. ij. thrice daily, in the form of pill, and gradually increases the quantity till ten grains are taken daily. M. Herpin enters into many statistical data with reference to the results of treatment by this agent. In the successful cases its use was continued for periods varying from five to twelve months.

Dose, gr. ij.-gr. v.

2270. ZINCI OXIDUM. Oxide of Zinc. ZnO. Obtained by subjecting carbonate of zinc to a red heat till the whole of the carbonic acid is evolved.

Med. Prop. and Action. Tonic and anti-spasmodic. In large doses it causes vomiting, and sometimes purging; by gradually increasing the dose, however, very large quantities may be taken without producing any sensible effect. In commencing its use, care should be taken not to give it

[1] Chir. Reports of London Hosp., 1867-68, p. 219.

[2] Bull. Gén. de Thérap., Nov. 1856.

on an empty stomach, as it is apt to create nausea, and leave an unconquerable aversion to the remedy. (Waring-Curran.) Externally applied, it is an astringent. It may be used in the form of ointment (gr. lxxx., Benzoated Lard oz. j.), or incorporated with glycerine (1 part to 4), or in fine powder.

Dose, gr. ij.–gr. v. or gr. x., in pill or powder.

2271. *Therapeutic Uses. In Spasmodic Asthma*, it was first employed by Dr. Withers, in 1787. He speaks highly of its efficacy, and relates several cases successfully treated by it; the dose recommended by him is from grs. v. to xx., twice or thrice daily. As a prophylactic, given in the intervals between the paroxysms, Dr. Symonds[1] observes that, whether for abating the morbid susceptibility of the respiratory nerves which engenders the spasmodic paroxysms, or for diminishing the liability to catarrhs, he knows nothing to surpass long courses of the oxide of zinc, with or without extract of conium for the one indication, and quinine for the other. Much may also be done at the same time by judicious hygienic treatment.

2272. *In Chorea*, the oxide proved very successful in the hands of Dr. Bedingfield,[2] Dr. Crawford,[3] and others, but as a general rule it seems inferior in efficacy to the sulphate. It should be commenced in small doses (grs. iij.–v.), and gradually increased till an impression is made on the disease. In one of Dr. Crawford's cases the dose was increased to grs. xxv. without any injurious effects. *In Epilepsy*, however, Dr. Russell Reynolds (ii. p. 280) regards the oxide as superior to the sulphate, and he states that the cases benefited by zinc were so by the former salt in doses of grs. iij.–v. thrice daily. Dr. Waring-Curran[4] regards it as a most valuable adjunct to the bromide of potassium in these cases. Given together, he considers that a cure is effected more certainly than by either of these drugs given singly.

2273. *In the Convulsions of Children*, the oxide of zinc is strongly recommended by M. Guersant.[5] One grain may be given at the commencement, and the dose gradually increased to grs. xx. daily. It is best given in powder, with a little sugar.

2274. *In Hooping Cough*, M. Guersant recommends the oxide, in doses of gr. j.–iij. (according to the age of the child), in combination with equal parts of the extract of hemlock or belladonna. Loeffer, also, speaks highly of its efficacy when used externally with oil, in the form of liniment, as well as internally. Hochsteker[6] regards it as a specific.

2275. *In Chronic Alcoholic Intoxication*, the oxide, according to Dr. Marcet,[7] is the proper remedy for the nervous symptoms

[1] Brit. Med. Journ., June 13, 1868.
[2] Comp. of Med. Pract., p. 51.
[3] Cyc. Pract. Med., i. p. 411.
[4] Lancet, Oct. 24, 1868.
[5] Med. Times, vol. xvi. p. 575.
[6] Ann. de Thérap., 1860, p. 252.
[7] Lancet, April 2, 1859.

which so often exist. It is necessary for the patient to abandon drinking his usual stimulants, and to take oxide of zinc gr. ij. twice daily, in the form of powder, an hour after each meal. The dose may be increased in the ratio of gr. ij. every third day, until the patient takes gr. vj.–viij. twice daily. This course, persevered in for periods varying from three to six weeks, proved, in Dr. Marcet's cases, signally beneficial. Dr. Anstie's (ii. p. 87) trials with this remedy were not so satisfactory as might have been expected from Dr. Marcet's report, and on the whole he considers that, in the majority of cases, quinine acts much more satisfactorily; still, he remarks, the oxide occasionally proves a valuable remedy. In certain subjects, especially the anæmic and the chlorotic, its continued administration produces a prejudicially depressing effect on the constitution. *In Delirium Tremens*, after opiates have done their work, the oxide, according to Dr. Waring-Curran (op. cit.), is of essential benefit in strengthening the nervous system. He mentions a case in which it seemed to ward off the ill effects of indulgence in stimulant beverages. *In Nervous Irritability and Depression*, resulting from other causes than alcohol, as anxiety, over study, &c., the oxide often appears to produce excellent effects, both as a tonic and as a sedative.

2276. *In Hysteria*, Dr. Waring-Curran (op. cit.) regards the oxide as more reliable and efficacious than the valerianate.

2277. *In Gonorrhœa and Leucorrhœa*, Somme[1] successfully employed an injection of a solution of the oxide (oz. ½, Aq. Oij.) *In Gleet*, Dr. Waring-Curran speaks favourably of the oxide; he states that under its use the mucous membrane soon takes on a healthy action. *In Spermatorrhœa*, he also found great benefit from it administered during the day, with camphor and conium at bedtime.

2278. *In Phthisis*, according to Dr. Waring-Curran (op. cit.), the oxide is of great value, especially in the earlier stages, steadying the nervous system, and acting as a general sedative. In the later stages it proves most useful in checking the *profuse sweating* and *colliquative diarrhœa*. He commences with grs. ij. combined with conium thrice daily, and increases the dose week by week as required. His estimate of it is very high.

2279. *In the Intermittent Fevers* of Barbadoes, Dr. Hendy found the oxide, in doses of grs. ij.–v., effectual even when cinchona and other remedies had previously failed. Sir Gilbert Blane[2] bears similar testimony to its value.

2280. *Chronic Diarrhœa and Dysentery* will be found occasionally to yield to the oxide in doses of grs. iij.–v., thrice daily, when other metallic tonics and astringents fail. It has the recommendation of Dr. Waring-Curran.

[1] Archiv. Gén. de Méd., i. p. 846. [2] Med.-Chir. Trans., vol. iii.

2281. *In the Chronic stages of Purulent Gonorrhœal and Scrofulous Ophthalmia, and in Ophthalmia Tarsi*, the oxide of zinc ointment is a very useful application, often producing speedy and permanent benefit. It should be applied to the lids with the finger or a camel-hair brush.

2282. *To Sore and Fissured Nipples*, the local application of a powder composed of 1 part of oxide of zinc and 2 of powdered gum acacia, has been found serviceable. It forms a thin crust over the affected surface, which, being thus protected, speedily heals. *To Bed Sores, Excoriations, &c.*, zinc ointment is a good and efficient application.

2283. *In Scrofulous Coryza and Ozæna*, the local application of the ointment is very serviceable. Dr. Willshire[1] directs that it should be introduced into the nasal cavity by means of a camel-hair brush, every night and morning. The patient should be put, at the same time, under a course of iodine, quinine, or iron, and the bowels regulated by rhubarb and soda. In these cases the glycerine of oxide of zinc is, as a general rule, preferable to the ointment. It is more easily applied and produces less irritation.

2284. *In Skin Diseases*, the ointment or glycerine of oxide of zinc is one of the most generally useful applications to which we can resort. Of the value of the ointment in *Eczema*, Mr. E. Wilson[2] speaks in the highest terms. "Properly benzoated, made of pure materials—pure oxide of zinc and pure lard—it is the most perfect local application for 'ekzema' at present known; and, indeed, is so perfect that we doubt the possibility of its ever being excelled. It is suitable for every form and every stage of the disease, but most of all for the dry forms; and it should be applied in a twofold manner, namely—1, in substance, with the point of the finger or a thin spatula, so as to spread it uniformly over the diseased surface; and 2, spread on some soft material, such as lint, cambric, or fine flannel. Employed in this way, the oxide of zinc ointment has all the advantages and most of the uses of the poultice, without the objectionable qualities of the latter; and it fulfils the purposes which it is sought to accomplish; it excludes the atmosphere without preventing transpiration, it keeps the surface soft and flexible, and it gives nature time to effect the reparative processes needed by the skin." Such testimony from so distinguished a dermatologist as Erasmus Wilson should have great weight. Others, as Dr. T. McCall Anderson,[3] prefer the glycerine of oxide of zinc, and in each case the efficacy of the application is increased by the addition of a little camphor. Its use is not confined to eczema, but may be resorted to with confidence in *Porrigo Larvalis, Porrigo Furfurans, Ecthyma,*

[1] Med. Times, vol. xviii. p. 151.
[2] Braithwaite, 1869, vol. ix. p. 216.
[3] Med. Times and Gazette, July 11, 1863.

Erythema, *Lichen Agrius*, *Sycosis*, *Impetigo*, *Ichthyosis*, *Crusta Lactea*, *Lepra*, and *Psoriasis*. *For allaying the local irritation, &c., consequent on Vaccination*, nothing generally answers better than oxide of zinc in fine powder, dusted over the surface, or in the form of ointment.

2285. Zinci Sulphas. Sulphate of Zinc. $ZnSO_4.7H_2O$. Obtained by the action of sulphuric acid on granulated zinc, purifying the solution by means of chlorine and carbonate of zinc, and evaporating the crystallization.

Med. Prop. and Action. Tonic, astringent, and anti-spasmodic, in doses of gr. j., gradually increased. In doses of gr. x.–gr. xx. it proves emetic, acting promptly and effectually, and leaving little subsequent depression; it is consequently much used in cases of poisoning by narcotic substances. Besides its tonic and astringent properties, which are evident only when persevered in in small and repeated doses, it appears to act powerfully as a nervine, and proves highly serviceable in spasmodic affections having their origin in derangement of the nerves or nervous centres (see *Chorea*). In excessive doses it is an irritant poison. Externally, it is an astringent and stimulant; it is used in the form of collyrium, wash, or lotion (gr. j.–x. or more, ad Aq. fl. oz. j.) If its internal exhibition be continued for too long a period, Dr. Graves observes that it occasions marasmus. *As a caustic*, its claims have been advocated by Sir J. Y. Simpson.[1] In a dried or anhydrous state and finely levigated, he characterises it as a powerful and very manageable caustic when applied to an open or diseased surface: it does not act where the epithelium is entire. He likewise uses it in the form of paste (Dried powder oz. j., Glycerine fl. drm. j.), or ointment (oz. j.–Axung. drm. ij.) Its advantages over other caustics are said to be —1. Its powerful escharotic action. 2. The rapidity of its action. 3. Its great simplicity and manageableness. 4. Its facility of application. 5. Its non-tendency to deliquesce, or spread. 6. Its perfect safety; and 7. Its efficacy. Where the skin is entire, he recommends a caustic made by saturating strong sulphuric acid with dried and powdered sulphate of zinc.[2]

Dose:—As a tonic, gr. ij., gradually increased to gr. v., or more; as an emetic, gr. x.–gr. xxx.

2286. *Therapeutic Uses.* *In Chorea*, the value of the sulphate of zinc has been attested by the late Dr. Babington,[3] Dr. Hughes,[4] and others; indeed, in the opinion of Dr. Golding Bird, it exercises a peculiar and specific influence on the nerve-substance. "In ordinary cases," Dr. Barlow[5] observes, "the exhibition of purgatives to keep the bowels freely open, and the sulphate of zinc, in doses gradually increased from gr. j. to grs. xij.–xv.–xx., or even more, will effect a cure. When, however, the sulphate has been used in these large doses, its sudden discontinuance seems to be felt by the system, and a return of the symptoms ensues; the best rule, therefore, for its exhibition is as follows:—The bowels being kept open, the

[1] Med. Times, Jan. 17, 1857.
[2] Ibid., Feb. 5, 1857.
[3] Guy's Hosp. Reports, Oct. 1841, and Oct. 1845.
[4] Guy's Hospital Reports, Oct. 1846.
[5] Pract. of Med. p. 279.

sulphate should be commenced in doses of gr. j., for a child æt. 12 years, and this should be increased by the addition of gr. j. to each dose daily, until it either causes sickness, or there is an obvious diminution of the choreal movements. In the former case the dose should be diminished by at least one-half, and so continued for several days with the view of establishing a tolerance; but if, on the other hand, there be marked improvement, it should be no further increased, but continued without alteration until either the improvement ceases—in which case it should be again gradually increased—or the disease has altogether subsided. When the latter is the case, the dose should be diminished day by day, rather than discontinued suddenly, as by following the former course we have less reason to dread a relapse. When anæmia is present, iron has more control over the disease than zinc." Dr. Stone's trials[1] with this remedy do not tend to confirm the high character given it by others, and Dr. Hillier (p. 233) states that he did not find it answer his expectations.

2287. *In Epilepsy*, it has also been found successful, although not so uniformly as in chorea. It is a remedy of long-standing repute, but is generally inferior to the valerianate and oxide. It should be commenced in small doses, gradually increased in the manner advised in the last section.

2288. *In Hysteria* depending upon debility, sulphate of zinc will be found to agree with many females better than the preparations of iron, causing less irritation. One grain, combined with extract of gentian, may be given twice or thrice daily.

2289. *In Angina Pectoris*, the salts of zinc, particularly the sulphate, have sometimes proved successful when persevered in during the intermissions. A case illustrative of its good effects is related by Dr. Perkins.[2] *In Spasmodic Asthma*, it has also appeared, when its use is continued, to diminish the frequency and force of the attacks. Dr. Copland (i. p. 152) states that he has derived great benefit from it in *Humoral Asthma* and *in Hooping Cough*. In the last-named disease, Dr. Fuller[3] obtained the best results from a combination of the sulphate and belladonna. To a child æt. 3 years, he prescribes gr. $\frac{1}{6}$th of Ext. Belladon. and gr. $\frac{1}{2}$ of Zinci Sulph., four times daily. Above that age, $\frac{1}{4}$ gr. of belladonna and gr. j. of the sulphate. Mr. Garraway also adopted the same treatment with great success in numerous cases of hooping cough.[4]

2290. *In Phthisis*, for controlling the *night sweats*, Dr. Barlow[5] considers that there is no remedy equal to the following combination:—℞ Zinci Sulph. gr. j., Ext. Hyoscyam. gr. iv., M.

[1] Med. Times, Sept. 17, 1859.
[2] Memoirs of Med. Society of London, vol. iii. p. 580.
[3] Lancet, July 28, 1860.
[4] Ibid., Oct. 17, 1863.
[5] Pract. of Med., p. 307.

ft. pil. h. s. s. *In Chronic Bronchitis*, for moderating the cough and expectorations, he recommends (p. 202) the following pill:—℞ Zinci Sulph. gr. j., Ext. Conii gr. iv., M. ft. pil. bis vel ter die sumend. He also speaks favourably (p. 352) of zinc in *Valvular (Mitral) Disease of the Heart*:—℞ Zinci Sulph. gr. iij., Ext. Lupuli gr. vj., M. ft. pil. vj. sumat. j. ter die. The dose of the zinc should be gradually raised to grs. iij. When there is much palpitation, he advises its combination with camphor:—℞ Zinci Sulph. gr. j.–iij., Camphoræ gr. j., Ext. Hyoscyam. gr. ij., M. ft. pil. ter die sumend. When there is much irritability of the stomach the oxide should be substituted for the sulphate.

2291. *In Intermittent Fevers*, sulphate of zinc has occasionally been used with success. Dr. Joseph Brown[1] advises it to be combined with some ginger and conserve, each pill to contain gr. iij. of the sulphate. Of these, two may be given thrice daily, during the intermissions; the number to be gradually increased as the stomach will bear it. It is advisable to avoid drinking immediately after the medicine has been taken, as it is apt to induce vomiting. Dr. Brown ranks zinc next in value to arsenic as an anti-periodic. Sir J. M'Grigor gave it to the soldiers in the Peninsular war, to the extent of ʒss. daily, with success. *In Typhoid Fever*, Dr. Heer[2] speaks undoubtingly of the beneficial action of the sulphate, especially in allaying the nervous agitation:—℞ Zinci Sulph. gr. viij., Aq. fʒviij., M. Dose, a tablespoonful every second hour.

2292. *In Menorrhagia*, Sir C. Locock[3] considers that, in the atonic forms, sulphate of zinc is more easily managed than steel medicines, and that in many instances it proves more useful. Dose, gr. j.–ij., in the form of pill, thrice daily.

2293. *In Flatulence, flatulent Affections of the Bowels, especially of the Colon, and in Constipation*, Dr. Strong[4] advocates the use of the sulphate, thus combined:—℞ Zinci Sulph. gr. xviij., Pulv. Opii gr. iij., Mucilag. q.s. ft. pil. vj. Of these, one is to be taken four or five times a day, immediately after a meal; when the stomach can dispense with the opium, he substitutes ext. of gentian or rhubarb. He states that he has persevered in this treatment for a considerable period, not only without any ill effect, but with decided benefit.

2294. *In Chronic Dysentery*, it has proved successful in the practice of Dr. Impey;[5] in these cases it is best combined with ipecacuanha and opium; it is inferior in efficacy to nitrate of silver. *In Chronic Diarrhœa*, it proves occasionally useful.

2295. *In Irritability of the Nervous System associated with*

[1] Cyc. Pract. Med., vol. ii. p. 228.
[2] Med. Zeitung, 1855.
[3] Cyc. Pract. Med., vol. iii. p. 109.
[4] Edin. Med. Surg. Journ., No. clxiii. p. 403.
[5] Lond. Med. Phys. Jour., vol. ix.

Dyspepsia and Oxaluria, the results of anxiety or exhaustion, the sulphate, first recommended by Dr. Golding Bird, often proves very serviceable. Dr. Wilson Fox (ii. p. 838) observes that the sulphate, as well as the oxide, seems to act as a tonic in this condition, but the latter, he remarks, has the additional advantage, if given at bedtime in doses of gr. ij.–iij., of procuring sleep.

2296. *In Cynanche Tonsillaris*, when the abscess is so situated that it cannot be opened by the lancet, it has been proposed to administer an emetic; under the exertion caused by vomiting, the abscess will often burst, and discharge itself; for this purpose no emetic is better than the sulphate of zinc (gr. xx.) An emetic at the very outset of the disease often removes the symptoms altogether.

2297. *In Gangrene of the Mouth in Children*, the sulphate of zinc (gr. xx.) well incorporated with honey (oz. j.), is a very useful topical application.

2298. *In Ophthalmia Infantum*, a collyrium composed of Zinci Sulph. gr. j. ad Aq. fl. oz. j.–fl. oz. ij., is very serviceable; in the ophthalmia of adults, it may be employed stronger (gr. j.–iv. ad Aq. fl. oz. j.) The addition of liquor plumbi improves its efficacy.

2299. *In Gonorrhœa*, in the third stage, a very useful injection is a solution of the sulphate (gr. x., Aq. fl. oz. viij.); liquor plumbi (fl. drm. ½–j.) may be advantageously added. Prof. Sigmund[1] regards it as more effectual than any other remedy. *In Leucorrhœa and Gleet*, the same injection may also be employed with advantage. *In Chronic Urethritis in the Female*, Dr. Braxton Hicks[2] has successfully employed sulphate of zinc, cast in sticks, simply introduced into the urethra, or applied in the manner advised in sect. 238; he allows it to remain about five minutes in the urethra. He has also employed the same measure in *Cervical Leucorrhœa*.

2300. *When Ulcers are attended with profuse discharge, or with loose, flabby granulations*, a solution of sulphate of zinc (gr. j.–v., Aq. fl. oz. j.) forms a useful stimulant application.

2301. *In some Chronic Skin Diseases*, a solution is occasionally employed as a stimulating application. *In Acne Punctata vel Follicularis*, the following mixture, recommended by Dr. A. T. Thomson,[3] forms a useful adjunct to other treatment:—℞ Zinci Sulph. gr. xxiv., Liq. Potassæ f℥iij., M. Dose, gutt. xxx. in water, twice daily. *In Ringworm*, Mr. E. Wilson (pp. 384, 448) advises a sulphate of zinc ointment (℥j., Cerat. oz. j.); and a similar ointment he found useful in *Ichthyosis*. *In Syphilitic Eruptions*, baths containing oz. ij. of the sulphate are well spoken

[1] Med. Times and Gaz., Nov. 6, 1858.

[2] Lancet, Oct. 12, 1867.

[3] Cyc. Pract. Med., vol. i.

of by Dr. Fricke.[1] *In Eczema and other skin diseases attended with intense itching*, Mr. T. P. Johnston[2] speaks highly of a solution of the sulphate (gr. v., Aq. fl. oz. j.) He states that he has never found it fail to relieve the pruritus; the pain it first causes soon passes off.

2302. ZINCI VALERIANAS. Valerianate of Zinc. $Zn(C_5H_9O_2)_2$. Prepared by decomposing valerianate of soda with sulphate of zinc.

Med. Prop. and Action. Nervine-tonic and anti-spasmodic; it is said also to act as an anthelmintic. It is best given in the form of pill with confection of roses, or suspended in a little mucilage.

Dose, gr. ½ increased to gr. iij., twice or thrice daily.

2303. *Therapeutic Uses. In Epilepsy*, the valerianate has been thought by some to possess greater efficacy than the other salts of zinc, but the point has not been satisfactorily established. It is without doubt a valuable preparation, especially when the disease partakes of an hysterical character. It should be commenced in small doses (gr. j.), and gradually increased as the stomach is able to bear it. Dr. Baretti[3] relates four long-standing cases, which were successfully treated by it; and other instances in which it has proved effectual are recorded.

2304. *In Chorea*, it has also been employed; but it does not appear to be so effectual as the sulphate. According to Dr. Neligan, it proves of great service in the ordinary *Convulsive Affections of Children*. Dr. Danet[4] has recorded a severe case of *Hiccough* of fifteen days' duration cured by the valerianate (gr. ¾), with a small portion of ext. of belladonna. *Hysterical Cough*, connected with arrest of the menstrual function, has been successfully treated by Prof. G. Harley[5] with valerianate of zinc and the cold douche.

2305. *In Nervous Affections associated with Uterine Diseases*, Dr. Tilt (p. 95) advises the valerianate, in doses commencing at gr. j. twice or thrice daily, gradually increasing the dose and combining it with ext. of hyoscyamus (gr. ij.) or ext. of belladonna (gr. ¼).

2306. *In Neuralgia*, the valerianate occasionally affords great and permanent relief. M. Devay[6] relates several instances in which it proved highly serviceable; and from which it appears that its curative powers are confined to those cases in which the disease is purely nervous, and to those neuralgic affections which accompany uterine derangement.

[1] Graves' Clin. Lect., vol. ii. p. 427.
[2] Lancet, May 5, 1866.
[3] Bull. del Scienz. Med., Feb. 1844.
[4] Gaz. Hebdom., Oct. 10, 1862.
[5] Med. Times and Gaz., Aug. 1, 1863.
[6] Gaz. Méd. de Paris, June 29, 1844.

2307. Zingiber. Ginger. The scraped and dried rhizome of Zingiber officinale, *Roscoe*. *Nat. Ord.* Scitamineæ. *Hab.* Tropics of both hemispheres.

Med. Prop. and Action. Stimulant and carminative. If the powdered root be snuffed up the nostrils, it causes sneezing and violent irritation; if chewed, it increases the flow of saliva; when taken into the stomach, it causes a sensation of warmth, and excites a general stimulating action in the system. Active principles, an acrid, volatile oil, and a soft, acrid resin. It is a useful adjunct to strong purgatives, the violence of which it moderates. The tincture is a good form for internal use. Externally, it is employed as a stimulant and rubefacient, the powdered dry root being made into a plaster with hot water.

Dose:—Of Powdered Ginger, gr. x.–xx. *Of the Tincture* (Ginger oz. ij½., Rect. Spirt Oj.), ℥xv.–lx. *Of the Strong Tincture, Essence of Ginger* (Ginger oz. x., Rect. Spirit Oj.), ℥v.–xx. *Of the Syrup* (Strong Tinct. of Ginger fl. drm. vj., Syrup fl. oz. xix.), fl. drm. j.–ij. *Of the Infusion*, Ind. Ph. (Ginger bruised oz. ½, Boiling Water fl. oz. x.), fl. oz. j.–iij.

2308. *Therapeutic Uses. In Short-sightedness*, Dr. Turnbull[1] states that he has seen remarkable benefit from the application of a concentrated tincture (one part of ginger and two of proof spirit) to the whole forehead, so as to act on the branches of the fifth pair of nerves; under its use, the iris is said to attain a greater power of contraction and dilatation.

2309. *In Flatulence, Colic, Spasmodic Affections, and in Gout in the Stomach*, the tincture, or infusion of ginger, with the addition of carb. of soda and aromatic spirit of ammonia, may often be administered with evident benefit. A ginger plaster placed over the epigastrium, often relieves the pain in a remarkable manner.

2310. *In Headache*, Dr. Pereira (ii. p. 235) states that he has often known a ginger plaster, applied to the forehead, afford much relief. *Toothache* is sometimes relieved by the same application to the face.

2311. *Relaxation of the Uvula and Tonsils, Paralysis of the Tongue and Fauces, &c.* These states are sometimes much improved by the local stimulus of ginger, chewed so as to produce a copious flow of saliva.

2312. *In Chronic Rheumatism*, the infusion of ginger (gr. cxx.–gr. ccxl. ad Aq. Ferv. fl. oz. vj.), commonly called "Ginger Tea," is a popular domestic remedy. Dr. Graves (i. p. 494) states that he has certainly seen benefit from its use.

[1] Med. Gaz., Nov. 15, 1851.

MANUAL

OF

PRACTICAL THERAPEUTICS.

PART SECOND.

MEDICINAL AGENTS AND CLASSES OF MEDICINES.

2313. Acids may be conveniently divided as therapeutic agents into two classes—Mineral and Vegetable.

2314. *Mineral Acids.* The strong mineral acids, including nitric, sulphuric, and hydrochloric, are powerful escharotics, destroying the tissues with which they come in contact, and when swallowed, acting as corrosive poisons. When properly diluted, they may be given internally with safety and advantage, acting in the character of refrigerants, antalkalines, astringents, and tonics. What their precise action on the animal economy is, appears uncertain; their first operation when swallowed is evidently to correct any excess of alkalescence which may be present in the stomach, and probably, in the case of hydrochloric acid, to assist the digestive process, as it is well known that healthy gastric juice contains a portion of this acid. That they combine with the bases in the stomach, and are then absorbed into the system, is most probable, as they have been detected in the form of salts in the blood and in the urine. Dr. Bence Jones, who places them foremost amongst the articles that directly retard oxidation, has furnished some important practical distinctions as to their relative action and uses. First, with regard to *Hydrochloric Acid*, he remarks, this is more especially the acid of the gastric juice, hence it is more particularly adapted where there is

feeble digestive power, after long illnesses, when animal food begins again to agree, and it should be taken almost immediately before each meal of animal food. Thus, the greatest immediate use can be got out of hydrochloric acid. 2. *Nitric Acid* may be considered to promote secretion, and perhaps oxidation; and with this intention it should be given so as to be absorbed before food enters the stomach. If taken one or two hours before meals, on an empty stomach, nitric acid acts on the system, and not on the food. 3. *Sulphuric Acid* has been always used as an astringent to stop perspiration, hæmorrhage, and diarrhœa. It may therefore be regarded as the opposite of nitric acid in its action on the system, and to obtain its fullest action, it should be given in time to admit of its absorption before food is eaten. Thus, then, rightly used, hydrochloric acid promotes digestion, nitric acid, secretion, and sulphuric acid, constriction. In addition to these special actions, they exercise a direct local action on the stomach. When used in small quantities with care, they all probably render the stomach less irritable than it otherwise would be; but if the dose of any one of them be too strong, it probably increases the sensitiveness of the mucous membrane, and may cause violent pain and spasm, increased chemical action, producing altered, and mechanical, and chemical changes in the gastric mucous membrane. All these acids have a distinct action on the urine, but there is no proof that dilute mineral acids increase acidity of the urine at all to the same degree that dilute vegetable acids will do. (Dr. Bence Jones.[1]) As refrigerants, also, the mineral are vastly inferior to the vegetable acids.

2315. *Vegetable Acids*, including citric, tartaric, and acetic acids, when given internally, and properly diluted, closely resemble in their action and properties the dilute mineral acids, as mentioned in the last section. Their primary action is that of antalkalines, although in this respect they are less permanent in their effects than the mineral acids. As refrigerants in fever, they are preferable to the mineral acids, being more agreeable to the palate, less injurious to the teeth, and less liable to cause digestive derangement. Vegetable acids, as Dr. Bence Jones (op. cit.) observes, have always been considered as antiphlogistic remedies; and when oxidized to carbonates they may assist in the removal of organic impurities in the blood and textures, by ultimately adding to the alkalescence of the liquor sanguinis, and thus promoting oxidation everywhere; but this action is entirely different from that of mineral acids, which by lessening the alkalescence of the blood directly retard the process of oxidation. The researches of Dr. Bence Jones

[1] Med. Times, March 11, 1865.

throw much doubt on the action of vegetable acids on the urine. He has shown that the secretion is most alkaline just after meals, and most acid just when the digestive process is completed; and from some trials he made with tartaric acid and lemon juice, he concludes that these two acids have the same action in increasing the acidity of the urine, but that neither of them, even when taken in very large doses, produces as marked an effect on the acidity of the urine as that produced by the action of digestion.[1] According to Dr. Owen Rees,[2] the salts of vegetable acids, *e.g.*, the citrate of soda or potash, are powerful agents in rendering acid urine alkaline; further researches, however, are necessary to establish the fact. The prolonged use of the vegetable acids, especially of acetic acid, is apt to produce dyspepsia and cachexia.

2316. *In Typhus Fever*, the mineral acids have been recommended in all countries, from the days of Forestus, Sydenham, &c. The theory of their action is obscure; but, as Dr. Murchison observes, their beneficial effects are undoubted. Dr. Murchison (p. 266) adds, that during the last few years he has used these acids in hundreds of cases, and he believes them superior to any other method of treatment, though far from ascribing to them the wonderful effects attributed to them by some writers. He states that he usually commences with the hydrochloric (ɱxx.) and nitric acids (ɱx.) every three hours, each dose being diluted with the patient's drink. In the advanced stages of severe cases, when the "typhoid state" is well marked, he prefers diluted sulphuric acid (ɱxv.–xx.) every three hours, with ether and small doses of quinine (*q.v.*) He states that he has often observed marked improvement follow the commencement of the acid treatment, at whatever stage of the fever it was prescribed, and although no wine or brandy was given with it. *In Typhoid* (*Enteric*) *Fever*, Dr. Murchison (p. 570) considers that no remedies are superior to the mineral acids, and that they are often of real service, though their powers have been over-rated. Here he prefers the hydrochloric and sulphuric acids; ɱ xv.–xxx. of the dilute acid every three or four hours. With each dose he combines about half a grain of quinine, believing it to be of great service, especially when the disease has anything of a remittent character.

2317. *In Dyspepsia*, the mineral acids often prove beneficial, especially when alkalies have been found to fail. Dr. Brinton (p. 330) considers that in these cases they all agree, whatever their minor differences, in furthering gastric secretion, as well as in aiding the solvent powers of the juice already poured out by the stomach. They should be administered, of

[1] Guy's Hosp. Reports, vol. iv., 1870, p. 3.

[2] Med. Gaz., July 4, 1851.

course properly diluted, during or immediately after a meal, and are apparently most efficacious when mixed with pure or distilled water. It is said that acids and alkalies are sometimes of great service when given alternately, the former just before or during a meal, and the latter an hour or two after; a mode of administration which is certainly of use in some forms of chronic, constitutional, and visceral disease, but objectionable as savouring too much of polypharmacy. (Dr. Brinton, p. 331.)

2318. ACUPUNCTURE. The introduction of a needle into the body, with a view to the relief or cure of disease. It has been for centuries employed in Japan and China, and was introduced into England in 1679, by Dr. Ten Rhyne,[1] but did not come into general use till 1810, when Dr. Berlioz,[2] of Paris, wrote in its favour.

The needles generally employed are of steel, long and fine, and furnished at the blunt end with a knob of sealing-wax or ivory. They are best introduced by slight pressure, and a semi-rotatory motion between the thumb and fore-finger, and should be withdrawn with the same motion. The pain is comparatively trifling, indeed often scarcely felt. The needles may be introduced into muscular, aponeuritic, and tendinous parts, but not into serous cavities, and should be inserted from one-fourth of an inch to two inches, according to the thickness of the muscles. In general no fluid escapes when the needle is withdrawn, but occasionally a drop of blood follows. If hæmorrhage occur, as sometimes happens, it may be restrained by gentle pressure. The period during which the needle remains in the part is of great importance; the pain sometimes ceases instantly, but, as Dr. Elliotson remarks, if one needle be allowed to remain in an hour or more, the operation is more efficacious than when several are inserted and speedily withdrawn. In some cases it requires to be repeated several times, but generally twice is sufficient. The *modus operandi* of acupuncture is obscure.

2319. *Therapeutic Uses.* *In Chronic Rheumatism*, it has been highly spoken of by Cloquet, Elliotson,[3] Churchill, and others, but its value is doubted by Dr. Fuller (p. 439), who, while admitting, on the authority of others, that in some cases it may prove eminently useful, adds, as the result of his own experience, that its application is disagreeable, its curative powers uncertain, and the cases calling for its use extremely rare. Cases of *Muscular Rheumatism* successfully treated by acupuncture are recorded by Dr. Leared.[4]

[1] De Arthride Mantissa Schematica, &c., 8vo, Lond. 1683.

[2] Mém. sur les Mal. Chron., Paris, 1 816.

[3] Cyc. Pract. Med., i. p. 92.

[4] Med. Times and Gazette, Nov. 30, 1861.

2320. *In Sciatica*, acupuncture proves useful in those cases where there is reason to suppose that there is effusion within the sheath of the nerve, and the relief which it produces apparently depends upon the mechanical assistance it affords towards the evacuation of the effused fluid. Its use is limited to purely chronic cases. If resorted to when no effusion exists, or whilst any trace of inflammation remains, it is useless, and may be prejudicial; whereas, if employed when inflammation has subsided, and the nerve is irritated by effused fluid, it promises speedy and effectual relief. (Dr. Fuller, p. 454.) These remarks apply equally to other forms of *Neuralgia*.

2321. *In Unconsolidated Fracture of the Thigh*, acupuncture was successfully employed by M. Lenoir.[1] It is a mode of treatment first proposed by M. Malgaigne.

2322. *In Dropsical Affections, especially Anasarca*, acupuncture, the needles introduced not more deeply than to pierce the cutis, often affords great relief by allowing the escape of the serous accumulations. It is simply a palliative, and when used the constitution requires to be well supported by stimulants and nutritives. Sloughing has in some cases followed this measure.

AFFUSION, COLD. See WATER.

2323. ALKALIES, called also Antacids and Absorbents, include potash, soda, ammonia, lime and magnesia, and their carbonates. The carbonate of lithia is also a powerful medicine of the same class. In their pure states, potash, ammonia, and lime are sometimes employed as escharotics. The carbonate is the form in which they are generally administered internally. The following are some of the principal objects attained by their employment:—

As Antacids. It is in this character that alkalies are chiefly employed; and if given judiciously, they perform their office with certainty and rapidity; but if given indiscriminately, or in too large or too long-continued doses, they are productive of great mischief. Dr. Prout's (p. 91) observations on this point well merit attention. "Alkalies," he observes, "exert no *curative* effect, that is, they will not prevent acidity; on the contrary, when taken in large doses, and at improper times, the effect of alkalies is to cause an absolute increase of acid. Thus, when a large quantity of alkali is taken into an empty stomach, the immediate effect is, that the stomach, in endeavouring to resume its natural condition, throws out an additional quantity of acid to neutralise the redundant alkali. When alkaline remedies, therefore, are injudiciously persisted

[1] Bull. de Thérap., 1851.

in, a daily contest arises between the stomach and the doctor. If the constitution be strong, the stomach usually gains the ascendancy, but at the expense of extraordinary labour in the secretion of a greater quantity of acid. If, on the contrary, the stomach be weak, the doctor may conquer, but at the risk of still further enfeebling the vital power of that organ; and in both instances the general result will be that the diseased functions of the stomach will be augmented rather than improved. The beneficial effect of alkaline remedies is confined to the neutralization of the acids already formed, thus preventing their secondary effect on the system." To the above valuable remarks it may be added, that a certain amount of acid is necessary to carry on the digestive process, and that by the free use of alkalies we neutralize, not only the superabundant, but the necessary amount of acid, thus establishing a state worse than the first. It may be stated in general terms that the person who habituates himself to the use of alkalies will, in a shorter or longer time, be the subject of the most obstinate forms of dyspepsia. Other ill consequences result from prolonged use of alkalies; by their liquefacient action on the blood they are apt to induce general cachexia, with marked derangement of the digestive and nervous systems.

2324. When alkalies are given with a view of correcting acidity of the primæ viæ, they should not be given immediately after a meal, as they would interfere with the digestive process, but about three or four hours afterwards, when the digestion of the last meal may be supposed to be about completed. If the acidity be confined to the lower portions of the intestinal canal, the more insoluble antacids, as magnesia, are preferable to potash, and the more soluble carbonates. When one alkali disagrees, another may often be substituted; some individuals who cannot take potash will take soda or magnesia with impunity.

2325. *As a means of rendering Acid Urine Alkaline*, this class of remedies is much employed. Liquor potassæ, the carbonates and the salts of potash, with vegetable acids (*e.g.*, the acetate and citrate), are most frequently prescribed for this purpose. The causticity of liquor potassæ interferes with its administration in doses sufficiently large to render highly acid urine alkaline (Garrod, p. 103); otherwise it is particularly eligible, as it is believed to diminish *ardor urinæ*, and to allay vesical irritation, which frequently accompany an acid state of the urine. The acetate, citrate, and tartrate of potash are decomposed in the system, and are converted into carbonates. The corresponding preparations of soda may be employed for the same purpose; but it is held by many that the action of soda is rather directed to the liver and its secretion, whilst potash is believed to act more energetically on the kidneys. The urate

of potash, also, being much more soluble than the urate of soda, the former alkali is preferable when an excess of uric acid is present in the urine. According to Garrod, the carbonate of lithia exerts a more powerful effect in rendering the urine alkaline than do the corresponding salts of soda and potash. The salts of ammonia, with a vegetable acid, exert no influence in producing an alkaline condition of the urine. (Garrod.) Dr. Owen Rees[1] suggests the administration of alkalies *when the urine is highly alkaline.* He observes that there are some cases in which the urine may be supposed to be acid on its leaving the kidneys, but by its irritation of the internal surfaces of the ureters and bladder, it produces so copious a secretion from them of alkaline mucus, as to cause the acidity to be more than neutralized, and the urine to be rendered alkaline with phosphatic deposits. Acting upon this view, Dr. Rees administered alkalies in numerous cases, and the result fully corroborated the correctness of the theory. The remedy should be given in small doses. The influence of alkalies in checking the production of *Artificial Diabetes* has been ably shown in the important researches of Dr. Pavy.[2] The investigation is well worthy of further research.

2326. *As remedies in Gout, Rheumatism, Scrofula, Phthisis, Bronchocele, &c.*, alkalies prove useful, partly by their property of liquefying or attenuating the blood and the various secretions, and partly by correcting any abnormal acidity which may be present in the stomach or in the circulating fluid. In the former of these ways they prove useful *in the advanced stages of Pneumonia and Bronchitis,* when the expectoration is thick and viscid. As a liquefacient remedy, the liquor potassæ is perhaps the best form which can be employed. The carbonated alkalies are generally less efficacious.

2327. *In Dyspepsia,* the alkalies and alkaline salts are chiefly useful in cases in which the close of the digestive act is attended with much flatulence, regurgitation, and heartburn, when their immediate effects may be attributed to a neutralization of those lactic and acetic acids which the decomposition of the undigested food can produce. In other cases they appear to bring about general results, at least as valuable towards the cure of the malady, preventing, for example, the uric acid sediments associated with some of the more obstinate varieties of the malady, or provoking, it may be, the secretion of the liver, pancreas, or intestines. To obtain these effects the administration of alkalies should be limited to the latter part of the act of gastric digestion, and to the succeeding period of rest. And in any case, unless some definite constitutional result be

[1] Analysis of the Blood and Urine, p. 137.

[2] Guy's Hospital Reports, 1861, vol. vii.

sought from their use, when a smaller dose and a larger dilution become advisable, these remedies should be regarded only as occasional palliatives, or as temporary measures, and should not be pursued for a longer period than a few weeks at a time. (Brinton, p. 330.) Their efficacy appears to be increased by combining them with a vegetable bitter.

2328. *In Diabetes*, the carbonated alkalies exercise considerable influence. Dr. Pavy (p. 269) is in the habit of ordering bicarb. of potash gr. x.–xv.–xx. with Spt. Ammon. Arom. It is a curious fact that in this disease alkalies generally fail to render the urine alkaline, although under their use there occurs a marked diminution in the amount of sugar in the urine.

2329. *Skin Diseases.* Alkaline medicines, observes Dr. M'Call Anderson,[1] are especially useful in the treatment of skin disease occurring in rheumatic and gouty subjects, and in persons who are martyrs to acidity, or in whom there is a tendency to the deposit of uric acid or the urates in the urine. The salts most used are those of potash, *e.g.*, the acetate, bicarbonate, and citrate, but if a stimulant is required, carb. of ammonia is preferable. They may often be advantageously combined with arsenic, or if there be a gouty tendency, with colchicum: ℞ Ammon. Carb. ʒj., Liq. Arsenicalis ʒiij., Syr. Zingib. ʒvj., Infus. Cascarill. ad ʒxxiv., M. Dose, a tablespoonful in half a tumblerful of water thrice daily after food.

2330. The well-known chemical affinity of alkalies for fat has led to their employment in the treatment of *Obesity*. In this capacity, they have been found most serviceable by Fleming, Chambers, and others.

For the special action of each of the alkalies, the reader is referred to the articles on each in the former part of the work.

2331. Alteratives are medicines which gradually correct the deranged or morbid condition of an organ, or of the constitution, and restore it to its healthy or normal state, without evidencing their action by an immediate or sensible evacuation. Their *modus operandi* is confessedly obscure, but this constitutes no valid reason for altogether rejecting, as has been proposed by some, the claims of this class of medicines. There are few medicines which may be regarded as solely alterative, but there is scarcely a single drug, however violent in its operation in large doses, which may not, by the proper regulation of the dose, or by its mode of preparation, be converted into an alterative. Mercury, arsenic, and antimony may be taken as examples of this fact.

Alteratives are especially applicable to chronic diseases and

[1] Lancet, March 19, 1870.

passive derangements; those of an acute character requiring a more active class of remedies. In all chronic diseases, it may be laid down as a general rule that nothing is to be gained, and that much permanent mischief may result, from the employment of violent remedies. When medicines are given with a view to their operating as alteratives, they generally require to be administered in small doses, and to be persevered in for a lengthened period, namely, for weeks, and perhaps months; the practitioner being satisfied with witnessing, at considerable intervals, an improvement, however small, in the state of the patient. A careful regulation of the diet, and strict attention to personal hygiene, are indispensable auxiliaries to an alterative course of medicine. Without these, remedies can be of little avail.

2332. ANÆSTHETICS are agents which prevent pain, and diminish or destroy sensibility. They comprise a variety of articles of very diversified character, and are introduced into the system by a variety of means; they may be conveniently divided into two classes—1. General; 2. Local.

1. General. First in importance in the list of general anæsthetics rank the liquids, chloroform, ether, amylene, bichloride of methylene, methylic and methyl-ethylic ether, &c., the vapour of which, inhaled through the lungs, induces such complete anæsthesia, that the most serious operations can be performed without the consciousness of pain on the part of the patient. The articles comprised in this group have been fully considered under their respective headings, and the comparative value of many of them has been noticed more particularly in Art. CHLOROFORM. With respect to these agents as a class it may be observed—1. That their action is far from uniform, the same dose not producing the same effect on all individuals, nor even on the same individual at different periods and under different circumstances. 2. That the young bear proportionately larger doses than adults. 3. That hysterical females are peculiarly susceptible to their action. 4. That the danger in every case is in proportion to the concentration of the vapour. 5. That though there may be modifications in their mode of action, yet the cautions, contra-indications, preliminaries, and treatment, in cases of over-doses, laid down in Art. CHLOROFORM, apply with more or less force to each article of this group. There are some points connected with their employment, *e.g.*, the advantage and safety of mixed anæsthetic vapours, which must be regarded as still *sub judice*. See some instructive remarks by Mr. R. Ellis, in the *Lancet*, Feb. 10, and May 12, 1866.

2333. The only gaseous general anæsthetic which has come into use is the protoxide of nitrogen, nitrous oxide, the laughing

gas of former times. It has been extensively resorted to, especially in dentistry; and if we may judge from the immense number of cases in which it has been employed, and the comparatively few accidents which have attended its use, we may pronounce it a safe and effectual anæsthetic. Dr. Richardson,[1] however, expresses himself strongly against this and other anæsthetic gases; he considers that the employment of an agent like the nitrous oxide, which requires the exclusion of all atmospheric air during inhalation, which produces the most perfect asphyxia, which requires for its administration a costly and troublesome apparatus, and which, if administered beyond a given period, even for a few seconds, must of necessity kill, is a bad agent for anæsthetic administration; is, in fact, "a rude and vulgar process, retrogressive in science." Still it has its advocates, who place much reliance on its power and safety.

2334. Safety is, of course, the primary consideration in the selection of an anæsthetic, but there are peculiarities appertaining to individual agents of this class, which necessarily render them adapted or otherwise to certain states of the system, and to particular operations; thus chloroform, which is one of the best agents we can employ when the object is to produce profound and prolonged anæsthesia for capital operations, is ill adapted for dentistry, on account of its liability to induce rigidity of the muscles of the face, which would materially interfere with the necessary manipulations. Here the bichloride of methylene or nitrous oxide gas possesses decided superiority. Again, in ophthalmic surgery, nitrous oxide gas is inapplicable as an anæsthetic, its action being attended with twitchings of the orbicular muscles, which cause the eye to roll and bulge in a curiously unsteady manner. Again, although chloroform either alone or in combination with ether and alcohol (sect. 619) holds a first rank in general anæsthetics, yet the comparatively long time required for the patient to recover from its effects, and the headache which often follows its employment, are grave objections to its use, and in these respects it is inferior to bichloride of methylene. There are many other points connected with this part of the subject which want of space prevents our considering.

As far as is known, there is only one medicinal agent which, when swallowed, will produce general anæsthesia, and that is chloral. It appears certain that in chloral sleep there is a period of anæsthesia, but the fact has not been turned to practical account—1, from the difficulty of ascertaining the exact anæsthetic period; and 2, from the fact that the period itself, occur when it may, is short and transitory.

[1] Lancet, April 2, 1870.

2335. There is one other general anæsthetic, belonging to neither of the above classes, and whose operation is *sui generis*, and that is *Mesmerism*. It would be beyond the scope of this work to enter on the consideration of this agent; but the operations performed under its influence by Dr. Esdaile,[1] at Calcutta, some years since, leave no room to doubt that so complete a state of anæsthesia can be produced by its agency, that capital operations may be performed without consciousness on the part of the patient. A fatal objection, however, to its general employment exists in the prolonged period required to induce this anæsthetic state, and the varying susceptibility of individuals to its action; some constitutions resisting its influence altogether. It is indispensable that any anæsthetic, to command confidence on the part of the patient and of the operator alike, should act with some degree of uniformity and certainty.

2336. *Local Anæsthetics.* For our present knowledge of local anæsthesia we are indebted to Dr. B. W. Richardson,[2] to whose important researches in this and other branches of medical science the profession is under a deep debt of gratitude. From his writings the following particulars are mainly drawn.

The principle of the local anæsthetic process consists in directing on a part of the body a volatile liquid, having a boiling point at or below blood heat, in a state of fine sub-division or spray, such sub-division being produced by the action of air or other gaseous substance on the volatile liquid to be dispersed.

When the volatile fluid, dispersed in the form of spray, falls on the human body, it comes with force into the most minute contact with the surface upon which it strikes. As a result there is rapid evaporation of the volatile fluid, and so great an evolution of heat from the surface that the blood cannot supply the equivalent loss. The part consequently dies for the moment, and is as insensible as in death; but as the *vis à tergo* of the body is unaffected, the blood, as soon as the external agency is withdrawn, quickly makes its way back again to the dead parts, and restoration is immediate. The extreme rapidity of the action of this deadening process is the cause of its safety. The process can suspend life without causing disorganization; it produces, so to speak, syncope of the part, not destruction. When we produce general anæsthesia we virtually extend this mere local action to the body altogether, *i.e.*, we check the evolution of force at the centre, and produce an approach to temporary death of the whole organism.

With regard to the fluid to be employed, Dr. Richardson, after many trials, comes to the conclusion that the best of all

[1] Mesmerism in India, London, 1846.

[2] Med. Times and Gazette, Feb., March, and April, 1866.

is *pure* ether, of sp. gr. 0·720, and having a boiling point of 92° F. Many others, as chloroform, methylic ether, amylene, pure chloric ether, nitrite of amyl, kersolene, &c., have been proposed as agents for producing local anæsthesia. Some of these are open to rejection at once, from their boiling power being too high (above that of blood heat); others are unpleasant, and would not admit of being used in operations on the mouth or teeth; others cause irritation of the skin; others, *e.g.*, methylic ether, in their pure state are so volatile that they could not be kept for any length of time; and others, *e.g.*, nitrite of ethyl and nitrite of amyl, being too volatile, might affect the operator if they were diffused in the pure state. None of them, as far as is at present known, is equal to *pure* absolute ether. The purity of the ether is a point of the greatest importance.[1]

2337. The instrument first employed by Dr. Richardson was the toy sold at perfumers for diffusing eau-de-cologne in fine vapour over the skin, but he subsequently substituted Siegle's apparatus with the hand-ball spray-producer, invented by Dr. Andrew Clarke, supplied by the manufacturers, Messrs. Krohne and Sesemann, of Whitechapel-road. There are at present many improved forms of spray-producers or atomizers which may be employed for the purpose of inducing local anæsthesia.

[1] Dr. Richardson furnishes the following tests by which the purity of the ether may be judged:—*a*. Take the specific gravity. The specific gravity should not exceed 0·723. *b*. Try the boiling point. Warm the hands by gently blowing into them the warm breath. When the hands feel as warm as the breath, make the palm of one hand into a cup, and pour in one or two drachms of ether. The ether ought immediately to boil briskly, without giving any pain. *c*. Test the effect on mucous membrane. Put one or two drachms of the ether in the palm of the hand, and quickly take up the ether into the mouth with the tongue. The ether should at once pass off, leaving neither smarting nor burning, nor any sensation, except a slight coldness. *d*. Pour a little of the ether on a piece of clean white blotting-paper, and lay the blotting-paper on the warm hand. The paper should dry within a minute, leaving no moisture and no smell whatever. If the paper, while drying, yield an odour like eau-de-cologne, there is some alcohol present. If it give a smell slightly pungent, and which hangs about for a time, there is some methylated compound present. Perfectly pure ether, in a word, leaves no persistent odour. *e*. Try the degree of cold producible by the ether. Charge the bottle connected with the spray-producer, and direct the spray on the bulb of a thermometer. The mercury ought to fall rapidly to six degrees below zero Fahr., and the falling of the mercury should continue until there is a deposit of snow on the bulb of the thermometer, from condensation of water in the air. *f*. Test the effect on the skin. Direct the spray at a distance varying from half an inch to an inch and a half from the jet, on the back of the hand. In a space of time extending from thirty seconds to two minutes, a slight hoar frost deposit should form on the skin, followed immediately by a profuse blanching. The skin is at this moment altogether insensible. *g*. Test the reaction of the ether by litmus. The reaction should be neutral.

2338. Local anæsthesia may be either quite superficial or deep, with entire blanching of the surface to be operated upon. The latter is only requisite when the operation to be performed is a severe one. For producing the deep anæsthesia with superficial whiteness, it is necessary to use absolute ether, and to direct the spray in a brisk current at a distance of about an inch from the part. To induce the less determinate condition, the ether may be diluted. This may be done by mixing alcohol with the ether, or still better, chloroform. Two mixtures of this kind are very useful; one contains six parts of ether and two of chloroform, the other seven of ether and one of chloroform. In using pure ether or the mixture, differences of time are required. To cause insensibility with the former—ether—from fifteen to fifty seconds only are necessary; with either of the mixtures from four to five minutes are required. The sensation felt by the patient also differs. When pure ether is used, little if anything is felt until the moment when the part becomes white, then there is a sharp, pricking, burning sensation; when the compound is used, the sensation, very prolonged by comparison, is that of aching and numbness. As a general rule, patients prefer the more rapid procedure.

The nature of the operation will, to a large extent, determine the method to be resorted to. For opening an abscess, for incising a small carbuncle, for tying a nævus, for removing very small tumours, for applying nitric acid, and for operations of a similar kind, a mixture of ether and alcohol, or of ether and chloroform, answers every requirement. They might also, perhaps, be used in the operation for hernia. But for deeper operations, such as removal of the nail, of portions of bone, of fingers, and the like, complete local anæsthesia is required. For teeth extraction, the pure ether also answers best; it acts rapidly and deeply, and there is no great accumulation of fluid in the mouth. By practice the two degrees of action described above, may be obtained by the employment of ether alone, simply by removing the jet three inches from the part on which the spray is directed; by this means a moderate effect is produced, nearly equivalent to the dilution of seven parts of ether with one of chloroform. The condition of the patient generally ought likewise to be considered. Aged and weak people become anæsthetic very readily, and for them the milder process is most applicable.

2339. Previous to the introduction of local anæsthesia by ether spray, ice had been introduced for this purpose by Dr. Arnott, and there can be no doubt that by its means a frozen or congealed state may be induced, during which the sensibility of the part may be so effectually destroyed that small operations, opening abscesses, &c., may be performed without consciousness of pain on the part of the patient; but the

practice is not without danger, for if it be applied too suddenly or be too long continued, it may induce gangrene. For mode of application see Art. Ice.

2340. Electricity was proposed in 1858 by Dr. Richardson, for the purpose of inducing local anæsthesia, but it has never come into general use; it appears to offer no advantage over ether spray or even over congelation.

2341. Before closing this article, there are two agents which require a brief notice, from their power of producing local anæsthesia *sui generis*—1. Bromide of Potassium, which, when taken internally in large doses, exerts an anæsthetic influence over mucous membranes generally, but especially over those of the pharynx and larynx, a circumstance which has been taken advantage of in preparing patients for laryngoscopic examinations and operations. It likewise appears to exercise a marked influence in diminishing or destroying the sensibility of the eyeball. (See Sect. 1749.) 2. Iodoform, which, when introduced in the form of suppository, induces so marked an anæsthetic influence on the rectum and lower bowels, that defecation can be accomplished without consciousness on the part of the patient. (Sect. 1193.) Both these agents require to be examined more closely with regard to their local anæsthetic properties.

2342. Anthelmintics are agents which destroy, or cause the expulsion of, intestinal worms. They are sometimes called Vermifuges. They may be divided into four classes:—1. Specific. 2. Mechanical. 3. Purgative. 4. Corroborant or Preventive.

1. *Specific Anthelmintics* are those which, by some inherent poisonous property, destroy the worm whilst in the intestines. To this class belong Kamala, Kousso, Filix mas., Santonin, Pomegranate, and Oil of Turpentine. The evidence of their specific action is that the worm is expelled lifeless. Most of this class require a brisk purgative to assist and complete their action.

2. *Mechanical Anthelmintics* operate by irritating and wounding the worms, and thus obliging them to leave their hold on the mucous coat of the intestine. Of this class, two only are at present employed, and even these rarely: viz., tin-filings, and cowhage. That they do not act poisonously on the worm is evident from the fact that, under their use, it is generally voided alive. A brisk purgative is required to evacuate the worm after it has been obliged to quit its hold on the mucous membrane.

3. *Purgative Anthelmintics* are those which cause the expulsion of the worm, by their action on the intestinal canal. This they effect, partly by increasing the peristaltic action of the

bowels to such a degree that the worm is unable to retain its hold, and partly by clearing away the accumulations of mucus with which the worms are so often found surrounded. The worms thus become detached, and are generally expelled alive. All the more powerful purgatives, particularly scammony and jalap, are included in this class.

4. *Corroborant or Preventive Anthelmintics.* In order to ascertain the remedies to be classed in this division, it is necessary to ascertain, first, what condition of the intestines or system is most favourable to the development of these parasites; and having done this, it should be the object of the practitioner to apply those remedies which appear the most likely to remove that condition. Now, it appears that debility, and a vitiated state of the secretions dependent upon unwholesome diet, are conditions the most favourable to their production; and to remove this state, wholesome digestible food, ferruginous preparations, and vegetable bitters, are indicated, and will, in the majority of cases, prove successful. Common salt appears to be particularly effectual, and considerable quantities may be given, not only as an article of diet, but as a medicine. The absence of salt as an ordinary condiment appears, more than any other circumstance, to favour their production. Dr. Paris regards hydrochloric acid with infusion of quassia as the most efficacious remedy of this class.

2343. Certain anthelmintics are more effectual against one class of worms than against others: thus, pomegranate, the male-fern, kamala, turpentine, and kousso are chiefly effectual against *Tæniæ or Tape-Worms;* purgatives of calomel and scammony or jalap, oil of turpentine, tin-filings, cowhage, spigelia, and santonin, against *Lumbrici or Round Worms;* and enemas containing turpentine, tinct. ferri perchloridi, quassia, olive or castor oil, assafœtida, and common salt, against *Thread-Worms.* It is only against the last class (thread-worms) and then only when situated in the rectum or lower intestines, that enemas, either simple or medicated, can be of any permanent benefit. (See Enemas.) The irritation caused by this worm is best relieved by enemas of olive oil.

2344. Antidotes are remedies given to counteract the noxious effects of poisonous substances. They are of two classes, Chemical and Mechanical. The first includes all those agents which, when taken internally, decompose the poison, and render it inert or less noxious; the second comprises those agents which act simply by sheathing the mucous surface of the intestines, enveloping the poisonous particles, and obstructing their absorption. Amongst these may be mentioned gelatinous, albuminous, oleaginous, and saccharine

substances, demulcents, &c. The two classes of antidotes may often be advantageously combined.

2345. A brief sketch of the antidotes adapted for some of the principal poisons may not be out of place here, and may, perhaps, on occasion be found of great practical service. It has been drawn mainly from Dr. Tanner's "Memoranda on Poisons," a very useful little book.

2346. *Hydrochloric, Nitric, and Sulphuric Acids.*—Carbonate of soda, or calcined magnesia, or the carbonate of magnesia, should be immediately given, mixed in milk or any mucilaginous fluid; repeated at short intervals, until it may be inferred that the acid is neutralized. In the absence of these remedies substitutes may be found in chalk, whiting, soap and water, or the plaster of the apartment beaten up with water. Oleaginous and mucilaginous fluids, as olive oil, linseed tea, barley water, milk, gruel, &c., may be freely given, either alone, or as the vehicle of the antidote. The success of this treatment will depend upon the promptitude with which it is adopted. When the patient is unable to swallow, the stomach-pump may be employed to inject these antidotes; it ought, however, to be a last resource, on account of the imminent danger of causing laceration. Should the larynx be injured, and the breathing impeded, tracheotomy must be at once had recourse to. After a sufficiency of the antidote has been given, the use of mucilaginous diluents must be continued for some time, and the subsequent treatment will be that for gastroenteritis. Great benefit will be derived from the use of oily enemata. The external parts which have been injured by the acid, should be well bathed with soap and water.

2347. *Acetic and other Vegetable Acids.* All that is necessary in these cases, is to administer draughts containing magnesia or its carbonate, followed by mucilaginous or demulcent drinks.

2348. *Oxalic Acid.* Chalk, whiting, or magnesia, suspended in water, or in some demulcent fluid, must be administered immediately; and, if necessary, vomiting should be excited by tickling the fauces, or administering emetics of sulphate of zinc, &c., followed by large quantities of emollient drinks. The antidote, to be effective, must be given as soon as possible, the plaster of the apartment being used in the absence of the remedies just mentioned. Alkalies (soda, potash, or their carbonates) are not only useless, but they form salts with oxalic acid, which are as injurious as the acid itself. Where there are symptoms of collapse, stimulants are to be freely employed.

2349. *Phosphorus and Phosphoric Acid.* The treatment often fails because applied too late. Vomiting is to be encouraged by large draughts of mucilaginous or albuminous drinks; and if necessary, emetics must be administered. As phosphorus is

supposed to produce its poisonous effects by its conversion into phosphorous and phosphoric acids, large doses of magnesia should be given. Oil must be avoided, since it is a solvent of this substance. Recent researches tend to show that oil of turpentine is the most effectual antidote in poisoning by phosphorus. It forms with it a substance resembling spermaceti.[1]

2350. *Iodine and its Compounds.* The treatment should consist in the encouragement of vomiting, and the free administration of amylaceous fluids, as gruel, arrow-root, starch, &c. This should be continued until the matters vomited are of their natural colour ; for as long as any iodide remains they will be rendered blue; iodide of starch being formed.

2351. *Ammonia, Soda, Potash, and other Alkalies.* The object must be to neutralize the poison, which may be effected by weak acids. Vinegar and water is perhaps the best antidote, and the most readily procured; its administration may be followed by freely allowing acidulated demulcent drinks, orange-juice, &c. The use of oil has been recommended, on the principle that it converts the alkali into a soap, but its efficacy is doubtful.

2352. *Nitrate and Sulphate of Potash.* As no antidotes are known to these salts, the treatment must consist in producing vomiting as speedily as possible by means of emetics; or the stomach-pump may be used. Demulcent drinks should be freely given subsequently.

2353. *Baryta and its Salts.* The sulphate of soda or sulphate of magnesia, or some earthy sulphate, should be speedily administered, by which the poison will be converted into an inert, insoluble sulphate of baryta. Emetics should also be given, or the stomach pump used.

2354. *Arsenic and Arsenical Preparations.* The first object must be to expel the poison from the stomach ; for which purpose the stomach-pump may be advantageously employed, or emetics of sulphate of zinc or mustard administered, unless vomiting is already present. The sickness must be promoted by the free use of albuminous or mucilaginous diluents. Raw eggs beaten up in milk are particularly useful, as is likewise a mixture of albumen, milk, and lime-water. Taylor advises equal parts of oil and lime-water, for the oil invests the poison, and the lime renders it less soluble. A large dose of castor-oil (fl. oz. j.–ij.) may be given, to carry off any of the poison which may have passed into the intestines. Animal charcoal, calcined magnesia, &c., when taken in large quantities, may be of service by enveloping the arsenic, and preventing its contact with the mucous membrane of the stomach ; but oil or

[1] British Medical Journal, Feb. 4, 1871.

milk will act more efficiently for this purpose. The humid peroxide of iron (in doses of a tablespoonful every five or ten minutes) holds a foremost place in the antidotes to arsenic: its action is perhaps more mechanical than chemical. (See Sect. 967.) The subsequent treatment must be conducted on general principles, according to the severity of the symptoms; but the great depression of the nervous and vascular systems must not be overlooked in combating any inflammatory action. Chloroform, henbane, or opium, in many instances combined with stimulants, will frequently be found of great service.

2355. *Corrosive Sublimate and other Mercurial Salts.* If vomiting does not already exist, it must be excited by the use of emetics. Various antidotes have been recommended for this poison; among these, albumen and gluten of wheat are the most to be relied upon; the albumen acting upon the perchloride so as to form an insoluble combination. The white and the yolk of raw eggs should therefore be abundantly given; for although one egg has been thought sufficient to render four grains of the poison innocuous, yet no injury can result from giving too many, as they will promote vomiting. Gluten has been much recommended, and may readily be prepared by washing flour in a muslin bag, under a stream of water; but on an emergency it will be best to exhibit the flour at once, made into a paste with milk or water. Several other antidotes have also been proposed, as iron filings, gold dust and iron filings diffused in mucilage, the hydrated protosulphuret of iron, &c.; but in the present state of our knowledge, it will be advisable to employ those substances only with whose action we are fully acquainted. The after-treatment consists in the free use of demulcent drinks; milk and ice will be very grateful to the patient's feelings; gargles of alum or borax do some good; opiates may be given in small doses, if there be much pain, and we should allow only a milk or farinaceous diet; chlorate of potash has been recommended to check the salivation. The most useful remedy, however, is the iodide of potassium; for this salt destroys the compounds formed by the union of mercury with certain of the tissues, and eliminates the poison through the kidneys.

2356. *Acetate of Lead (Sugar of Lead), Subacetate of Lead (Goulard's Extract), and Carbonate of Lead (White Lead. Ceruse).* The sulphates of soda or magnesia, and other soluble alkaline or earthy sulphates dissolved in water should be freely given; milk, or milk and eggs, will be useful. If vomiting is absent, an emetic of sulphate of zinc should be administered; or the stomach-pump may be advantageously employed. As a purgative no remedy is better than croton oil. For a chemical antidote in poisoning by carbonate of lead, Dr. Taylor recommends a mixture of vinegar and sulphate of magnesia.

2357. *Sulphate of Copper* (*Blue Vitriol*), *Subacetate of Copper* (*Verdigris*), *Arsenite of Copper* (*Mineral Green*), *and other Salts of Copper.* Vomiting sets in spontaneously, and is to be encouraged by the use of warm water; the stomach-pump will rarely be needed. The only effectual antidote is albumen; the white and yolk of several eggs should therefore be given, followed immediately by milk or mucilaginous drinks. Sugar, iron-filings, and the ferrocyanate of potass have been recommended as antidotes.

2358. *Tartarated Antimony* (*Tartar Emetic*), *Chloride of Antimony* (*Butter of Antimony*), *and other Antimonial Preparations.* Vomiting should be encouraged by warm greasy water, milk, &c. Tannate of antimony is regarded as inert, and hence an infusion containing tannin (tea, decoction of galls, or oak bark) must be freely given; cinchona bark in tincture or powder may be advantageously administered. In poisoning by the chloride, magnesia, in plentiful draughts of milk, should precede the use of the other remedies just mentioned.

2359. *Sulphate of Zinc* (*White Vitriol, White Copperas*), *Sol. of Chloride of Zinc,* (*Sir W. Burnett's Disinfecting Fluid.*) Vomiting is to be encouraged by milk or albuminous fluids; and then remedies containing tannin (strong tea, decoction of oak bark, or tincture of cinchona) are to be given.

2360. *Nitrate of Silver* (*Lunar Caustic*). Common salt is the antidote; it should be given promptly and freely in solution, and followed by emetics.

2361. *Sulphate of Iron* (*Green Vitriol, Copperas*). Magnesia in draughts of milk or albuminous fluid, should be freely administered.

2362. *Bichromate of Potash.* Emetics, and magnesia or chalk, are the principal remedies.

2363. *Cantharides* (*Spanish Fly*). No antidote is known. Vomiting must be excited or encouraged; and linseed tea, or gum water, or gruel copiously administered; the warm bath will afford great relief. Oil must be avoided on account of its being a solvent of the active principle (cantharidine) of this poison. (See also Sect. 510.)

2364. *Opium and Morphia.* The first object is to remove all the poison from the stomach, and this cannot be effected in any way so well as by the stomach-pump. In the absence of this instrument, emetics of half a drachm of sulphate of zinc, or a tablespoonful of mustard, must be employed; being administered as enemata, if there is inability to swallow. The patient at the same time is to be prevented as much as possible from going to sleep. When the stomach has been thoroughly emptied, every means must be adopted to keep the patient roused. This is to be effected by dashing cold water over his

head and chest, walking him quickly about, supported by two attendants in the open air, irritating his legs by flagellation with a wet towel, applying electro-magnetic shocks to the spine, and administering strong coffee. If there is much depression, alcoholic stimulants are to be given. Bleeding has been recommended; but it is only to be used after the poison has been removed from the stomach, and when, from the coma and full pulse, we are sure that there is cerebral congestion; in extreme cases artificial respiration must be tried. The remedies recommended must be perseveringly used; remembering that as long as life lasts, hope of recovery is not to be banished. In the great majority of cases the treatment is successful. The subcutaneous injection of atropia has been advised, but to be of any avail, it must be employed in the earliest stages.[1]

2365. *Hydrocyanic Acid.* There is no antidote to this poison which can be relied upon. Chlorine and the mixed oxides of iron have been recommended; but even if one of these agents happened to be at hand, it is doubtful if its employment would be advantageous. Attempts must be made to restore animation by cold affusion, stimulating frictions to the chest and abdomen, warmth to the surface, and the application of ammonia to the nostrils. Cold affusion over the head and neck has proved the most efficacious, when promptly resorted to, and repeated at short intervals so as to cause a shock. If recovery ensue from the immediate effects, vomiting should be produced by emetics; after which strong coffee, with brandy, ought to be administered. (See also Sect. 1174.)

2366. *Cyanide of Potassium.* Treatment the same as that for Hydrocyanic Acid.

2367. *Chloroform, Ether, Amylene, Bichloride of Methylene and other Anæsthetics, Vapour of.* (See Sect. 621.)

2368. *Calabar Bean (Physostigmatis Faba).* Emetics to empty the stomach thoroughly, and promptly followed by strong coffee and diffusible stimulants. Strychnia might be cautiously tried with the view of setting up an antagonistic action.

2369. *Alcohol.* Empty the stomach by emetics (sulphate of zinc gr. xx. or a tablespoonful of mustard in warm water), or if the patient be insensible, by the stomach-pump. Cold affusion, followed by a few drops of liquor ammoniæ, strong coffee should be tried; subsequently warmth must be promoted.

[1] See a severe case of opium poisoning in the practice of Dr. B. Wilson, of Philadelphia (Practitioner, Jan. 1869), which yielded speedily and completely to atropia (gr. $\frac{1}{4}$) subcutaneously injected. He considers that all future cases of opium poisoning should be treated by the subcutaneous injection of atropia, gr. $\frac{1}{16}$–gr. $\frac{1}{16}$ every half hour or hour till the patient is relieved, or till the effects of the remedy manifest themselves. Dr. Harley's views of its utility (Sect. 1494) are not encouraging.

2370. *Chloral.* Strychnia is said to be a complete antidote. (Sect. 605.)

2371. *Creasote.* Albumen is a chemical antidote; hence white of egg should be freely given; any subsequent inflammation must be treated on general principles.

2372. *Aconite.* Strong diffusible stimulants, brandy, ammonia, and cold affusion have been found serviceable; also friction of the limbs and back with hot towels. Artificial respiration might prove useful. Mr. B. Wills Richardson[1] records a case in which the subcutaneous injection of fl. drm. ½ of undiluted liquor ammoniæ effected recovery; the injection was repeated four times within half-an hour; the only subsequent annoyance was a small cutaneous eschar.

2373. *Digitalis.* In addition to the administration of emetics and castor oil, some infusion containing tannin (*e.g.* the officinal decoction of gall-nuts, or tannic acid diffused in water) should be given as an antidote. Substances containing tannin render the digitaline inert. Strong tea or coffee, with brandy, will likewise be needed, to lessen the somnolency and exhaustion; for this purpose chloric or sulphuric ether may also be employed with advantage.

2374. *Cocculus Indicus, Hellebore, Colchicum, Dulcamara, Nightshade, Hemlock, Tobacco, Belladonna, Stramonium, Henbane, &c.* The prompt administration of emetics, followed by purgatives (castor oil) and stimulants (ether or brandy) offer the best chances of success. In all these cases animal charcoal should be employed, and if there should be much stupor or coma, cold affusion may be used with advantage.

2375. *Euphorbiaceous Seeds*, including those of *Croton Tiglium* (Croton oil seeds), *Ricinus communis* (Castor oil seeds), *Hura crepitans* (Sand-box), *Hippomane Mancinella* (Manchineal apple), *Jatropha Curcas* (English Physic nuts), *Jatropha multifida* (French Physic nuts). After the prompt administration of an emetic to evacuate the stomach, plentiful draughts of lemon or lime-juice should be given; improvement often speedily takes place; stimulants are also often required. The same treatment is effectual in poisoning by the root of *Jatropha Manihot*, the Mandioc or Bitter Cassava. In the absence of lemon or lime-juice, diluted vinegar may be substituted.

2376. *Nux Vomica and its Alkaloids, Strychnia and Brucia.* Emetics are to be given at once, and repeated until very free vomiting is induced. If the tetanic spasms have not commenced, the stomach-pump ought to be used. When the patient is unable to swallow, a drachm of sulphate of zinc, or a couple of ounces of ipecacuanha wine, should be injected into the rectum; then an ounce or two of castor oil, perhaps

[1] Medical Times, Dec. 18, 1869.

with a couple of drops of croton oil, is to be administered. Fatty matters appear to retard the absorption of this poison; hence the advantage, if the case is seen before the poison has had time to become absorbed into the system, of giving copious draughts of olive or other bland oils, melted lard or other fats. The iodide of methyl wonderfully modifies and diminishes the power of strychnia, and if at hand should be tried (Sect. 1372). Recourse should be had to the subcutaneous injection of Calabar bean (Sects. 1603, 4). Chloral in full doses, also seems worthy of a trial. The spasms may in a measure be controlled by chloroform inhalation (Sect. 651). Aconite, (which has been shown to be a physiological antidote in animals),[1] tobacco, and nicotine, wourali, animal charcoal, iodine, camphor, have each their advocates, but the superiority of any one of them cannot be said to be established. The patient's strength should be supported, and care should be taken to keep all as quiet as possible around, as the slightest cause, even a light touch, or a cold draught of air, often suffices to bring on a paroxysm, and the longer these can be delayed, the greater the chance of recovery.

2377. *Poisonous Mushrooms.* After a prompt emetic, followed by a cathartic (castor oil), so as to evacuate from the stomach and intestines the poisonous substance, it is often necessary to combat exhaustion with stimulants; of these, chloric or compound sulphuric ether is the best; if these are not at hand, brandy may be substituted. Any subsequent inflammation must be treated on general principles. Infusion of galls, oak bark, and other substances containing tannin, are said to be useful after the evacuations.

2378. *Narcotic Gases*, including *Carbonic Acid Gas* (*Charcoal fumes, &c.*), *Sulphuretted Hydrogen, and Carburetted Hydrogen* (*Coal-gas*). The first thing to be done in all these cases, is prompt removal to the pure air; this, with cold affusion and stimulating applications to the chest and extremities, are the best means of resuscitation. If the countenance be bloated, venesection may prove useful by relieving congestion. Artificial respiration, galvanism, and the inhalation of oxygen gas (Sect. 1563) have been found useful. Chlorine is an antidote to sulphuretted hydrogen, its vapour should therefore be inhaled in poisoning by that gas (Sect. 609).

2379. ANTIPHLOGISTIC, a term applied to agents which are employed to diminish or subdue inflammatory action. Amongst the remedies chiefly classed under this denomination are blood-letting, calomel, antimony, aconite, digitalis, and colchicum. They operate by lowering the action of the heart

[1] Dr. Woakes, British Medical Journal, Oct. 1861.

and arterial system, reducing vascular excitement, diminishing the quantity of fibrine in the blood, and increasing all the secretions, particularly those of the skin and bowels.

Antiphlogistic regimen is the system of diet and hygiene employed to co-operate with the above named remedies; it consists of low diet, and bodily and mental rest. It includes abstinence from animal food, from all spirituous, vinous, and fermented liquors; the avoidance of all strong emotions and mental agitations, of muscular action, in fact of everything which may tend to quicken the circulation, or cause disturbance, either mentally or bodily. If a limb be inflamed, rest in the horizontal position should be maintained; if the brain, mental quiet should be enforced; if the lungs, all exercise of the vocal organs should be prohibited; if the eye, strong lights should be avoided; if the ear, silence should be enforced. The admission of pure air, by proper ventilation, into the patient's apartment, is a point never to be neglected. A temperature of about 62° F. should be maintained.

This class of remedies, formerly regarded as indispensable in the treatment of all acute cases, has in a great measure been superseded in modern practice by nutritives and stimulants; still there are a large number of cases in which the antiphlogistic treatment is productive of the best effects. It is indicated, 1, in all acute inflammatory and other febrile diseases, of a sthenic type, occurring in young and healthy subjects; 2, in plethora; 3, in acute hæmorrhage; 4, in certain injuries, particularly in those of the head and of the eye.

2380. Antispasmodics are remedies which relieve existing spasm, and prevent its recurrence. They may be divided into four classes as follows :—

1. *Narcotic Antispasmodics.* Those which deaden the sensibility and irritability of the nervous system generally, and thus allay that irregular and violent contraction of muscular fibre which constitutes what has been denominated a true spasm. Amongst this class may be enumerated the narcotics, particularly opium and belladonna. The former generally affords more speedy relief, but it is not of so permanent a character as that obtained from belladonna. The operation of all this class is attended by more or less subsequent narcotism.

2. *True or Specific Antispasmodics.* This class includes assafœtida, valerian, musk, castor, galbanum, &c., medicines which relieve spasms, without producing any other sensible effect on the system. It is generally considered that they produce benefit by their stimulant action; but how this can be the case, when the spasm itself, in many cases, arises from excessive stimulus or irritation of muscular fibre, remains to be explained. When, however, the spasm arises, as it doubtless often does,

from deficient nervous energy, this explanation is much more satisfactory.

3. *Tonic Antispasmodics*, or those agents which establish a healthy tone of the nervous system. This class includes the salts of silver, zinc, and copper. Remedies of this class are of little or no service during a paroxysm; the intervals being the proper time for their administration, and their utility being confined to preventing a recurrence of the spasm. They appear to operate by establishing a tonicity and healthy condition of the nervous system, thus preventing the occurrence of abnormal irritability of the nerves, and consequent inordinate contraction of muscular fibre. They all require to be persevered in for a lengthened period; indeed, few of them exercise any permanent benefit, if not continued for weeks, or even months.

4. *Stomachic Antispasmodics* are those agents which, by correcting a deranged state of the stomach and digestive organs, operate indirectly in establishing a healthy condition of the nervous system. Visceral derangements are a frequent cause of great nervous irritability; and, as a consequence, a tendency to irregular muscular contractions in various parts of the body. This deranged state of the digestive organs may arise from so many causes, that the practitioner must examine minutely into each case before determining on the remedy or class of remedies likely to prove most serviceable: thus, if it arise from a vitiated state of the biliary secretion, a mild course of mercury, or even a single dose of calomel, may be sufficient; if from abnormal acidity, alkalies are indicated; if from the presence of worms, anthelmintics; but it may be laid down as a general rule in all spasmodic diseases, that strict attention to the state of the alvine secretions and of the digestive functions is indispensable.

2381. In the practical application of antispasmodics, the only point which requires particular notice is the necessity of distinguishing clearly between spasm and inflammation, a point of occasional difficulty. In spasm, as compared with inflammation, it may be stated generally, that the pain comes on more suddenly, is of a more acute and distressing character, is relieved by slow and continued pressure (whilst that of inflammation is increased), is accompanied by intervals of comparative or positive ease; the pulse in the meantime is not accelerated in proportion to the amount of pain, and wants that peculiar, wiry throb which accompanies inflammation of serous membranes. For the other distinguishing marks, the reader is referred to the lectures of Drs. Watson, Graves, &c. It is only necessary to add, that spasm will be relieved by the above-named remedies, sometimes in a marked and sudden manner, whilst the pain of inflammation will be

either only slightly eased, or in some cases even increased by them.

2382. Astringents are agents which cause a contraction of the capillaries, constringe muscular fibre, coagulate albuminous tissues, and solidify the parts to which they are applied. When used externally, to arrest superficial hæmorrhage, they are denominated Styptics. The purposes for which they are employed are thus enumerated by Dr. Pereira:—1, to stop preternatural secretion from mucous surfaces, as in leucorrhœa, gonorrhœa, and gleet; 2, to check profuse secretion from ulcerated surfaces; 3, to stop hæmorrhage, as from the uterus and piles; 4, to strengthen and constringe relaxed parts, as in prolapsus; 5, to subdue inflammation of superficial parts, *e.g.*, nitrate of silver in erysipelas. The great majority of astringents act chemically by coagulating the albumen of the blood.

Indications for their Use. 1, Atonic or passive hæmorrhage; 2, non-inflammatory diarrhœa; 3, diabetes; 4, chronic discharges, as gonorrhœa, gleet, and leucorrhœa; 5, excessive mucous discharges from the lungs, stomach, bladder, and other mucous surfaces, when attended with relaxation of the parts, and atony of the system; 6, ulcers with copious secretion; 7, profuse perspirations of phthisis and other diseases.

Contra-indications. 1, Inflammation; 2, active hæmorrhage, inflammatory diarrhœa, and excessive mucous discharges, attended by inflammation; 3, rigidity of parts; 4, extensive external injuries. In these cases, the local application of astringents will not only fail to arrest the hæmorrhage, but may excite excessive irritability or inflammation of the surrounding tissues.

2383. Baths. It would be beyond the limits of this work to consider at length the effects of various baths on the animal economy, in health as well as in disease; in the present article, therefore, a few important particulars as to their employment as therapeutic agents will be considered. For further particulars, the reader is referred to an excellent treatise by Dr. Forbes,[1] from which much of this article is drawn.

Baths are divided into:—

1. The Cold Bath,	from	33°	to	60° F.
2. The Cool Bath,	„	60°	„	75°
3. The Temperate Bath,	„	75°	„	85°
4. The Tepid Bath,	„	85°	„	92°
5. The Warm Bath,	„	92°	„	98°
6. The Hot Bath,	„	98°	„	112°

[1] Cyc. Pract. Med., vol. i. art. Bath.

2384. The Cold Bath is employed chiefly with a view of producing one of the three following effects:—1, a shock on the nervous system, independently of the accompanying refrigeration, or subsequent reaction; 2, refrigeration, independently of the nervous shock, or vascular reaction; 3, reaction, independently of the shock or refrigeration. The two first of these objects are of inferior practical importance; the last comprehends nearly the whole doctrine of cold bathing.

2385. *Observations on its Use.* 1. The morning is the most proper period for the cold bath. 2. It should not be taken whilst the body is in a state of profuse perspiration. 3. It is objectionable immediately after a full meal. 4. The head should, if possible, be immersed first. The advantage of the plunge bath is that this object is effected suddenly, and with certainty. 5. It should never be continued so long as to cause shivering, blueness of the nails, &c.; five or ten minutes is a sufficient time for one bath. 6. If it produce these effects, the bath should not be repeated at the same temperature, or for the same length of time. 7. After coming out of the bath, the body should be rapidly dried, and gentle exercise taken.

2386. *Cautions and Contra-indications.* The cold bath is inadmissible under the following circumstances:—1. During the menstrual period, and only with great caution during pregnancy. 2. In great plethora, or in cases where there exists a tendency to any active hæmorrhage, or apoplexy. 3. In persons affected with disease of the heart, particularly with dilatation or valvular obstructions; or in those having a tendency to disease of the heart. 4. In indurations, obstructions, or chronic inflammations of the internal parts of the body; likewise in all acute inflammations of these parts, more particularly of the principal viscera. 5. In loaded states of the bowels, more particularly if combined with a congested condition of the venous system of the abdomen. 6. In most cutaneous diseases, particularly in such as are apt, when suddenly repressed, to be followed by internal affections. 7. In great general debility, and where there does not exist sufficient power of reaction, more especially if there exist an habitually cold state of the surface. 8. In scrofulous disease; and it should be used with great caution when a predisposition to this disease exists. 9. It is less applicable in infancy and in old age than in youth or middle life.

2387. *The Cold Bath is generally applicable* to those cases in which there is much languor and weakness of the circulation, accompanied by profuse perspirations, a relaxed state of the system generally, and a deranged condition of the nervous system, which are so frequently the consequence of debilitating diseases, or intense study. In short, from whatever cause

it may arise (disease of the internal viscera excepted), when great relaxation and debility exist, the cold bath, properly employed, will be found a valuable therapeutic agent.

2388. *Therapeutic Uses.* *In Spasmodic Asthma*, many writers advocate the employment of the cold bath; it is stated to lessen the morbid sensibility to the impression of cold atmospherical changes, and to give tone and vigour to the system; it should be employed only in the intervals, never during a paroxysm. Simply sponging the body is preferred by some to immersion. Salt (oz. j. ad Aq. Oj.) may be added with advantage, and the body should afterwards be rubbed with rough towels or a flesh-brush. The best time for using it is immediately after getting out of bed in the morning. Sir T. Watson prefers the use of the shower-bath. *In the Chronic stages of Hooping Cough* the cold bath, or shower-bath, is sometimes attended with excellent effects.

2389. *In Nervous Diseases, when unconnected with disease of the Brain, and in those cases of Paralysis consequent on severe inflammatory attacks of the Brain and Spinal Column*, the use of the cold bath, particularly the shower-bath, is often attended with benefit; on the other hand, it sometimes fails altogether, or even aggravates the severity of the symptoms. *In Congestive and Hysterical Headaches*, the shower-bath may be used with advantage.

2390. *In Chorea*, the cold shower-bath is a valuable adjunct to other treatment. Part of the good results, observes Dr. Radcliffe (ii. p. 140) is ascribed to the shock; part—a greater part, perhaps—to the reaction. Still there are many cases in which the shock is not tolerated, and where reaction is not easily established; cases in which the patient is rendered worse rather than better, as far as the chorea is concerned, with the additional disadvantage of a bad cold, or actual rheumatism, or some other evil. These cases are by no means uncommon. These remarks also apply to cold plunge baths, and to other forms of cold bath. With respect to hot baths and to warm baths, adds the same authority, the case is very different. A hot bath at bedtime has often seemed to have a marked calmative influence, and it is probable that much of the benefit ascribed by M. Baudelocque to sulphur baths is due to the high temperature of the water, or to the cutaneous irritation caused by them. There is much force in Dr. Hillier's remark (p. 236) that shower-baths are useful in the later stages of chorea, when the patient is not too timid and too much excited by them. These observations hold good with reference to *Epilepsy*, and some other forms of *Convulsive Disease*.

2391. *In some forms of Hysteria, in Hypochondriasis, and in Nervous Prostration*, after excessive study or debilitating disease, the shower-bath proves highly useful. A paroxysm of hysteria

may often be arrested by the cold douche to the head, chest, or spine.

2392. *In Scrofula*, salt-water baths, both hot and cold, have often an excellent effect. Their efficacy appears to depend upon cleansing the body, opening and stimulating the pores of the skin, and allowing the cutaneous exhalation to be carried on with normal activity. It should also be observed that sea-bathing has generally been employed at those seasons of the year at which, without any treatment, all the symptoms of scrofula are alleviated, viz., summer and autumn. In very weakly subjects, however, or when softening of tubercular matter has taken place, so far from being beneficial, cold-water bathing is decidedly injurious, producing a degree of depression from which the constitution can with difficulty recover itself.

2393. *In Spermatorrhœa*, cold hip-baths are stated to be of the highest value. The patient should begin by sitting in a hip-bath for five minutes three times a day, the water being about 65°F. The time is gradually increased and the temperature lowered, until the patient sits for twenty minutes, thrice daily, in water at 50°. In some cases the spine is sponged for three or four minutes before leaving the bath, and very often a shower-bath is used after the first daily sitting-bath, the head being protected by a conical cap. Gentle exercise for five minutes before, and half an hour after, each of these processes, is ordered. It has been found particularly beneficial in persons who have been debilitated by a long residence in a hot climate.[1] *In Prostatorrhœa*, the cold hip-bath is often of great service.

2394. *In Leucorrhœa*, baths are often highly serviceable, but the condition of the patient must determine the choice of the form employed. The most simple is the "sponge-bath;" the patient being directed to sponge the whole body, night and morning, with water at first tepid and then quite cold, friction with a coarse towel being continued for some minutes subsequently. Then comes the "hip-bath," with either pure, salt, or medicated water, tepid at first, cold subsequently. If medicated, means must be taken to ensure the passage of the fluid into the vagina; friction, as above, should follow. With due care both these forms of bath, alone or together, may be used in all cases, however debilitated the patient may be; if headache follow, they should not be persevered in. For those who can bear it, the shower-bath or the cold plunge-bath is to be recommended. In cases which, from the severity of the symptoms and suddenness of their invasion, may be termed *acute*, the warm bath is of the greatest utility.

[1] Brit. For. Med. Chir. Rev., July 1, 1851.

(Dr. Graily Hewitt, p. 395.) The sponge-bath is most useful for women subject to *Menorrhagia*, and the hip-bath is frequently the means of keeping patients in health who would otherwise suffer constantly from profuse menstruation. Its good effects are especially noticeable at the climacteric period. (*Ibid.*, p. 424.)

2395. The Shower Bath, in its operation and effects, is very similar to the cold bath, but the immediate shock it communicates is much more violent, particularly if the quantity of water is great, the temperature low, and the fall considerable. Its indications and contra-indications are those of the cold bath (*ante*), and it is applicable to the same class of diseases. When the brain and nervous system are deranged, it often proves most serviceable. (See Cold Bath.)

2396. The Douche Bath consists of a stream of water directed with considerable force, by means of a tube or otherwise, on some portion of the body. It varies in its power, according to the diameter of the stream, the temperature of the water, and the force with which it is projected. It is a very powerful agent, and requires to be used with much circumspection.

2397. *Therapeutic Uses.* *Infantile Convulsions* are often mitigated, if not entirely removed, by a thin stream of cold water, directed at an elevation of two or three feet on the vertex. It is often attended with immediate effect, and is preferable to the use of the hot bath in plethoric children. It was the favourite remedy of the late Dr. Abercrombie.

2398. *In Syncope*, the cold douche, suddenly applied to the spine, has often an instantaneous effect in restoring consciousness.

2399. *In Spasmodic Stricture of the Urethra*, the cold douche on the thighs and pubes is spoken of by Dr. Currie[1] as having been successful in relieving the spasm and allowing the flow of urine.

2400. *In incomplete Anchylosis*, Dr. Fleury[2] considers the cold douche to the parts as the most certain and speedy application for setting up a healthy action and effecting a cure; forced movements, unless they cause great pain, should also be employed. *In Stiffness of Joints after injuries, or resulting from Rheumatism*, the use of the local cold douche has often an excellent effect.

2401. The Hot Bath (98° to 112° F.) and the Warm Bath (92° to 98° F.) are very valuable therapeutic agents in many affections, when judiciously employed.

[1] Med. Reports on Cold Water. [2] Edin. Med. Surg. Journ., July, 1849.

The objects for which they are employed are—1. To establish a sedative action on the nervous system. 2. To equalize the temperature of the whole body. 3. To modify the action of the skin, both as an exhalant and an absorbent organ, and at the same time to modify the texture of the skin. 4. To modify the frequency and force of the heart's action. 5. To equalize the distribution of blood throughout the system; thus, when a disproportionate quantity exists in the internal organs, it recalls it to the surface. 6. To relax the muscular system and all the external tissues.

They should be used with caution, or are contra-indicated, —1, in very gross habits, in plethora of all kinds, and in great obesity; 2, in persons predisposed to apoplexy, or determination of blood to the head, hæmorrhage, particularly hæmoptysis, also in organic diseases of the heart and great vessels; 3, in great relaxation of the system, with a tendency to dropsy; 4, in all febrile diseases, whether accompanied with visceral inflammations or not, where there is a dry, hot skin, and an active circulation; 5, during the menstrual period and the later stages of pregnancy. (Forbes.)

2402. *Therapeutic Uses. In Inflammatory Attacks of Children*, the hot bath often proves signally beneficial; it may be repeated daily, or even two or three times a day. It determines to the skin, promotes diaphoresis, relaxes the muscular system, and keeps the surface clean, which is a point of no small importance. *In Gastric Remittent Fevers*, a warm bath at bedtime often proves serviceable.

2403. *Insanity.* The continued application of cold to the head by means of a douche bath, or by pouring cold water upon it, while the patient lies in a warm bath, is often successful in calming excitement and in procuring sleep in acute insanity. The warm bath alone, taken for about half an hour, has a soothing effect and may induce sleep, and its efficacy is said to be wonderfully increased by the addition of several handfuls of mustard, so as to produce a general redness of the body. (See also SINAPIS.) Bierre de Boismont professes to get very good results from employing the warm bath for eight or ten hours at a time; and Leidersdorf has used for three or four hours, and in many cases with marked calming effect, a bath constructed by Prof. Hebra, in which patients may be kept night and day at a definite temperature. Such a bath must obviously be avoided when the pulse is feeble, and when there is anything like commencing paralysis, and it is of no avail in cases of chronic insanity. The prolonged use of the shower bath and of the cold bath, at one time much in fashion, is now justly abandoned. The shower bath or cold douche may certainly be usefully employed in certain cases of

Melancholia, where reaction does not fail to take place after it; and in cases of chronic insanity, with the purpose of rousing the patient and giving tone to the system; but it should never be continued more than three minutes, and it should not be employed with the aim of producing any special effect, but on general principles of improving the health. The good effects of the Turkish bath have been much vaunted by its advocates, but an exact discrimination of the cases in which it is useful yet remains to be made. Packing in a wet sheet has sometimes a beneficial effect, and is commonly grateful to the patient. (Dr. Maudsley, ii. p. 59.)

2404. *In Infantile Convulsions*, the warm bath, at 98°, is often most serviceable, cold or ice being simultaneously applied to the head. It is a measure which should never be omitted. The trunk should be immersed for ten or fifteen minutes. It requires to be used with caution in very plethoric children. *In Laryngismus Stridulus*, a hot bath may prove advantageous, if it can be used without fretting the child, a point carefully to be avoided.

2405. *In Granular Disease of the Kidney*, the regular use of the warm bath every other evening or oftener, is often effectual in removing restlessness, anxiety, and want of sleep. At the same time Dover's powder, acetate of ammonia, &c., should be given, in order to promote diaphoresis.

2406. *In mild forms of Dysentery*, Dr. Maclean has much confidence in the hot bath. He directs it to be brought to the bed-side, to be kept at a high temperature, and the patient to remain in it until he feels faint; to be then quickly and carefully dried, put to bed, and given ipecacuanha (gr. xv.–xx.), which may require to be repeated in eight or ten hours. If the patient abstains from all fluid for some hours after taking the medicine, there is seldom much nausea or vomiting, provided the horizontal position is maintained, which it ought to be. The result, generally, is free action of the skin, rapid subsidence of the griping, and the appearance of feculent motions. Sometimes it is well to give a few drachms of castor-oil with a few drops of laudanum or chloroform. Turpentine epithems to the abdomen are advisable. The above simple treatment will suffice in a great many cases of that mild form of dysentery which follows chills without much charging the system with malaria, provided it be had recourse to sufficiently early. (Maclean, i. p. 119.)

2407. *In Scarlatinal Dropsy*, the daily use of a warm bath, when it can be borne, is often of signal use, and it also proves serviceable in other *Dropsical Affections*, when the patient is not debilitated; subsequent friction adds greatly to its efficacy.

2408. *In Diabetes*, the value of the warm bath is much insisted

upon by Sir H. Marsh,[1] and other writers on this disease. It is a powerful and valuable means of promoting the cutaneous action, and of inducing copious perspiration. Care should be taken to prevent the access of cold air after coming out of the bath.

2409. *In Prurigo*, Mr. E. Wilson (p. 270) observes that the first point, and one of the most important, is the daily employment of baths. Their temperature should not be higher than 70° F., and they may consist of simple water with soap, or the alkaline bath, or sulphur bath. *In Syphilitic Eruptions*, the same baths prove highly useful, but Mr. E. Wilson prefers, in most cases, the use of the vapour bath.

2410. *In Irritative and Inflammatory Affections of the Kidneys, Bladder, and Uterus, in Spasmodic Stricture of the Urethra, in the passage of Calculi, either renal or biliary*, and in many spasmodic affections of the bowels, the hot bath or the hot hip-bath proves highly serviceable and soothing.

2411. *In the reduction of old Dislocation and Strangulated Hernia*, the hot bath was formerly much in use for producing muscular relaxation, and thus aiding reduction; but since the value of anæsthetics has been known it is rarely resorted to, though it is a measure not to be forgotten.

2412. The Vapour Bath, commonly employed in British practice, is a small close cell or tent, in which the patient is either altogether or partially inclosed, and into which the vapour is conveyed by a simple apparatus. The external covering should be so constructed, that the patient may breathe the air or vapour at pleasure, by excluding or including the head, through an aperture at the side or top. The effects of the vapour bath are very similar to those of the ordinary hot bath; "but," as Dr. Forbes observes, "it is, on the whole, more derivative to the surface, more diaphoretic, and, probably, less generally stimulant." It seems, however, to have a less soothing effect on the nervous system. This result is partly owing to the more constrained and upright position in which it is usually taken. It is applicable to most of the cases enumerated under the hot bath; and the same rules are observable in its use, but it seems more particularly useful in *dry, scaly Cutaneous Affections*, and in some forms of *Chronic Rheumatism*. The judicious employment of the vapour bath in these cases is attended with the best results. A case of *Hydrophobia* has recently been reported to have been cured by its use.

2413. The Medicated Vapour Bath differs only from the ordinary vapour bath in having the vapour of various medicines

[1] Med. Press, Jan. 16, 1867.

either substituted for, or diluted with, that of water. It is a valuable and powerful therapeutic agent. (See CALOMEL, SULPHUR, CAMPHOR, &c., part i.)

2414. THE WARM-AIR BATH (sometimes called the Sudatorium) consists in the temporary exposure of the naked body to the air of a common chamber, the temperature of which has been artificially raised. "The warm-air bath," observes Dr. Forbes, "is most analogous in its operation to the vapour bath" (*ante*). It seems to possess all its stimulating qualities, without its relaxing and soothing effects; it is, therefore, a much more exciting application, at the corresponding temperatures. It appears to be more powerfully derivative to the skin than any other bath, and more certainly productive of perspiration within a short period. *The diseases in which it has been found most beneficial are*—1, *Congestive Fevers*, in which it has been found highly serviceable by Drs. Armstrong, Tweedie, and Forbes; 2, *Chronic Rheumatism;* 3, *Morbid Affections of the Skin;* 4, *the early stages of Cholera;* 5, *some Pulmonary Affections;* 6, *Diabetes*, in which it has been employed with excellent effect by Willis, Lefevre, Wylie, and Watson; 7, *Renal Dropsy*, which, according to Sir T. Watson, is greatly benefited by its use.

2415. THE TURKISH BATH is essentially a hot-air bath, although when followed by cold ablution or affusion, as it usually is, it partakes more of the character of a transition bath. The procedure is now so well known, that any description of it in this place would be superfluous. The diseases in which it has been employed, in most cases with marked advantage, are—*Chronic Affections of the Skin generally; Cachectic Diseases*, such as *Scrofula*, *Syphilis*, *Incipient Phthisis*, *Malarious Intermittent and Remittent Fevers*, *Biliary Derangements*, *Gouty and Rheumatic Diathesis*, *Dyspepsia*, *Renal Affections, especially Bright's Disease, and Diabetes; Neuralgia*, *Hysteria*, and many *Nervous and Spasmodic Diseases*, as *Epilepsy, &c.; Hypochondriasis*, *Paralytic Affections*, *Contraction of the Joints*, *Dropsy*, *Amenorrhœa*, *Dysmenorrhœa*, *Leucorrhœa*, *Catarrh*, *Influenza*, *&c.* Discretion, of course, must be exercised in the selection of cases, as well as the particular stage of the disease in which it is to be employed. It is no specific in these cases, and will sometimes fail to afford relief in any given case: the bath often requires to be repeated several times, in order to ensure its efficacy. *It is contra-indicated* in several forms of disease, especially those of an hæmorrhagic or sanguineous tendency, and in cardiac disease generally, as well as in those in which much determination of blood to the head exists. But a little reflection is sufficient to guard an intelligent physician from an incautious,

indiscriminate use of an agent of so powerful a character. (Dr. Wollaston.[1])

2416. BLISTERS, or VESICANTS, are agents which, when applied to the skin, irritate it and occasion a serous secretion, raising the epidermis, and inducing a vesicle. Many substances, as liq. ammoniæ and sinapis have been employed for this purpose. In England cantharides is generally employed, and in India the mylabris chicorii; cantharidin in each of these cases being the active principle. Boiling water is a speedy and powerful vesicant.

2417. *The objects for which they are employed* are fourfold: 1, to establish a degree of inflammation or irritation on the surface of the body, and thus to substitute a mild and easily-managed disease, for an internal and intractable one; on the principle that two different sets of inflammation cannot be carried on in the system at the same time; 2, to stimulate the absorbents, and thus to cause the removal of effused fluids; 3, to act as derivatives; 4, to stimulate the whole system, and raise the vigour of the circulation.

2418. *Observations on their use.* 1. Never apply a blister at the beginning of inflammation; never in its acute stage; wait till this has been subdued by appropriate remedies, and then it may be employed with advantage. 2. Do not apply a blister where the skin is thin and tender, to the scrotum or mamma, for example, as it causes intolerable irritation; nor over a bony prominence, as the process of healing will be slow and difficult. 3. In many instances, as in acute laryngitis, it is inadvisable to apply a blister immediately over the seat of the disease, as it sometimes aggravates the symptoms, and prevents the application of leeches and other local measures which may be necessary. 4. A blister is often more efficacious if applied to a part far removed from the seat of disease, *e.g.*, to the heel in sciatica and lumbago. 5. Do not allow a blister to remain on for twelve or twenty-four hours, as is sometimes done, but remove it at the end of six or eight hours and apply a soft warm poultice. Vesication soon ensues. 6. Do not apply a blister to the chest or mamma during pregnancy.

2419. *To obviate the Strangury which arises from the use of Cantharides blister*, one of the following plans may be resorted to:—1. Remove the blister as soon as it causes decided pain, although the part be not vesicated, and apply simple dressings; free vesication subsequently occurs. 2. Insert an extremely thin piece of paper or muslin between the blister and the skin. 3. Let the patient drink plentifully of

[1] Brit. Med. Journ., Oct. 27, 1860.

diluents and demulcents, avoiding those of an oleaginous description.

2420. *To obviate Gangrene or Ulceration, in infants and young children*, spread the plaster on fine soft linen or calico, smear with oil, and place it on the skin until redness be produced; then remove it and apply a soft warm poultice, and in two or three hours vesication will ensue. The serum being evacuated, dress the blistered surface with ung. cetacei, smoothly spread upon fine cotton; this is a point of importance, many cases of sloughing having resulted from coarse dressings. Thus employed, blisters may be used with perfect safety, even in the youngest children. (Thompson.) Another excellent and speedy method of applying blisters to young children, is to put on a mustard poultice until the skin is reddened, and immediately afterwards a blister; in an hour (it need never be continued longer) vesication will ensue. Dr. Graves (i. p. 159) makes some practical observations on the subject of blisters on children and persons of a delicate skin, which are well worthy of attention. "In treating the bronchitis of children and in the bronchial affections of fever, I have frequently," he observes, "directed *the blister to be left unopened*, and I can state, from experience, that this plan answers very well. The effused serum forms one of the best dressings for the excoriated surface of the skin, and the formation of troublesome sores is avoided. I have frequently," he continues, "had recourse to this mode of treating blistered surfaces in children, and in persons of irritable habit, in whom the cutis is extremely tender and vascular." He therefore advises, that in such persons the blisters should be left alone, particularly where they have been applied to the fore part of the chest, or to any other part exposed to pressure or friction. As soon as the blister rises, apply over it a piece of lint, smeared with spermaceti ointment, which can be renewed as occasion requires, and leave the rest to nature.

2421. *Cautions and Contra-indications.* 1. Pregnancy. "Blisters," observes Dr. Dewees (p. 202), are to be used with great caution with pregnant women, owing to the great excitability of their systems: they produce much pain during their operation, and this is not always followed by benefit." He states that under these circumstances he has seen entire retention of urine follow their use, and he thinks that in two instances they were the cause of premature labour. 2. Scurvy; here they are apt to produce gangrene. 3. The first stage of acute inflammation.

2422. *Open or Perpetual Blisters.* It is often desirable to keep up a discharge from the blistered surface for many days, or even weeks, in succession; for this purpose, savin ointment is generally employed as a dressing; but there is reason to doubt the prudence of using it, as savin itself is a powerful irritant

poison, and its use has been known to be followed by serious consequences when thus applied. Some prefer dressing the surface with cerat. cantharides; but the plan recommended by Sir B. Brodie is decidedly the best, viz., to apply a succession of blisters; after the second or third they are productive of but little irritation. In employing any ointment with a view of keeping a blister open, it is necessary to vary the kind frequently, or the blister will heal in defiance of the remedies used. In many chronic diseases, issues or setons are preferable to perpetual blisters. (See ISSUES.)

2423. *Flying Blisters.* This is a term employed by Prof. Graves (i. p. 149) to denote blisters which are allowed to remain on for two or three hours, and are then removed. The primary action of a blister is that of a local and general stimulant; its secondary, that of an evacuant and depressant. It is the first of these which it is desired to obtain from these "flying blisters." Dr. Graves speaks highly of their value in fevers, and in all cases in which the vital powers are greatly depressed; and adds, that the application of flying blisters over the region of the heart, the epigastrium, the inside of the legs and thighs, has been attended, in his practice, with the most striking benefit. They should on no account be left on long enough to produce vesication.

2424. *Sir Anthony Carlisle's Blister* consists in the application to the skin of a small flat iron heated by a spirit-lamp or boiling water. The operation is completed in a few seconds, is productive of little or no pain, and is immediate in its effects. Dr. Day has invented a small hammer-like instrument by which it may be more conveniently applied, but Dr. Fuller (p. 429) doubts if it is as effectual as a laundress's small box-iron, or one of the irons used by druggists for spreading plasters, with either of which the whole of the affected surface may be ironed, while the skin is covered with a piece of brown paper or thin flannel. The cuticle should never be raised, the only visible effect desirable being redness of the part. *In Lumbago and Rheumatic and Neuralgic Affections*, it is stated to be often of great and immediate service.

2425. *Therapeutic Uses. In ordinary cases of Inflammatory, Continued, or Remittent Fever*, blisters are rarely called for; but when the disease is complicated with inflammation of the lungs, heart, brain, or other important viscera, blisters prove of the highest service. In the advanced stages also, when the vital powers are greatly depressed, the action of the heart feeble, and when there is much debility, flying blisters (*ante*) are stated by Prof. Graves (i. p. 159) to restore the vital powers in a remarkable manner. *In Bilious Remittent or Yellow Fever*, a blister to the whole length of the spine, in a certain number of cases, allayed the irritability of the stomach

in every case except one; it was also found useful when cerebral complications existed.[1] *In Typhus and Typhoid Fevers*, the great objection to the use of blisters is the danger of the blistered surface degenerating into troublesome or gangrenous sores; as a general rule sinapisms and turpentine epithems are preferable. In the *Coma of these Fevers*, a blister to the scalp may, however, have the effect of arousing the patient.

2426. *Diseases of the Brain, Spine, &c. In Sanguineous Apoplexy*, very little benefit will accrue from blisters; but in *Simple*, or so-called "*Serous*," *Apoplexy* advantage will sometimes be obtained from the application of blisters to the calves of the legs, and sometimes to the nape of the neck. When a tendency to apoplexy exists, an open blister at the nape of the neck is often attended with the best effects; a seton or issue, however, is preferable.

2427. *In Insanity*, blisters are much less employed now than they were formerly. "Blisters to the nape of the neck," observes Dr. Maudsley (ii. p. 59), "appear to have little other effect than to increase mental irritation; and the benefit of setons and issues in the neck," he adds, "is very problematical." Still there are chronic cases, characterized by stupor or severe cephalagia, which are benefited by blisters to the extremities. *In Acute Delirious Mania*, blisters are of very doubtful utility. Blistering the shaven scalp is decidedly objectionable, for our aim is to keep the head cool rather than increase its heat; and blistering the spine or legs is a source of such terrible discomfort to an excited patient, who by it is prevented from lying at his ease, that sleep is prevented rather than procured by such counter-irritation. (Dr. Blandford.[1])

2428. *In Hydrocephalus*, blisters to the scalp or nape of the neck have been thought useful; but Dr. Hillier (p. 172) states that he has not seen any benefit from them, and as they add to the discomfort of the patients, he has ceased to recommend them. If, however, the acute stage has passed, and the excitement is about to yield to that stupor which usually precedes a state of complete coma, blisters to the nape of the neck or vertex are sometimes very serviceable; they are recommended by Dr. West (p. 103). *In Meningitis* (non-tubercular), blisters, under the same circumstances, prove occasionally of great use. They are inadmissible during the acute stage.

2429. *In Paralysis and other Nervous and Spinal Affections*, where there is reason to suspect effusion within the theca, blisters to the spine may be used with advantage. *In Epilepsy, to arrest the aura*, Dr. Buzzard,[3] in some instances, found a

[1] Cyc. Pract. Med., vol. ii.
[2] Practitioner, Feb. 1869.
[3] Practitioner, Oct. 1868.

narrow circular blister applied above or at the starting-point of the aura effectual in preventing or modifying a paroxysm; in others, however, it failed. He was induced in the first instance to resort to this mode of treatment by the observations of Dr. Brown-Séquard, who has shown that convulsions, even of a tetanic character, are often arrested by severely irritating the sensory nerves, as by violent flexion of the great toe. He explains the action of the ligature, which it is well known will sometimes succeed in arresting an epileptic fit, by showing that it does not act by preventing the passage of an aura to the brain, but by setting up a fresh irritation which counteracts the pre-existing one.[1] A very narrow ring of vesication, made by means of blistering fluid, is all that is necessary, or, indeed, advisable. *In Hysterical Paralysis*, Dr. Russell Reynolds (ii. p. 329) states that he knows of no mode of treatment comparable in efficiency with that of placing narrow strips of blister completely round the affected limbs. This measure, he adds, has succeeded perfectly and rapidly after all other plans have failed; it is well worthy of a trial in all cases. He mentions a case of *Hysterical Aphonia* which had resisted electricity, but yielded to a strip of blister round the throat.

2430. *Diseases of the Chest. Of Pericarditis, Pleuritis, Bronchitis, Pneumonia, and Laryngitis*, it may be stated generally that blisters in the early or acute stage are productive of more harm than good, but in the advanced stages they may be resorted to with manifest advantage; and when effusion has taken place, especially in *Hydrothorax* and *Hydropericardium*, they certainly seem to stimulate the absorbents to action, and to aid in the removal of the effused fluid and other morbid deposits.

2431. *In Croup*, blisters are of very doubtful efficacy; but, if used, should never be applied to the throat, but to the nape of the neck, or between the shoulders. A blister, observes Dr. Squire (i. p. 265), may be required for more serious pulmonary implication, but should be so dressed with cotton-wool as to give rise to no ulterior pain or discomfort. They are inadmissible in *Diphtheria*.

2432. *Obstinate Pleurodynia* will often yield to a blister over the seat of pain, when other remedies have failed. (Ringer, p. 284.)

2433. *Diseases of the Genito-urinary Organs. In Inflammation of the Kidneys and Bladder*, blisters are rarely required, and there is especial objection in these cases to cantharides, as the absorption of the active principle, cantharidin, would increase the irritation and aggravate the symptoms. They are some-

[1] Practitioner, Dec. 1868.

times of great service in *Subacute Ovaritis*, placed over the ovarian region.

2434. *In Dysmenorrhœa and Leucorrhœa*, Dr. Churchill (p. 61) states that he has often derived great benefit from a blister applied to the sacrum, and either kept open or repeated. The value of blisters to the cervix uteri in the minor idiopathic *Affections of the Uterus and Ovaries* is shown by numerous cases cited by Dr. Johns.[1] The best and most speedy way of effecting this is by means of a strong solution of cantharides applied by a camel-hair pencil. An anodyne should be added to prevent pain; no unpleasant symptoms generally follow; cicatrization soon takes place; a speculum is necessary to bring the parts into full view. Care should be taken that the fluid does not extend beyond the parts. Dr. Tilt (p. 149) considers that the advantages of directly blistering the cervix have been exaggerated, though in some instances he has seen it subdue *subacute chronic irritation and swelling of the Cervix Uteri.*

2435. *In Incontinence of Urine in Children*, when belladonna and other remedies fail, a blister to the sacrum, repeated according to circumstances, sometimes proves effectual.

2436. *In Chronic Inflammation of the Prostate*, Sir H. Thompson (p. 155) has seen the best results from a small blister on either side of the raphé of the perinæum, made by liquor epispasticus, every four or five days. It should not be large enough to distress the patient or prevent locomotion, and should be kept open four or six weeks. Tonic medicines and regimen should be enjoined at the same time.

2437. *In Gleet*, the application of blisters to the penis is strongly advised by Mr. Milton,[2] who considers that every gonorrhœa or gleet, however obstinate, may, if uncomplicated, be cured by blistering, singly or combined with the use of an injection (Zinci Sulph. ʒj., Aq. Oj.) Before applying the blister, the hair at the root of the penis is to be cut off, a piece of paper is then to be fitted on the penis, and cut till it exactly covers it, from the root to within half an inch of the mouth of the urethra. This is then laid down on the blister, which is cut out by it, wrapped round the penis and fastened with threads. Care is necessary to prevent the ointment spreading to the scrotum. In mild cases, it may remain on an hour and a half, and the vesicated spots dressed with zinc ointment; a T bandage should be worn.

2438. *Diseases of the Abdominal Viscera. In Acute Peritonitis and Enteritis*, blisters are inadmissible in the early stages, but in the advanced stages, especially if effusion has taken place, they may be resorted to with advantage.

[1] Dub. Med. Journ., May, 1857. [2] Med. Times, Sept. 20, 1851.

2439. *In obstinate Subacute Diarrhœa*, a small blister to the abdomen is sometimes effectual, when all other measures have failed. It may be used in conjunction with other remedies.

2440. *In the Collapse of Cholera*, flying blisters (*ante*) may be applied to the epigastrium, the region of the heart, &c. Occasionally they prove highly serviceable in reviving the patient, and restoring the vital energies, but they more frequently are of little avail. In some of the sequences of cholera, their efficacy is undoubted.

2441. *Vomiting, arising from functional or nervous disorder of the Stomach, and that also consequent on Fevers*, is often effectually relieved by a small blister over the epigastric region.

2442. *Regurgitation of Food.* When this is either purely nervous or neuralgic, Sir H. Marsh[1] found great benefit from small blisters, applied simultaneously to the pit of the stomach and to the spine. In some instances, this treatment was attended with speedy and permanent benefit; in others, the relief was only temporary.

2443. *Diseases of the Eye.* In many acute as well as chronic diseases of the eye, blisters to the temples, or behind the ears, or to the nape of the neck, are valuable auxiliaries to other treatment. *In Amaurosis*, blisters are recommended by Travers, Laurence, and other high authorities. The temples, or the forehead above the eyebrow, are the best situations for them. *In Hemeralopia or Night Blindness*, Mr. Bampfield[2] states that the most efficacious treatment consists in a succession of small blisters (about an inch and a half in diameter) close to the external canthus of the eye. He states that this plan succeeded in every case of idiopathic hemeralopia which he treated. *In Variolous Ulceration of the Cornea*, the early application of a blister to the temple is nearly always of decided benefit. A second is often required. (Mr. Marson, i. p. 460.) *In Purulent Ophthalmia*, blisters behind the ears often prove serviceable.

2444. *In Acute Rheumatism*, "the blister treatment," which consists of covering the inflamed joints with blisters, has of late attracted much notice. Dr. Herbert Davies, the chief advocate of this method, directs armlets, wristlets, and even fingerlets of blister plaster, to be applied at the time when the inflammation is most acute; linseed-meal poultices being subsequently applied to keep up the serous discharge; he places these blisters entirely round the affected limbs, and in the case of the knees, orders them of at least three inches wide, regarding any slight strangury which may arise as of little importance compared with the benefit afforded by the free vesication. According to Dr. Davies, this treatment causes a speedy diminution in the frequency of the pulse,

[1] Dub. Journ., vol. xxiii. p. 452. [2] Med.-Chir. Trans., vol. v. p. 47.

rapid subsidence of the joint affection, and diminished liability to cardiac inflammation; within twenty-four hours after the removal of the blisters the urine is stated to become alkaline in reaction.[1] Dr. Davies[2] adduces the evidence of others in support of this treatment, which he considers may be aided by a *mild* course of alkali; but he does not regard this as essential, except in those cases where the rheumatic virus attacks the heart in the first instance, and appears to hesitate in fixing itself upon the joints. Amongst others who have testified to the value of this "blister treatment" are Mr. D. Macgregor[3] and Mr. Howard Moore.[4] Dr. Ringer (p. 284) considers that all the alleged good effects may be more surely obtained by the use of "flying blisters." Dr. A. Fleischmann[5] looks upon a blister (about two inches square) an inch and a half below the left clavicle as an almost certain preventive of cardiac mischief. *In Rheumatic Carditis*, in the advanced stages, when effusion has taken place, blistering is, according to Dr. Fuller (p. 235), of all local remedies the most serviceable. Its efficacy appears to vary in proportion to the amount of liquid effusion, its virtue being most unequivocally displayed when the amount of fluid is greatest.

2445. *In Chronic Rheumatism*, the value of blisters has been variously estimated, according as they have been made use of properly or improperly. In muscular rheumatism they are seldom of much service, and are rarely, if ever, necessary in articular rheumatism; they are never needed unless the pain has been long fixed in one particular joint, or some thickening or enlargement has gradually taken place. But in periosteal rheumatism they are extremely serviceable, more especially when there is thickening; and in *Rheumatic Enlargement of the Bursæ*, which has passed into a chronic form, they are almost indispensable for effecting a rapid cure. In both these latter cases their application should be followed by the external use of iodine (*q.v.*) (Dr. Fuller, p. 435.)

2446. *In Neuralgia*, a blister is often of great service; vesication is not essential, all the benefit to be expected from it may be obtained from flying blisters. In numerous early cases, observes Dr. Anstie (ii. p. 750), one or two flying blisters applied successively over different points in the course of the painful nerve, have at once and permanently arrested the disease. It is a remedy which ought always to be tried in cases of any severity, especially if the subcutaneous injection of morphia and of atropia has failed. There is one method of blistering which he states he has tried with great success; namely, applying a blister close to the spine, as nearly as

[1] Reynolds's Syst. of Med., i. p. 914.
[2] Lancet, Aug. 19, 1865.
[3] *Lancet*, Nov. 25, 1866.
[4] Med. Times, Feb. 3, 1866.
[5] Lancet, May 1, 1869.

possible opposite the intervertebral foramen, from which the affected nerve issues. This method is, of course, not so applicable to neuralgias of the fifth as to those of the spinal nerves, yet even in these, blistering of the nape has sometimes appeared to do marked good, through, it is presumed, the occipital nerve. (Dr. Anstie.) *In Sciatica*, great and immediate benefit sometimes results from the plan proposed by Dr. Fiorvante, of applying a blister to the heel.

2447. *In Hydarthrosis*, blisters are often strikingly beneficial, and will in some instances effect a cure without the aid of other remedies. A succession of blisters conjoined with perfect rest of the part should be enjoined. They are particularly useful in effusion into the knee-joint.

2448. *In Otitis*, blisters behind the ears, stretching to the occiput, or on the nape of the neck, and either kept discharging or repeated, are often very serviceable. The same measures are often highly beneficial in *Deafness depending upon circumscribed Inflammation of the Auditory Passage and Membrana Tympani.* (Copland.)

2449. *In Ringworm*, Dr. Maclagan[1] found a small blister over the affected part soon effected a cure; but according to Dr. Hillier, it is very painful, often fails, and sometimes leaves permanent baldness.

2450. Blood-letting, the abstraction of blood from the system, either general or topical. The former includes venesection and arteriotomy; and the latter, leeching, cupping, and scarification. It is to the first of these, or general blood-letting, that the following remarks principally refer.

2451. *The Objects for which Blood-letting has been employed.*—1, to weaken the action of the heart, and the consequent force of the circulation; 2, to lessen the quantity of blood in the system; 3, to cause a derivation of blood from other parts to that whence the blood issues; 4, to promote absorption of medicines internally administered; 5, to impoverish the blood in the quantity of fibrin and globules. This point is best exemplified by the following table by Andral:—

	A strong man aged 23.	After the first bleeding.	After the second bleeding.	After the third bleeding.
Water	780·21	792·90	834·05	853·46
Globules and Fibrine	139·13	127·73	87·51	76·19
Albumen	80·66	70·21	71·11	70·35
Salts, &c.		9·16	7·33	
	1000·00	1000·00	1000·00	1000·00

[1] Medical Times, vol. xv. p. 218.

2452. As general blood-letting was formerly one of the most commonly employed of all therapeutic agents, so is it now amongst one of the rarest. "Fashion," without doubt, has had something to do with bringing about this result; but there are other and more solid grounds for justifying the disuse into which it has fallen; some of these grounds are mentioned more in detail in the next section. For a full consideration of blood-letting, as a point of scientific practice, the reader will do well to peruse carefully Dr. Richardson's paper on the subject, in the "Practitioner," Nov. 1868; it contains much matter for reflection.

2453. *Therapeutic Uses. In Acute Inflammation, especially of Serous Membranes*, the practice of general blood-letting, advocated in the first edition of this work (1854), has undergone considerable modification, and it is now generally admitted that the indiscriminate and repeated use of the lancet not only fails to "cut short an inflammation," as was formerly thought it could, but that the practice is, on the whole, not only useless, but injurious. Various explanations have been offered to account for this change of practice. By one class it has been affirmed that of late years there has been a change in the type of inflammatory disease, the present type having assumed a more asthenic character than that which formerly prevailed. The subject has been ably reviewed in all its bearings by Dr. Markham,[1] in his Gulstonian Lectures for 1864; and he adduces evidence to show that the change of practice is due, not to any change of type in disease, but to our better scientific knowledge, to advances in animal chemistry and physiology, and partly to the observation of the ill effects of blood-letting, as practised in the early part of the present century. In perusing the statements of those who condemn blood-letting, it should be remembered that their observations have almost invariably been made in the hospitals of large cities, where the inhabitants, especially that class who apply to hospitals for relief, are already debilitated by residence in over-crowded, ill-ventilated apartments, with the further depressing concomitants of bad and scanty food, and insufficient clothing; and it may admit of a question, how far conclusions drawn from this class are applicable to strong plethoric residents in country districts, who have been subjected to none of those debilitating influences which must always, more or less, bear upon the inhabitants of large towns. That blood-letting is a remedy of great power, for good or evil, as it is judiciously or injudiciously employed,—that by its aid we can reduce the force and frequency of the heart and circulation more certainly and more speedily than by any other single measure,—that by

[1] British Med. Journ., April, May, and June, 1864.

it we can, as shown by Andral (*ante*), alter the composition of the blood, reducing to a minimum the amount of fibrine and globulin in the circulating fluid,—that by its aid we can often afford immediate relief to urgent symptoms, as in great obstructions of the respiratory and circulatory systems,—that it is capable of effecting these ends, there can be no doubt; and it is to be feared, with the prejudice which at present exists against blood-letting, there is danger of going to the other extreme, and of too much neglecting, if not altogether abandoning, a remedial measure which, applied judiciously in proper cases, may be productive of the best effects. "Venesection," Dr. Markham remarks, "is not a remedy for inflammation, but a remedy for the accidents which accompany or rather arise out of certain inflammations and non-inflammatory diseases—viz., those inflammations and diseases which are accompanied with obstructions of the cardiac and pulmonary functions. It is, therefore, of service only in those inflammations which are attended with such obstructions." "*In local Inflammations*, the direct abstraction of blood (by leeches, &c.) acts immediately upon the seat of inflammation; its benefits are sure and immediate also, and, as usually practised, its influence over the system generally is scarcely perceptible. Venesection, on the other hand, has no such influence over the local inflammation, but a very powerful one over the system at large. It acts only through the influence which it exercises indirectly over the inflammation. The good effects of direct abstraction of blood are positive and manifest, and admitted by all, and they are obtained at a small cost to the system at large." "In all those cases of *internal Inflammations* in which there is a direct capillary connection between the skin and the internal inflamed part (this applies to *Pleuritis*, *Peritonitis*, &c.), the local abstraction of blood is frequently of manifest service, just as we see it to be in external inflammations; but in all those inflammations in which there is no such capillary communication, the benefits of the local abstraction of blood are neither so clear nor positively ascertained." "Still, even in these latter cases, local blood-letting is often found of service, and it may very fairly be suggested whether any good effected by leeches, and local irritation of the skin over these internal inflammations, may not be ascribed to the excitement of the reflex action of the vaso-motor nerves producing contraction of the inflamed capillaries." For a further detail of these views, and the practice which results from them, the practitioner cannot do better than consult for himself Dr. Markham's Gulstonian Lectures.

2454. *In Fever*, the treatment by venesection is now abandoned. The best modern authorities agree in condemning it in *Typhus*, *Typhoid*, and *Relaxing Fevers*; even when serious

Relapsing.

complications arise, and the abstraction of blood may be deemed necessary, local depletion by leeches has superseded the use of the lancet. If there be an exception to this, it is in the case of the *Ardent Continued Fevers of Tropical Countries*, but its use even then is limited to a single blood-letting at the very outset of the attack, when the patient is young, vigorous, and has recently arrived from temperate climates. When the same class of persons are attacked with *Remittent Fever*, a single blood-letting may be, but rarely is, necessary at the outset to relieve the urgency of the symptoms. In all cases it should be borne in mind, 1. That, in the great majority of instances, the danger in remittent fever consists in prostration of the vital actions of the heart and nervous system. 2. That not only exhaustion, but also the protraction of the disease, is favoured by needless and undue evacuations. 3. That evacuant means used in the exacerbation have no power in shortening the duration of the attack. (Dr. Morehead, p. 123.) *In uncomplicated Intermittents*, venesection is wholly uncalled for; but if complications arise, local depletion by leeches will generally meet all the requirements of the case. The same remark applies equally to *Small-pox, Measles, and the Exanthemata generally*, which when uncomplicated require little more for their cure than good ventilation, mild diaphoretics, an occasional aperient, sponging the surface with cold or tepid vinegar and water, and a well-regulated nutritious diet. *In Puerperal Fever*, blood-letting has generally been abandoned as useless or even injurious.

2455. *Cerebral Affections. Acute Inflammation of the Brain and its Membranes* requires to be treated on the general principles laid down in inflammation. Blood-letting is only applicable to the early stage of the disease, occurring in robust plethoric individuals, and the extent to which it should be carried must be left to the judgment of the physician and the circumstances of the case. *In Insanity*, Dr. Maudsley (ii. p. 58) observes, general blood-letting is now rarely if ever used; even in the most acute and seemingly sthenic insanity it is not simply useless, but positively pernicious; violent symptoms may abate for a time, but the disease is very apt to become chronic, and to pass rapidly into dementia. Local abstraction of blood by leeches, or by cupping, may be useful where there is great determination of blood to the brain; by withdrawing blood from the overloaded vessels the opportunity of rest is afforded to the struggling and suffering nervous element. Speaking of its use in *Acute Delirious Mania*, in which blood-letting was formerly regarded as indispensable, Dr. Blandford[1] observes that those patients who would best stand bleeding—the young,

[1] Practitioner, Feb. 1869.

the strong, the "sthenic" cases—get well without it in a large proportion, and recover more rapidly than if they had been pulled down by blood-letting.

2456. *In Insolation, Coup de Soleil*, blood-letting was formerly much employed; but, from the mortality which attended this treatment, in the hands of Dr. Russell and others, it has fallen into comparative disuse. Dr. Morehead (p. 621), indeed, goes so far as to say, that he "should have no hesitation in altogether interdicting this proceeding in the treatment of sunstroke." This is, perhaps, rather too sweeping a direction; but it is certain that, except in young plethoric constitutions, and where vascular action runs high, by far the most successful treatment consists in cold affusion to the head, throat, chest, spine, and epigastrium, the application of ice to the spine, stimulants internally (ammonia, ether, weak brandy and water), and frictions to the surface. In the stage of reaction, leeches to the temples or cupping at the nape of the neck may be required.

2457. *In Apoplexy*, it was formerly the routine practice to bleed copiously; indeed, such treatment was considered the only one which afforded a chance of recovery. This error has been fully exposed, and it is now generally admitted that venesection is far from applicable to a large proportion of apoplectic seizures. Mr. Copeman[1] furnishes much valuable information on this subject. *The contra-indications of bleeding in Apoplexy*, he observes, are—"when the patient is sixty years of age and upwards; when the pulse is feeble, very frequent, intermitting, slow, or large, and inclined to double beat; when the respiration is laboured, and accompanied with *cold* perspiration; when there is great mobility of the nervous system, with weak muscles, whether the body be thin or corpulent; when the attack comes on soon after a full meal, or after great mental or bodily fatigue. Whenever the pulse has a double beat the case is best relieved by diffusible stimulants. In all these cases bleeding is unnecessary or prejudicial, generally." *The indications for bleeding* are a quick, wiry, resisting pulse, flushed countenance, warm perspirations, noisy breathing, and a tendency to spasmodic, muscular contraction, occurring in persons under sixty years of age. These circumstances seem to point out the necessity for resorting to the abstraction of blood; but Mr. Copeman adds, "that there will be less danger in not bleeding in any case, than in always having recourse to it, where there are *some* of the circumstances indicative of the propriety of its employment."

2458. *In Puerperal Convulsions*, the value of blood-letting is strongly insisted upon by Dr. J. G. Swayne,[2] who considers

[1] On Apoplexy, p. 198. [2] Brit. Med. Journ., Oct. 17, 1868.

the disuse into which the lancet has fallen in the present day a matter of regret; he supports his opinion with cases which tend to confirm his views. He does not detract from the value of chloroform in these cases—"the most effectual sedative we know of for mitigating the severity of the fits, and tranquillizing the patient whilst artificial delivery is being effected"—but he objects to its being adopted as a substitute for bleeding. Similar opinions are expressed by Mr. A. Steele;[1] and cases in which early blood-letting was employed with success are recorded by Dr. Dyce[2] and others.

2459. *Diseases of the Chest. In Pneumonia*, venesection is now nearly abandoned. In the words of Dr. Waters (p. 46), "few cases are now met with which are benefited by general bleeding, and the abstraction of blood by cupping or leeches is not often necessary." No doubt local bleeding sometimes gives great relief to pain, but we can generally afford equal relief by the use of other measures. (See OPIUM.) With regard to the *Pneumonia of Children*, bleeding is now rarely employed. Dr. Hillier (p. 31) states that he has never had occasion to resort to it, but he considers that cases may occur in which it should be employed. If the disease, he remarks, had only commenced twenty-four or thirty-six hours previously, if very much pulmonary tissue were inflamed, the pulse full and bounding, the dyspnœa and pain very great, the temperature 105° or more, and the previous health good, it would be wise to let blood from the arm to the extent of a few ounces. Usually, however, the best treatment is to keep the patient in a room about 60°, well ventilated, without a draught, and to give a simple saline mixture containing citrate of potash or nitre, a milk diet during the height of the fever, and when the temperature falls, some good beef-tea. With regard to the use of antimony, calomel, and blisters, see those articles. *In Pneumonia supervening upon Bronchitis, Hooping Cough, or Measles*, blood-letting, even local, is inadmissible. *In Pleurisy*, even in the early stages, and in the more acute forms of the affection, Dr. Waters (p. 227) considers it doubtful whether blood-letting, general or local, is often desirable. Whilst he admits that very great relief to the pain follows the local abstraction of blood, he believes that the same result may be brought about by the use of opium (*q. v.*)

2460. *In Inflammation of the Heart and its Membranes*, venesection was formerly regarded as indispensable, but the practice, in this as well as in other acute inflammations, has undergone much modification. Thus Dr. Waters (p. 327) states that he has never taken blood by venesection in *Pericarditis*, and that he has rarely found it necessary either to cup or leech, the

[1] Brit. Med. Journ., Aug. 17, 1867. [2] Ibid., April, 1868.

relief derived from these measures being, he believes, equally obtainable from opium. Dr. Garrod (i. p. 911), however, states that so much relief follows the application of leeches to the cardiac region in *Rheumatic Pericarditis* and in *Endocarditis*, that he has no hesitation in recommending the measure. The loss of blood, he remarks, need not be large, from three to twelve leeches are generally sufficient, and the bleeding should never be allowed to produce any appreciable weakening of the patient; he prefers the slow loss of blood by leeches to the more expeditious abstraction by cupping.

2461. *In Acute Laryngitis*, if blood-letting is to be advantageous, it must be employed early and copiously. "When," observes Sir T. Watson (i. p. 816), "there is high inflammatory fever present, and the skin is hot, the pulse firm and full, the cheeks red, and the lips florid, you may bleed your patient with decision and advantage. But if his powers are beginning to sink under the poisonous influence of imperfectly aërated blood, if his skin be cold or even cool, his face pale or leaden, his lips blue, his pulse small and feeble, his mind wavering, you will do no good by blood-letting; nay, you will increase the debility which already exists, and hasten the fatal catastrophe." Leeches or blisters *to the throat* are objectionable; cupping at the nape of the neck is far preferable, and may often supersede the necessity of venesection; if these and other remedies fail, tracheotomy must be employed, in order to save the patient's life.

2462. *In Croup*, general bleeding is only of service in the *early* stage of the disease, and is not to be repeated. Loss of blood is only allowable while there is heat of skin, florid hue of face and lips, and firmness as well as fulness of pulse, but these conditions do not of themselves demand it. It is to be sparingly resorted to among town populations; it is seldom advisable where the attack accompanies any marked deterioration of health, and is contra-indicated in almost all cases of secondary croup. Local bleeding by leeches is often of great service when the disease is progressing towards its full development; the relief thus afforded is often very great, and this may be repeated if desirable, unless other circumstances forbid it; they are best applied over the mastoid process, or a little lower in the neck if a free after-flow of blood is desirable. (Dr. W. Squire, i. p. 264.) *In Diphtheria*, bleeding, local or general, is wholly inadmissible.

2463. *Diseases of the Abdominal Viscera, Acute Peritonitis, Enteritis, Hepatitis, and other Abdominal Inflammations*, should, in accordance with modern views, be treated on the general principles laid down in sect. Inflammation. In strong, robust individuals, when the symptoms are urgent, a full blood-letting may be necessary; but, under other circum-

stances, local depletion by leeches, followed by fomentations, poultices, and the free use of opium and other sedatives internally, is often sufficient to control the disease and bring it to a favourable termination.

2464. *In Acute Dysentery*, the practice of one full blood-letting, at least, in the first or inflammatory stage, has the sanction of Annesley, Twining, Johnson, Martin, Morehead, and other high authorities, but it has fallen into partial or total disuse; in the words of Dr. Maclean, "A generation has certainly arisen in India that knows not the lancet;" and since the pathology of the disease has become better understood, and the remarkable anti-dysenteric powers of ipecacuanha have become re-recognised, the reasons which led to its employment, apart from blind routine, have lost much of their force. Dr. Maclean (i. p. 125) condemns blood-letting in dysentery for the following reasons:—1. Because although from the violence of the symptoms there is an appearance of *power*, this is deceptive, for alarming depression often follows free depletion. 2. Even where the measure appears to relieve the symptoms, the heart's action is weakened to such an extent that congestion of the affected mucous membrane remains, a condition which Dr. Blacklock has shown to be nearly as destructive to the tissues as the more acute action. 3. Because convalescence after bleeding is tedious; and 4. Because, although bleeding has fallen into disuse, the mortality from dysentery has decreased. In general terms it may be said that the lancet has been superseded by ipecacuanha (*q.v.*)

2465. *In Cholera*, blood-letting has been employed with the view of relieving existing congestion, but the propriety of the practice is extremely doubtful. Amongst its advocates is Dr. Massy,[1] who conjoins its employment with the simultaneous exhibition of stimulants. On first opening a vein no blood may flow, but under the use of stimulants and friction, a few drops, at first thick and tarry, then florid, and then a small stream will appear. "As you draw blood, stimulate; give punch, brandy, or wine and water, or carbonate of ammonia. Apply friction with stimulating and hot liniments to the extremities, warm sand-bags to the feet, sinapisms to the calves of the legs, and pit of the stomach, for if you can once raise the pulse, the chances in favour of recovery will be vastly increased. I have seen more than one case where the pulse improved after this treatment, and again fell away, when it was deemed advisable to take blood a second time with decided advantage, stimulating at the same time. Cases of this kind cannot endure the loss of blood, even in small quantities,

[1] Braithwaite's Retrospect, 1865, vol. lii. p. 393.

without stimulants. This we learned by sad experience at Umballa; most of the cases we bled in this stage sunk without a rally. We were about to condemn bleeding in cholera, when once the symptoms of collapse set in, but we tried stimulants together with the bleeding, and found the practice the most successful of all we adopted." We have given Dr. Massy's experience in his own words, for in a doubtful line of practice like this, it is better that the practitioner should be able to judge for himself. Dr. Bell,[1] another advocate of this practice, remarks:—"All depends upon the period at which bleeding is resorted to. If early in the congestive stage or just previous to its second accession, it is invariably successful (?); if just as the congestive stage is passing off, when the pulse begins to acquire a little power, it is invariably fatal." In any case in which bleeding is resorted to, it should invariably be conjoined with the use of stimulants, on Dr. Massy's plan described above. Drs. McClay and Robertson[2] regard venesection favourably; they consider that by relieving the pulmonary embarrassment and freeing the circulation, it would increase the excretory power of the intestinal mucous membrane.

2466. *Diseases of the Genito-urinary Organs. In Acute Nephritis*, leeches, or cupping over the loins, followed by the free use of opiates, diluents, and demulcents, with rest and an antiphlogistic regimen, often suffice, without venesection. *In Cystitis*, leeches over the pubes, and to the verge of the anus, opiate enemas, hot baths, demulcents, &c., are usually sufficient to subdue inflammatory action. *In Pelvic Peritonitis and Pelvic Cellulitis*, Dr. Lauchlan Aitken[3] advocates leeches (when bleeding is necessary) to the verge of the anus; as he remarks, the communication between the hæmorrhoidal veins and those of the uterus and its appendages is so free that we may almost regard it as direct leeching. This measure has been most useful in those forms of *Pelvic Inflammation* which arise from the sudden suspension of the menstrual discharge. It is at the best only an adjunct to other treatment, especially to opium (*q.v.*)

2467. *Diseases of the Eye. In all cases of Inflammation of the Structures of the Eye*, including under this head, *Iritis, Conjunctivitis, Retinitis, Sclerotitis, Inflammation of the Capsule of the Crystalline Lens, Inflammatory Amaurosis, and Purulent and Gonorrhœal Ophthalmia*, bleeding, both local and general, was formerly regarded as an essential part of successful treatment; but it is now admitted that the cases requiring general blood-letting are very limited. Experience, indeed, goes to prove

[1] Braithwaite, 1865, vol. lii. p. 393.
[2] Med.-Chir. Trans., vol. l. 1867, p. 185.
[3] Edin. Medical Journal, April, 1870.

that a far larger proportion of cases of purulent and gonorrhœal ophthalmia recover with good useful eyes where depletory measures are altogether omitted, and their place supplied by tonics, diffusible stimulants, and a liberal diet, together with local stimulant collyria. (See sect. 232.) In the other cases, when inflammation is intense, leeches to the temples are more effectual than general blood-letting.

2468. *In Acute Rheumatism*, from the time of Sydenham up to a recent period, blood-letting was advocated by the highest authorities, but as a *routine* practice it is now properly abandoned. Venesection, Dr. Garrod (i. p. 907) observes, certainly gives speedy relief to the pains of the joints even when practised to very small amounts, but free depletion tends to weaken the patient and retard his restoration to health; it also causes the joint affection to linger, and favours relapses. Whether there is any real advantage in small depletions is questionable; and Dr. Garrod adds that, in the majority of instances, he should certainly hesitate to bleed, as there is no proof that it either shortens the duration of the joint affection or lessens the tendency to cardiac complication. In the recurrent form of the disease it is wholly inadmissible.

2469. Carminatives are medicines which, by stimulating the stomach, cause the expulsion of flatus, and relieve pain caused by its presence in that viscus. They act in two ways—1, by exciting muscular contraction, and so effecting an expulsion of the flatus that has been generated; and 2, by checking the occurrence of changes of ordinary fermentation and decomposition in the food contained in the stomach, and so diminishing the subsequent production of gas. The relief which they sometimes afford is so marked and instantaneous as to have suggested the idea of their acting like a charm, and thus arose the employment of the term *carminative* (*carmen*, a charm). The relief, however, produced by them is only likely to be of a temporary nature. To obtain permanent relief, a more healthy state of the *primæ viæ* must be induced by the remedies suggested by a careful consideration of the circumstances of each case. (Dr. Pavy, p. 125.)

2470. Cataplasms, or Poultices, are external applications of a soft, pap-like consistence, and are rendered anodyne, emollient, stimulant, or antiseptic, according to the ingredients employed in their formation. A simple poultice acts chiefly by virtue of its warmth and moisture. The various kinds of poultices have been considered in the first part of this work, under the headings of the respective articles which form the principal or active ingredients; they prove of great service

in promoting the suppurative process in *Abscesses* and *Ulcerations*, and in *Wounds* and *Inflamed surfaces* generally.

2471. CATHARTICS, or PURGATIVES, are medicines which increase the quantity or number of the alvine evacuations. Those which are violent in their operation are called drastics; those which produce copious watery stools, hydragogues; and those which act mildly, aperients or laxatives.

The objects for which they are employed. 1. To remove crude matters or accumulated fæces from the intestines. 2. To act as derivatives, by draining off much of the serous portion of the blood. 3. To excite increased biliary secretion. 4. To stimulate the action of the absorbents in all parts of the body. 5. To promote the discharge of other secretions; thus, the previous use of purgatives often apparently promotes the action of diuretics. (Alison.[1]) 6. To affect remote organs, on the principle of revulsion or counter-irritation; *e.g.*, croton oil, in cerebral affections. 7. To act indirectly as emmenagogues, by stimulating the various pelvic vessels and nerves.

2472. *Observations on their use.* 1. The action of every cathartic is followed by a greater or less amount of constipation; this is peculiarly the case with rhubarb, and is less observable with the salines and castor oil.

2. Most cathartics operate on a particular part of the intestinal canal: thus calomel, jalap, and colchicum stimulate the duodenum, and promote the discharge of bile; aloes and scammony act upon the colon and rectum; while saline and oleaginous purgatives seem to affect the whole intestinal canal.

3. Their purgative effects in many instances (as aloes, croton oil, and rhubarb) may be obtained, though not in so constant or uniform a manner, if applied to the skin or to an abraded surface, or introduced into the system hypodermically, instead of being taken internally.

4. The constitution, temperament, and idiosyncrasy should always be considered when an aperient is to be administered; generally speaking, salines are inadmissible in old, debilitated, or anæmic subjects, aloes in hæmorrhoidal patients, and mercury in scorbutic cases. It should be laid down as a general rule, that croton oil, elaterium, and other drastic purgatives, should *never* be given when a milder aperient will answer the purpose.

5. Saline purgatives, particularly the sulphate of magnesia, are often productive of hypercatharsis in residents in the tropics.

6. Cathartics are more required in persons of a melancholic than in those of the sanguine temperament, and in women more than in men.

[1] Outlines of Pathology, p. 84.

7. Cathartics should never be given to a woman when menstruating, and should be employed with great caution during pregnancy; the uterus, from its contiguity to the rectum, is likely to be affected by aloes, which should, consequently, be carefully avoided; the milder aperients, as castor oil or confection of senna, are preferable.

8. Cathartics of a warm character, as rhubarb, &c., are best adapted to old age and childhood; salines, on the other hand, should be avoided.

9. The habitual use of cathartics cannot be too strongly condemned: such a practice lays the foundation of dyspepsia and other serious evils.

10. Cathartics are not required in every case of costiveness. In some persons, from idiosyncrasy, the bowels are not open for two or three days, or even longer; such a state is compatible with perfect health; in such cases, it would be useless and injurious to administer aperients. (Dr. Chambers.) In the costiveness of hysterical women, cathartics may prove useless, whilst antispasmodics are indicated.

11. Under a course of cathartics it is advisable to intermit the medicine for a few days, in order to ascertain the real state of the alvine secretions. A knowledge of the characters of the evacuations caused by various cathartics is important; ignorance of these points may lead to confounding the stools produced by cathartics with the effects of disease: thus, the evacuations caused by aloes, abounding as they do with mucus, and sometimes with blood, may easily be confounded with those of dysentery, and those caused by sulphur may be mistaken for a deficiency of biliary secretion.

12. The time required for the operation of different purgatives is a point of practical importance; thus salines, from their rapidity (three or four hours), are best calculated for febrile and active diseases; croton oil generally operates in one or two hours; jalap, scammony, gamboge, and senna, in three or four hours; rhubarb and castor oil, in four or six hours; and aloes, from its difficult solubility, requires several hours before it takes effect.

13. The combinations which increase or diminish the activity of purgatives require attention; thus, the power of colocynth is increased by a combination with camphor, whilst that of aloes, by the same combination, is rendered milder and less irritating. In spasmodic affections, the operation of a cathartic is promoted by the addition of opium; and in all cases the combination of senna with the neutral salts, and of calomel with the resinous cathartics, promotes the cathartic operation. On the other hand, soap and the aromatic oils render the action of aloes almost inert; and a few grains of extract of hyoscyamus, whilst they appear to have no considerable in-

fluence in increasing or diminishing the purgative qualities, prevent griping and tenesmus.

14. The facility with which a cathartic may be given in certain cases, as in apoplexy, mania, or asphyxia, requires attention; thus a drop or two of croton oil, placed at the base of the tongue, will often be applicable when the patient is unable or unwilling to swallow a draught or pill.

15. Cathartics may often be advantageously administered in the form of enema; they form a very valuable resource, either where the patient is unable to swallow, or where it is of importance speedily to unload the lower intestines.

16. Cathartics should not ordinarily be given so as to interfere with the regular rest.

17. They should not be given immediately after a full meal.

Cautions and contra-indications. 1. Pregnancy. 2. The presence of the catamenia. 3. Great debility and anæmic states. 4. Inflammatory states of the intestinal canal and peritonitis. 5. Passive dropsies, particularly hydrothorax, occurring in old persons or broken-down constitutions.

2473. *Therapeutic Uses. Inflammation.* "Purging," observes Sir T. Watson (i. p. 230), "is an expedient which, in cases of violent inflammation or high general fever, should scarcely ever be omitted. To keep the bowels what is called open forms, indeed, a part of the antiphlogistic regimen; but in acute inflammatory diseases, active purging is of very great service. These two points are gained by it: the intestinal canal is freed from accumulated fæces or other matters, which, by their bulk or their acrimony, might prove irritating; and, at the same time, depletion is carried on by means of the serous discharge which is produced from that large extent of mucous membrane. There are some cases of inflammation in which the operation of purgative medicines is of especial benefit, as in *inflammatory affections of the Head*, either external or internal, of which part these medicines assist or cause depletion in a very sensible manner. We have an illustration of this in the paleness of the face, which often, during health, accompanies the action of a brisk cathartic. The usefulness of repeated purgatives is less distinctly seen *in inflammations situated within the Thorax*, although in these cases, also, they are often highly beneficial. They are efficient remedies *in all inflammatory conditions of the Liver*. But when *inflammation has fastened upon the Stomach or Bowels* themselves, although it may be indispensable that they should be unloaded of their contents, which are often composed of irritating, ill-digested food, and of morbid secretions no less teasing and hurtful, the propriety of going beyond this point is extremely questionable." Sir T. Watson adds, that "much harm is often done by pressing the inflamed alimentary canal with active purgatives."

2474. *In Intermittent Fevers*, the routine practice of prescribing a purgative is now exploded; still they are useful, if the bowels are loaded; they also tend to relieve the congested condition of the solid abdominal viscera, and prepare the way for the action of quinine. But great caution is required in their use in persons labouring under malarial cachexia, particularly in Asiatics. The same remarks apply to *Remittent Fevers:* in these it is well that the bowels should be thoroughly cleared as soon as possible; for this purpose a combination of calomel (gr. iij.-v.), colocynth, and scammony, with a few drops of any aromatic oil, is very effectual; it rarely, if ever, gripes or causes nausea, acts apparently on the whole tract of the intestine, and seldom requires any subsequent draught. (Dr. Maclean, i. pp. 62, 76.)

2475. *In Typhoid (Enteric) Fever*, where ulceration of Peyer's patches is suspected, purgatives should be avoided; or if administered, the very mildest should be selected. They are hardly admissible in the adynamic forms; indeed, in these latter, Dr. Murchison (pp. 264, 569) considers that the natural history of the disease appears to him to contra-indicate laxatives. Both with regard to *Typhus and Typhoid (Enteric) Fever*, he states that he has seen alarming prostration follow the use of purgatives; their use requires the greatest caution.

2476. *In Small-pox and other Exanthemata*, it is generally advisable at the outset to unload the bowels by an aperient, avoiding strong purgatives as being apt to induce a degree of exhaustion which may exercise a prejudicial influence on the subsequent course of the disease. *In Measles*, it should be remembered, the intestines are usually very easily influenced by purgatives.

2477. *In Puerperal Fever, Puerperal Peritonitis*, cathartics have been advised by Denman, Gordon, Armstrong, Hey, Hulme, and Murphy; and have been prohibited by Clarke, Campbell, Thomas, Baglivi, and others. The weight of evidence is in favour of the use of mild, unirritating aperients. Dr. Ferguson judiciously advises their being combined with Dover's powder or henbane, in order to prevent tormina, which is often the precursor of metro-peritonitis.

2478. *In Insanity*, active purgation, formerly much in favour, is now quite eschewed. The bowels may generally be regulated by dietetic means; and if a purge is needed, a dose of aloes, rhubarb, or castor oil will answer every purpose—a moderate dose of the latter often succeeding where the most drastic purgatives fail. (Dr. Maudsley, ii. p. 60.) *In Acute delirious Mania*, a brisk purgative at the outset of the attack sometimes has the effect of arresting the attack; but should this fail, we should avoid violent purgation, as it induces exhaustion, which is the chief danger we have to apprehend; and in this stage

aperients often fail unless frequently repeated. Castor oil will often operate when stronger drugs fail. (Dr. F. Blandford.[1]) *In Delirium Tremens*, an active purgative at the outset is often of essential service, especially in the young and robust, when the attack results from the ingestion of a large quantity of spirits; but in the old, debilitated habitual, drunkard purgation is rather prejudicial than otherwise.

2479. *In Acute Hydrocephalus*, the value of purgatives, observes Dr. West (p. 100), can scarcely be overrated; but they must be given so as not merely to obtain free action of the bowels, but to maintain it for some days. After having once overcome the constipation, you will secure this end best by giving small doses of a purgative every four or six hours. The administration of strong cathartics every morning will not answer the end nearly so well; if they cause sickness, it is better to give a single full dose of calomel, and follow it up with sulphate of magnesia at short intervals. The following mixture is then advised:—℞ Magnes. Sulph. ʒj., Potass. Nit. gr. x., Syr. Limon. ʒiij., Aq. ʒix., M. Dose ʒij. thrice daily for a child æt. 1 year. In all cases, of course, the selection and regulation of the purgatives must be determined by the strength of the child.

2480. *In Chorea*, it is admitted by the best authorities that a combination of purgatives with antispasmodics and tonics is far more effectual than when either is employed singly. To counteract the tendency to constipation which exists in this disease, cathartics, repeated according to circumstances, are required. *In Epilepsy*, excepting when the bowels are overloaded, purgatives are of little service.

2481. *In Hysteria*, it is a point of importance to keep the bowels freely open. If constipation exist, connected with torpor of the uterine system, aloes are indicated; if with biliary derangement, mercurials or podophylline; if with plethora, salines: active purgation, in any case, is unadvisable.

2482. *In Anasarca, Ascites, and Dropsical Affections*, active purgation is often of great service. The hydragogue cathartics, as elaterium and gamboge, are the most generally applicable; cream of tartar is also particularly valuable; their use is often attended with speedy and decided improvement, but great caution is necessary in their exhibition when the patient is debilitated. In dropsy connected with heart disease, powerful purgatives should, as a rule, be avoided. You may, as Dr. Waters (p. 376) observes, possibly by such means get rid of a large quantity of fluid, but the result may be accomplished at the expense of much of your patient's strength, and possibly at the risk of his life. You must never forget the effect which

[1] Practitioner, Feb. 1869.

depressants have on the circulation, and the danger of fatal syncope which always attaches to heart disease.

2483. *In Purpura Hæmorrhagica*, they have been found very useful; they are particularly recommended by Dr. Hasty, of Dublin.

2484. *In Colica Pictonum*, the utility of purgatives is undoubted, but care is necessary in the selection of the medicine to be employed. The sulphate of magnesia, oil of turpentine, and castor oil are those which appear the most appropriate; and in many cases their action is rendered more certain and efficacious by being combined with opium and antispasmodics; they are only to be regarded as adjuncts—valuable ones, it must be admitted—to other treatment. *In Ileus*, purgatives have been advised, but unless they afford speedy relief they should be at once abandoned for opium (*q.v.*) *In some Spasmodic Affections of the Bowels, Flatulent Colic, &c.*, a purgative of castor oil or oil of turpentine, or of both these oils, often affords immediate relief. Aperients constitute a main feature in the evacuant or eliminative treatment of *Cholera*, which has been detailed in sect. 1859.

2485. *In Dysentery*, mild cathartics, if given judiciously, are most beneficial; but if ill-chosen, or given in inappropriate cases, they are productive of the worst effects, increasing in a marked degree the severity of the symptoms. Castor oil is very valuable, but is inferior to the acid tartrate of potash, which, either alone or with jalap, in the form of Pulv. Jalapæ Co., or with sulphur, is the best purgative which can be resorted to.

2486. *In Congestion of the Liver*, active cholagogue purgatives must be had recourse to, and repeated frequently, so as to keep up a free flow of bile. *In Jaundice, depending upon hepatic derangement*, Dr. Graves (ii. p. 524) observes, that after you have succeeded in producing bilious evacuations, you should never omit prescribing an active aperient every second or third day, for the space of ten days or a fortnight, with the view of carrying off the remains of the disease, so as to prevent the occurrence of a relapse. He adds, that this is a simple but successful practice, and one which should never be omitted.

2487. *In Dyspepsia*, aperients within certain limitations are often most serviceable. They are of greatest service in emergencies; of little service—almost of dis-service—as prominent features in treatment which ought always to aim at such a tonic effect as is incompatible with habitual purgation. Against habitual constipation they are generally ineffective; this is best accomplished by the regulation of the diet; they should be given in the smallest doses on an empty stomach, either before dinner in the shape of a slowly acting pill, or early in the morning in that of a more rapidly acting liquid. As a

rule, the pill form is preferable, especially where the aperient is often repeated; the liquid aperients, especially the saline, often acting injuriously on an irritable stomach: to this, castor oil is in many constitutions an exception. (Dr. Brinton, p. 333.) *In Gastritis*, according to the same authority (p. 96), the use of aperients demands great caution; only the mildest should be used; of these the best is castor oil, and even this, in most cases, is best given in the form of enema.

2488. *In Diabetes*, when the patient is not much weakened and the disease is recent, aperients may be given with advantage. Free alvine evacuations appear to reduce considerably the amount of fluid discharged, and also to correct in a measure its mellitic character. Rhubarb or magnesia, or both these medicines combined, may be used with benefit.

2489. *In Erysipelas*, purgatives should not be neglected; the neutral salts, particularly the sulphates of magnesia or potash, are the best which can be employed. They should be combined with other remedies, as the strength of the patient and the character of the disease require; the combination of sulphate of magnesia with sulphate of quinine often proves useful. *In Gangrene*, previous to the exhibition of tonics, purgatives should be administered; they should be of a warm, carminative character, and conjoined with remedies of the latter class.

2490. *In Croup*, purgatives (calomel, scammony, or jalap) prove highly serviceable, not only as a means of removing any crude, ill-digested matter, worms, &c., from the bowels, but as derivatives from the seat of disease; they need not interfere with the other necessary remedial measures.

2491. *In Bronchorrhœa*, purgatives prove of great service. Dr. Copland (i. p. 268) states that he has never seen a case of the disease which has not been much relieved by purgatives; taking care, however, that they should not lower the energies of the constitution by combining them with tonics, and allowing light nutritious food.

2492. *In Emphysema of the Lungs*, the bowels should be kept open, for all accumulation in them has a tendency to distress the breathing and embarrass the action of the heart. A purgative, mercurial or otherwise, may be given in the first instance, but for the most part enemata are preferable to aperients given by the mouth. (Dr. Waters, p. 182.)

2493. *In Albuminuria*, Dr. Osborne[1] observes that the use of purgatives may be easily overlooked in our anxiety to strike at the root of the disease; but that their value can hardly be over-estimated, and is, indeed, limited by the tendency to gastritis and enteritis which so generally prevails. If it be true

[1] Dub. Quart. Journ., Aug. 1851.

that the stomach and bowels have the faculty of eliminating urea, the tendency now mentioned must be viewed as an effort of nature to relieve herself when the proper emunctories fail to do so. Certain it is, that a powerful purgative, such as elaterium, given at intervals, tells more on the swellings, and exhausts the strength less than the plan of daily purging.

2494. *In Acute Rheumatism*, free catharsis has been strongly insisted upon, but according to Dr. Fuller (p. 88) its value has been overrated. To obtain a free evacuation every morning, and at the same time to avoid repeated purging, he considers should be our first care. To attain this he prescribes calomel (gr. iv.–v.) with a full dose of opium (gr. ij.) at night, and on the following morning, when necessary, a draught of rhubarb or senna with colchicum and the potassio-tartrate of soda in just sufficient quantity to produce one full dejection. This measure is often attended with benefit.

2495. *In Chronic Rheumatism*, *Lumbago*, &c., purgatives are often of great service. When the urine is scanty, high-coloured, or loaded, the bowels costive, or the stools dark-coloured and offensive, they are almost always of inestimable service, and a large turpentine and castor-oil enema, or a few doses of colocynth and calomel at bedtime, followed each morning, or on alternate days, by a black draught containing tartarated soda (oz. $\frac{1}{2}$), or vinum colchici (♏xxx.), often go far towards effecting a cure. (Dr. Fuller, p. 427.) *In Sciatica*, the same treatment often proves effectual. Purgative enemas of castor oil (oz. j.), spirit of turpentine (oz. j.), and assafœtida, are often valuable aids in these cases, when there is any reason for considering that there is an overloaded state of the colon. Croton oil, as advised by Mr. Hancock, Mr. Newbigging, Sir C. Bell, Mr. Hunt, &c., is a valuable purgative, not in these cases only, but in *Tic Douloureux and other forms of Neuralgia*.

2496. *In Gout*, purgatives were forbidden by Sydenham and Mead, but their use was re-introduced by Hoffmann; and of late years they have been very generally employed. Mild carminative aperients certainly appear beneficial; a dose of blue pill with podophylline, followed by a saline aperient, is useful in unloading the portal system, which is often congested in these cases.

2497. Collyrium, a fluid application for the eyes, commonly called an eye-wash. Collyria are divided by Dr. Jacob[1] into four classes, viz., Stimulant, Astringent, Sedative, and Escharotic.

1. *Stimulants*, as vinum opii, weak solutions of the sulphates of zinc and copper, are most useful when there is a sensation

[1] Dub. Med. Press, May 7, 1851.

of scalding, with a flow of tears and intolerance of light; or when no other inconvenience remains except a certain tenderness or rawness of the surface, depending perhaps upon a want of epithelium.

2. *Astringents*, as alum, tannin, liq. plumbi, are serviceable both in acute and chronic stages of ophthalmia. Their mode of action is obscure: all that seems proved is, that the surface to which an astringent is applied becomes shrivelled and corrugated; but whether the vessels become diminished in calibre, or the secreting structures disabled from acting, or the epithelium coagulated by its operation, remains to be determined. Be the change, however, what it may, it seems to be proved by experience that astringents diminish the enlargement of vessels caused by inflammation; in fact, remove the increased vascularity or redness, while they at the same time diminish or arrest the secretion of purulent matter, and perhaps benumb the sensitive villi or papillæ.

3. *Sedatives*, as warm stupes, or tepid lotions, containing opium, henbane, belladonna, &c. They are chiefly useful when the case assumes a neuralgic character; but it appears undecided whether their beneficial effect is not derived as much from the warmth and moisture, as from the sedative properties of the medicines; the relief obtained from them is by no means constant. Vinum opii seems to combine the properties of a sedative and stimulant, and is a peculiarly valuable application.

4. *Escharotics*, as saturated solutions of the nitrate of silver, the sulphates of copper and alum, are useful in the acute and chronic stages of purulent ophthalmia, in ulceration of the cornea. They operate as chemical solvents of the tissues to which they are applied; and being so, must be very cautiously employed.

2498. *The mode of applying Collyria.* Dr. Jacob observes that, in order to secure a full exposure of the whole conjunctiva of both the eye and the lids to the contact of the fluid, it should be introduced beneath the upper lid at the outer angle by separating the two surfaces and introducing between them a large drop from a full-sized camel-hair pencil. By laying the thumb or finger on the skin between the lid and the brow, and pushing it up over the margin of the orbit, a space is made between the lid and ball, into which the fluid should be dropped; and from this it will spread over the whole surface. If a more complete saturation of the upper lid be required, it must be everted, and repeatedly brushed over with the solution.

2499. *Observations on their use.* 1. Collyria, particularly the stronger ones, should not be employed indiscriminately; they are often not only unnecessary, but absolutely mischievous.

2. It is the opinion of many of the best oculists of the day that the employment of collyria of a strength to cause pain in the eye tends to induce subsequent chronic inflammation. 3. Those containing lead should never be employed when ulceration of the cornea exists, as they are apt to leave a permanent opaque cicatrix. 4. Those containing nitrate of silver sometimes cause a blackish or bluish discoloration of the conjunctiva.

2500. Counter-irritation. This term designates any irritation artificially established, with a view to diminish, counteract, or remove some other irritation or inflammation existing in the body. (Dr. Williams.) The substances employed in establishing this state are called counter-irritants, and may be divided into —1. Rubefacients. 2. Pustular counter-irritants, as tartar emetic. 3. Vesicants, or Blisters. 4. Issues and Setons. 5. Caustics, or Escharotics. These have been considered under other heads.

The extent and form of counter-irritation should, in a great measure, be regulated by the character of the disease or lesion which it is intended to cure: thus a rubefacient is chiefly indicated in irritation of mucous membranes; a vesicant in inflammation of serous membranes ; and a seton or issue, when the disease is of a suppurative character. The practice of counter-irritation is made the subject of a valuable paper by Dr. Anstie, in the "Practitioner" for March, 1870, which will well repay careful perusal.

Therapeutic Uses. These are enumerated fully in the articles Blisters, Issues and Setons, and Derivants.

2501. Derivants are agents employed to produce an artificial hyperæmia in some part of the body distant from the seat of an existing hyperæmia. Under this head, therefore, may be included several forms of counter-irritation already noticed; but in addition there are two important modes of derivation to be referred to—viz., Dry-cupping, and the application of Junod's Exhausting Apparatus.

2502. *In Intermittent Fevers*, M. Gondret[1] states that in his private practice, during a period of twenty-seven years, he has never once met with a case of ague which has not yielded to dry-cupping along the spine. He gives the following directions for its use :—Apply eight or ten middle-sized cupping-glasses on each side of the spinal column, on the neck downwards,.and let them remain on for thirty or forty minutes. The time for applying the cups is the beginning of the cold stage, or, if it be possible, a short time before its accession ; this not only

[1] Ranking's Abstract, ix. p. 15.

prevents the attack, but at the same time arrests the hot and the sweating stages. In most cases one application of the cups is sufficient to effect a cure; but in long-standing cases it requires to be repeated three or four times. This simple remedy deserves a further trial.

2503. *To Poisoned Wounds, whether from Snakes or other sources*, the application of cupping-glasses (dry-cupping) over the affected part is one of the surest and best means of preventing the ill effects which would otherwise probably ensue. The valuable experiments of Sir David Barry[1] place this beyond a doubt. Several dogs and rabbits were bitten by vipers; to the bites of some he applied the cupping-glass, to the bites of others nothing. When the glass was applied for half an hour to such as had been bitten by one, two, or even three vipers, no symptom whatever of constitutional disturbance appeared; whilst those which were left to nature were invariably attacked with convulsions and stupor; none of them, however, died. From these experiments he draws the following inferences:—1. That neither sound nor wounded parts of the surface of a living animal can absorb when placed under a vacuum. 2. That the application of the vacuum by means of a piston cupping-glass arrests or mitigates the symptoms caused by the poison. 3. That the application of a cupping-glass for half an hour deprives the vessels of the part over which it is applied of their absorbent faculty for an hour or two after the removal of the glass. 4. That this measure is rendered, in a great measure, inoperative if extensive scarifications have been made in the neighbourhood of the original wound.

2504. *In Hysterical Headaches*, Dr. Graves (ii. pp. 315, 548) speaks highly of dry-cupping at the nape of the neck, between the shoulders, and below the clavicles; six cups should be applied, and should be allowed to remain on for ten or fifteen minutes. During a paroxysm of *Hysteria*, he also found their application attended with the best effects. *In Epilepsy*, particularly where previous headache or other premonitory symptoms advertise an approaching fit, dry-cupping, according to the experience of Dr. Graves, is most useful in averting the paroxysm. He also mentions cases of *Sciatica*, *Lumbago*, and *Neuralgia*, which were greatly benefited by its use.

2505. *In the Dyspnœa and Cough of Phthisis*, dry-cupping on the chest, particularly under the clavicles, often affords sensible relief.

2506. In many forms of *Atonic Inflammation and Passive Congestion*, the application of the dry cupping-glasses at a distance from the affected organ will be found a valuable adjuvant to

[1] Res. on the Influence of Atmospheric Pressure on the Blood, Lond. 1826.

other treatment, directly relieving the congested or inflamed organ without diminishing the strength of the patient.

2507. Junod's Exhausting Apparatus, or Boot, may be described as a large cupping-glass fitted over the leg and thigh. The apparatus is exhausted by means of a syringe, and consequently a large proportion of the blood in the body is drawn to the lower extremity, and the circulation through the rest of the system is proportionately relieved. It has been found that, under its application, the force and frequency of the circulation are reduced, and in certain cases of inflammation of internal organs this effect has continued after the use of the apparatus has been discontinued. It appears to be especially valuable in acute inflammation where the type of the affection renders abstraction of blood inadmissible.[1] The average time during which it should be applied is from fifteen to forty minutes.

2508. DIAPHORETICS are medicines which increase the cutaneous exhalation; those which produce profuse sweating are designated sudorifics; they may both be considered under one head. They act either by stimulating the sudoriparous glands of the skin, or by augmenting the force of the circulation generally, or by both these ways at once. Of the first, we have examples in the influence of saline diaphoretics, and in that of the large ingesta of aqueous fluids. Of the second, in the effects of stimulant diaphoretics, alcoholic liquors, and violent exercise. Tepid diluents and external warmth seem at once to augment the vigour of the circulation, and to stimulate the cutaneous exhalants. Emetics and nauseants have also a great tendency to relax the cutaneous surface. (Dr. Joy.)

The objects for which they are employed are thus summed up by Dr. Pereira:—1. To restore the cutaneous secretion when it has been checked by cold, and thereby to relieve the consequences of its suppression. 2. To promote the subsidence of diseases which naturally terminate in augmented cutaneous secretion, as in simple continued fever, the exanthemata, and intermittents. 3. To produce determination to the surface in various maladies attended by coldness of the skin and congestion of the internal organs. 4. To antagonize other secretions; thus, diaphoretics are sometimes employed to check excessive secretion of urine, or to relieve diarrhœa. 5. To establish a substitute for some other secretion; thus, when the renal secretion is diminished or suppressed, we endeavour to relieve the system by diaphoretics.

[1] Army Medical Report, Med. Times and Gazette, Sept. 10, 1853, and Oct. 15, 1853.

Their action is promoted—1. By previous depletion, if the skin be hot, and the febrile symptoms urgent. 2. By the free use of diluents, excepting where antimonials have been taken, when vomiting will probably supervene. When the temperature of the surface is high, cold diluents should be used; when it is moderate, they should be tepid. 3. By the use of flannel next to the skin. 4. By keeping the body in an equal and warm temperature. 5. By avoiding the use of cold drinks after the perspiration has once begun to flow. 6. By immersing the feet in hot water.

Their action is retarded—1, by diuretics and purgatives; 2, by exposure of the body to the cold air.

2509. *Remarks on their Use.* 1. Sweating may be produced, not only by medicines introduced into the stomach, but by many external agents; as affusion, hot and cold; by the vapour bath (a very powerful means); and by frictions. These are considered under other heads.

2. It is more reasonable as well as beneficial in practice to have regard to the changes in the circulation producing diaphoresis, than to the action of sweating itself. (Sir H. Holland.)

3. The amount of perspiration is rarely a just measure of the good obtained, and to make this a primary object is likely to give a wrong and injurious bias to the treatment of disease. (Ibid.)

4. The period of the day best suited for their exhibition is at bedtime, as there appears to be a greater disposition to perspire at that time than at any other period of the day. Dr. A. T. Thomson, however, considers that the morning, after sleep, is the period best suited for their exhibition.

5. When sweating is to be checked, the body should be dried with warm towels, and the patient moved into dry flannels, taking care not to expose the body to the cold air; the coverings should be gradually lessened, allowing the arms to be first exposed to the air. (Dr. A. T. Thomson.)

6. Stimulant diaphoretics should not be given at the height of an inflammatory attack, as their stimulating property tends to increase the violence of the symptoms.

7. The exhibition of stimulant diaphoretics in fevers, whilst the body is perhaps at the same time kept heaped with a profusion of bed-clothes, tends to the production of typhoid symptoms.

Diaphoretics are indicated—1, in Rheumatic affections; 2, Diseases of the skin; 3, Diarrhœa and Dysentery; 4, Febrile and inflammatory states; 5, Dropsy; 6, Gout; 7, Secondary or constitutional syphilis, &c.

2510. Diuretics are medicines which increase the quantity

of the urinary discharge. They may operate in four ways—1, as direct stimulants to the kidneys, by being absorbed into the circulation, and passing unchanged to them; 2, by undergoing decomposition *in transitu*, and acting on the kidneys by one or more of their constituents; 3, by acting primarily on the stomach and primæ viæ, and sympathetically on the kidneys; 4, by stimulating the disordered capillary system to a more healthy action.

The objects for which they are administered—1, to restore a natural amount of urine, when, from any cause, it has been diminished; 2, to promote the elimination of any acrid or poisonous matter from the system; 3, to relieve inflammatory action; 4, to promote the absorption of dropsical effusions; 5, to augment the elimination of water, and thereby to enable the urine to keep in solution the solid constituents of this secretion, as well as to act as a solvent for calculi contained in the urinary organs (Pereira); 6, to act as derivatives in diseases of the heart; 7, as evacuants in fever.

Their operation is promoted—1, by the previous employment of depletion and antiphlogistic remedies, if the patient be not already too much debilitated; 2, by drinking plentifully of diluents, particularly when salines have been employed; 3, by avoiding all agents which cause perspiration or purging; 4, by remaining in a cool and equal temperature; 5, by a combination with other remedies of the same class. N.B. Certain passions, particularly fear, increase the urinary secretion. Even under the most favourable circumstances, diuretics are very uncertain in their operation.

Their action is impeded—1, by opium; 2, by the use of diaphoretics and cathartics; 3, by abstinence from diluents.

The period of the day best suited for their administration is the daytime, the patient remaining out of bed during their operation.

2511. *Therapeutic Uses. Anasarca, Ascites, and Dropsical Affections generally*, much improve under copious diuresis. When the patient is strong, or not debilitated by long previous illness, depletory measures should precede the use of diuretics; by this means their efficacy and operation are greatly increased. In passive dropsies, it is often advantageous to combine diuretics with tonics and mild stimulants. *In Dropsy connected with Disease of the Heart*, especially when accompanied by a scanty secretion of high-coloured urine, diuretics prove of the highest service. In most cases, the dyspnœa, palpitation, and cough, decrease in the same proportion that the urine increases, and the dropsy disappears. Digitalis, squill, and acid tartrate of potash are excellent diuretics in these cases. (Dr. Hope.)

2512. *In Inflammatory Dropsy attendant on Granular Disease*

of the Kidney, Drs. Bright, Osborne, Watson, and others, condemn the use of diuretics, particularly those of a stimulating nature; but Dr. Christison[1] considers that they may be used without any risk of aggravating the primary disease, and that hydropic effusions cannot, in general, be so efficiently removed in any other way. He advises the following formula:—℞ Pulv. Digitalis gr. j.–ij., Potass. Bitart. ʒj.–ʒij., M. ter in die ex aq. Dropsies are occasionally removed by the endermic use of diuretics.

2513. *In Valvular Disease of the Heart*, Dr. Hope (p. 408) remarks that diuretics are remarkably beneficial in every stage; for, by drawing off the serous portions of the blood, they diminish the quantity, without deteriorating the quality of that fluid, and thus relieve palpitation and dyspnœa, and obviate infiltration, without materially reducing the strength.

2514. *In Hypertrophy of the Heart*, Dr. Hope (p. 287) found the most decided advantage result in severe cases from diuretics; not only when there was dropsy, but when this state was absent. They act as powerful derivatives.

2515. *In Puerperal Fever*, Dr. Murphy[2] states that he has found diuretics, particularly the nitrate of potash, very efficient as evacuants in this disease. The kidneys, in this case, act as the outlet for the poison in the blood.

2516. *In Inflammation*, diuretics are sometimes required, not merely on account of any derivation from the seat of disease thereby procured, but with the view of reducing whatever serous plethora may exist, and of removing from the circulation those ultimate products of assimilation which are liable to accumulate in the blood, to an injurious extent, during the febrile state, and thereby to heighten the local affection. The refrigerant diuretics, as sweet spirit of nitre, cream of tartar, &c., should be employed for this object. (Dr. Copland, ii. p. 411.)

2517. *a.* Electricity.

b. Faradisation; Electro-Magnetism; Magneto-Electricity.

c. Galvanism; Voltaic Electricity.

These three varieties of the same agent, although closely allied, yet differ somewhat in their special therapeutic uses and action. All the forms of Electricity act as stimulants to the nervous system, and, unlike other remedies of the class, the stimulation they produce is not followed by subsequent depression. *Common or Frictional Electricity* may be obtained

[1] Lib. of Med., vol. iv. p. 293. [2] Med. Gaz., Jan. 28, 1850.

for medical purposes from the ordinary electrical machine, in which it is produced by the friction of a glass plate or cylinder on a rubber. Frictional electricity is not so much used in the present day as formerly. In addition to its action as a nervine stimulant, it may be employed to produce counter-irritant effects. A common mode of using it is as follows:—"The patient is placed upon an insulating stool, and made to take hold of the prime conductor of the electrical machine. Sparks are then drawn from the body, either by the hand of the operator or by metallic conductors. By this proceeding a sharp pricking or pungent sensation is produced at the points touched; and after a time the skin is reddened, and an eruption resembling lichen urticatus breaks out." (Althaus.[1]) *Faradisation* is the term applied by Duchenne to indicate the application to therapeutical purposes of Faraday's discovery, "That electric currents of instantaneous duration are induced in conducting-wires by the passage of an ordinary galvanic current (*electro-magnetism*), as well as by the approach to, and withdrawal from, conducting-wires, of a permanent magnet of steel (*magneto-electricity*)." (Op. cit., p. 9.) The *Faradic or induction current* is an *interrupted current*, and differs in its physiological, chemical, and physical effects from the *ordinary Galvanic* or *continuous current*. The difference in the physiological effects of the interrupted (Faradic) and continuous (Galvanic) currents are exemplified by applying each in turn to the face: the continuous galvanic current will be found to excite the retina, producing the sensation of a flash of light, whilst it has but little action on the facial muscles; on the other hand, the interrupted galvanic current has little or no action on the retina, but produces a powerful effect on the muscles. The continuous galvanic current always moving in the same direction produces considerable chemical effects, whilst induction currents, which move alternately in different directions, have only a slight chemical action. Dr. Althaus (op. cit.) therefore observes, "that if we wish to make use of the chemical effects of electricity, it follows that the continuous galvanic current alone should be used." This observation applies to the treatment of *Aneurisms* and *Varices* by electricity. For the production of the ordinary galvanic current, Dr. Althaus recommends that Daniell's, Grove's, or Bunsen's batteries be employed. For Electro-magnetism and Magneto-electricity, the induction machines used for medical purposes are either volta-electric or magneto-electric (rotatory). The latter are generally preferred on account of their being cleaner and always ready for action.

[1] On the Treatment of Paralysis and Neuralgia by Galvanisation and Faradisation, p. 3.

If electricity be applied to animals in too large quantities, or in too great a degree of intensity, death ensues; and, as in some constitutions, there is a peculiar susceptibility to its action, and as there are no means of distinguishing beforehand those with whom it disagrees, it is always advisable to use it in the first instance cautiously, commencing with weak currents or slight shocks. It is, as a rule, a purely chronic remedy, applicable only to chronic diseases, and one which requires to be continued for several weeks in succession. Common electricity should be used with caution in inflammatory and plethoric states of the body; and in pregnancy, as miscarriage might be produced.

2518. *Therapeutic Uses of Electricity. In Paralysis and Paralytic Affections generally*, electricity, if employed with due care and in proper cases, proves highly serviceable. It is inadmissible so long as inflammatory or febrile symptoms are present; is productive of no benefit if the disease be connected with organic lesion of the nervous system; and should never be applied in recent cases, as in apoplexy, if there be reason to suppose that the effused blood or coagulum remains unabsorbed. Experience has fully justified the observation of Dr. Percival, that few cases which resist the power of small and repeated shocks will yield to great and terrifying ones. It is in local paralysis, when a nerve or set of nerves is affected, unconnected with organic disease of the nervous centres, when the paralysis arises from torpor of the nerves themselves, that electricity proves most useful. Dr. Golding Bird[1] gives the following results of his experience with this remedy:—Of 12 cases of *Paralysis from Affections of the Nervous System*, 6 were cured, 2 relieved, 4 received no benefit. Of 11 cases of *Saturnine Paralysis, or "dropped Hand,"* 5 were cured, 4 relieved, 2 not benefited. Others have also found it signally beneficial. Of 10 cases of *Paralysis from Rheumatism, exposure to cold, &c.*, 5 were cured, 3 relieved, 2 not benefited. *In Paralysis resulting from a stroke of lightning*, a case is related by Mr. Orton, of Sunderland, in which a complete cure was effected by electricity. *In Paralysis Agitans*, the continuous current may be employed with a prospect of benefit. It requires to be persevered in. The direction of the current in these cases is by no means unimportant. "In paralysis of sensation only," observes Dr. Pereira (i. p. 45), "the current should be direct or centrifugal. In paralysis of motion, it should be inverse or centripetal. In paralysis of both sensation and motion, the vibrating current, obtained by the ordinary coil (volta-electric induction) machine, is peculiarly appropriate; for by this the sensitive and motor nerves are alternately excited, while the

[1] Guy's Hospital Reports, vol. xi.

one current promotes the restoration of the excitability, which may have been lessened by the preceding current."

2519. *In Progressive Muscular Atrophy*, Dr. Fagge[1] has obtained excellent results from electricity; in some of his cases the continuous, in others the interrupted current (faradisation) was employed, in others both forms were used. *In Muscular Anæsthesia*, faradisation of the affected muscles has proved of service, as has also friction of the skin and its electric irritation. (Dr. Russell Reynolds, ii. p. 335.)

2520. *In Nervous or Hysterical Aphonia*, the best treatment, according to Dr. G. Johnson,[2] consists in the application of electricity directly to the larynx by means of Dr. Morell Mackenzie's "laryngeal galvanizer." The shock excites spasm and a scream, and the cure is sometimes very rapid. Dr. Johnson states that he has cured several of these cases at a single sitting, and one by a single shock of electricity, but in most cases it has to be applied several times before the cure is complete. In using this remedy, Dr. Morell Mackenzie's[3] directions should be carefully followed.

2521. *In Amaurosis depending upon torpor of the optic nerve*, electricity has been resorted to, but with very doubtful benefit; indeed, in some cases it seems to aggravate the symptoms; it is inadmissible when the amaurosis depends upon organic disease of the nerve or nervous centre. *In Nyctalopia*, electricity is occasionally useful; Mr. Bampfield[4] states that he knew several instances in which complete success attended its use.

2522. *In Chorea*, electricity was first employed by De Haen; Dr. Addison[5] employed it with benefit, and Dr. Golding Bird[6] speaks highly of its efficacy; he used it in the form of sparks taken in the course of the spinal column, every alternate day, for about five minutes at each time. It is chiefly useful in cases depending upon deranged catamenial function. *In Epilepsy*, it was employed by Dr. Franklin, Linnæus, &c., but the results were on the whole unsatisfactory.

2523. *In Amenorrhœa*, Dr. Althaus states that in many cases he has found benefit from faradisation assiduously and properly applied. Pulvermacher's apparatus is also a most simple mode of continuously applying this agent, which is peculiarly suited for chronic cases of amenorrhœa, after the general health has been re-established by suitable means. (Dr. Graily Hewitt, p. 415.)

2524. *Constipation depending upon Paralysis of the Intestines* has yielded to the use of electricity in the hands of M. Terzi.[7]

[1] Practitioner, Dec. 1868.
[2] Med. Times, Jan. 15, 1870.
[3] London Hosp. Reports, 1867–8, p. 85.
[4] Med.-Chir. Trans., vol. v.
[5] Guy's Hosp. Reports, vol. ii. p. 493.
[6] Ibid., vol. vi. p. 84.
[7] Brit. and For. Med. Rev., April, 1850.

Dr. Althaus[1] also records several cases of *Obstinate and Habitual Constipation*, which yielded readily to faradisation of the bowels, after the failure of the other ordinary modes of treatment. His remarks are well worthy of attention. A case of *Ileus*, accompanied by fæcal vomiting, which was successfully treated by the application of galvanism to the mucous surface of the intestine, is related by Mr. Finny.[2] In this case, one sponge, with the metallic handle to which it was attached, was passed up the rectum two or three inches, whilst the other sponge was applied to the abdominal walls. The effect was immediate; the constipation was at once relieved, and the patient recovered from an apparently hopeless condition. Cases of *Paralytic Dysphagia* benefited by electricity are recorded by Dr. Munro and others.

2525. *In Hernia*, Dr. Clemens[3] has used electricity as a radical cure. The hernia being reduced, and the patient placed in a semi-recumbent position, the ball of the conductor is carried as far into the hernial canal as possible, and the application of the electricity continued for five minutes, its power being increased day by day. After a few *séances*, the mouth of the ring becomes diminished in size, and the hernia will not descend as easily as heretofore; a perseverance in this treatment effects a cure; no ill effects have been observed to follow its employment. For the same object, Dr. Clemens also suggests the use of a galvanic hernia truss.

2526. *Therapeutic Uses of Electro-Magnetism and Magneto-Electricity. In Chronic Rheumatism and Rheumatic Paralysis*, electro-magnetism is sometimes productive of benefit. *In Chronic Rheumatism*, Dr. Fuller (p. 438) states that electricity and galvanism are rarely needed, and when needed, have, in his hands, seldom afforded material aid, excepting in a few cases of *Lumbago*, and in certain other cases of *Muscular and Neuralgic Rheumatism*, in which the pain has been stationary and more or less paroxysmal in its character, where the continuous current has afforded speedy relief. In the synovial form of the disease he states that he has never known it of the least service. Both faradisation and galvanism have been employed with great success by Dr. Althaus (op. cit.) in various forms of *Rheumatism and Paralysis;* with regard to the former disease, he states that the curative influence of faradisation is most remarkable in rheumatism of the deltoid. The removal of *Rheumatic Effusions* in the joints is said to be expedited by faradisation and galvanism; if the effusion be considerable, the latter form is to be preferred.

2527. *In pure Atony or slight Paralysis of the Bladder, un-*

[1] Lancet, Nov. 16, 1867.
[2] Dublin Quart. Journ. of Med., Nov. 1864.
[3] Ranking's Abstract, 1859, vol. xxix. p. 138.

complicated with prostatic enlargement, Sir H. Thompson (p. 161) has seen benefit from the daily application of an electro-magnetic current in the following manner:—To one pole the ordinary handle and moist sponge are attached, which is placed over the lumbar vertebræ, an elastic bougie containing a conducting wire and tipped with metal is attached to the other pole, and is introduced into the bladder. A weak current is established, and its effects watched; a slight sensation only should be produced. The bougie should be moved about gently in contact with the walls of the bladder, the urine having been just withdrawn, and, finally, it should rest a little in the neck of the bladder, where greater discomfort is felt; in all cases allowing the current to pass for eight or ten minutes before withdrawal.

2528. *In Neuralgic Affections*, the value of electricity and galvanism has been variously estimated. The fact appears to be that where the disease is dependent on irritation in the bowels, or is sympathetic of mischief occurring elsewhere, these agents exert no control over its progress, and usually tend to aggravate it, especially if used before the active symptoms have subsided; whereas when the complaint is of a purely neuralgic nature, and is unconnected with irritation in distant parts of the body, the continuous galvanic current is often of essential service. In all cases, as soon as the sensibility of the nerve has been subdued, and while the patient's limb is weak and stiff from long-continued inactivity, electricity supplies a stimulus which assists materially in maintaining the nutrition of the muscles and restoring their healthy function; but if employed before the pain has subsided, the interrupted current very generally aggravates the patient's sufferings. (Dr. Fuller, p. 468.) Various forms of *Anæsthesia* from paralysis of the sentient nerves have been found to be greatly benefited by faradisation. Dr. Althaus mentions a case of *Deafness* which was cured by it, but its use in this affection demands the utmost caution, as serious results may follow its injudicious employment.

2529. *In Opacities of the Cornea*, faradisation is recommended by Dr. Althaus (p. 21), who quotes Dr. A. Von Graefe in its support. The latter used, in patients in whom both eyes were similarly affected, the induced current on the one, and laudanum, nitrate of silver, &c., on the other, with the result that the cure by faradisation was much more rapid than by the other means.

2530. *In Indolent Ulcers and Wounds*, both faradisation and galvanisation have been successfully employed to stimulate the healing process by Dr. Althaus and Mr. T. Spencer Wells.

2531. *To stimulate the secretion of Milk*, faradisation has been

successfully employed by Dr. Skinner,[1] of Liverpool, Dr. Althaus, and others. In a case of *Suppression of Milk*, electricity proved successful in the hands of M. Bequerel.[2] The current was passed in various directions through the substance of the breast, by means of moistened sponges applied to the ends of the wires ; its effect was almost instantaneous.

2532. *Therapeutic Uses of Voltaic Electricity, or Galvanism. In Local Paralysis unattended by organic lesion of the nervous centres, particularly in Mercurial and Lead Palsy*, galvanism has proved highly serviceable. Mr. Grantham found it particularly useful in a peculiar form of paralysis which attacks block-printers. *In Infantile Paralysis*, Dr. Russell Reynolds[3] has found greater benefit from the persevering use of galvanism than from drugs internally administered ; it may, however, require to be continued for months. *In the Atrophic Paralysis of Children*, Dr. Hillier (p. 264) also speaks highly of the value of galvanism. *In Incontinence of Urine in Children dependent on loss of nervous power*, Mr. Simon[4] successfully employed galvanism, the current being passed along a catheter which had been previously introduced into the bladder. *In Paralysis of the Bladder* and *Vesical Catarrh*, electricity proved effectual in the hands of M. Peterquin ;[5] and a case of *Impotence* cured by the same means is recorded by Dr. N. Althaus (op. cit., p. 218). Dr. Rodolfi has successfully employed electricity in *Hydrocele* (loc. cit., p. 229).

2533. *In Spasmodic Asthma*, Dr. Wilson Philip[6] employed galvanism ; by transmitting its influence from the nape of the neck to the pit of the stomach, he gave decided relief in every one of the twenty-two cases in which he employed it ; the power varied from ten to twenty-five pairs of plates. Dr. Hyde Salter (p. 307), however, condemns its use, having, in some instances, seen it aggravate the symptoms, and in no case, he remarks, was it productive of good.

2534. *In Beriberi*, galvanism was employed with benefit in some cases by Dr. George Thompson,[7] of the Madras Service. It was obtained from fifty small plates, and sent through the spine, by small blistered surfaces on the neck, sacrum, and feet, for ten minutes. In one case the patient was able to walk between two men after the first application ; and after the second, with the assistance of one ; he gradually recovered. It was found much more effectual when directed through the spinal cord than along the nerves of the extremities. Dr.

[1] Trans. of Obstet. Soc., 1863.
[2] Gaz. Hebd. de Méd. et de Chir., Jan. 1857.
[3] Lancet, July 11, 1868.
[4] Med. Times, Nov. 14, 1848.
[5] Ranking's Abstract, xxx. p. 218.
[6] Philosophical Trans., 1817, p. 22.
[7] See Malcolmson on Beriberi, p. 291.

Malcolmson considers that galvanism will probably be of use in the removal of the paralytic symptoms.

2535. *In Organic Disease of the Eye, in Opacity of the Cornea, Incipient Cataract, &c.*, galvanism was employed extensively by Dr. Crusell, of Finland; the success of the treatment is said to have been very striking. Dr. Lerche,[1] of St. Petersburg, adopted the same practice, and performed some remarkable cures in that city. Mr. H. Lobb[2] has recorded an interesting case of *Rheumatic Ophthalmia* cured by galvanism; he adds that in *all cases of Ophthalmia* in which he used the continuous galvanic current, a rapid cure was effected. Dr. Althaus, however, advocates faradisation in preference to galvanisation in the treatment of opacities of the cornea, in consequence of the peculiar action of the continuous current on the retina (*ante*).

2536. *Tumours.* Dr. Althaus[3] has recorded fifty-eight cases of tumours, forty-seven non-malignant and eleven malignant, in which he has employed "electrolysis" with more or less benefit. In the former class were included eleven cases of *Nævus*, eight of *Bronchocele*, fourteen of *Sebaceous Tumours of the Scalp and Face*, five of *Hypertrophy of the Skin*, three of *Enlarged Glands*, three of *Lipoma*, and one each of *Kelis Cyst of the Lip* and *Ganglion*. Of these, twenty-nine were cured, ten improved, and in seven no result was obtained, or the result was unknown. The success of this treatment has been further confirmed by the experience of Dr. Maurice H. Collis, of Dublin. Mr. T. Holmes[4] speaks favourably of the electric-wire cautery in the treatment of *Nævus;* the plan is tedious, and there is liability to hæmorrhage during the separation of the sloughs, but Mr. Holmes states that he has successfully applied it in the treatment of very large vascular tumours. For the mode of employing electricity in these cases, Dr. Althaus' paper (op. cit.) should be consulted.

2537. *Epilepsy* has occasionally been treated with galvanism. Dr. Duncan,[5] Mr. Whitlam,[6] and others, have advocated its employment, and recorded cases in which it appears to have exercised a favourable influence. "Of electricity and galvanism," observes Dr. Copland (i. p. 813), "it may be said generally that they have occasionally been found successful; that when resorted to shortly before the seizure, they have sometimes suppressed it, or rendered it more mild; that when applied during the paroxysm, they have often mitigated its violence and duration; and that the safest mode of employing electricity is to place the patient on the insulating stool, and

[1] Med. Zeitung, June 16, 1841.
[2] Lancet, Sept. 12, 1860.
[3] Brit. Med. Journ., Dec. 7, 1867.
[4] Dub. Quart. Journ., Aug. 1869.
[5] Annals of Med., viii. p. 339.
[6] Lond. Med. Phys. Journ., vol. xiv. p. 527.

subject him to the electric bath, and to draw sparks from different parts when thus insulated, and placed in connection with the prime conductor."

2538. *In Parturition*, galvanism has been employed by Dr. Radford,[1] of Manchester, with a view of inducing uterine contractions in cases of hæmorrhage; and also when the labour is tedious, in consequence of atony of the uterus. The conclusions arrived at by Professor Simpson on this point were, however, unfavourable. The subject has since been examined by Dr. Mackenzie.[2] He considers—1. That a sustained current of electricity passed through the gravid uterus, directed longitudinally through the uterus from the upper portion of the spinal cord, exercises a remarkable influence in increasing the tonicity and contractility of the uterine fibre. 2. That in the action so excited and sustained we have a powerful and reliable means of moderating and controlling *Uterine Hæmorrhage*, whether accidental or unavoidable, and of simultaneously accelerating the dilatation of the os uteri, and the general progress of labour. 3. That the current of electricity may be continued for a lengthened period, when required, without any appreciable pain or inconvenience to the mother, or danger to the child.

2539. *Rigid Muscular Contractions, whether Hysterical or Rheumatic*, are often materially benefited by the use of the continuous galvanic current.

2540. *In certain forms of Hysteria or Moral Insanity*, Dr. Laycock[3] considers that the prophylactic and curative treatment consists in the persevering and systematic application of electro-galvanism to the abdominal and pelvic regions, in combination with the internal use of tar.

2541. *In Poisoning by Opium, Chloroform, &c.; in Drowning, and other forms of Asphyxia*, galvanism is a most valuable means of stimulating the patient, and restoring respiration and circulation.

2542. Electro-Puncture, or Galvano-Puncture, consists in introducing two acupuncture needles, as advised in Acupuncture, and connecting them with the poles of a weak voltaic battery. The great advantage of this over the ordinary mode of application is the facility it affords of especially operating upon certain muscles or nerves, instead of the electric fluid being expended upon the skin and the surrounding tissues. The current of electricity should not be kept up continuously, but intermitted in order to produce a succession of small shocks.

[1] Prov. Journ., Dec. 1844.
[2] Proceedings of Med.-Chir. Soc., Feb. 23, 1858.
[3] Med. Times, July 20, 1850.

2543. *Therapeutic Uses. In Paraplegia and Hemiplegia*, it proved very successful in the hands of Dr. Terzi;[1] he also found it effectual *in facial Paralysis*.

2544. *In Bronchocele*, it was employed successfully by Dr. Terzi;[2] the number of plates employed amounted to sixteen or twenty, and upon the intervening discs of cloth, moistened in an acid or saline solution, a little tincture of iodine was dropped; the tumour at first became painful, and increased in size, but soon after diminished.

2545. *In Sciatica, Tic Douloureux, and some forms of Chronic Rheumatism*, electro-puncture has been found serviceable; it should be applied only during the intermissions of pain.

2546. *In ununited Fractures*, it was employed in three cases by Dr. Lente,[3] of New York. To be efficacious, the needles should be passed down to the ends of the bones: the simple application of the poles to the soft parts adjacent to the fracture appears to have little influence.

2547. *In Aneurism*, electro-puncture has lately been much used in France and Germany. It being a well-ascertained fact that galvanism or electricity has the power of coagulating fibrine, it is employed with a view of coagulating the blood within the aneurismal tumour. A full *résumé* of the whole subject has been given by Dr. John Duncan,[4] who, after considerable experience, furnishes the following directions for the employment of this treatment:—1. The needles should be carefully insulated. 2. They should be prevented from touching each other, or the sac, and to attain this are best introduced from the same side, parallel to each other, and from one to two inches apart; thus also their action, while sufficiently rapid, is not too localised. 3. They should be extremely fine, but may be multiplied according to the size of the aneurism; they should be made of steel, but had better be coated with gold, as the steel is eaten away with great rapidity, and the surface acting is thus diminished. 4. A battery of medium strength, and with a continuous current, should be employed; four to eight of Grove's or Bunsen's cells are sufficient for a large aneurism. 5. The action may be continued till pulsation stops, or gas can be clearly detected by percussion; several cases of *Nævus Maternus* successfully treated by galvano-puncture are recorded by Dr. Duncan.[5] Dr. Althaus insists on the necessity of employing continuous galvanic currents, and not induction currents, in the electric treatment of aneurisms and varices, and that the positive pole at which alone the clot is produced should alone be made to act on the blood. The employment of galvano-puncture in these

[1] Brit. For. Med. Rev., April 1850.
[2] Ibid.
[3] Amer. Jour. Med. Sci., April, 1851.
[4] Edin. Medical Journal, April, 1866.
[5] Ibid., March, 1870.

cases, however, is not unfrequently attended by phlebitis, and other ill effects, and its efficacy is far from being well established. Dr. Althaus thinks that, in the treatment of *Varices*, galvanisation would be more frequently successful than in that of aneurisms.

2548. EMETICS are medicines which are given in appropriate doses with the view of inducing vomiting, or of causing the evacuation of the contents of the stomach. Dr. Headland[1] divides them into two classes—1, specific, and 2, irritant; the former acting through the blood, the latter by local irritation. Specific emetics, including tartar emetic and ipecacuanha, may cause nausea, even without vomiting, depressing the action of the heart by their influence over the vagus nerve; whilst the irritants, *e.g.*, the sulphates of zinc and copper, common salt, and mustard, scarcely cause nausea, producing only a feeling of discomfort, arising from the inverted action of the stomach; they cause by contact and irritation a large quantity of gastric juice to be poured out, and this, together with the emetic and the contents of the stomach, is rejected. Such emetics are chiefly used when we wish to unload the stomach of any irritating or poisonous matters, but when our object is to cause nausea, depression of the heart's action or relaxation of the muscles, the former class, specific emetics, must be had recourse to.

The objects for which they are employed. 1. To remove from the stomach any crude indigestible matters, or poisonous substances. 2. To depress the muscular and vascular systems. 3. To promote the biliary, cutaneous, and pulmonary secretions. 4. To promote the absorption of other medicines internally administered. 5. To check internal hæmorrhage. 6. To dislodge foreign bodies impacted in the throat or air-passages.

Contra-indications. 1. Diseases of the heart and large vessels. 2. Aneurism of the aorta. 3. Predisposition to apoplexy and cerebral affections in general. 4. Hernia. 5. Prolapsus of the rectum or uterus. 6. The latter months of pregnancy. 7. An irritable state of the stomach. 8. Great debility. 9. Gastritis.

Their occasional ill effects are:—1. Abortion. 2. Hernia. 3. Apoplexy and comatose affections. 4. Hæmoptysis. 5. Suffocation. 6. Prolapsus of the uterus or rectum. 7. Rupture of the abdominal muscles. These effects, though rare, indicate the necessity of caution in their exhibition.

Their action is promoted by drinking plentifully of warm diluents, and by tickling the fauces with a feather; opium impedes their action.

[1] Action of Medicines, p. 89.

2549. *Observations on the use of Emetics.* 1. In childhood and infancy emetics are generally well borne, and prove highly serviceable in the diseases of early life; in them, generally speaking, ipecacuanha is preferable to tartar emetic; the latter occasionally causing great depression. Sydenham reprobates the use of antimonial emetics before the eighth year.

2. Emetics differ much in the rapidity of their action; thus the sulphates of zinc and copper act almost immediately after they have been swallowed, and should, in consequence, be employed whenever it is of importance to unload the stomach rapidly, as in cases of poisoning. Tartar emetic acts more slowly than these substances, but quicker than ipecacuanha or mustard; but it should be remembered that a great difference exists in individuals with regard to the facility with which vomiting is induced.

3. The relative amount of subsequent depression which the various emetics induce is a point of practical importance. Of the whole range of emetics, tobacco produces the greatest and most permanent depression; so much so, indeed, that nothing but extreme circumstances can justify its employment. Tartar emetic is more depressing in its action than ipecacuanha; and this, in its turn, more so than the sulphates of zinc or copper, and mustard; the last, indeed, hardly produces any perceptible depression, and is consequently well suited for debilitated subjects, atonic gout, drunkenness, &c.

4. The degree of nausea and depression which certain emetics produce is not proportionate to their emetic effect. This is very evident if we compare the operation of tobacco with that of mustard, or tartar emetic with sulphate of copper.

5. The amount of diaphoresis which they produce merits attention. Tartar emetic and ipecacuanha cause copious perspiration, whilst the sulphates of zinc and copper excite comparatively little.

6. An habitual use of emetics is highly injurious, rendering the stomach so susceptible that ordinary diet cannot be retained, and debilitating the system generally; no means are so likely to produce dyspepsia. It is a practice which cannot be too strongly condemned.

7. The period of the day best adapted for their administration is the evening, when the tendency to sleep which supervenes can be readily indulged; if, however, the urgency of the case requires it, there is no period of the day when they may not be given.

8. When the vomiting is too violent or too long-continued, the means best adapted for checking it are effervescing draughts, with a few drops of laudanum or hydrocyanic acid. A sinapism to the epigastrium is sometimes effectual.

2550. *Therapeutic Uses. Fevers. In Intermittent Fevers,* an

emetic given at the commencement of the cold stage was formerly regarded as a sure means of cutting short the disease. Though they will not do this, emetics, when not otherwise contra-indicated, appear to exercise a beneficial influence in mitigating the subsequent severity of the attack, not only by unloading the stomach of crude and undigested food, but by lowering the vascular excitement, and determining to the skin. Their use is almost entirely limited to the very outset of the attack, and should on no account even then be employed, if there be any great amount of gastric irritation. The same remark applies to *Remittent and Continued Fevers;* but in *Yellow Fever*, the experience of the best authorities agrees in condemning their employment. In all fevers, the great danger which attends the use of emetics is that they may induce an irritable state of the stomach, which is but little under the control of medicines. In the severe fevers of the Mediterranean, Sir William Burnett[1] found them highly injurious; when employed, ipecacuanha should be preferred. *In Typhus Fever*, an emetic, observes Dr. Murchison (p. 263), is often of undoubted service in relieving symptoms during the first five or six days of the disease. Its good effects are often most marked in mitigating or removing the headache and general pains, in reducing the temperature, quenching the thirst, and quieting any gastric disturbance. It is only contra-indicated when the patient is unusually weak, or when the disease has advanced beyond the first week. The same remarks apply to *Typhoid (Enteric) Fever;* here they ought never to be given after the twelfth day; for when the peritoneum is laid bare by intestinal ulcers, the act of vomiting may induce perforation.

2551. *In Gastric Remittent Fever*, if the child is seen early, and there is reason to suppose that improper food has been the cause of the attack, an emetic will often be found at once to relieve the symptoms; it is only applicable to the earliest stage. (Sir C. Locock.[2])

2552. *In Scarlet Fever*, at the commencement of the disease, an emetic may be administered with great advantage; it often appears to exercise a favourable influence on the course of the fever subsequently.

2553. *In Puerperal Fever*, emetics are advocated by Doulcet, Richter, Tonnelli, Cruveilhier, and others. Dr. Ferguson considers that the cases in which they are chiefly useful are those in which the liver is implicated, and biliary derangement is a prominent symptom. Dr. Gooch advises caution when the face is pale, the skin cool, and the pulse small and weak. When

[1] On the Mediterranean Fever, 2nd ed., p. 33.

[2] Lib. of Med., vol. i.

used, they should only be as auxiliaries, and their utility is chiefly confined to the earliest stages. They entirely failed in the hands of Dr. Dewees and Dr. Clarke.

2554. *Disease of the Brain, &c. In Insanity*, emetics are advised by Esquirol, Rush, Foville, Cox, Wake, and others; they are undoubtedly useful when derangements of the stomach exist. Dr. Prichard[1] observes that emetics are sometimes useful during a state of furious excitement, and produce calmness and a mitigation of violence. Sometimes, under these circumstances, he adds, their exhibition is followed by a restoration of sleep and tranquillity. Maniacs bear large doses of antimony without effect. Considerable judgment is necessary in selecting cases in which emetics may be administered with safety. *In Puerperal Insanity*, when gastric disorder exists in a marked manner, Dr. Mackenzie[2] considers that an emetic may be given with safety and advantage.

2555. *In Delirium Tremens*, emetics were employed by Stoll, in 1778. They have more recently been reintroduced into American and English practice; but on the whole the treatment appears to be very inferior to that which aims at supporting the constitution, excepting at the very commencement of the attack, when there is reason to suppose that the stomach contains a large quantity of spirituous fluid.

2556. *In Puerperal and other Convulsions, also in Delirium and Apoplexy, clearly attributable to the introduction into the stomach of crude, indigestible, or poisonous substances*, an emetic, by removing the exciting cause, is of essential benefit; much care and discrimination, however, are required in its employment.

2557. *In Epilepsy and Epileptoid Affections*, Dr. Marshall Hall[3] considers that an emetic, given either when an attack is imminent, as ascertained by premonitory signs, or when, without these signs, we may be anticipating the attacks generally, will ward off a threatened attack.

2558. *In Chronic Bronchitis*, where no fever, no remarkable dyspnœa, nor acceleration of the pulse is present, and where the bronchial secretion is very copious, you will be able to produce very good effects by giving an emetic every night, for two or three nights, before you begin with remedies calculated to arrest the super-secretion of the lung. It is productive of a double advantage in such cases; a large quantity of mucus is discharged from the stomach and lungs, expectoration is rendered more easy, the tongue becomes clean, and the appetite is improved. (Dr. Graves, ii. p. 16.) *In the Bronchitis of Typhus Fever*, an emetic of mustard, observes Dr. Murchison

[1] Cyc. Pract. Med., vol. ii. p. 860.
[2] London Journ. of Med., June, 1851.
[3] See Ranking's Half-Yearly Abstract, vol. xiii., p. 30, 1851.

(p. 283), is said sometimes to act like a charm, by promoting copious expectoration and allowing free ingress of air into the bronchial tubes, so as to save the patient from impending suffocation. (Lyons.)

2559. *In Croup*, the induction of vomiting in the early stages is often the most effective means of arrest, and one that must be resorted to in all stages of the disease but the last. (Dr. Squire, i. p. 261.) When a predisposition to this affection has manifested itself, or any symptoms exist which show an attack to be impending, an emetic should always be in readiness, as the earlier it can be given the greater is the probability that it will arrest the course of the symptoms. Much has been said of the advantage of particular emetics in croup; but as Dr. Eben. Watson[1] remarks, the essential quality desirable in such cases is speedy action, with as little as possible depressing effect, and this he considers is abundantly fulfilled by a combination of ipecacuanha and sulphate of zinc. (See also next section.)

2560. *In Diphtheria*, emetics are given with the view of relieving the congestion of the larynx and the spasm, and of loosening and aiding the expulsion of the false membrane, though in the experience of Dr. Hillier (p. 145) this last result is seldom obtained. Of all emetics, he prefers ipecacuanha; but in sthenic cases, limited to the larynx, tartar emetic, followed by nauseating doses of the same, is most efficacious. If this drug, however, is given to delicate children, or in asthenic cases, it causes too much depression, and leads to troublesome and exhausting diarrhœa. The relief afforded by the full action of an emetic is the surest indication as to the advisability of repeating it.

2561. *In Cynanche Tonsillaris*, an emetic given at the very outset of the disorder may sometimes succeed in cutting it short; it is also occasionally useful in the more advanced stages.

2562. *In Cholera*, emetics form an important part in the "evacuant" or "eliminative" treatment of cholera. (Sect. 1859.) Drs. M'Cloy and Robertson[2] are of opinion that their value cannot be over-estimated; they state that they found them very useful in freeing the stomach from the quantities of opiates and stimulants which had, in the majority of cases which came under their care, been previously administered. The brisk action of an emetic, they remark, often relieved the feeling of oppression; this may have resulted partly from the stomach being emptied of morbid secretions, partly from a mechanical stimulus to the circulation, and partly from relaxation of pulmonary arterial spasm. The emetic employed in

[1] Glasgow Med. Journ., Feb. 1867. [2] Med.-Chir. Trans., 1867, p. 184.

these cases was mustard in hot water: nauseating emetics were not tried. Notwithstanding the high testimony borne to the value of emetics in cholera by these and a few other observers, they have never come into general use, and in the opinion of many experienced practitioners are uncalled for unless at the very outset of the attack, when it is clearly traceable to the ingestion of crude or indigestible articles of food.

2563. *In Diarrhœa and Dysentery*, an ipecacuanha emetic, repeated once or twice, according to circumstances, is often effectual in arresting the discharge.

2564. *In Erysipelas*, emetics are advised by Liston, Chelius, Desault, Nunneley, and Donellan; their good effect is limited to the early stage, and they are chiefly indicated when there is derangement of the digestive organs.

2565. *In Neuralgia arising from Dyspepsia*, Mr. Hunt advises the exhibition of an emetic, followed by an aperient draught of rhubarb, &c., previous to the use of quinine or arsenic. In those cases in which the paroxysm is regularly intermittent, an emetic should be given an hour before its expected arrival. (Mr. Hunt.)

2566. *In Hysteria*, an ipecacuanha emetic, given when a paroxysm is impending, often has the effect of altogether preventing it. (Conolly.)

2567. *In Aphonia, arising from an Atonic or Paralytic state of the Larynx*, an emetic of ipecacuanha, or sulphate of copper, or sulphate of zinc, followed by tonic and stimulant medicines, sometimes proves useful.

2568. *In Rheumatic Gout*, attended with acidity of the stomach, foul tongue, disagreeable sour taste in the mouth, when the dejections are dark-coloured and offensive, or else pale and deficient in healthy bile, a brisk emetic often proves most beneficial. (Dr. Fuller.) Tonics and other remedies, which cannot previously be borne, are after its operation often productive of the best effects (p. 356.)

2569. *Otalgia* is sometimes immediately relieved by the exhibition of an emetic; and in *Atonic Deafness, depending upon accumulation of mucus in the Eustachian Tube*, the same measure is attended with benefit; but in both these cases emetics are inadmissible when much cerebral congestion or plethora is present; under such circumstances they may prove highly injurious.

2570. *In Urticaria, arising from the ingestion of noxious and indigestible substances (as poisonous fish, &c.)*, no time should be lost in obtaining the ejection of the offending matters; for this purpose the sulphates of zinc or copper are best suited; a simple cathartic should afterwards be administered. (E. Wilson, p. 158.) *In Chronic Urticaria*, a course of emetics, one every

other morning, taken fasting, is sometimes effectual in removing the disease.

2571. EMMENAGOGUES are medicines or agents which tend to establish or restore a healthy condition of the menstrual secretion. They may be conveniently divided into three classes, viz., direct, indirect, and constitutional.

1. *Direct Emmenagogues* comprise all those agents which act directly or specifically upon the uterus. Of these, the chief are electricity, which stimulates the nerves of that organ, and ergot of rye, which acts directly on its muscular fibres. Leeches to the os uteri, which relieve any existing local congestion, and thus permit the secreting vessels to perform their functions, and stimulant applications, as nitrate of silver, or liquor ammoniæ, belong to the same class. Amongst the minor remedies may be mentioned savine, borax, and cinnamon.

2. *Indirect Emmenagogues* include a large number of powerful cathartics, as aloes, and some diuretics, as nitrate of potash, which stimulate the pelvic organs in the neighbourhood of the uterus, the stimulant action being conveyed by sympathy to the latter organ; their efficacy is extremely doubtful. In some cases, perhaps, where the suppression of the secretion depends upon congestion of the vessels of the uterus, a hydragogue cathartic, or powerful diuretic, may act favourably as a derivative, but not unfrequently they are productive, not only of no benefit, but of much mischief.

3. *Constitutional Emmenagogues* are those which establish a healthy tone and condition of the general system, and restore a natural action of all secreting organs, the uterus included. Those most commonly employed, and on which most reliance is to be placed, are the salts of iron. They are chiefly indicated when amenorrhœa is combined with anæmia or debility, and operate by restoring the deficient constituents in the blood.

2572. *Observations on their Use.* 1. Emmenagogues should be used with great caution, if at all, to bring on the first menstrual discharge. In the majority of cases, when the uterus is properly and fully developed, the catamenia will appear, and the application of stimulants to that organ before it is capable of performing its functions may prove highly prejudicial; so long as the general health remains good, the late appearance of the menses does not call for medical aid.

2. They should be given with extreme caution about that time of life when the menses decline naturally. The uterus has completed its functions, and unnaturally stimulating it to more work than nature has allotted to it, will only increase the constitutional disturbance generally present at that period, without delaying the final cessation of the discharge.

3. They should never be given during pregnancy, or when there is malignant disease of the uterus.

4. When one emmenagogue fails, another will frequently succeed; and a combination often proves more effectual than when they are given singly.

5. Emmenagogues operate the most certainly and effectually, if administered at those periods at which the menstrual discharge should naturally appear.

6. When amenorrhœa is associated with cachexia or general ill-health, constitutional emmenagogues (*ante*) should always precede the employment of direct or specific remedies of the same class, should such be required; but it often occurs that with the return of general bodily health, the catamenial function is restored to a healthy state.

2573. ENDERMIC, from ἐν "in," and δέρμα "the skin," a term employed to designate the method of introducing medicines into the system by placing them on a denuded portion of the surface of the body. By this means medicines are rapidly absorbed, and produce their effects in some instances as quickly, or even more so, than when taken by the mouth. Almost all medicines, the dose of which is not very large, or which do not irritate severely, or corrode the surface to which they are applied, may be employed in this way; but it is especially appropriate to the alkaloids, morphia *par excellence*, and to the other more active proximate vegetable principles.

The dose of medicines administered in this way may be twice or thrice that given by the mouth. There is less danger here from an over-dose, as what remains of the offending material may be readily removed, should serious consequences be threatened. Sometimes the medicine will be found to act as efficiently as by the stomach in the same dose.

The part best adapted for the application of the medicines, when some local affection does not call for a special direction, is the epigastrium; but any portion of the anterior surface of the body, or the inner surface of the thighs and arms, will answer well. A denuded surface for the purpose is most conveniently obtained by means of a blister of cantharides, though in cases of great urgency the more rapid action of the stronger solution of ammonia may be resorted to. Upon the average the blistered surface may be about three or four inches square; it is not necessary to detach the cuticle immediately. The medium may be first applied over the raised epidermis, which, if cut freely, will come off with the first dressing.

The medicine should be reduced to the state of a very fine powder, and, if irritant, should be diluted with pulverized gum acacia, or other bland substance, and then sprinkled equally over the surface, or applied upon dressings of simple cerate.

If so soft that it cannot be powdered, it may be rubbed up with solutions of gelatine, mucilage, lard, or cerate, and applied upon pledgets of lint, and substances originally liquid may be applied in the same way.

Care should be taken to avoid irritation as far as possible. Active congestion and inflammation, independently of the pain and inconvenience, interfere with the operation of the medicine, by offering an impediment to absorption. Sometimes sloughing results from the incautious use of an irritant medicine, and a permanent scar is left. This has been known to follow the application of sulphate of quinia undiluted.

In cases of excessive constitutional action from the medicine, it may sometimes be advantageously followed, after removal, by a counter-agent. Thus, unpleasant symptoms from strychnia or digitalis might possibly be relieved by morphia applied to the blistered surface; and the effects of morphia are said to have been neutralized by musk. (Dr. G. B. Wood, i. p. 75.)

This mode of treatment has in a great measure been superseded by that of subcutaneous injection, or the hypodermic treatment, as it is usually termed. But Dr. Brown-Séquard[1] protests against its abandonment, on the ground that it possesses the double advantage of counter-irritation and rapid absorption of a therapeutic agent, and which may sometimes prove more useful than simple subcutaneous injection. In illustration of this, he cites a case of crural neuralgia which had not been markedly benefited by hypodermic injection of morphia and atropia, in which rapid amelioration and ultimate cure resulted from a series of blisters, and the application of sulphate of morphia on the denuded dermis.

2574. Enema, called also Clyster, Glyster, and Lavement, a liquid thrown by means of a proper instrument, per rectum, into the large intestines.

The objects for which they are employed. 1. To remove from the rectum and lower intestines accumulated fæces, scybala, and other irritating matters. 2. To allay irritation of the bladder, uterus, and other pelvic organs. 3. To remove constipation, particularly when depending upon stricture or intus-susception. 4. To introduce medicinal substances into the system, when from any cause they cannot be administered by mouth.

2575. *Observations on their use.* 1. Carefully oil the tube or pipe which is to be introduced into the anus, in order to prevent any injury being done to the soft parts; and care should be taken that the pipe be introduced an inch or two within the sphincter ani.

[1] Lancet, March 10, 1866.

2. The quantity of fluid employed requires attention. For a child of from one to five years, three or four ounces is the proper quantity; from ten to fifteen years, six or eight ounces; for an adult, twelve or sixteen ounces. These quantities answer well for ordinary enemas; but in some diseases, *e.g.*, dysentery, four or even six pints may be thrown by means of a long tube into the sigmoid flexure of the colon; and, on the other hand, when the enema is intended to remain any length of time in the rectum, in order to allow the medicinal substances which it may contain to be absorbed into the system, the quantity should not exceed one or two ounces for an adult or a drachm or two drachms for children.

3. If the fluid be injected slowly, or with moderate force, it is more likely to be retained than if thrown in with considerable impulse.

4. All medicinal substances, particularly those of an irritating kind, should be well diluted in some mucilaginous fluid, or they may give rise to inflammation of the tissues with which they come in contact.

5. The forcible injection of simple air or medicated vapour, per rectum, was formerly recommended, but is now almost entirely and justly abandoned. The introduction of tobacco smoke, formerly advised, is a most dangerous remedy.

6. The form of instrument used does not much signify. If used with proper caution, an enema is perfectly safe, and is a valuable resource in many forms of disease, in children as well as in adults.

2576. *Therapeutic Uses. In Constipation, from whatever cause arising*, enemas may be used with advantage; but it must be remembered that they are only temporary measures, removing an existing overcharged state of the bowels, but incapable of establishing that healthy condition of the peristaltic action upon which a natural daily discharge of the fæces depends; this must be done by tonics, alteratives, and other remedies. *In the Constipation of Hysterical Women*, assafœtida and other antispasmodics may be advantageously added to the enema. *In that depending upon Spasm of the Rectum*, tepid-water enemas, with soap, are very useful, temporarily relaxing the spasm, and bringing away the accumulated fæces.

2577. *In Diarrhœa*, enemas often prove most serviceable; they may be either simply mucilaginous, or containing opiates, ipecacuanha, &c. In a case which occurred in my own practice, the diarrhœa had continued several weeks, and had resisted the employment of almost every other means; but, by the use of enemas, a cure was effected in a very short period. The first enema, consisting of about two pints of demulcent fluid, brought away a large number of small and very hardened scybala; immediate relief followed their expulsion; and the

remaining irritation, which had been caused by the presence of these hardened bodies, yielded entirely to small glysters, containing opium and ipecacuanha.

2578. *In Dysentery*, the employment of large enemas (four or six pints thrown into the transverse colon, by means of a long flexible tube introduced per rectum) was first proposed by Dr. O'Beirne.[1] The rationale of this treatment, its mode of application, together with some obstacles to its employment, are fully considered when speaking of Dr. Hare's treatment in the article Argenti Nitras (*q.v.*) They may doubtless prove highly useful in removing accumulated fæces and irritant matters from the colon, and have proved successful in the hands of Dr. Irving,[2] Dr. M'Pherson,[3] and others. Small enemas (f℥jss.–f℥ij.), containing opiates and ipecacuanha, often prove useful in allaying the tenesmus and tormina. *In other Abdominal Inflammations, in Peritonitis, Peri-hepatitis, Nephritis, and Abdominal Typhus*, Dr. Eisenmann[4] speaks highly of the value of enemas of three or four quarts of water at blood-heat. The first injection generally returns in a short time, bringing with it much fæcal matter; the second, which is given immediately after the return of the first, is generally retained without difficulty. He considers that he has often seen cases of the above inflammations cut short by the use of these enemas.

2579. *In Cancerous or other Ulceration of the Stomach, Extreme Stricture of the Œsophagus, Irritability of the Stomach*, and other conditions in which it is inadvisable or impossible to administer food by mouth, life may be prolonged, and even in some cases preserved, by the persevering use of enemas consisting of strong beef-tea, milk, raw eggs, cod-liver oil, wine, and in extreme cases of even diluted brandy or opium. Their use and frequency and constituents must be regulated by the history of each case; they should, however, be as small as practicable, and it is rarely desirable to repeat them at intervals of less than three or four hours. (Dr. Brinton, p. 175.)

2580. *In Intus-susception of the Bowels*, Cullen proposed the employment of large warm-water enemas. The flexible tube of a stomach-pump, introduced per rectum, is to be passed up six or seven inches, in the manner advised in dysentery (see sect. 229); and several pints of water, as hot as the patient can bear it without pain, are to be injected. The warmth, the moisture, and the pressure of the fluid, sometimes cause relaxation of the surrounding tissues, and a reduction of the affected

[1] New Views of Defæcation, &c., 1833.

[2] Edin. Med. Surg. Journ., Jan. 1849.

[3] On Bengal Dysentery, Calcutta, 1850.

[4] Bull. de Thérap., lv. p. 542.

part is effected; it, however, often fails. *In Colica Pictonum*, hot-water enemas have also been found serviceable.

2581. *Cholera.* In following out the eliminative treatment of this disease, Drs. M'Cloy and Robertson[1] state that they obtained marked benefit from hot enemata; at first they employed saline injections, but they subsequently found that water at 120° did equally well. They consider that their good results are due as much to the purgation they excite, as to their warming and diluting the blood; after free purgation had been induced, warm bland injections were often found to relieve the sinking feeling of emptiness in the bowels. In the stage of collapse, enemas containing turpentine and other stimulants seem worthy of a trial.

2582. *Worms.* In the treatment of *Ascarides, Vermiculares, or Thread-worms*, enemas are essentially useful in removing the entozoa from the rectum and lower intestines. Common salt, tincture of perchloride of iron, infusion of quassia, aloes, and lime-water, have all had their advocates; but, as far as is known, neither of these possesses any marked superiority over the others; the best is only a palliative; for effecting a cure, constitutional treatment must be had recourse to. Enemas of olive oil are very useful in allaying the irritation and uneasiness caused by the presence of the parasite in the rectum.

2583. *In Cerebral Affections, Apoplexy, Insanity, &c.*, terebinthinate and other enemas prove highly serviceable. They not only remove the scybala which so often accumulate in the intestines of maniacal patients, but operate as powerful revulsives. *In Fevers attended with Cerebral Complication*, Prof. Graves found tartar emetic, administered in this manner, very serviceable.

2584. *In Affections of the Genito-urinary Organs*, enemas containing opiates prove in the highest degree beneficial. The researches of Dr. Brown-Séquard[2] tend to prove that absorption takes place much more rapidly by the mucous membrane of the rectum than by that of the vagina; hence we may anticipate more speedy relief in uterine and ovarian disease from medicines administered in the form of small enemas and suppositories, than from pessaries or vaginal injections. *In Subacute Ovaritis*, warm-water enemas, simple or medicated, are strongly recommended by Dr. Tilt; they should be retained as long as possible. *In Rigidity of the Os Uteri*, warm-water enemas, and *in Uterine Hæmorrhage*, enemas containing iced water may be used with advantage.

2585. *In Hysteria* connected with worms, terebinthinate enemas may be employed with the best results; a cold-water

[1] Med.-Chir. Trans. vol. l., 1867, p. 185.

[2] Lancet, March 10, 1866.

enema has been found to check a violent paroxysm of hysteria.

2586. *In Hæmorrhoids or Piles*, the daily practice of injecting half a pint of cold water proves highly serviceable. Under the use of this simple remedy, and a few grains of rhubarb daily, long-standing cases have not unfrequently been found to yield completely.

2587. EXPECTORANTS are medicines or agents which increase the secretion of bronchial mucus, and promote its subsequent expulsion. They are divided into two classes, Topical and General.

1. *Topical Expectorants* include all those agents, the vapour of which, when inhaled, acts directly on the mucous lining membrane of the air-passages.

2. *General Expectorants* are medicines which are taken into the stomach, and which, after being absorbed into the system, operate on the lungs and their membranes. They comprise medicines of very diversified characters and qualities, and which are each adapted to some particular cases or stages of pulmonary disease.

Their action is promoted—1, by keeping the surface of the body moderately warm; 2, by emetics; 3, by the copious use of diluents; 4, by avoiding agents which increase the secretion of urine, or immoderate action of the bowels. *Their action is retarded*—1, by opiates; 2, by diuretics; 3, by purgatives; 4, by keeping the surface of the body cool.

2588. *Observations on their use.* 1. Expectorants of any kind are of little use, and may prove injurious during the early stages of acute sthenic inflammation, croup excepted.

2. In such cases, depletion and antiphlogistics should precede their use.

3. Stimulant expectorants are contra-indicated in all cases where sthenic inflammation exists.

4. Stimulant topical expectorants, as the vapour of iodine, should be discontinued if they produce much irritation.

5. Nauseant expectorants are inadvisable in purely nervous asthma, when the patient is much debilitated, or the disease assumes a typhoid character.

6. The vapour of hot water is one of the best expectorants when it answers at all; but to some persons it proves irritating, and they derive no comfort from it. (Sir T. Watson.)

GALVANISM. See ELECTRICITY.

2589. GARGLES are fluids intended to be retained in the mouth for a certain time, and to be thrown in contact with the uvula, tonsils, &c. For this purpose, the head should be

thrown back, and the liquid agitated with the air issuing from the larynx. This is the usual method of application; but Sir J. Murray proposes another mode, which in many cases will be found preferable. He suggests drawing the gargle through the nostrils; it thus passes along the posterior nares, and reaches the pharynx, touching in its course the whole mucous surface. Sir J. Murray justly observes, that there are often untoward secretions of mucus, and sometimes an injected, relaxed, or turgid state of the coats and vessels of the posterior nasal passages; these troublesome conditions extend down the fauces, and cause sore throats, with an inflamed appearance over the glands and the entire surfaces. These conditions cannot, he observes, be removed by gargles applied in the usual manner through the mouth; but if the gargle be drawn through the nostrils, the source of irritation is healed, and the continuous surfaces soon partake of the same salutary influence.

Gargles may be made stimulant, astringent, or sedative, as the circumstances of the case may require. They are purely local in their action, and are chiefly employed in relaxed or ulcerated states of the tonsils and fauces.

They should never be employed whilst active inflammation of the throat is present; for then they not only cause great pain, but increase the urgency of all the symptoms. In chronic cases, they prove of great service.

2590. *Therapeutic Uses.* Gargles are chiefly employed as topical applications in various affections of the throat, in ulceration of the fauces, in relaxation of the uvula, &c. None of these, however, require separate notice in this place, having been considered more particularly in the body of this work.

2591. *In Deafness* which originates in acute or chronic disease of the throat, gargles are amongst the most useful means which can be resorted to; and when it is considered how very often inflammations of the ear, and deafness, are caused by lesions of the Eustachian tube, proceeding from the throat and posterior nares, especially during the various forms of cynanche, and in the course of eruptive fevers, the importance of local means cannot be overlooked. These applications should be suited to the nature of the affection of the throat; in the more sthenic states of inflammatory action, they should be refrigerant, and contain nitrate of potash, or hydrochlorate of ammonia, or borax; in the more asthenic forms of the affection, they may be astringent, tonic, and stimulant, and may contain either of these, or some other detergent substances. When the occlusion of the guttural extremity of the Eustachian tube with mucus is suspected, these salts, especially the last, will be of service; and when the deafness is in a great measure

nervous, the tincture of capsicum may be added to these, or to any other form of gargle that may be preferred. *In Deafness connected with Secondary Syphilis*, the perchloride of mercury may be employed, in the form of gargle, with advantage. (Dr. Copland, ii. p. 163.)

2592. Hypodermic—from υπω, under, δερμα, the skin—the term employed to designate the method of introducing medicines into the system by means of subcutaneous injection. The introduction of this mode of treatment is due to Dr. Alexander Wood, of Edinburgh, who is stated to have thus employed morphia in the treatment of neuralgia as far back as 1843; it, however, attracted comparatively little attention till about 1855, since which date it has been submitted to numerous trials; and the recorded experience of a large number of trustworthy observers, notably Mr. Charles Hunter and Dr. Anstie, leaves no room for doubting that this method of treatment deserves to take rank as one of the greatest improvements in the modern practice of medicine.

2593. In 1867, the Royal Medico-Chirurgical Society appointed a Committee to report upon this mode of treatment, and the conclusions at which they arrived are as follows:—1. That as a general rule only clear neutral solutions should be injected, for such solutions rarely produce local irritation. 2. That whether drugs be injected under the skin or administered by mouth or rectum, their chief physiological and therapeutical effects are the same in kind, though varying in degree. 3. But that symptoms are observed to follow the subcutaneous injection of some drugs which are absent when they are administered by the other methods; and on the other hand, certain unpleasant symptoms which are apt to follow the introduction of the drugs by the mouth and rectum, are not usually experienced when such drugs are injected under the skin. 4. That as a general rule, to which, however, there may be exceptions, clear neutral solutions of drugs introduced subcutaneously are more rapidly absorbed and more intense in their effects than when introduced by the rectum or mouth. 5. That no difference has been observed in the effects of a drug subcutaneously injected, whether it be introduced near to or at a distance from the part affected. 6. That the advantages to be derived from this method of introducing drugs are—*a*. Rapidity of action. *b*. Intensity of effect. *c*. Economy of material. *d*. Certainty of action. *e*. Facility of introduction in certain cases. *f*. With some drugs, the avoidance of unpleasant symptoms. This plan, therefore, is most likely to be adopted where very rapid and decided effects are required from drugs which are operative in small doses.

2594. In the above conclusions, it will be observed that

nothing is said with regard to the *safety* of this mode of treatment. On this point, Dr. Anstie,[1] in an excellent paper on this subject, justly remarks, that there is absolutely no danger whatever if the injector will remember two cautions:—First, that the physiological activity of nearly every substance which can be thus used is *three, if not four times greater when it is given by the skin than when it is swallowed;* and secondly, that the liquid injected must not be either markedly acid, nor markedly alkaline, nor in any way obviously irritant to tissue. The only case of serious inconvenience which occurred amongst hundreds of injections was the formation of a small abscess in cellular tissue in which chloroform had been employed, an agent entirely unfit to be used in this way.

2595. *The best mode* of making the injection is that described by Mr. Charles Hunter, to whom we owe so much of our knowledge of the subject, viz., to pick up a fold of loose skin and push the canula right through till its point works loosely in the subdermic cellular space; then inject slowly, with two or three pauses of a second or two; wait one minute, and then withdraw the canula slowly, pressing firmly with the finger on the track, and keeping it applied to the puncture for a minute or two. It is a mistake to apply plaster (except in the rare instances where a large quantity of fluid has to be injected), for it leaves an ugly mark on the skin for some days. However, it is not always possible to find a convenient loose fold of skin, and in this case another plan must be adopted. The skin must be strained to one side with the thumb, and the canula run in with a steady pressure; the disadvantage of this procedure is that it is rather more painful, and that we are not sure of getting into the subcutaneous cellular tissue: failing this, it is rather more difficult to get the fluid in; the injection must be more slowly performed, and it may be necessary to apply plaster to prevent its escape. Otherwise, injection into the dermis favours instead of opposing the absorption of the fluid, as there are a much larger number of absorbent vessels in this situation. If the patient be very sensitive, it will be well to freeze the skin beforehand with ether spray, a plan first suggested by Mr. Hart. It is convenient in that case to adopt a plan which Dr. Lawson devised, viz., to perform the local etherization gently, thereby causing, not a dead whiteness of the skin, with crystallization of the tissue, but merely depositing a thin layer of ice on the surface; this produces quite enough anæsthesia, and does not make the puncture so difficult as it is when the skin is frozen hard.

2596. *As to the locality* to be selected for the injection, it is still impossible to lay down precise rules, but we know a good

[1] Practitioner, July, 1868.

deal more than we did a few years ago. When the object is simply to procure sleep, to quiet general convulsion, or to inoculate the whole system with a constitutional remedy (*e.g.*, quinine in ague), it is only necessary to find a spot where absorption is likely to be free, and we thus have a choice between many places. The skin near almost any large joint, when the joint is flexed, will generally offer a convenient loose fold; but as already explained, loose skin is not necessary. If the object, however, be to relieve *local* pain or spasm, it becomes a question whether, or in what cases, the injection must be applied to the painful part. On this subject the contradictory nature of the statements of different authors is remarkable. On the whole, the conclusion arrived at is this, that when the painful part is a convenient place for injection, it is as well to perform it locally; and that in rheumatic and other cases in which, from thickening of tissues round the nerve, the process of absorption is slow, it is desirable to do this even at considerable inconvenience, since the local effect is probably considerable; but that in the vast majority of cases it is absolutely indifferent, as regards the effect on the pain, where we inject, provided we select a favourable place for absorption, and that in these cases it will be desirable to vary the place of injection each time, in order to avoid local irritation and thickening.

2597. *The Instrument.* The three kinds of syringe recommended by the Medico-Chirurgical Society's Committee, namely Coxeter's, Whicker and Blaise's, and Weiss's, are each of them sufficient and good. The ideal syringe is, perhaps, a Coxeter, with the addition of a screw-joint by which the barrel can be removed and refilled without withdrawing the canula from the skin. Such an instrument is so cheap as well as handy that the surgeon can afford to have two, in case of breakages; and breakage does not inflict very large expense. It should be provided with one or two steel canulas, besides the gold ones ordinarily used; they are useful to penetrate tough skin, especially skin which has been frozen with ether spray, a necessary preliminary with some sensitive patients.

2598. Ice. A valuable therapeutic agent, extensively employed of late years, both externally and internally. When given internally, it proves sedative, refrigerant, and astringent; and as such is very serviceable in fevers, inflammations, and acute hæmorrhage. Externally applied, Dr. Arnott[1] regards ice in the threefold character of a remedy, a prophylactic, and an anæsthetic. 1. As a remedy, it is effectual in

[1] Med. Gaz., March, 1849.

many diseases of the nervous and vascular system; in external inflammations it is speedy, certain, safe, and agreeable. 2. The prophylactic virtue of congelation is the power it possesses of preventing inflammation of those surfaces which have been subjected to its influence. Wounds, he states, have invariably appeared to heal more speedily after the application of congelation than under the usual circumstances; probably on account of the absence of any injurious degree of inflammation. 3. As an anæsthetic, its excellence consists in its power of producing local anæsthesia while the consciousness of the patient remains undisturbed, and also especially in its perfect safety. Dr. Arnott quotes several cases in support of these opinions (see *infra*); caution, however, is necessary in its use. If applied for a short period, the congelation or frozen condition of the parts which it induces may not only be not injurious, but beneficial; but if this agent be applied too suddenly, or be too long continued, it may induce gangrene. It may conveniently be employed pounded, mixed with an equal quantity of common salt, and inclosed in a bag of gauze or some other thin material: this constitutes an ice poultice, and it should be applied for one, two, or three minutes, or until congelation of the subjacent tissues is effected; it should then be discontinued. It is an application which requires discrimination and caution.

2599. For the purpose of controlling the circulation through the nervous centres, the external application of heat and cold to the spine has been advocated by Dr. John Chapman.[1] He claims to have discovered that a controlling power over the circulation of blood in the brain, in the spinal cord, in the ganglia of the sympathetic system, and through their agency in all the organs of the body, can be exerted by means of applying ice and hot water to different parts of the back. In order to lessen the excito-motor power of the cord, he applies ice in an india-rubber bag over the particular portion of the cord on which he wishes to act; the vitality of the cord may be measured by applying ice and hot water alternately. In order to obtain fuller and more equable circulation through the brain, he applies ice to the neck and between the scapulæ. To affect the thoracic and abdominal viscera, the applications are made to the dorsal and lumbar regions. The diseases in which Dr. Chapman has found this plan of treatment successful are *Affections of the Nervous System*, particularly various forms of *Epilepsy and Paralysis; Uterine affections*, especially *Disordered Menstruation*, *Leucorrhœa*, and *Procidentia Uteri; Constipation* and *Diarrhœa; Neuralgia*, *Lumbago*, *Sciatica*, and *coldness of the surface*, *particularly coldness of the feet*.

[1] Med. Times and Gaz., July 18, 1863.

Dr. Chapman's ingenious papers on the subject will well repay perusal, but his method of treatment requires to be confirmed by further experiment and observation before it can be generally received. With regard to its use in *Epilepsy*, Dr. Russell Reynolds (ii. p. 283) states that it utterly failed in a large number of epileptics in which he employed it.

2600. *Contra-indications to the use of Ice.* 1. Old age. 2. Debility, whether constitutional or induced by disease. 3. Coma, with a feeble pulse. 4. Advanced stages of disease. Its powerfully sedative influence might in these cases overwhelm the powers of life. (Dr. Bennett.)

2601. *Therapeutic Uses.* *In Insanity*, the application of ice to the shaven scalp is sometimes productive of excellent effects. M. Foville employed a cap containing pounded ice, which was closely fitted to the head of the patient, while the body was immersed in a hot bath for two or three hours. This proceeding was renewed twice or thrice daily, according to the intensity of the symptoms. On adopting it only once a day, he found the tranquillity produced by it followed, in some instances, by increased agitation ; but on repeating the bath, with the ice constantly applied to the head, it induced sleep and tranquillity in many instances of obstinate restlessness and agitation, and was the apparent means of recovery in several acute cases. (Dr. Prichard.[1])

2602. *In Inflammation of the Brain and its Membranes*, the application of ice, in the manner recommended in the last section, is attended with the best effects. The situation of the cap should be changed every minute or two, both to cool every part of the head, and to prevent the injurious effects which might result from a too protracted application to one spot. By this mode of procedure, observes Dr. Hope,[2] its use may be continued for half an hour or more at a time ; when, if the head feel cool, evaporating lotions may be substituted, until a return of heat and flushing demands the re-application of the ice. It must be used with caution in the aged, in coma, and in the advanced stages of the disease.

2603. *In Delirium Tremens*, when there is much vascular excitement, ice to the shaven scalp has in some instances been found serviceable, but it requires to be used with great caution, especially in habitual drunkards, and if the patient be much debilitated or the application be long continued, it may depress the vital powers to a dangerous extent. Dr. Chapman[3] details seven cases in which the spinal ice-bag (*ante*) appears to have exercised a favourable influence. *In*

[1] Cyc. Pract. Med., vol. ii. p. 859.
[2] Lib. of Med., vol. ii. p. 56.
[3] Practitioner, July 1869.

Acute Hydrocephalus, ice is too powerful a depressant for ordinary cases; but iced water or evaporating lotions to the head, prove most serviceable.

2604. *In Headaches arising from a morbid state of the nerves* of some portion of the forehead and scalp, the freezing mixture (ice and salt) is strongly recommended by Dr. Arnott (op. cit.) "In no disease," he observes, "have the efficiency, safety, and speedy operation of congelation been more conspicuous than in this. It is particularly serviceable when the headache is combined with much heat of the integuments, and when the symptoms appear to threaten secondary local inflammation."

2605. *In Apoplexy*, ice applied to the head, at the same time that the feet are placed in hot water, is a measure occasionally productive of benefit. Great caution, however, is necessary in its use, particularly in debilitated or old subjects.

2606. *In the Convulsions of Infancy and Childhood*, Dr. R. B. Todd speaks highly of the external application of ice: it should be powdered, and placed in bags along the whole length of the spine; it will often succeed when other remedies fail. *In Puerperal Convulsions*, ice to the head, and mustard poultices to the feet, simultaneously applied, have been found highly serviceable.

2607. *In Tetanus*, Dr. Todd[1] states that he has seen great benefit from applying ice along the whole length of the spine; the bladders or bags containing the ice should be frequently renewed; otherwise they become elevated to the temperature of the body, which is an occurrence that should be obviated. When the cold finally reaches the spinal cord, which it will do if the ice be perseveringly applied, its influence is shown by a marked depression of the action of the heart, which tends to general depression of the vascular system; if this depression becomes great, the use of the ice must be suspended. During its application, nutritious and slightly stimulant substances should be frequently given.

2608. *In External Inflammations, as of the Skin, Mouth, and Throat*, Dr. Arnott (op. cit.) advocates the application of ice, so as to produce congelation of the surface. He regards it as a certain remedy, because, whenever congelation is produced, inflammation ceases; as speedy, because congelation instantly arrests inflammation; as safe, because, in the hundreds of cases in which it has been employed, it has not been productive of any injury or untoward effect; and, finally, as agreeable, because it instantly benumbs the part, and relieves the pain which is attendant on inflammation. *In Erysipelas*, he testifies strongly in favour of congelation, but the practice is regarded

[1] Medical Gazette, May 4, 1849.

by the majority of practitioners as of doubtful safety; it has never come into general use.

2609. *In Throat Affections* generally, Dr. Symonds[1] remarks that, of common remedies, none surpass the use of ice, whether in lumps or in iced drinks. *In Diphtheria* also, he considers that the assiduous swallowing or holding in the mouth of small lumps of ice, gives relief by lessening the general engorgement of the tissues. *In Parotitis* (*Mumps*), the thirst is most effectually relieved by sucking pieces of ice.

2610. *In Prurigo Pudendi Muliebris*, Dr. Arnott found the congelation of the surface, by means of ice, of the greatest service.

2611. *In Cholera*, ice answers several most important indications; it relieves, in a remarkable manner, the burning heat at the pit of the stomach and the intolerable thirst, arrests the vomiting, and contributes greatly to excite reaction; for this purpose small pieces of ice may be put frequently into the patient's mouth, and iced drinks given *ad libitum*. It is a remedy of the highest promise, and should be employed whenever practicable; stimulants and opiates being, at the same time, strictly prohibited.

2612. *In Internal Hæmorrhage*, ice may be given with great advantage; it seems to act in the threefold character of refrigerant, sedative, and astringent. *In Hæmatemesis*, it proves particularly useful, as it comes in immediate contact with, and tends to constringe, the bleeding vessels. *In Hæmaturia*, it is advisable to apply bags of ice to the perinæum and above the pubes; better still, to introduce small pieces of ice into the rectum. (Sir H. Thompson, p. 174.) Perfect rest is to be maintained. *In Uterine Hæmorrhage*, ice in every form is the first thing to try; small pieces of it should be swallowed, iced water in small quantities should be freely taken; vaginal and rectal injections of iced water, leaving an elongated piece of ice in the vagina, or a bladder of it placed on the abdomen, are all measures worthy of trial. (Dr. Tilt, p. 224.) *In Hæmorrhage from the Mouth, Throat, or Nostrils*, ice, applied in a solid form to the bleeding vessel or surface, proves an efficient styptic.

2613. *In the Passage of Renal Calculi*, Dr. Prout (p. 212) states, that in protracted cases of suffering, he has occasionally known the greatest relief obtained by the application of pounded ice to the region of the kidney. It is chiefly applicable when the calculus is composed of the oxalate of lime, or the phosphates, but it should not be employed in plethoric, gouty individuals, labouring under lithic acid calculi. M. Bricheteau[2]

[1] Brit. Med. Journ., March 14, 1868.
[2] Mém. de la Soc. Méd., vol. ix. p. 194.

found, that if applied to the epigastrium, it afforded great relief *in the passage of Gall Stones*, when other remedies had failed.

2614. *To produce Uterine Contractions*, Dr. Mackall,[1] of Maryland (U. S.), states that he has for many years employed ice, and that in no single case has he been disappointed in its action, or witnessed the slightest ill effects from its administration. The cases in which he found it the most useful are—1, *in protracted Labours proceeding from Atony of the Uterus;* 2, *in retention of the Placenta from the same cause;* 3, *in alarming Hæmorrhage after delivery;* and 4, *in Abortion;* in the last case he considers it invaluable. In short, whenever the firm contraction of the uterus is desirable, that object, he states, will be effected by ice, pounded and swallowed freely, in considerable quantities.

2615. *In Acute Ovaritis*, when the pain is intolerable and the patient too much reduced to bear leeches, Dr. Tilt (p. 50) states, that he has seen great temporary benefit from the application of a bag of ice to the painful spot.

2616. *In Strangulated Hernia*, the application of ice to the tumour occasionally proves effectual, but more frequently fails; care must be taken that it be not so applied as to freeze the scrotum, and bring on sloughing. In large, old herniæ, the application of ice is often attended with remarkable efficacy; and in other cases, if it does not completely succeed, it sometimes arrests the progress of the symptoms; it may be used as an adjunct to chloroform or ether anæsthesia.

2617. *In Ileus*, Dr. Brandis,[2] of Copenhagen, successfully treated ten cases by the application of cloths, dipped in iced water, to the abdomen, at the same time that he gave iced water as a drink; laxative and antispasmodic medicines were also administered by mouth, and in the form of enema.

2618. *In severe Vomiting attendant on Pregnancy or Uterine disease*, the patient should be made to suck small pieces of ice from time to time, and a teaspoonful of milk or milk and water should be swallowed every half hour, or oftener if possible; at the same time the horizontal position, and absolute rest and quiet, should be enjoined; opiate liniments or the endermic use of morphia may also be employed (Dr. Graily Hewitt, p. 381); minute quantities of iced brandy and water or champagne may be given every hour. (Ibid.) *In Idiopathic Vomiting*, swallowing small pieces of ice often proves very effectual in allaying the irritability of the stomach. Dr. Routh[3] mentions an obstinate case of *Vomiting of Pregnancy*,

[1] Monthly Retrospect, April, 1847.
[2] Nouv. Journ. de Méd., vol. v. p. 89.
[3] Brit. Med. Journ., Aug. 22, 1868.

which yielded to the use of Dr. Chapman's ice-bag to the spine for an hour night and morning.

2619. *In Gastritis*, iced water, or small lumps or raspings of ice, seem to allay thirst and appease pain, even in the severest cases. (Dr. Brinton, p. 95.) *In Ulcer of the Stomach*, when there is obstinate vomiting or severe pain, great relief may be obtained by frequently swallowing small lumps or raspings of ice; and in cases of *Hæmorrhage* its use is almost indispensable. Here, too, it is sometimes advisable to apply it externally, bladders of pounded ice being kept in contact with the epigastrium for a few minutes at a time. (Ibid., p. 167.) *In Dysphagia arising from Spasms*, swallowing iced fluids slowly will sometimes overcome the spasm. (Dr. Pavy, p. 37.)

2620. *In Pyæmia*, where there is much sickness or irritability of stomach, with a parched mouth and fever, as a rule nothing is so refreshing as pieces of ice allowed to dissolve in the mouth. (Mr. Savory.)

2621. *In the Hiccough which occurs early in the progress of Typhus and other Fevers*, Dr. Graves (i. p. 135) advises iced water in small quantities, leeches to the epigastrium, and bland aperient injections. In the hiccough of the later stages, swallowing a small piece of ice is sometimes effectual; but unless it speedily affords relief, it should not be persevered in.

2622. Inhalation, in its therapeutic sense, is the act of drawing air impregnated with medicinal substances into the air passages. From the earliest times the inhalation of vapours has been a recognised means of medication. In the treatment of *Bronchitis, Asthma, and other Pulmonary Affections*, the inhalation of watery vapour, impregnated with stramonium, hyoscyamus, camphor, and substances of the same class, has been found a useful means of allaying spasm and irritability of the bronchial tubes. Recently the inhalation of pulverized fluids, *i.e.*, solutions of various medicinal substances broken into a fine spray, by means of an apparatus designated an "atomizer," has been introduced. This method was first employed in 1857 by Sales Girons, who found it beneficial in *Pharyngitis, Laryngitis, Bronchitis, and Phthisis;* since then it has been frequently tried on the Continent. Dr. Smyly,[1] of the Meath Hospital, states that fluid impregnated with substances not otherwise volatile, can be broken into such fine spray that the solution may be inhaled without inconvenience, and that the medicinal agent may thus be brought in direct contact with the bronchial tubes, even as far as their small ramifications. The instrument used by Dr. Smyly was

[1] Dublin Quarterly Review, Nov. 1864.

made by M. Krohne after M. Lewin's. "It consists of a glass chamber, covered with an air-tight brass cap; in this cap a glass tube is fixed, almost touching the bottom of the glass vessel; the end outside the brass cap is drawn out to a capillary opening, and bent at an angle. Into another part of the cap an air-pump is screwed, to press air into the chamber, thus forcing any fluid introduced into the chamber through the capillary opening with very great force. A glass cylinder, open at both ends, and having a small round hole in the side, is fixed by means of a metal rod at a short distance, so that the stream from the capillary opening may enter the hole in the side. Opposite this hole a metal button is fixed, on which the stream strikes, and is broken into a fine spray, which falls out of the cylinder at each end; the patient is then placed opposite one end of the glass cylinder, and by breathing draws a considerable portion of the spray into his air-passages." Dr. Smyly relates a case of obstinate laryngeal affection which was completely cured by the inhalation of a pulverized solution of nitrate of silver (gr. xv. ad Aq. fl. oz. j.) Solutions of tannin and other substances have also been employed in the same manner by Dr. Morell Mackenzie, Dr. Beigel, and others.

2623. Injection. A fluid thrown, by means of a syringe, into a passage or cavity of the body. They may be conveniently considered with reference to the locality to which they are applied.

2624. *Injections into the Urethra.* The disease in which these are principally employed is *Gonorrhœa*, but some discrimination is requisite in their use, otherwise they may act prejudicially. They are applicable during the very outset of the attack, before acute symptoms set in; this, termed *the abortive treatment*, consists in the injection of nitrate of silver (gr. x. ad Aq. Dest. fl. oz. viij.), repeated every four hours for twelve times, desisting, however, sooner if the discharge becomes thin and bloody, when a solution of sulphate of zinc (gr. j., Aq. fl. oz. j.) may be substituted. Perfect rest and low diet are essential to the success of this treatment. In the second stage, when inflammation has set in, urethral injections are totally inadmissible. In the third or chronic stage, when the discharge is degenerating into *Gleet*, astringent injections, *e.g.*, alum or tannin, may again be resorted to, in many instances with manifest advantage. Mr. Morgan[1] has published some judicious remarks on the superior value of deep-seated and continuous injections over those in ordinary use, as it is impossible by the latter to reach the whole of the urethral surface up

[1] Dublin Quarterly Journal, May, 1869.

to the prostate itself, which surface is generally involved in gonorrhœal inflammation. In order to do this he has invented an apparatus, using the principle of the chemical "wash bottle" as the injecting force.

2625. *Observations on their use.* 1. An injection should never be used so strong as to cause anything like severe pain in the urethra. (Graves.)

2. The patient, before using an injection, should void a little urine, in order to clear the urethra of any mucus, which would otherwise prevent the fluid coming in contact with the lining membrane.

3. The point of the syringe must be carefully introduced, at least half an inch within the lips of the urethra; and care should be taken that the point be not hitched in a fold of the membrane lining the urethra.

4. When the point of the syringe is withdrawn, the lips of the urethra should be kept closed with the finger and thumb for two or three minutes or more before allowing the fluid to escape.

5. In employing caustic injections at the commencement of an attack of gonorrhœa, Mr. Acton directs that the patient should not pass urine immediately after their use, and that he should lie down for half an hour or so.

6. It is of importance to remember that the sulphates of copper, zinc, and alum, which coagulate albumen when used in moderate proportions, re-dissolve it when employed too strong, and may thus tend to keep up the discharge; nitrate of silver in small quantities coagulates the albumen; in large ones it combines with it, and cauterizes the tissues.

7. Injections should not be trusted to alone for the cure of gonorrhœa; copaiba, cubebs, aperients, and an antiphlogistic regimen should be used as auxiliaries.

8. When one kind of injection fails, another often succeeds.

9. A glass syringe is always preferable to a metal one, as the latter is apt to form compounds with the solution used, and to become coated with dirt.

2626. *Injections into the Vagina.* These are chiefly employed in *Leucorrhœa* and *Menorrhagia*, and in some diseases of the uterus. They frequently fail, however, from the non-observance of a few plain rules, as pointed out by Sir C. Locock:[1]—

1. In order to obtain their full effect, the quantity injected should not be under half a pint, three or four times a day; and they should be so employed that the whole of the lining membrane of the vagina is subjected to their action. To do this effectually, a proper apparatus, such as is described by

[1] Cyc. Pract. Med., vol. iii. p. 38.

Dr. Graily Hewitt (p. 396-7), should be employed. In most cases, it is mere trifling to employ a small syringe.

2. It is desirable to ascertain as far as possible the cause of the discharge: if there be heat, excoriation, and any local inflammatory action, sedative injections, particularly liquor plumbi, are the most applicable; if the discharge be muco-purulent, or simply of a thin mucous character, depending upon a relaxed state of the vaginal membrane, astringent injections will be found most beneficial.

3. The vagina should always be washed out with cold water after an astringent injection, particularly one containing alum; as otherwise the discharge will sometimes become coagulated, and, remaining in the vagina, will keep up the irritation, and aggravate the symptoms; this is a point to which sufficient attention is not paid.

4. Every injection will fail to produce anything beyond temporary relief, when the discharge arises from an over-loaded state of the rectum, or from the presence of ascarides in that viscus; consequently, the use of an enema, either plain or with oil of turpentine, should always precede that of vaginal injections.

5. Astringent injections into the vagina should not be used, if there be tenderness on pressure, or a sense of weight in the pelvis; they should at once be discontinued if during their use these symptoms arise, as they indicate a degree of uterine congestion. A case illustrative of the danger of their indiscriminate use is related by Mr. W. Cooke:[1] in this case the vagina was so contracted as hardly to admit the finger; was intensely hot and painful, with much fever; the coagulated albumen adhered so tenaciously to the os and cervix uteri, that it was with difficulty removed.

6. *In Menorrhagia*, astringent injections should rarely be used during the first few days of the menstrual period, as they often produce uterine spasm; but when coagula are passed, either alone or mixed with the catamenial fluid, the secretory function is either partially or entirely suspended, and injections may then be highly useful. To the above advice Dr. Ashwell (p. 139) adds the following directions:—When the injection is to be administered, the patient should lie down, the pelvis should be raised by a cushion placed under the hips, and the fluid should be retained for ten or fifteen minutes; to insure which a nurse should hold a napkin accurately applied to the parts.

7. In some organic diseases of the uterus and its appendages, more permanent relief is derived from medicated pessaries, than from injections containing the same substances. Fetid

[1] Lancet, May 11, 1850.

discharges often much improve under the use of injections containing chloride of lime or soda, permanganate of potash, &c.

8. The researches of Brown-Séquard and others tend to show that medicinal substances are much more rapidly absorbed by the mucous membrane of the rectum than by that of the vagina; hence in uterine, and ovarian, and vesical disease, we may anticipate more speedy benefit from enemas than from vaginal injections.

9. In the use of this and other vaginal remedies, it is very important to ascertain previously what is the condition of the uterus, as if there be no abrasion of the mucous membrane there is no risk, but if the surface be abraded the risk is considerable; a lady was in this manner nearly poisoned by $\frac{1}{16}$th gr. of atropia. (Dr. West.[1])

2627. *Intra-Uterine Injections.* The safety of these injections was much doubted by the older obstetricians; indeed, some, as the late Dr. Ashwell, regarded them as fraught with danger. These fears are now dispelled, and it is evident from recent experience that if used with due caution and in appropriate cases, they may be resorted to with manifest advantage. Dr. R. Barnes has thus successfully used a strong solution of perchloride of iron in post-partum hæmorrhage in a large number of cases (sect. 924), and Dr. Snow Beck has repeatedly used solutions of the alkaline sulphites in this manner as a means of preventing puerperal fever. (Sect. 2012.) The chief points to be attended to are, 1, to be careful that all air is excluded from the syringe prior to its employment, which may be done by passing the fluid through it several times; and 2, to inject slowly, carefully avoiding all force, otherwise the fluid may pass into the Fallopian tubes. Prof. Strohl, of Strasburg, who employed these injections in uterine catarrh, advises that the tube of the syringe should not be so large as to fill up completely the os uteri, so that the injected fluid can at once escape without exercising any pressure on the apertures of the Fallopian ducts. Dr. Barnes (op. cit.) gives full directions for their use.

2628. *Injections into the Bladder* are occasionally used in *Chronic Cystitis*, and also with a view of their acting as *solvents of Calculi*. Their value in the former, when all acute symptoms have subsided, is highly spoken of by Dr. Braxton Hicks,[2] who, amongst other directions, advises that the point of the catheter should not pass far beyond the neck of the bladder, otherwise, if it touches the sides or back, it occasions great distress. Sir H. Thompson (p. 149) furnishes excellent advice regarding their use. He directs a flexible catheter to be first introduced into the bladder; "have ready a four-ounce india-rubber bottle with a brass nozzle and stop-cock, the

[1] Brit. Med. Journ., Aug. 22, 1868. [2] Lancet, 1867.

nozzle long and tapering, so as to fit a catheter of any size between Nos. 5 and 10, filled with warm water—say at 100° F. Attach the nozzle gently to the catheter and throw in slowly a fourth of the contents; let that run out—it will be thick and dirty, no doubt; then inject another fourth, which will be less so; again another, which will return clearer than the preceding; and the fourth portion will probably come away nearly clear. Now these four separate washings of an ounce each will have been really more efficient than two washings of four ounces each, and you will have reduced the amount of instrumental irritation to a minimum." "Never, under any circumstances, throw in more than two ounces at a time, and even this quantity for efficient washing is better avoided. If water fails, we may have recourse to medicated injections of acetate of lead, nitric acid, nitrate of silver, carbolic acid, or glycerine, or borax" (*q.v.*)

2629. *Injections into the Nasal Passages* are chiefly employed in *Catarrhal states of the Mucous lining membrane*, and in *Epistaxis*. The common plan is to place the patient in an upright or slightly stooping position, the head being thrown forwards and downwards on the chest, and the fluid slowly injected; the patient should then be directed to draw in the air through his nostrils, and to hold his breath as long as he can; by this means the fluid may be retained in contact with the mucous surfaces for a short period. A more effectual mode of washing out the nostrils has been suggested by Dr. Thudichum;[1] it consists in placing the fluid in a basin or vessel at a small elevation above the patient's head, inserting in it one end of a flexible caoutchouc tube; to the other extremity is attached a suitable nozzle, which is introduced into one of the nostrils, the ala being pressed upon it without quite closing it; the fluid is thus conveyed through the tube, which acts as a syphon, up one nostril, and passing round the posterior edge of the septum, escapes from the other nostril, thus thoroughly washing out the nasal passages. The head should be bent a little forward, and the mouth kept open, and the patient should not swallow during the operation; the force of the current is regulated by the height of the vessel above the head; at first it should be a little raised (about a foot), subsequently the elevation may be increased. When one nostril is alone affected, the nozzle should be inserted into the other or healthy nostril, so that the fluid will carry with it any offensive discharge or mucus directly out of the nasal passage; should this caution be neglected, it is evident that the discharge will be carried down the healthy nostril, with the great probability of extending the

[1] Lancet, Nov. 26, 1864.

disease to a hitherto healthy surface; when both nostrils are affected, the fluid may be sent through the two nostrils alternately.

2630. *Injections into the Meatus Auditorius Externus* are frequently and often injudiciously employed in *Otorrhœa*, *Otalgia*, and other affections of the ear; they require great caution, as, if employed in improper cases, they are productive of serious mischief. They should never be of a strength to cause pain, should generally be used tepid, should be injected slowly, without force, and should never be employed if acute inflammation or perforation of the membrana tympani exist.

2631. *Injections into Serous Cavities* were formerly considered highly dangerous; but of late years, several instances have been recorded in which strong solutions have been injected even into the peritoneal cavity, not only with safety, but advantage. They are almost daily used in the radical cure of hydrocele; and when injected into the joints, they do not appear to prove injurious. (See IODINE.) For the different modes of employing them, the reader is referred to modern surgical works.

2632. INSUFFLATION. The act of blowing a vapour or powder into some cavity, or on some particular part of the body; *e.g.*, air blown into the mouths of new-born infants to excite the respiratory functions. In modern practice the term is chiefly applied to the following mode of applying solid substances to the larynx, as proposed by Trousseau and Belloc.[1] Alum, subnitrate of bismuth, &c., having been reduced to *impalpable* powders, are put into one end of a reed or glass tube, and the other is carried back as far as possible into the mouth; after a full expiration, the patient closes his lips around the tube, and inspires suddenly and forcibly through it, by which some of the powder is carried into the larynx and trachea. The cough which is excited should be restrained as much as possible, to prevent the too speedy expulsion of the medicine. The subnitrate of bismuth should be used pure; calomel should be diluted with 12, red precipitate, the sulphates of zinc and copper with 36, alum with 2, acetate of lead with 7, and nitrate of silver with 22, 36, or 72 times their respective weights of sugar. The powders should be impalpably fine, as the least roughness excites such efforts to cough, as to ensure the expulsion of the powder; they are chiefly used in affections of the larynx and trachea. (Dr. Williams.[2])

2633. ISSUES and SETONS, considered as therapeutic agents,

[1] Trait. de la Phthisie Laryngée, 8vo, Paris, 1837.

[2] Lib. of Med., vol. i.

closely resemble one another in their operation and effects, and may be conveniently considered together. They are mentioned in the earliest records of medicine, and their use doubtless arose from observing how constantly nature, by the formation of natural issues, *e.g.*, ulcers, relieves the system from a tendency to certain diseases; how much these natural issues mitigated the severity of the symptoms when the disease is established; and how frequently serious, and even fatal effects follow their removal, either spontaneously or by artificial means. In employing these agents we closely follow nature, and the benefit derived from them is very great, particularly when compared with the very little expense to the strength of the constitution which they occasion. They are purely chronic remedies, suitable only to chronic diseases, in which they appear to act chiefly as derivatives, and partly perhaps also as evacuants.

2634. *Observations on their use.* 1. In acute diseases, the benefit from setons or issues is very small; their use is chiefly confined to chronic diseases.

2. They should never be placed over projecting points of bone, or over the bellies of muscles, or in any part which is much interfered with by muscular action, or they may degenerate into ill-conditioned ulcers.

3. Cleanliness is of the utmost importance. Issues should be dressed at least once daily.

4. Care is necessary that the sore does not discharge too profusely; a drachm of pus in the day is the utmost that can be borne by most constitutions.

5. Great care is necessary in healing an issue or seton when once established. It should never be done suddenly.

2635. *Therapeutic Uses. In Chronic Pulmonary Affections, particularly in Asthma, Angina Pectoris, Chronic Bronchitis, and Catarrh*, an issue at the nape of the neck is often effectual in mitigating or removing the symptoms. In the early stage of *Phthisis*, a sub-clavicular seton (three or four silk threads) sometimes appears to retard the progress of the symptoms. *Chronic Laryngitis* is often benefited by the same means.

2636. *In Chronic Inflammation of the Heart or its Membranes*, much relief is obtained from the use of an issue in the præcordial region. *Violent Palpitations*, consequent on the healing of an old ulcer or skin disease, have been known to disappear under the establishment of a seton or issue, near the seat of the original disease.

2637. *In some Chronic Cerebral and Spinal Affections*, they prove most useful. *Where there exists a predisposition to Apoplexy*, an issue at the back of the neck is sufficient to ward off an attack; this is shown by the fact, that the sudden

healing of an artificial or natural issue has been followed by its appearance. (Prichard.[1]) The remark is equally applicable to *Paralysis ;* a long issue or seton applied to different parts of the spine has sometimes been found beneficial in *Paralysis Agitans*. *Headaches* of the most obstinate character, occurring in robust subjects, have been found to yield to an issue at the nape of the neck.

2638. *In Plethora, and in Epilepsy connected with Plethora*, an issue at the nape of the neck sometimes mitigates the severity of the symptoms, but the benefit is far from uniform.

2639. *In many Chronic Affections of the Eye*, including *Opacities and Ulcers of the Cornea, Scrofulous Ophthalmia, Obstinate Ophthalmia Tarsi*, and *Amaurosis*, a small seton in the temple, kept open if required for a long period, has been found effectual when other remedies have failed. Mr. Spencer Watson[2] has recorded two cases of *Vascular Ulcers of the Cornea*, in which small setons in the temples produced speedy and remarkable benefit. The seton used in one of the cases was of double ligatured silk, the track under the skin not exceeding half an inch.

2640. *In Chronic Uterine Affections*, Dr. Tilt (p. 150) recommends the introduction of three or four silk threads as a seton above the pubes ; and for the relief of *Vomiting* in these cases, when other remedies have failed, he speaks favourably of establishing an issue in the pit of the stomach (p. 327).

2641. *In Chronic Cystitis*, Dr. West speaks highly of a seton just above the symphysis ; and Dr. Graily Hewitt adds (p. 678) that he has seen great benefit from counter-irritation in this locality.

2642. *In Deafness*, a seton or issue at the nape of the neck or on the arm, is occasionally useful as a derivative; but it is inferior in efficacy to blisters behind the ears, and is not only useless, but even injurious in nervous deafness, or in that caused by excessive discharges.

2643. *In Chronic Inflammation, Congestion, and in some other Chronic Affections of the Liver*, an issue or seton over the region of that organ is often productive of marked benefit. Dr. Graves bears testimony to its value in these cases.

2644. *In Chronic Enlargements and Inflammations of the Joints*, issues in the neighbourhood of, *not upon*, the joint are powerful and beneficial remedies.

2645. *Bronchocele*. Of this affection there are two varieties— 1, simple hypertrophy of the thyroid gland, which constitutes the majority of goîtres met with ; and 2, cystic enlargement, of much rarer occurrence. In the former there is little doubt that iodine or the iodides are best adapted as a means of cure ;

[1] Cyc. Pract. Med., vol. ii. [2] Brit. Med. Journ., Jan. 28, 1871.

not so the latter. Mr. Curling,[1] who has published some excellent remarks on the subject, observes that injections of iodine are certainly not so well adapted as the seton to the cure of cases where the cyst is much thickened. Another advantage in the seton over injections is, that it always affords an outlet for the escape of fluids; on the whole, he regards the seton as the more valuable plan of treatment, and the one most generally applicable in these (cystic) cases.

2646. *In Ununited Fractures*, setons have been used with advantage; according to the tables of Mr. Norris,[2] of 46 cases treated by seton, 36 were cured, 3 partially so, 5 derived no benefit, 2 died.

2647. *Some Obstinate Cutaneous Affections, Sycosis, Impetigo, Psoriasis, &c.*, which resist all other remedies, disappear rapidly on the establishment of a seton or issue. Dr. Graves (ii. p. 356) gives an excellent piece of advice on this subject. When the disease is of long standing, always insert an issue in the arm, before you attempt a cure. "I have seen," he adds, "water on the brain, and other fatal consequences, from the neglect of this precaution."

2648. Leeches, Hirudines, are very commonly employed as agents for local blood-letting. In many local or chronic forms of inflammation, and in diseases of infants, leeches are preferable to cupping or general bleeding; possessing the advantage of being easily applied on the seat of disease, or in its immediate vicinity. Local blood-letting is mainly employed for the relief of local inflammations and congestions; and in the modern treatment of disease is employed in most cases where venesection would have been formerly used. Cupping is preferable to leeches—1, when we desire to draw blood rapidly; 2, when we desire accurately to ascertain the quantity of blood drawn; 3, when it is desirable to make an impression on the system.

2649. *Observations on the use of Leeches.* 1. The capacity of leeches for drawing blood differs considerably: one leech is calculated to draw, on an average, about a drachm and a half to two drachms of blood, exclusive of that which flows subsequently, which often equals the quantity abstracted by the leech. Dr. A. H. Leith,[3] of the Bombay Army, after repeated observations, found as a general rule that Indian leeches draw from four to five times their weight of blood, the fluctuation being apparently dependent on the state of the leech, and partly on the vascularity of the part to which they are applied. In order to obtain four or five ounces of blood, he therefore

[1] Lancet, Dec. 14, 1867.
[2] Ranking's Abstract, xiii. p. 291.
[3] Bombay Med. Trans., 1860, p. 94.

orders one ounce of leeches to be weighed and applied; if ten or twelve ounces, he orders two ounces and a half of leeches, and so on. Local depletion can thus be practised with a precision equal to that by cupping. These results are confirmed in a great measure by M. Moquin-Tandon,[1] who states that small leeches will draw $2\frac{1}{2}$ times, small middle-sized leeches 4 times, large middle-sized ones $5\frac{1}{2}$ times, and large ones $5\frac{1}{11}$ of their own weight of blood.

2. In order to make leeches bite readily, thoroughly cleanse the surface of the skin with soap and water, and then dry it; this is particularly necessary if an embrocation has been previously employed. If they will not bite, one of the following plans may be tried:—1, remove the leech from the water and roll it for fifteen or twenty minutes in a warm dry cloth; 2, lower the temperature of the surface of the skin; 3, smear the surface with cream or sugared milk; 4, roll the leech in porter; 5, make a puncture with a lancet, and smear the blood over the surface: this is often effectual. It should also be remembered that the fumes of sulphur, vinegar, or tobacco in a room will often effectually prevent leeches from biting at all.

3. To make leeches bite on particular spots, take a piece of blotting-paper and make in it as many small holes as there are leeches, the holes corresponding with the spots on which it is desired to apply the leeches; they are then to be covered over with a tumbler; the animals, finding themselves on a rough surface, creep about till they come to the openings in the paper, when they instantly bite the exposed points of the skin; the blotting paper is easily removed by being moistened.

4. Leeches should never be applied to the tonsils, orifices of the uterus, or rectum, excepting by means of a glass properly constructed for the purpose, otherwise they may get beyond reach and do much mischief; should, however, such an accident occur, a strong solution of common salt, either by mouth, or enema, or injection, as the case may require, will be sufficient to dislodge them.

5. In order to apply leeches to the os uteri a moderately-sized speculum should be first introduced, so that its upper extremity touches the vaginal portion of the cervix at every point, and a small piece of lint is next inserted in the os itself; the leech or leeches are then pushed into the tube, and allowed to fix themselves on the exposed portion of the cervix. An injection of tepid water should precede their application, and it may be necessary to remove the discharge covering the cervix by means of a piece of lint. When the leech attaches itself to the interior of the os or to the vaginal wall, the patient usually

[1] Med. Zoology, p. 146.

experiences sharp pain: to detach the leech under such circumstances, an injection of salt and water is to be used. (Dr. Graily Hewitt.)

6. Great care is necessary in the application of leeches to infants and young children; the loss of a small quantity of blood produces a more sensible effect upon them than a proportionate quantity upon adults; and it should be borne in mind that, on account of the thinness of the skin and the greater vascularity of the subjacent parts, a leech will abstract a greater quantity of blood from a young child than from an adult. In the case of children, leeches should, if possible, be placed on some part of the body where the bone is near the surface, so that counter-pressure may be conveniently made in case of excessive hæmorrhage. Dr. Garrod advises that leeches should not be applied to an infant towards evening, unless quite unavoidable, lest hæmorrhage continue unchecked through the night. In these cases especially, we should bear in mind the difference between a large leech and a small one, the former, from the size of its mouth, leaving a much larger and more gaping wound than the latter. (Dr. Symonds.)

7. There is more danger than is usually imagined in applying leeches a second time; there can be little doubt that some diseases, particularly syphilis and puerperal fever, have been transmitted by the too hasty application of leeches which have been previously employed in these diseases; too little attention is usually paid to this point.

8. To remove leeches, if they do not drop off by themselves (which they generally do in fifteen or twenty minutes), sprinkle them with a little cold water, or a little vinegar and water, or powdered sugar.

9. To promote bleeding from leech-bites, apply fomentations or warm dry cloths, which should be changed frequently; the application of cupping-glasses over the bites greatly promotes the flow of blood.

10. To check hæmorrhage from leech-bites, expose them to cold air, carefully removing coagula, or make continued and firm pressure with the finger; or, if these fail, apply styptics, as matico or alum. (See Index—*Hæmorrhage from Leech-bites.*)

11. In order to preserve leeches, add a piece of charcoal to the water, and do not change it too frequently—once or twice a week at the furthest; when they are to be taken a long voyage, they should be carried in well-charred casks.[1]

[1] *M. Lisfranc's Rules for the Application of Leeches.*—1. The cicatrices of leech-bites being often very apparent, we ought to refrain, if possible, from applying them to parts habitually exposed. 2. In children and females of delicate skin, the course of large veins should be avoided, especially in the neck. 3. Leeches on the eyelids produce unseemly

2650. *Therapeutic Uses. In many cases of Acute Inflammation and in most Subacute and Chronic Inflammations*, leeches are preferable to general blood-letting. In some acute local inflammations, the application of leeches in the neighbourhood of the disease proves highly serviceable; and even when more active treatment appears necessary, they are valuable auxiliaries to general blood-letting and other antiphlogistic measures; in diseases of infants, leeches are a valuable resource, and may in many cases be employed with safety and advantage. *In Acute Pericarditis, Peritonitis, Pleuritis, and Hepatitis*, the application of leeches often affords sensible relief to the urgency of the symptoms.

2651. *In Acute Laryngitis*, leeches applied to the throat are valuable auxiliaries to general treatment, but they are of little service beyond reducing the local heat and swelling. *In Chronic Laryngitis*, a few leeches to the sides of the throat may be applied with advantage. *In Parotitis* (*Mumps*), when the pain is great and resists hot fomentations, one or two leeches often afford speedy relief. *In Tonsillitis*, leeches applied by means of a proper glass to the tonsils are productive of the best effects, according to the experience of Crampton and others.

ecchymosis, and often an œdematous erysipelas; they should be placed instead on the temples, along the roots of the hair, or behind the ears (?) 4. Leeches to the inner surface of the eyelids are ineffectual as evacuants, and the bites prove injuriously irritant; consequently, scarifications are here preferable. 5. In inflammation of the fauces, leeches should be placed over the mastoid processes, or behind them; there the results are not seen, and moderate pressure readily commands bleeding. 6. In applying leeches to the epigastrium, let none fasten over the costal cartilages, otherwise the movement of these is likely to entail a troublesome bleeding. 7. In leeching a part where there is much subcutaneous fat, little blood will flow; under such circumstances it will be prudent to increase the number of leeches, or aid them by venesection. 8. Do not place leeches where there are many subcutaneous nerves; the pain will be great; erysipelas may result. For example, in leeching the forearm, prefer the dorsal to the palmar aspect. 9. Leeches should not be applied to the mucous membrane of the vulva, nor to the immediate neighbourhood of the rectum; the bites are apt to degenerate into troublesome ulcers; applied round the margin, they are equally potent as remedial agents. 10. The scrotum, prepuce, and skin of the penis should not be directly leeched; the pain is excessive; inflammation and gangrene have resulted; when the leeches are placed behind the scrotum, on the raphé, the result is in every way satisfactory. 11. By leeching the skin investing the mamma great pain is occasioned, and erysipelas not unfrequently results; the surrounding integument is the preferable site. 12. If possible, leeching of inflamed skin ought to be avoided. 13. Leech-bites on a syphilitic bubo are liable (occasionally) to ulcerate and assume a venereal character. 14. Do not leech a fractured limb at the site of the injury. 15. Do not apply leeches *to* a tumour of doubtful character, but *near* it; otherwise, should the swelling prove carcinomatous, the leech-bites may accelerate the open or advanced condition of that disease. (Brit. and For. Med. Rev., No. xxvii. p. 3.)

2652. *In Croup*, leeches are of great service when the disease is progressing towards its full development; the relief thus obtained is often very great, and unless otherwise contra-indicated, they may be repeated more than once. The influence of even a moderate loss of blood in this manner may either favour the subsidence of the disease or the specific action of mercury upon its products, while in conjunction with the warm bath it may often replace with advantage the too frequent repetition of antimony. They are best placed over the mastoid process, or a little lower in the neck. (Dr. W. Squire, i. p. 264.) *In Diphtheria*, depletion, even local, is generally regarded as prejudicial, as tending to produce that debility which is one of the great dangers of the affection; but Sir J. Alderson[1] states that topical depletion by leeches has reason to commend it, and the testimony of success in the cases in which he has tried it; even after the formation of the membrane, he states he has seen the happiest results from the practice. He directs the leeches not to be placed too near the affected part, in order to avoid the consequence of effusion beneath the bites.

2653. *In Nephritis and Nephralgia*, the local abstraction of blood from the surface over the kidneys is a valuable auxiliary to the hip-bath and other treatment.

2654. *In Acute Dysentery*, leeches (6 to 12) to the verge of the anus often afford sensible relief to the tormina and tenesmus, and exercise a favourable influence on the course of the disease by unloading the portal and hæmorrhoidal veins. Thus applied, they also prove most useful in *Congestion of the Liver:* in these cases, Dr. Graves (ii. p. 251) obtained excellent results from two leeches every second day to the verge of the anus, repeating them sometimes as often as fifteen times.

2655. *In Gastritis*, depletion is only required in cases of great severity, and even here is best limited to the application of leeches to the epigastrium (Dr. Brinton, p. 95); the relief afforded by them is sometimes very marked. A few leeches to the same site will often relieve the pain attendant on *Ulcer of the Stomach*, but the practice, especially in the weak and cachetic, is of doubtful propriety. (Ibid., p. 166.) *In the passage of Gall Stones*, if there be much tenderness on pressure, great relief will often be obtained by a few leeches over the region of the gall-bladder. (Dr. Murchison, p. 350.)

2656. *In Vomiting connected with Uterine affections*, Dr. Tilt (p. 327) states that after all ordinary remedies had failed, he has on several occasions seen it suddenly checked by the application of six leeches to the pit of the stomach, although there was no sign of inflammation there, and although the

[1] Lancet, May 4, 1867.

patient's debility was such as not to justify loss of blood. The same measure has occasionally been found useful in *Idiopathic Vomiting*.

2657. *In Congestion of the Brain, in threatened Apoplexy or Paralysis arising from the suppression of an habitual discharge, as from Piles*, a few leeches to the verge of the anus often afford more immediate and permanent relief than three times the number applied to the temples or other part of the body. They are equally applicable if the threatened attack arise from suppression of the menses, but in such cases the leeches should be applied to the inner side of the thighs. In reference to this mode of treatment, Sir H. Holland[1] observes, that he knows of no mode in which a given quantity of blood can be removed with equal good effect. *In Congestive Headaches*, leeches may be applied with advantage to the temples, or to the crown of the head, or in the situation advised above.

2658. *In Acute Hydrocephalus*, when much febrile action is present, the local abstraction of blood by leeches sometimes proves serviceable. Dr. West judiciously directs that they should be placed on the crown of the head rather than on the temples; they are inadmissible when the little patient is much debilitated.

2659. *In Uterine Affections*, leeches are chiefly of service when there are inflammatory symptoms present, where the pain is more or less constant, and the patient is of full habit. In plethoric individuals, who suffer a good deal at the menstrual periods (*Dysmenorrhœa*), leeches applied to the inside of the thighs once a month, halfway between the two periods, are often of decided benefit. *In Acute Inflammation of the Uterus or its appendages*, leeches to the hypogastric region may be required. *In cases of Pain dependent on long-standing Congestion or Chronic Inflammation of the Uterus*, leeches applied to the cervix uteri are very serviceable. *In cases where the Ovaries are the seat of persistent pain, or tenderness and aching*, leeches may be applied over the groin, or inside the thigh, with good effect. *In cases of Peri-uterine Hæmatocele*, the early application of leeches is to be recommended, but at a later period, except to check inflammatory action, they are inadmissible. (Dr. Graily Hewitt, p. 377.)

2660. *In Amenorrhœa*, leeches to the os uteri a few days previous to the catamenial period has been favourably spoken of by Dr. Ashwell, Dr. D. Davis, and others; but Dr. Tilt (p. 211) prefers their application to the more sensitive cutaneous surface of the labia, as by this means a stronger reflex action on the part of the uterus is induced.

2661. *In Neuralgia*, attended with inflammatory action or

[1] Med. Notes and Reflections, p. 49.

much vascular excitement, particularly when it obstinately resists the application of anodynes and other local measures, leeches placed along the course of the nerve often afford immediate relief; but even if they fail in this, they place the system in a favourable condition for the use of other remedies.

2662. *In Pruritus Scroti, Pruritus Ani, and Pruritus Pudendi Muliebris*, leeches applied round the affected part, and followed by anodyne fomentations, are often productive of much relief. Remedies which had failed to make any impression previous to the use of the leeches, are often very effectual after their application. *Sycosis, Psoriasis, and other obstinate Skin Diseases*, are sometimes benefited by the application of leeches to the sound skin in the neighbourhood of the disease. *In Inflammation of the Skin and subjacent Tissues during the formation of Abscesses*, when the part is hot, swollen, and tense, leeches applied to the affected part are often effectual in mitigating the inflammation and in affording relief.

2663. *In Phlegmasia Dolens*, leeching the seat of pain and swelling is commonly of great service, especially during the acute inflammatory stage: the limb, wrapped up in cotton-wool surrounded with oil-silk, should be kept slightly raised on an inclined plane and flexed inwards, so as to take off tension from the affected vessels. (Dr. R. Barnes.[1])

2664. *In Hooping-Cough*, Dr. Pidduck[2] states that for thirty years he has adopted the following treatment (originally proposed by the late Dr. Sandars), with such success that he cannot recollect a single failure in the uncomplicated form of this disease. It consists in applying leeches immediately over the junction of the occiput and the atlas vertebra, to relieve the congestion of the vessels surrounding the origin of the pneumogastric nerve, and the subsequent application of a sinapism or blister between the shoulders. The rule to be observed is one leech for each year of the child's age, from one to six; these and the sinapism are to be repeated every three or four days, if necessary.

2665. Narcotics, according to the definition of Dr. Headland,[3] are medicines which pass from the blood to the nerves or nerve-centres; which act so as first to exalt and subsequently to depress nervous force, and which exercise a special action on the intellectual part of the brain. They are divided by Dr. Headland into three classes:—1. Inebriants; 2. Soporifics; and 3. Deliriants. Of these, the Inebriants induce the most, and the Deliriants the least, of the primary exaltation of the nervous force. The secondary action, or nervous depression, is not in

[1] Lancet, Sept. 30, 1865.
[2] Ibid., June 16, 1849.
[3] Action of Medicine, p. 230.

a direct, but in an inverse ratio to the primary stimulation; the less the one, the greater the other. Thus the depression cannot be considered as the mere reaction from the stimulation, as supposed by Dr. Brown, for there would then be a direct relation between the two effects. But we find that the exhilarating action of alcohol may often be followed by no manifest depression; and that belladonna, which scarcely stimulates at all, exerts a very sensible depressing influence. Regarded simply in their action on nervous force generally, the medicines of the first order of narcotics would approach very nearly to stimulants, and those of the third order to sedatives. But narcotics have all a power which is possessed by neither of the other divisions. They influence the intellectual functions, *i.e.*, the mind, and the physical ties by which mind is connected with matter. These physical ties are the functions of volition and sensation, by which the mind is connected with the body, moving it or feeling it; and the five senses, by which the mind, through the body, is connected with external things. These intellectual properties, the centre of which is the brain, are more or less affected by narcotic medicines. The first action of the latter is to exalt these functions, just as they first exalt nervous force in general. The degree of this exaltation varies, as in the former case. Inebriants stimulate the mind to a considerable degree; soporifics less; and deliriants possess least of this primary exciting power. But it is in their secondary action on the mind that we find the most characteristic differences between them. Space will not permit of entering here into the consideration of the comparative action and uses of the various medicines comprised in this class; they have already been considered individually in PartI.; for further information, we must refer to the works of Dr. Headland (from whom we have quoted the above passage), Dr. Anstie (p. 173, *seq.*), and Dr. Harley.

For Observations on their Use, see those already made on opium (sect. 1493) and belladonna.

2666. Pessaries, Medicated, are medicines of a more or less solid consistence introduced into the vagina, and there allowed to remain until dissolved. They usually have cocoa butter for a basis, and weigh about ʒjss. Dr. A. Meadows,[1] who has published some valuable remarks upon their use, objects to the ordinary basis, as it, in common with all greasy substances, is not only uncleanly, but tends to shield the active ingredients contained in the pessaries from the absorptive action of the vaginal membrane. He therefore substitutes the officinal soft soap, thickened with powdered althæa root or with white wax

[1] Practitioner, Jan. 1869.

(1 part of either to 3 of soft soap). This mass melts gradually, and forms with the vaginal mucus a kind of emulsion, which is readily absorbed. The only objection to pessaries thus formed is, that they are apt to get hard by long keeping; hence it is advisable not to prepare more than six at a time. Dr. Meadows also regards the ordinary size as unnecessarily large, and he therefore suggests to reduce them to one-half, or even less. The active ingredients which he has employed by this method are, extract of belladonna gr. j., atropia gr. $\frac{1}{18}$, acetate of morphia gr. $\frac{1}{3}$–$\frac{1}{2}$, extract of hyoscyamus grs. v.–viij., and conium, but from the latter he obtained no satisfactory results.

Another form of pessary, proposed by Dr. Sansom, consists of a hollow cone of white wax, containing a watery solution of the active ingredient, the apex of the cone being covered with cocoa butter; and as this melts much sooner than the wax, the liquid flows out and is absorbed. Dr. Meadows, though he has been unable to test these pessaries efficiently, gives a preference to those described above, as he fears lest the watery solution contained in the former might escape too quickly for complete absorption, and thus the dose become untrustworthy. Dr. Meadows states that by means of medicated pessaries we may, if we wish it, affect the whole system; but as a general rule they are only adapted for *Diseases of the Vagina, Uterus, and contiguous Pelvic Viscera.*

2667. Refrigerants are medicines employed to diminish the morbid heat of the body in disease, and to quench inordinate thirst; they are of two classes, Internal and External.

1. *Internal Refrigerants* comprise chiefly the acids and acidulous drinks, particularly solutions of tartaric and citric acids, citrate of soda, and nitrate of potash; these require plentiful dilution in cold water, and may be drunk freely.

2. Of *External Refrigerants*, the most important is cold water, the efficacy of which is well known, when applied to the surface of the body in fevers, particularly in the exanthemata, when these exist uncomplicated with internal inflammations; if the latter, however, are present, external refrigerants are inadmissible. The addition of a portion of vinegar, and, in some cases, of alcohol or ether, to the water, increases its refrigerant effect; sponging the body with tepid water, or vinegar and water, may be substituted in some instances with advantage.

The diseases in which they are employed are febrile and inflammatory affections, acute hæmorrhages, and all diseases where there exists morbid heat of the body.

2668. Spongio-piline is a fabric composed of sponge and wool felted together in three layers, and coated on one of its

surfaces with caoutchouc, which renders it impermeable. It was invented in 1847 by Mr. A. Markwick, of London. When the soft or inner surface is moistened with water, it forms a substitute for the ordinary cataplasm, warmth and moisture being thus secured, and its applications may be further extended by sprinkling the moistened surface with charcoal, yeast, &c., as may be required in each individual case. It may also be made a vehicle for lotions and liniments; moistened with liquor ammoniæ, it is stated to raise a blister in four minutes. In tropical practice it is comparatively of little use, the outer or caoutchouc covering being destroyed by the heat of the climate.

2669. Stimulants are medicines which exalt the nervous force, either of the whole organism, or of a particular portion of the system; and according as they thus operate they are divided into, 1, General or Diffusible Stimulants, and 2, Specific Stimulants.

General Stimulants. Medicines of this class, especially when introduced into the stomach, exalt at once the sensibility of the nervous system, and the action of the muscular fibre, as well as that of the mucous membrane. They augment the strength and frequency of the heart's pulsations, give vigour to the play of the lungs, and raise the temperature of the whole body. In some instances they prove excitant, and even irritant, to the urinary organs. In their mode of action, they approach most nearly to narcotics and tonics. The former, indeed, if regard be had only to their primary action, are not always satisfactorily distinguished from stimulants. From tonics they differ, and especially the so-called diffusible stimulants (alcohol, &c.), in the rapidity and the comparatively evanescent nature of their action, in their power of increasing the susceptibility to external impressions, and the tendency they have to be followed by exhaustion, when once their action is expended. The great majority of vegetable substances exerting a stimulant power are indebted for it to the presence of an essential oil; camphor, ether, or ammonia, manifest the same quality in a very marked degree; fermented liquors, too, from the alcohol which they contain, rank high in the class of excitants, both in respect to their beneficial results when judiciously exhibited, and their injurious consequences when unnecessarily or too frequently employed. Their habitual use, and more especially the frequent employment of those of a very stomachic or spirituous character, ought to be discouraged, as, from the agreeable but treacherous excitement, both mental and corporeal, which immediately follows their exhibition, as well as from the distressing feelings of collapse which ensue upon the termination of their action, forthwith suggesting

instinctively the desire of a repetition of the dose in a still stronger form, a tendency to confirmed dram-drinking is apt to be the result. (Dr. Joy.[1])

Specific Stimulants. So great is their number, and so diversified are their characters, that if all the medicines which, strictly speaking, belong to this class were rigidly included, it would embrace in its range most diuretics, emmenagogues, expectorants, errhines, sialagogues, many cathartics, and, in fact, all those classes of medicines, however designated, which stimulate the action and increase the secretion of any particular organ of the body. Of special stimulants, we may mention as examples, ergot of rye, upon the uterine muscular fibre; cantharides, upon the mucous coat of the genito-urinary organs and the neck of the bladder; and nux vomica, with its alkaloid, strychnia, upon the excito-motory function of the spinal cord.

The objects for which they are employed. 1. To exalt a depressed state of the vital functions. 2. To remove exhaustion and debility. 3. To correct certain nervous affections, as hysteria, depending upon debility. 4. To increase secretions from particular organs.

2670. *The modus operandi* of alcoholic stimulants has been the subject of much difference of opinion; on this point we cannot do better than quote the following excellent observations of Dr. Waters (p. 412, *seq.*) He lays it down as a general principle that the therapeutic value of alcohol does not rest on its supposed use as an article of diet, nor on any supposed chemical change it may undergo. It would, he remarks, be very satisfactory to know, by incontrovertible evidence, that it is used up in the system, either as a heat or fat producer, or in affording nourishment to the nervous tissue. The establishment of such a fact on a sound basis, would increase our estimate of the usefulness of alcohol; but its value as a therapeutic agent rests on no such assumption, and may be altogether independent of any such action. We may grant all that some chemists have of late advanced: that the substance is not oxidized in the system, that every particle of it is eliminated unchanged, that, contrary to our long-cherished notion, it does not form fuel for the combustion going on in the body; but we do not by all this in anywise impugn its therapeutic value, nor is our confidence shaken in its applicability to various conditions of the body, even when taken as an article of habitual use.

Amongst the most important, if not the most important, of the actions of alcohol, in a therapeutic point of view, is the influence which it produces on the circulating system. That

[1] Lib. of Med., vol. v. p. 281.

the administration of alcohol increases the power of the heart, diminishes the frequency of its beat, and augments the force of its contraction, under conditions of debility, are facts which must be familiar to all who are in the habit of prescribing it. And there is nothing more striking and more satisfactory than to watch the effects of the remedy in those cases of asthenic inflammation which are marked by a rapid and weak pulse. Under its use we see a pulse, abnormally quick, gradually fall; we see an irregular one become steady and regular; we see delirium subside, and a tongue, foul, dry, or brown, assume a moist and healthy character.

But the effects which alcohol produces on the circulation cannot be accounted for, simply on the ground that it acts as a stimulant and tonic to the heart. It has been proved by some physiologists that the introduction of certain substances into the blood has a tendency to increase the rapidity of the circulation, whilst the introduction of others has a directly opposite effect. Amongst the latter is alcohol; and according to the observations that have been made, when this substance is injected into the vessels of a living animal, there is a retardation of the circulating current, apparently from some physical influence which the alcohol produces, either on the blood itself or on the coats of the vessels, or on both. And it may be remarked that when alcohol is taken into the stomach, although we have evidence of increased action of the heart, this by no means proves that the blood is circulating more rapidly through the capillaries of the body. The very symptoms, indeed, which follow the administration of a small dose of alcohol, namely, a sensation of fulness and heat of skin, and the congestion which ensues when the dose is increased, tend to prove that there is some impediment to the peripheral circulation. Such a state of capillaries must necessarily give rise to an increased tension of the arterial system, and a fulness of the pulse, especially when taken in connection with the effects produced on the heart itself by the action of alcohol. A knowledge of this local action of alcohol on the capillaries serves to explain in some measure the effects which we witness in certain cases of disease from its administration.

It is very remarkable to see the large quantities of alcoholic liquids—wine, brandy, &c.—that are borne in disease, even by persons who have previously taken, whilst in health, little or none, without any of the ordinary physiological effects being produced, without the occurrence of intoxication, of headache, of furred tongue, or of disturbance of the stomach.

Dr. Waters concludes his excellent remarks with the following passage, which is worthy of all attention:—"In expressing my opinion of the value of alcohol as a therapeutic agent, and

as an article of diet, I would warn against the danger we may run of using it indiscriminately, and I would protest against any extremes of practice, or careless administration of the remedy, without due regard to the pathological conditions to which it is applicable. I consider alcohol, properly used, one of the most powerful of therapeutic agents. It is a remedy which has no special application to any one disease, but it may be used beneficially in a large number of diseases, under certain circumstances. In administering it, we must be guided, not by the name of the affection we have to treat, but by the symptoms which are present. Alcohol has no restricted local action; its effects are not confined either to the nervous or vascular system; but it has, undoubtedly, great power in rousing the flagging action of the heart, and in restoring, in some cases, the perverted function of the brain."

2671. *Therapeutic Uses. Acute Diseases.* Within the last five and twenty years a great change has taken place in the views of the majority of medical practitioners in this country on the subject of stimulants in the treatment of acute disease, and they are now fearlessly resorted to in the early stages of inflammation, and at the same time in quantities which in former times would have been regarded as dangerous in the extreme. When this change first took place, principally through the writings of the late Dr. Todd, brandy and wine were administered by many practitioners in the most indiscriminate and injudicious manner; but this has now been happily abandoned for a moderate and rational employment, and it is now almost universally admitted that alcoholic stimulants in moderate doses constitute a most important feature in the nutritive treatment of disease, which, for the most part, has replaced the antiphlogistic treatment formerly in vogue. The *modus operandi* and the principles which should guide us have been considered at length in the preceding sections.

2672. *Acute Inflammations.* Amongst those which have been successfully treated by stimulants is *Pneumonia*, and in this affection we have an excellent indication in the state of the pulse. As a rule, observes Dr. Waters (p. 55), it may perhaps be said that when the pulse is below 100 the case is not a grave one, and will yield to treatment of a simple character (sect. 195); but when the pulse rises to 110, 120, or upwards, the case assumes a much more serious aspect. *The more frequent the pulse the greater is the need for stimulants*, and it is very remarkable to see the effect they produce on the pulse when it is abnormally frequent in some cases of pneumonia. Intermission of pulse he also (p. 59) regards as an invariable indication for the free use of stimulants, not only in pneumonia but in other *Acute Inflammatory Affections. In Pneumonia occurring in aged people*, stimulants, he considers, may be given

without hesitation; and in the *Bronchitis of the Aged*, attended, as it often is, with profuse secretion, threatened apnœa, and a weak pulse, wine or brandy, given at regular intervals, is, in his opinion, the most useful remedy we possess. In the *Pulmonary Affections of Children*, stimulants are of great value, and they are generally well borne by the young. Dr. Waters (p. 417) states that he has seen the treatment of *Infantile Pneumonia and Bronchitis* by tartar emetic and mercury, and has been led to form an unfavourable opinion of these drugs in such cases, whilst he has found a moderately stimulating treatment followed by satisfactory results. Dr. Anstie (p. 447) relates an interesting case of *Pleurisy* successfully treated by stimulants, the only other remedy employed being morphia in large doses.

2673. *In Rheumatic Pericarditis*, alcoholic stimulants are often very beneficial; wine answers very well in some cases, but where there is much depression, brandy should be given. Dr. Waters (p. 326) considers that in most cases of pericarditis it is advisable to give a moderate quantity of stimulants from an early period of the disease, the quantity being measured by the character of the pulse and the general condition of the patient. If there be any tendency to delirium, or if the pulse, previously regular, become irregular, intermittent or dicrotic, the quantity of stimulants must be increased, and it will generally be found that under their influence these symptoms will disappear. It is of great importance in all these cases to watch the patient very carefully, so as to anticipate and prevent an outbreak of delirium by meeting the early indications of its approach by suitable measures. Dr. Anstie (p. 436) also speaks highly of alcoholic stimulants in rheumatic pericarditis, especially when the attack is characterized by great pain, sleeplessness, and jactitating movements of the limbs. In this form of the disease he regards alcohol as superior to opium as an anodyne and soporific. To act favourably he considers that it should be given in repeated small doses; the production of even the minor signs of intoxication being carefully avoided.

2674. *Fever*. The subjoined abridged remarks of Dr. Murchison (p. 269), although having special reference to *Typhus and Typhoid Fevers*, offer some valuable suggestions for the use of stimulants in the advanced stages of fevers of all descriptions.

1. There are cases of typhus and typhoid fevers which, under a supporting diet and mineral acids, do not require wine or brandy at any stage of their course.

2. They are rarely required during the first five or six days, but most cases require them more or less during the second week; as a rule, they may be commenced about the seventh or eighth day.

3. The chief indications for their use are derived from the organs of circulation.

4. Extreme softness and compressibility of pulse, especially if irregular, intermittent, or imperceptible, are greater indications for stimulants than mere rapidity; an abnormally slow pulse (*e.g.*, 40 to 60) is occasionally a stronger indication for stimulants than a quick pulse; if the pulse becomes quicker and the face flushes under their use, they are contra-indicated; if the pulse is made slower, they may be expected to do good.

5. The state of the heart affords valuable information: if the cardiac impulse is good, stimulants are not required; but when the impulse is weak, and when the first sound is impaired or absent, a liberal allowance is demanded; in all cases of doubt the heart should be examined with the hand and stethoscope.

6. *Other indications for the use of stimulants* are—*a*, a tendency to syncope, when the patient is raised into the semi-erect posture; *b*, the eruption becoming darker and more copious; *c*, profuse perspirations, with no attendant improvement in general symptoms; *d*, coldness of the extremities; *e*, the marked presence of the typhoid state, *i.e.*, low delirium, tremor, subsultus, &c.; *f*, a dry brown tongue: if the tongue becomes clean and moist at the edges, it is a sign that the alcohol is doing good; *g*, the presence of complications, as pyæmia, erysipelas, bronchitis, pneumonia, bed-sores, or gangrene; *h*, persons of intemperate habits, or of advanced years: here they are required earlier and in larger quantities.

7. Scanty urine of low specific gravity, containing little urea or much albumen, and complete suppression of urine, are in themselves indications against a large amount of spirits.

8. As a rule, they are contra-indicated if there be severe darting or throbbing headache, or acute noisy delirium, especially when these symptoms co-exist with great heat and dryness of skin and suffusion of the eyes, and with little or no improvement of the cardiac and radial pulse. When stimulants are thought to be required under such circumstances, they should be given in the intervals between the paroxysms of delirium.

9. The propriety of giving stimulants in delirium depends upon the state of the pulse: if the patient becomes more restless and delirious under their use, they do harm; if he becomes more tranquil, they do good.

Port, sherry, madeira, brandy, gin, and whiskey are the forms in which alcohol is best given; but when a weaker stimulus is wanted, claret and burgundy answer well; malt liquors are best adapted for convalescence. Spirits should be given diluted; iced soda-water is the best vehicle; but when

great prostration exists, hot brandy or whiskey punch is the best stimulant; they should be given in divided doses, frequently repeated. In urgent cases, a dose may be given every hour, and, as a rule, a larger quantity will be required during the night and towards morning than in the day-time, for it is usually in the early morning that the vital powers are at the lowest ebb; many patients are undoubtedly lost from negligence of their attendants at this time. It is impossible beforehand to decide upon the quantity required; begin with 4 oz. of wine in twenty-four hours, and watch its effects. It will be rarely necessary to give more than 8 oz. of brandy daily at any period of the fever; occasionally this may be exceeded; it is astonishing how much some persons, of previously temperate lives, can take with advantage. In urgent cases they should be persisted in as long as the patient is able to swallow; apparently hopeless cases have been known to recover under frequent enemas of beef-tea and brandy; when the symptoms improve, the quantity should be reduced, and smaller doses ordered at longer intervals; in most cases of great prostration, it is as well to combine other stimulants—*e.g.*, ether—with the wine and spirits.

2675. In the treatment of the *Exanthemata*, the lighter French wines, which contain less alcohol than madeira, port, or sherry, as bordeaux, mixed with water, make a most agreeable and refreshing beverage; it supports strength and induces sleep. In the treatment of *Scarlatina*, claret was first proposed by Dr. A. T. Thomson, and has of late years been extensively prescribed; it is an excellent adjunct to carbonate of ammonia, quinine, and the mineral acids.

2676. *In Diphtheria*, the importance of keeping up the patient's strength by nutritives and stimulants is almost universally recognised, and it may be laid down as a general rule, the less quantity of nourishment the patient is able to take the greater must be the dependence upon the stimulant. The youngest children may require a teaspoonful of brandy every two hours; a child of three years old two teaspoonfuls; this may be given diluted in any way, and in very small quantities, frequently repeated; older children take it best mixed with iced water or soda-water. Champagne is often a good substitute; port wine requires dilution, except for adults, who also find good claret, red hock, or some of the stronger Hungarian wines suitable. The quantity of stimulant ordered must be considered not only in relation to the immediate necessity that may exist for its employment, but also to the probable course of the disease and the strength of the patient; a moderate quantity repeated at regular intervals is of most service in maintaining the strength of the patient

where all the symptoms are well marked and likely to go through their full stages; at certain crises of the disease, or where some symptoms only have attained great prominence, the benefit that results from a bold resort to stimulants is surprising, and the effect is the more marked if their use had up to that time been neglected. Where the exudation is checked and is first separating, I have known the determined deglutition of four pints of beef-tea and nearly two pints of port wine in little more than twelve hours by a temperate young man, teacher in a school, put a stop to further illness. At a further period of the disease, when the separation of the deposit is completed, extra stimulants are required to combat the restlessness and depression, then sometimes extreme. (Dr. W. Squire, i. p. 407.)

2677. *In Delirium Tremens*, great difference of opinion exists as to the continued use of stimulants, many practitioners regarding their sudden withdrawal as fraught with danger, and likely to aggravate the symptoms; but Dr. Anstie (ii. p. 86), whose experience in this affection is great, expresses a decided opinion to the effect that complete abstinence may always be carried out without any immediate danger to life or health, if proper care be taken to substitute a substantially nourishing diet. Looking at it from a moral point of view, he considers that in all cases, and more especially in first attacks, the subjects of which we may hope are not irremediably debased by drunken habits, we should use the time of sickness as an opportunity for possible reformation unless alcohol is *necessary*. We should therefore commence by giving the patient's system an entire rest from the action of alcohol during the time he is under treatment. In young subjects, therefore, and in first attacks, it is proper to abstain altogether from the use of alcohol. This will be found more difficult with older patients, and with those who have been for a long time accustomed to depend upon strong drinks for a large part of their ordinary nutrition. In every case, however, he thinks it is our duty to abstain as long as possible from the use of alcohol, and before resorting to it to try less harmful narcotic stimulants, especially morphia hypodermically and Indian hemp. (Op. cit., p. 91.) When alcoholic stimulants are deemed indispensable, it is advisable to conjoin them with nutritives, *e.g.*, with eggs, in the form of egg-flip, &c.

2678. *In Acute Neuralgia*, Dr. Anstie (p. 436) states that he has often observed that after large doses of various narcotics have been tried in vain, the first real and substantial relief has been obtained by the use of a moderate dose of alcohol; in his own person he states that he has more than once experienced this when tormented with an unusually severe attack of neuralgia of the fifth nerve. The consequences of overdoing

this remedy is, however, nearly always disastrous; it requires to be given with as much precision as to dose, as we should use in giving an acknowledged deadly poison. In the more chronic forms of neuralgia its use requires especial caution. (See CHRONIC DISEASES, *infra*).

2679. *Convulsions of Dentition.* Dr. Anstie (p. 433) remarks, that the effect of alcohol in arresting the convulsions of teething is one of the most remarkable instances of a real therapeutic influence which can be witnessed; he states that there is no other plan of treatment from which he has seen such benefit produced. There is not the least necessity for intoxicating the little patients; a minute dose of wine or brandy (for young infants a few drops at a time in a little water) is amply sufficient for any good purpose that can be effected; not only in his own practice, he adds, but in that of others, it has been productive of excellent results.

2680. *In Tetanus*, the use of stimulants was first proposed by Dr. Rush,[1] who, considering that the disease was essentially one of debility, advised brandy, wine, ammonia, and bark. In America, this treatment has been much followed, and cases which recovered under their use are recorded by Drs. Hossack, Wright, Currie, Bright, and others. In one case recorded by Dr. Currie,[2] the patient took 140 bottles of wine, besides ale and brandy, in less than a month; the man recovered. Notwithstanding these successful cases, the unsuccessful ones far overbalance them; and stimulants are rarely trusted to alone, at the present day. They have also been recommended in *Hydrophobia*, but no reliance is to be placed upon them.

2681. *In Apoplexy*, when the state of the patient approximates more or less nearly to a state of syncope, the pulse being weak, the aspect pinched and bloodless, and the skin cool, blood-letting is inadmissible, and the treatment most likely to prove successful is the cautious application of warmth to the surface, and the cautious administration of diffusible stimulants, particularly the preparations of ammonia; gr. v. of the carbonate, or fl. drm. ½–j. of the aromatic spirit in water, or camphor mixture.

2682. *In Asphyxia from Submersion, Cold, &c.*, it is to stimulants, cautiously employed, that we look for hope of success; warmth (from 90° to 100°) by baths or dried cloths or heated bricks; friction, electricity, the application of stimulant vapours to the nostrils, and of largely diluted diffusible stimuli, as brandy, internally, form the basis of all other treatment. Artificial respiration is an important part of the treatment to be adopted at the same time.

2683. *In Cholera*, stimulants were formerly considered an

[1] Trans. Amer. Phil. Soc., ii. [2] Med. Reports, i. p. 148.

indispensable and invariable resource; but of their real value many doubts are, at the present day, justly entertained. It appears certain that the indiscriminate use of stimulants, especially the more diffusible ones, as brandy, if given in large quantities, and in a concentrated form, so far from being beneficial, is actually injurious. There are few points in medicine which require more care and discrimination than the selection of the proper cases and the proper periods for the administration of stimulants in cholera. No rule can be laid down on the subject, as almost every case differs widely from the preceding one; certain it is, that they should not be given in the excessive quantities formerly advised; that they should be given largely diluted; that they should not be trusted to alone; and that in some instances, at least, they appear to exercise a prejudicial influence. Champagne, ammonia, and turpentine are, perhaps, the best stimulants which can be employed. Dr. Goodeve justly observes that a little weak brandy and water is sometimes retained better than any other stimulant.

2684. *In Passive Diarrhœa attended with Debility, in the advanced stages of Phthisis, in Chlorosis, in some forms of Atonic Dyspepsia, in Convalescence from Acute Diseases*, and in *other states of Debility*, Dr. Aran[1] speaks highly of the advantages to be derived from the employment of wine in the form of enema; it should be diluted with water, and care taken to prevent a loaded state of the bowels. Dr. Williams[2] relates a severe case of *Post-partum Hæmorrhage*, in which port wine enemata exercised the best effects, saving apparently, the life of the patient. He employed it in fl. oz. iv. doses with ♏ xx. of laudanum; three enemata were found sufficient. *In the Vomiting of Pregnancy*, sparkling moselle is productive of the best effects, allaying vomiting, and enabling the patient to retain and digest food.

2685. *In Amenorrhœa, Leucorrhœa, and Chlorosis*, associated with anæmia and a depressed state of the system, the regular use of wine and nourishing diet is an essential adjunct to other treatment.

2686. *In Pyæmia*, stimulants are almost invariably necessary throughout the case, but the extent to which at any period they should be given requires the nicest judgment. Of all stimulants brandy is the best. Others will often prove useful in particular cases, *e.g.*, carb. of ammonia, but as strong stimulants are least likely to disagree, pure spirit, and above all, brandy is the best. As the patient recovers, wine is better borne, and should replace brandy partially or wholly.

[1] Bull. de Thérap., Jan. 15 and 30, 1855.
[2] Brit. Med. Jour., Sept. 4, 1858.

Of wines, good champagne, iced, is often most grateful, even from the commencement, especially when the stomach is irritable. Brandy and iced champagne, either alternately or mixed together, will often remain on the stomach when everything else is rejected. (Mr. Savory.[1]) These remarks apply equally to *Dissection Wounds* when the attendant fever assumes an asthenic or adynamic form; the diet should at the same time be nutritive and stimulant.

2687. *In Snakebites*, the free use of stimulants is most important; the quantity should be regulated solely by the effects produced. In America, we are told by Dr. Addy,[2] alcoholic stimulants are given to the extent of intoxication—a state which is regarded by the practitioners there as evidence of the effects of the poison being overcome. Of all stimulants, liquor ammonia is the best, and when injected into a superficial vein in the manner directed by Prof. Halford (sect. 152), its value seems to be enhanced. The quantity required varies according to the severity of the case, from ♏x. to ♏xx. of the strong liquor, with double the quantity of water. No ill effect, local or otherwise, seems to have followed this practice; the injection may be repeated if required.

2688. *In Chronic Diseases*, stimulants may often be resorted to with advantage, but as a general rule they are not so imperatively called for as in acute diseases, and their use is attended with special dangers. Dr. Anstie has ably pointed out the chronic cases in which there is a marked tolerance of alcoholic stimulants, and furnishes some excellent rules which should guide us in their use. His remarks are as follows. 1. There assuredly is a marked tolerance of this kind in many cases of *Chronic Debility* which have been induced by one or more copious *Hæmorrhages*. 2. There is a variety of *Pulmonary Phthisis*, especially common in persons with delicate skin and slight frame, with marked tendency to colliquative sweating, and a notable inability to assimilate either ordinary food or fatty matter of any kind, in which the tolerance for large and long-continued doses of alcohol is very remarkable, and the benefit produced by such treatment is very great. 3. In certain *Chronic Neuralgias* of the aged, where the power of digesting ordinary food is almost suspended by reflex irritation, an almost exclusively alcoholic diet continued for some time occasionally works wonders. 4. In certain *Infantile Chronic Diseases*, attended with marasmus and an inability to digest ordinary food, small and frequent doses of alcohol, continued for some weeks, produce a remarkable revolution in the general condition. There are two rules, the observance of which ought to

[1] Lancet, Jan. and Feb. 1867.
[2] Dub. Med. Press, March 30, 1859.
[3] Practitioner, July, 1869.

become general, only to be departed from under very special circumstances. One is that alcohol should never be directly prescribed for the relief of chronic pain, convulsion, or spasm, during the *self-conscious* period of life; in infancy and early childhood it is quite possible to administer it exactly as one would a medicine, without leaving the faintest trace of a hankering after its illegitimate effects; in the old age of those who have led temperate lives, but have habitually used alcohol, it may also be possible to permit the somewhat freer use of it: but during the whole of that period which corresponds to the sexual life, especially in women, the organism is so exquisitely alive to its own emotions, that the effect of a false step in the direction of narcotic indulgence may be tremendous. A second rule is that never, under any circumstances where it is possible to avoid it, should alcohol be given for the class of maladies we are considering, in larger quantities than those already roughly indicated as the limits of its useful *dietetic* employment in health. There is no true physiological tolerance for it in those cases; even in the instance of severe and agonising pain, in which large quantities of brandy may be swallowed without any apparent drunkenness, the appearance of considerable quantities of unchanged alcohol in the urine, and the occurrence of after-headache, &c., show that there has been true narcotic poisoning. The relief of such pain (*e.g.*, *Angina Pectoris*, *severe Ovarian Neuralgia*) may be better and more speedily accomplished by the use of ether, or of morphia or atropia subcutaneously injected. And as for the whole series of *Chronic Convulsive Disorders*, and of the mental states which hover between *Hysteria* and *Insanity*, he adds that he is convinced that everything which can be done in a more special direction than that of careful improvement of nutrition can be far better effected by bromide of potassium, than by the more liberal use, or as it may be called abuse, of alcohol.

2689. *In Gout*, it is an important question to decide whether alcohol is to be ever allowed, and if so, to determine the form which is best adapted for the patient. All malt liquors should be eschewed, as they almost always cause an increase of dyspepsia, and if at all strong, have undoubtedly a very powerful influence in inducing the disease and in keeping up a paroxysm. Strong wines will also prolong an attack to an almost indefinite length of time, and if they are moderately indulged in, will often lay the foundation of the gouty diathesis. The wines to be carefully avoided are port, sherry, madeira, and any in which the fermentation has been checked by the addition of alcohol. If wine is taken at all, that which is best adapted for the majority of patients is a sound claret—one free from sugar and without acidity. When red wine does

not agree with the stomach, hock or moselle may be substituted, or even a light and dry sauterne or chablis. The beverage best suited for those of a strongly marked gouty diathesis is undoubtedly French brandy, taken in very limited quantities, and freely diluted with water. Whiskey, hollands, or gin, may in many cases be substituted for brandy; but the latter two should be avoided if there is any appreciable amount of kidney disease, or at least should not be taken without advice. The distilled spirits should only be used at the meal, and from one to three ounces may be allowed daily, the amount depending upon the former habits of the individual. If gout has become developed at a very early age, and the youth strongly inherits it, a question arises whether it would not be desirable to advise an entire abstinence from alcoholic drinks; such a step would be most likely to check the future progress of the malady. (Dr. Garrod, i. p. 874.)

2690. Suppositories are medicinal substances, of a pillular consistence, introduced into the rectum, and there allowed to remain until dissolved. They demand a short notice, as there are one or two points connected with their employment which are of practical value.

1. Care should be taken that the substance is properly inserted into the rectum, otherwise it will increase instead of diminish the sufferings of the patient. If it be only placed within the anus, under the influence of the sphincter muscle, it will produce an aggravation of all the symptoms; while if it be passed into the bowel, above the sphincter, it will speedily produce the desired soothing effect. The best way of introducing it is by means of a hollow tube, with a moveable rod inside; the bolus can thus be introduced high above the sphincter, which cannot be conveniently done by the finger.

2. Suppositories, whether opiate or purgative, should always be combined with soap, which facilitates their solution, and renders their operation more speedy, certain, and mild.

3. They will occasionally be retained, if properly inserted, when enemas are instantly expelled; although, in the majority of cases, they are of inferior efficacy.

2691. Tonics are medicines which improve the tone, not only of the muscular system, but of the digestive organs, the nerves, and the constitution generally; their operation is in all cases gradual. They hold a middle place between Alteratives and Stimulants; from the latter, however, they differ in producing a comparatively slight amount of excitement, unaccompanied by subsequent depression, and leaving a more permanent tonicity in the system. In some respects, they approach nearly to astringents, but are slower in their action.

Their mode of operation is various. Some, as the pure vegetable bitters, act upon the stomach, and by improving the tone of the digestive organs, exercise a beneficial action on the system at large. Others, as the salts of iron, act specifically upon the blood, enriching it with hæmatin and globulin, thus invigorating the muscular tissues; whilst a third class appears to act specifically upon the nerves. Their immediate operation is obscure, but we have good examples of their efficacy in nitrate of silver and oxide of zinc, in epilepsy, chorea, and other nervous affections. Strychnia and brucia, although often classed as tonics of the nervous system, more properly belong to stimulants.

They are indicated—1, in all cases of debility unattended by inflammation; 2, in dyspepsia; 3, in anæmia; 4, in many convulsive diseases; 5, in convalescence after fevers.

Contra-indications. 1. Plethora. 2. Active Inflammation. Dr. Paris observes of tonics, that, if given when the powers of the system are at their maximum, they will assume the character of excitants, and that their administration will be followed by collapse.

2692. WATER. In the article Baths, many of the effects and uses of water, hot and cold, have been considered; but there are other important therapeutic uses to which it is applied, which deserve separate notice.

2693. *Cold Water.* Taken in moderate quantities, cold water quenches thirst, allays inordinate heat of the body, promotes the process of digestion, and by being absorbed into the system, repairs the loss of the fluid portion of the blood, occasioned by the cutaneous and other exhalants. If taken in too large quantities, or immediately before a meal, it dilutes the gastric juice to such an extent as to incapacitate it for performing, in the normal manner, the digestive process; but if taken during a meal, and in moderate quantities, it acts partially as a solvent for the food, and thus proves highly advantageous. The large quantities of cold water advised by the hydropathists cannot but prove eventually the source of dyspeptic and other complaints, for the reason that, like most other substances, when taken in excess, it tends to weaken the tone and impair the functions of the digestive organs.

2694. *Therapeutic Uses of Cold Water. In Fever*, cold affusion was first brought prominently forward by Dr. Currie;[1] and, although its value is now generally acknowledged, the many inconveniences attending its use have generally caused it to be superseded by simply sponging the body with cold water, or vinegar and water, which, though it causes a less shock to the

[1] Reports on Cold Water.

system, produces one of the most beneficial effects of cold affusion, namely, a reduction of the morbid heat.

The mode of applying cold affusion, as proposed by Dr. Currie, is to have the patient stripped naked, and from three to five gallons of water, at 50° or 60° F. in the winter, and 60° or 70° in the summer, thrown over him; water alone, or salt and water, or vinegar and water, may be employed. When applied with the undermentioned cautions, the effects of cold affusion are to diminish the morbid heat of the skin, to lower the pulse, and to induce subsequent perspiration and sleep. The safest time for its application is when the exacerbation is at its height, or immediately after its declination has begun. Dr. Currie directed its employment at from six to nine o'clock in the evening.

Cautions in the use of Cold Affusion. 1. It should never be employed when there is any sense of chilliness, although the thermometer indicate a morbid degree of heat.

2. It should never be employed in the cold stage of fever.

3. It should never be employed when the heat, measured by the thermometer, is less than, or equal to, the natural heat (96° F.), notwithstanding the patient feel no sense of chilliness.

4. It should never be employed when the body is under a profuse sensible perspiration.

5. It should not be employed if the fever be complicated with any visceral inflammation.

6. The earlier in the disease it can be employed, the more benefit will be derived from it; in the more advanced stages, however, it will be found to moderate the symptoms, but in no case will it "cut short" the fever, as supposed by Dr. Currie.

7. The patient should always immerse his hands for a few moments in the fluid before it is applied to any other part of the body; it prevents the shock being too violent.

2695. *Sponging the body in Fevers* is, in most cases, preferable to affusion, although it fails to induce the same impression on the system. Cold water, either alone or mixed with vinegar, may be used, and the whole body should be freely sponged over once or twice daily; it reduces the morbid heat of the surface, is extremely grateful and refreshing to the patient, and may be used with perfect safety, unless the heat be high above the natural standard, or there be any greatly irregular distribution of temperature; in the latter cases, tepid water should be substituted for cold. It is equally applicable to *Continued Inflammatory and other Fevers* as to *Small-pox*, *Measles*, *Scarlatina*, *and the Exanthemata* generally. The feelings of the patient are the true guide as to the temperature; if cold applications are disagreeable, tepid ones should be substituted, and *vice versâ*. *In Typhus and Typhoid Fevers*, also, the practice is

fraught with benefit. Dr. Murchison (p. 253) advises that small quantities of Condy's fluid or hydrochloric acid (℥j. ad Oj.) should be added to the water; from this the patient not only experiences the greatest comfort and benefit, but it likewise diminishes risk to the attendants by preventing the accumulation of poisonous exhalations.

2696. *In Remittent and other Fevers*, the treatment by wet-sheet packing, originally introduced by the hydropathists, has been resorted to by regular practitioners in India and elsewhere. Dr. Morehead (p. 187), from observation of numerous cases treated on this plan, draws the following conclusions:— 1. In the conditions which justify cold affusion, it is possible that the wet sheet renewed every ten or fifteen minutes, for two or three times, may be a convenient and effective mode of reducing the temperature of the body. Should there, however, be tendency to hepatic or splenic congestion, the wet sheet is likely to do harm by increasing the congestion. 2. With regard to its use during the height of the exacerbation, it is not denied that moisture of the surface of the body may somewhat modify this state, by inducing diaphoresis; but it is now well understood that this is not a leading indication in the cure of the disease, and that means which merely aim at this can never occupy other than a subsidiary position. 3. Employed towards the close of an exacerbation, it is not improbable that the increased diaphoresis caused by it may increase exhaustion, and may produce it when it would not otherwise have occurred. 4. Its routine employment, by directing the chief curative means to the reduction of febrile heat, must tend to withdraw attention from those methods by which local inflammation, &c., may be detected. Whilst the value of causing the skin to perform its share in the elimination of morbific matter is admitted, can there, asks Dr. Morehead, be a greater error in practice than that of acting on the skin alone, and neglecting the other important excretory organs? It is evidently one of those measures which, though beneficial in well-selected cases, is capable of great abuse when employed without due discrimination.

2697. *In Scarlet Fever of a malignant type*, cold affusion is highly commended by Dr. S. J. Gee (i. p. 355) and others. Dr. Hillier (p. 316) states that in the few cases in which he resorted to it he had reason to be well satisfied with the effects, the patient having been always relieved for a time, and in a few cases permanent benefit was received and recovery promoted. He directs the patient to be placed in an empty bath lined with a blanket, and then to have two or three pails of water at 70° to 75° F. poured over him as quickly as possible; he is then to be immediately wrapped in dry blankets and placed in bed. Reaction usually follows in 10 or 15 minutes.

It should be repeated once or twice in 24 hours, according to the gravity of the symptoms; it is inadmissible where there is collapse with cold extremities. When this treatment has been objected to, or seemed too cold, Dr. Gee states that he has seen very good results follow from packing the patient in a wet sheet for an hour; it is also well spoken of by Dr. Hillier. A still milder method is occasional sponging the body with cold water, a proceeding generally most grateful to the patient's feelings.

2698. *As a drink in Fevers and Inflammations*, cold water may be taken *ad libitum;* but the addition of some mucilaginous agents, as barley, rice, &c., and its being acidulated with lemon-juice or one of the vegetable acids, renders it more refrigerant and agreeable to the palate.

2699. *In Sun-stroke*, the first thing to be done after removing the patient into the shade, is to dash cold water over the head, neck, and chest. If this be effectually and quickly done, the powerful impression on the cutaneous nerves will soon re-establish respiration, at first by gasps and catches, and soon in a more regular and tranquil manner; it will at the same time reduce the heat of the skin. When the patient can swallow, cold water should be freely drunk, and Dr. Parkes suggests the use of enemas of ice-cold water. The use of the douche to the head requires to be used with some discrimination, especially if the skin is cold and clammy, in which case we must restrict its use to the face and chest. (Dr. Maclean, ii. p. 164.)

2700. *In Delirium Tremens*, cold affusion has been well spoken of, but it is certain that it is capable of acting most injuriously when any signs of debility or prostration of the vital powers are present. Of the value of the wet sheet in these cases, Dr. Wilks states that he has seen enough of its sedative effects to fully warrant the statements which have been made by others of its efficacy. "You strip the patient naked, roll him in a wet sheet till he looks like a mummy, then a blanket round this again. In many cases of delirious excitement you will find as soon as a hot vapour surrounds the patient he falls into a quiet sleep." (Dr. Wilks.[1]) *In Narcotism from over-doses of Opium and Belladonna*, cold affusion is often an effectual means of rousing the patient.

2701. *In Sleeplessness*, the warm bath is a valuable means of determining blood from the head, and calming nervous irritation. Dr. Hammond,[2] of New York, states that he has frequently found, especially in children, that simply putting the feet into hot water (100°) has been sufficient to induce sound and healthy sleep when laudanum and other means had failed. For the same purpose he speaks highly of the local application

[1] Med. Times, Sept. 19, 1868. [2] Braithwaite's Retros., lii. p. 75.

of cold water, as near 30° as possible, except in the asthenic forms of wakefulness, when he regards it as inadmissible. But when the individual is strong, the heart beating with force and frequency, and the mental excitement great, its influence, according to his experience, is almost invariably good. In support of his views he cites the practice followed in Thibet, of placing wakeful children in such positions as will admit of a small stream of cold water falling from a slight elevation on their heads.

2702. *In Delirium, arising in the course of Fevers, or from Inflammation of the Brain or other causes*, the application of cold fluids to the head has received the approbation of all writers. "If, however," observes Dr. Copland (i. p. 495), "it (cold) be continued too long, or after morbid heat has been subdued and the features have shrunk, it will be injurious by depressing the nervous energies too low, and favouring the supervention of coma, or violent agitations, terminating in fatal exhaustion."

2703. *In Laryngismus Stridulus*, it is of the highest importance to diminish as far as possible the nervous susceptibility of the child. In order to effect this, Dr. Merei[1] strongly advises washing the whole body with water, used gradually colder and colder every morning, for a time varying from one to four minutes, together with cold affusion on the head. If the skin of the infant does not seem sufficiently active, he directs the washing to be performed with a mixture of 1 part of alcohol, and 8 to 15 parts of water: after the washing, the body should be well dried, and if the day be fine, the child may be taken out in the open air. In children whose constitutions are not much debilitated, this treatment offers the best chance of success.

2704. *In Meningitis*, the most effectual mode of applying cold to the head, is by irrigation; *i.e.*, allowing a small stream of water to run on the shaven head from a vessel placed a little above it. The effect of this is almost magical, but it should be used with great caution, particularly in children and aged persons, so that its sedative influence should not be too powerful. (Dr. Ramskill, ii. p. 368.) *In Tubercular Meningitis*, cold affusion has been said to be successful in rousing the patient after the supervention of complete coma, but it is an extreme measure, only to be resorted to in exceptional cases. *In the Convulsions of Children, in Puerperal and other Convulsions*, the continuous application of iced water to the head is a measure attended with salutary effects.

2705. *In Cholera*, the free use of cold water as a drink appears materially to aid other treatment of whatsoever kind that

[1] Edin. Monthly Journ., Nov. 1850.

may be; it should be as cold as is procurable, iced if possible; it should be taken in large and repeated draughts, and although for the first four or five times it may be rejected, its use should be persevered in. It soon remains on the stomach; and when this is effected, a beneficial change in the state of the patient is soon observable; the intense thirst which usually accompanies cholera would alone justify the adoption of this treatment. Whatever other treatment is adopted, iced water in copious draughts will prove a valuable auxiliary, perfectly safe, agreeable to the patient, and likely to be productive of the best effects.

2706. *In Chronic Dysentery*, Dr. Maclean (i. p. 124) recommends the use of a water belt over the abdomen for some hours daily. This, he remarks, acts as a fomentation, and the steady uniform pressure it maintains seems to favour the absorption of the fibrine effused between the intestinal coats. If there be much uneasiness about the anus, a water compress over the part often affords more relief than opiate enemata; he likewise advises that the cold hip-bath should be used daily for a few minutes.

2707. *Nervous Palpitations.* A draught of cold water is an efficient expedient for calming the violent action of a palpitating heart; this measure would not, however, be advisable in persons predisposed to syncope. (Dr. Williams.[1])

2708. *In Uterine Hæmorrhage*, enemas of iced water into the rectum have a marked temporary effect in arresting the discharge; vaginal injections of cold water may be employed at the same time, and cold water applied to the abdomen. Dr. Tilt (p. 246) speaks very favourably of prolonged cold-water irrigation in *Cancer of the Uterus.*

2709. *Hot Water* is a valuable therapeutic agent. For internal use the temperature should be about 100° F.; if drunk at this temperature, it causes nausea, and if taken in large draughts, vomiting; it also acts as a diaphoretic and diluent, becomes absorbed, and attenuates the blood. Externally applied, it is, at a moderate heat, emollient and sedative, relaxing the tissues to which it is applied; at a high temperature, 212° F., it acts as a powerful vesicant and counter-irritant. The vapour, when inhaled, acts as a topical, sedative expectorant, relieving the constriction of the vessels, and thereby facilitating expectoration.

2710. *Therapeutic Uses of Hot Water. In Croup*, hot-water stupes are very useful; sponges filled with water as hot as the little patient can bear, should, on the accession of an attack, be applied immediately beneath the chin, and along the whole course of the larynx. It should be steadily per-

[1] Lond. Journ. of Med., April 1850.

severed in for half an hour; if it do not produce benefit in that time, it may be considered to have failed; it should be employed at the first outset of the attack. This simple plan is stated to be very successful in arresting the progress of the disease. *In Laryngismus Stridulus and Laryngitis*, it may also be used with a prospect of success; it has this merit, at any rate, that it can do no harm, and is capable of producing a vast amount of benefit.

2711. *In Cynanche Tonsillaris, Cynanche Maligna, and in Scarlatinal and other Affections of the Throat*, the inhalation of the vapour of hot water will afford, in most instances, even in the acute stages, a remarkable amount of relief; it may be frequently repeated. *Acute and Chronic Bronchitis, and Chronic Catarrhs*, are often signally benefited by the same means; it greatly facilitates expectoration. *In Hay Asthma*, the vapour of hot water is advised by Dr. Mackenzie.[1]

2712. *In Asthma*, it is often serviceable to stupe the whole chest, during the fit, with flannel wrung out of water as hot as can be borne. (Graves, ii. p. 87.)

2713. *In Fever, as a means of relieving the Headache, Restlessness, &c.*, Dr. Graves (op. cit.) considers that the local application of hot water is far more effectual than the cold lotions usually employed. He remarks that in 1832, a violent influenza, accompanied by the most distressing headache, attacked thousands in Dublin; and that this intense pain in the head was relieved by nothing so effectually as by diligent stuping of the temples, forehead, occiput, and nape of the neck, with water as hot as could be borne: my own experience confirms the value of this advice. *In Congestive Headaches*, Dr. Graves considers that the application of leeches to the feet, and the subsequent immersion of the legs as far as the knees in water as hot as can be borne, is more effectual than the abstraction of blood from the head or its immediate vicinity. The hot foot-bath without the leeches often proves effectual.

2714. *In Piles attended with great irritation and pain*, much relief is often obtained from the hip bath, from sitting over the steam of hot water for fifteen or twenty minutes, and immediately applying a warm bread-and-milk poultice; these measures should be repeated five or six times a day. (Graves.) *In Pruritus Genitalium*, the same measure, or bathing the parts with hot water and soap every night and morning, may be resorted to with much advantage. *In Prurigo Senilis and other forms of Prurigo*, the same treatment may be adopted with benefit.

2715. *In Dyspepsia*, attended with a sensation of coldness at the stomach, and with cold extremities, a cupful of water

[1] London Medical Journal, July 1, 1851.

taken as hot as it can be drunk, affords very considerable relief. (Dr. A. T. Thomson.) *In Gastritis*, extreme benefit is derivable from continuous fomentations, as hot as the patient can bear them. (Dr. Brinton, p. 95.)

2716. *In Chronic Cystitis*, injections of *tepid* water into the bladder are in many instances productive of excellent effects. Not more than f℥jss. or f℥ij. should be injected at once, and it should not be retained more than thirty or forty seconds; it may be repeated once or twice in twenty-four hours. (Sir B. Brodie, p. 110.)

2717. *During the passage of Renal Calculi*, much relief will often be obtained by the free injection of warm water into the bowels; the hot bath and hot fomentations may be employed at the same time with advantage; the water should be as hot as the patient will bear. (Dr. Prout, p. 312.)

2718. *In all Skin Diseases where there is excessive moisture on the surface*, originating in vesicular, pustular, or ulcerative diseases, the *constant* application of water is necessary; for this purpose, lint well saturated in water is applied over the whole of the affected part, and covered with oil-silk or gutta-percha sheeting, and the whole kept *in situ* by bandages, so that evaporation is effectually prevented. Prof. Bennett, whose advice this is, adds previously to the water a little carbonate of soda (℥ss. ad Aq. Oj.), but he regards the success which attended this practice as due to the water, and its *constant* application rather than to the alkali. This treatment is applicable to *Eczema*, *Herpes*, *Pemphigus*, *Impetigo*, *Ecthyma*, and *Rupia*. In the last case, the ulcers which supervene on the disappearance of the crust should be treated as isolated sores with water dressing.

2719. *To Ulcers*, *Wounds*, *Inflamed Surfaces*, *&c.*, the application of what are called water dressings was first recommended, of late years, by Dr. Macartney,[1] of Dublin; and they have in many instances been substituted with great advantage for poultices. Mr. Liston,[2] who entertained a great aversion to the latter application, observes that heat and moisture—by which qualities a poultice produces its soothing and beneficial effects—by which the surface is relaxed, its capillary circulation encouraged, and the discharge promoted—are amply afforded by water dressing, without any of the weight, putrefactive fermentation, stench, and filth, which are inseparable even from the best and most scientifically contrived cataplasms. Water dressing is exceedingly simple, consisting only of a piece of lint, of thick texture, and of sufficient size to cover the wound, soaked in tepid water. This is placed on the affected

[1] Treatise on Inflammation, London, 1838, 8vo.
[2] Pract. Surg., 4th ed., p. 32.

part, and the whole enveloped in an ample piece of oiled silk, so as effectually to prevent evaporation. In some cases cold water may be substituted for tepid; the sensations of the patient are here the best guide. *For Abscesses*, the warm water dressings, as advised above, prove, in many instances, an effectual substitute for poultices, but the latter are generally more soothing and agreeable to the feelings of the patient. *For Phagedenic Ulcerations*, few applications are more serviceable than that of water poured from a small height in a stream, by the process called *Irrigation*. Mr. E. Cock[1] appears to have first advocated its employment. This treatment has proved most successful in the hands of Dr. J. Sutherland amongst the natives of India.[2]

[1] Med. Times and Gaz., April 12, 1856.
[2] Indian Annals of Med. Science, April, 1857.

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Page 47, sect. 76, *for* "Oj.," *read* "℔j."
Page 57, sect. 117, *for* "atomic," *read* "atonic."
Page 295, sect. 933, *for* "942," *read* "941."
Page 299, sect. 953, *for* "Mercury," *read* "Iron."
Page 302, sect. 967, *for* "hydrated," *read* "humid."
Page 464, sect. 1522, *for* ("*infra*,") *read* ("sect. 1390.")
Page 599, sect. 2017, *for* "*Saracina*," *read* "*Sarcina*."
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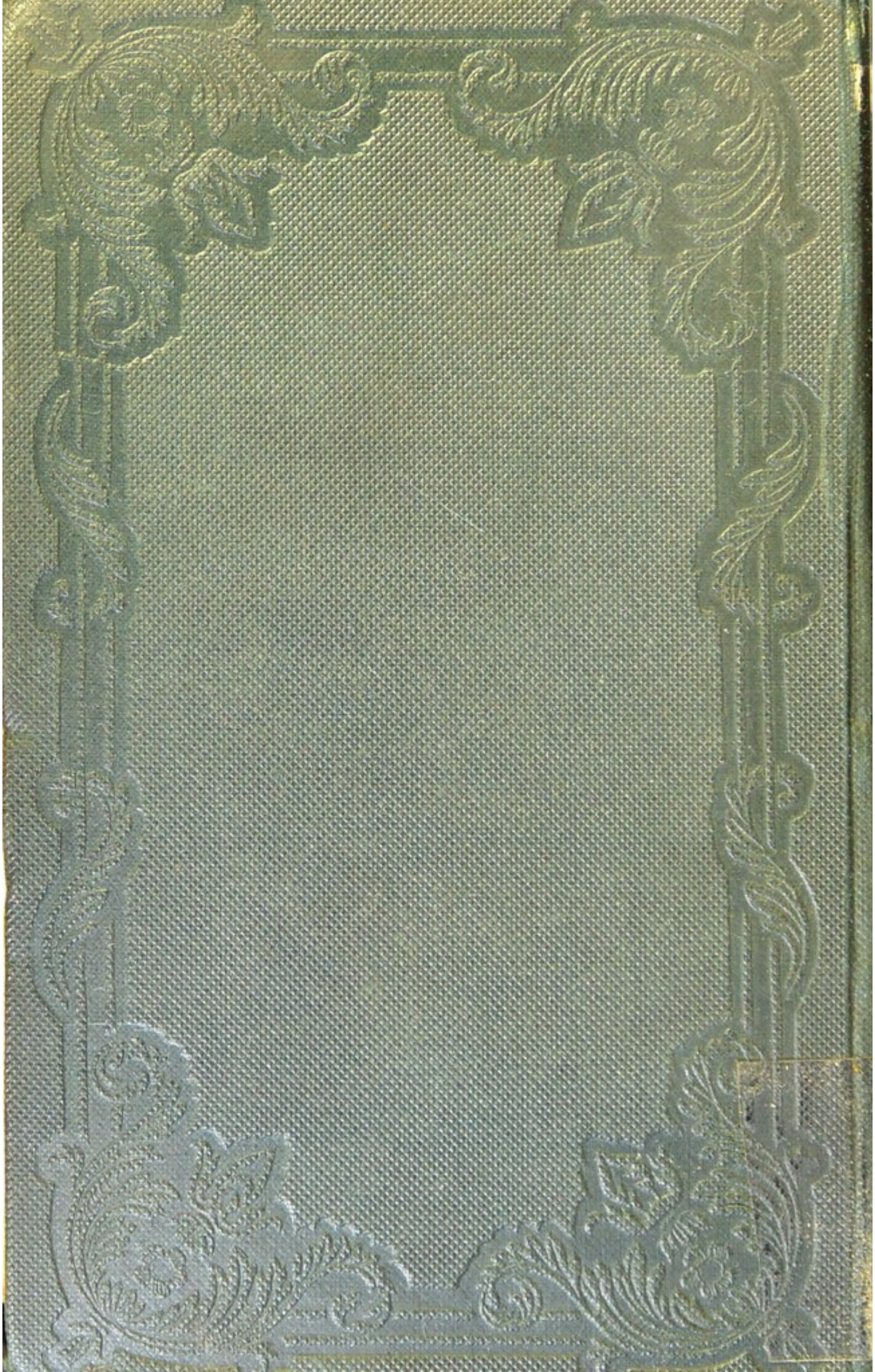
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