

cases are open to the suspicion that the appearances on the skin are merely accidental, and not causative.

THERAPY.—A solution of quinine will sometimes, when applied to the nares, arrest an attack of *summer catarrh*, a malady which appears to be produced by the pollen of plants. The preparation most suitable for this purpose is an aqueous solution of the hydrochlorate (gr. iv—gr. viij— $\frac{3}{4}$ j). This should be applied by a large camel's-hair brush, or spray-producer, to the nares and fauces. The utility of quinine in this peculiar disease will be determined by the extent to which the local trouble has proceeded; it can be useful only when the irritation is confined to the nares and fauces.

The *aphthous ulceration (muguet)* which succeeds to an exhausting entero-colitis, or which occurs in cachectic infants, is much improved by quinine—a grain or two every three hours. An attack of *acute tonsillitis* may sometimes be aborted by a full dose of quinine (ten to fifteen grains). This practice is especially indicated in those cases which proceed to suppuration, but the quinine must be administered before pus forms.

The preparations of cinchona are much used as stomachic tonics. In *atonic dyspepsia* they are employed, like the simple bitters, to promote the flow of gastric juice. In *gastric catarrh* they relieve that morbid state of the mucous membrane on which the increased production of mucus depends. For these purposes they may be combined with the mineral acids. The best preparation is the infusion; the decoction, although official, is inelegant and faulty. The alkaloid quinine is frequently used for the same purposes, and notably in the *gastric catarrh of drunkards*, combined with acids. When vomiting of yeast-like material is due to the presence of *sarcina*, quinine may be used in virtue of its power as a poison to these minute organisms, and as an anti-ferment. In these stomach-disorders other and less expensive drugs may be used with equal advantage. (See HYDRASTIS.) When there is a relaxed state of the gastro-intestinal mucous membrane, manifested by catarrh, diarrhœa, etc., but without inflammation, the preparations of red bark are more particularly indicated in virtue of the tannins which they contain. The reader need hardly be reminded that the preparations of cinchona are contraindicated in all inflammatory states of the intestinal mucous membrane. Furthermore, if too long continued, they will set up an irritation, and perpetuate the troubles which they were prescribed to remove.

Sometimes it happens that the *entero-colitis* of children (cholera infantum), which resists every possible combination of astringent and laxative, will yield readily to quinine. The author has seen quinine give prompt relief in the following: A child suffers with tenesmus, and after much straining voids a transparent mucus streaked with blood, but there is no fever nor other disturbance of the bowels, and the stools when passed are natural.

The preparations of cinchona and quinine are very serviceable in that state of the mucous membrane which favors the development of *ascarides*. After the expulsion of the parasites, these remedies remove the saburral state of the mucous membrane. A combination of purgatives and bitters will correct the following condition of things as they occur in children: A foul breath, coated tongue, capricious appetite, tumid belly, and constipation alternating with diarrhœa.

The use of quinine as a restorative tonic in cases of *debility* is almost universal. Given in moderate doses—six to twelve grains a day—it promotes constructive metamorphosis. Its utility is due not to any direct action on the blood, but to its stimulant effect on the digestive function, and the retardation of the combustion process. When cinchona or quinine proves irritant to the intestinal mucous membrane, this beneficial restorative action ceases. Iron and arsenic increase the power of quinine to promote construction of tissue and to retard waste.

There can be no doubt in regard to the power of quinine to arrest the *inflammatory process* in its formative stages. Its utility, given with this view, ceases when the migration of the white corpuscles and the proliferation of the cellular elements of the inflamed parts have taken place, for it possesses no power to cause disintegration and absorption of inflammation products. Administered at the critical moment, a commencing *fibrinous pneumonia*, a *pleuritis*, an *endocarditis*, may be suppressed by a full dose (twenty to forty grains). Its power in this respect is much increased by combination with morphine. If the time have passed for the use of quinine in this way, it is employed with advantage as a restorative tonic in the various inflammatory affections of low type, small doses (two to four grains) being given frequently.

In *septic diseases* quinine has very important uses. Although the observations of Binz, showing the influence of quinine over septic processes, may not be applicable to the full extent for which he proposes them, there can be no doubt of the good effects in practice of quinine in *septicæmia*, *pyæmia*, *erysipelas*, and *puerperal fever*. In these diseases, only large doses—five to twenty grains—every four hours, are useful.

The author's experience in the treatment of *acute rheumatism* does not justify the use of large doses of quinine, as now employed by Briquet and his followers in France. In the *hyperpyrexia* of acute rheumatism, it is true, large doses of quinine will depress the temperature, but we have less distressing and more effective means for accomplishing this object in the wet-pack and the cold bath. When the acuter symptoms have subsided, and the skin is cool and perspiring, and the pulse weak, quinine in moderate doses—two to five grains—is very serviceable.

A careful examination of the large number of facts which have now been accumulated, and considerable personal experience and observation, have satisfied the writer of the inutility of quinine as a means of aborting or shortening the duration of *typhus* and *typhoid fevers*. Not only has this remedy little or no influence over the course and duration of these affections, but its irritant effects upon the gastro-intestinal mucous membrane, and its inhibitive influence, exerted through the organic nervous system, upon the heart and lungs, may, in some cases, render it positively injurious in large doses. As a rule, the dryness of the tongue, the diarrhœa, the subsultus, and the delirium of typhoid fever, are increased by it. In certain parts of the United States, the prevalence of a mixed type—*typho-malarial*—requires, under certain conditions, the use of quinine in continued fevers. But it becomes less and less effective as the *typh-element* predominates. When there are evidently true remissions—and not merely the rhythmical morning remission and evening exacerbation characteristic of typhoid—quinine is indicated, and it is most effective when administered in an occasional large dose during the remission. When there is a condition of hyperpyrexia, or of continuously elevated temperature, which endangers life by parenchymatous degeneration and cardiac or cerebral paralysis, quinine in antipyretic doses renders an incontestable service. This opinion of the author is fully confirmed by the committee of the Clinical Society of London, who find that large doses of quinine have a marked effect in reducing the temperature in pyrexia, and that, although, with the exception, perhaps, of certain cases of rheumatic fever in which the temperature is high, no decided evidence has been obtained to show that quinine has any influence in shortening the attack of a specific disease such as typhus or scarlet fever, yet from the marked effect on the temperature and pulse there is reason to believe that at the critical stage of acute disease, when pulse and temperature are high, a large dose of quinine may be employed with benefit. Jürgensen, Ringer, Liebermeister, and other authorities, and a vast clinical experience in all civilized countries, are now agreed in respect to the fever-reducing power of quinine and to the absence of ill results from large doses (especially Liebermeister). Liebermeister, indeed, says, if he were restricted in his choice to one antipyretic, he would select quinine. The quantity necessary to effect a decided reduction of the body-heat in fevers is determined by the age, the amount of disturbance, and the individual susceptibility to its action. In general, it may be stated that from twenty to sixty grains will be required. The antipyretic effect is more decided if it is given toward the close of the exacerbation or during the remission in typhoid or other fevers. The duration of the effect is "from one to forty-eight hours"; consequently, a repetition of the dose will be necessary, if it is desired to maintain the reduction of the temperature.

A few large doses at short intervals until the necessary quantity is reached, or a single maximum dose if the stomach is tolerant, should be prescribed, rather than a succession of smaller doses. The rapidity with which elimination takes place is a sufficient reason for adopting the former mode of administration. The effect of quinine is not less happy in the fevers of childhood, and comparatively large doses are well borne at this period, as Jacobi, especially, has shown us. The same rule should be followed as in the case of adults: to give the amount required in several doses within a brief period—an hour, according to Liebermeister—or at one time. The antipyretic use of quinine should not be confounded with its tonic or supporting qualities. In the treatment of fevers, the typhoid state, or the condition of adynamia supervening during the course of fever, small doses (two, three, or four grains), at short intervals, are employed for the stimulating effects which they have on the organs of circulation, respiration, and digestion. Large doses, as has been set forth, depress these functions.

In *cerebro-spinal meningitis*, doubtless a continued fever with cerebro-spinal lesions, quinine is indicated under the conditions already defined for the treatment of other inflammations, viz., in the beginning of the disease, when the alterations of cutaneous sensibility first occur, and before the febrile movement has developed. If a few large doses—twenty to thirty grains—do not produce a good result, it is useless to repeat them, or to pursue a tentative plan with small doses.

In the treatment of the *eruptive fevers, variola, scarlatina, rubeola*, quinine has an important place. It is used in small doses, frequently repeated in adynamic states, and in large doses at longer intervals to reduce hyperpyrexia. In scarlet fever, Dr. Hood especially urges the use systematically of quinine from the earliest stage of the disease, preceded by an emetic and purgative, and he states as the result of this practice that since he has adopted it he has not lost a single case of this disease treated by him from the beginning. In measles, large doses of quinine have an unquestionable utility in relieving the catarrhal pneumonia, and in preventing those changes in the exudation products which end in caseation.

The most important uses of quinine are those which, in the present state of our knowledge, can not be deduced from a study of its physiological actions, viz., the cure of *malarial diseases*. It is true, the toxic action of quinine on minute organisms is supposed by Binz and his followers to be the true explanation of its *methodus medendi*, but the exact influence of these organisms in the causation of malarial diseases has not hitherto been defined. The recent discovery of the *bacillus malarie* by Klebs and Tommasi-Crudeli, if confirmed, will afford the needed explanation. The power of quinine to render inactive the minute organisms of disease must also be exerted against

the malaria-germ. Other agents possess this power, it is true, but they are, unlike quinine, destructive of the tissues as well as of the disease-germs.

The alkaloids of cinchona are employed as *prophylactics* against *malarial infection*. The experience of the English naval service, of crews engaged on the coast of Africa in the suppression of the slave-trade, of the expeditionary force into Ashantee under Lord Napier, and of our late civil war, has abundantly shown that quinine is in a high degree prophylactic. The first public reference to this property seems to be that of Dr. Bryon in 1854, who called attention to the success which attended its use among the crews of the British vessels serving on the coast of Africa. Since that time, for several years the statistical reports of the British naval medical service have contained conclusive evidence on this point. Dr. Joseph Jones has published since the close of the civil war some valuable statistical data, showing the efficiency of quinine as a prophylactic. The troops who were the subjects of experiment were stationed in a highly malarious locality. Of the number, 230, who took no quinine, 134 had fever. Of those who took quinine irregularly, 246 in number, 96 had fever. Of the 506 who took quinine regularly, 98 had fever. The proportion of cases of fever was, therefore, 1 to 5.66 men. On the coast of Africa, the proportion has varied from 1 in 8 to 1 in 20. Of the unprotected, more than one half—on the coast of Africa, three fourths—were attacked by malarial disease in some form. As the quantity of quinine daily taken has been usually three to five grains, it is probable that the results would be even more favorable if a larger quantity of the prophylactic were given. When the poison is not intense, this amount may be sufficient, but if concentrated and active, and the conditions are otherwise unfavorable, twice as much should be administered daily. An enormous experience has now shown that quinine is entirely free from injurious effects when taken as a prophylactic. It is probable that the influence slowly decreases, and that some addition to the daily quantity may be necessary after a time. The prophylactic dose should be administered on rising in the morning, and may be usefully prescribed in a cup of black coffee, or in pill-form. The practice adopted in the civil war, of giving whisky as the vehicle, is not to be commended. If the quinine administered fail to prevent the disease, those attacked will suffer far less severely than the unprotected. Experience has shown that, to be entirely efficient, the quinine must be administered for some time, at least ten days, after exposure to the causes of fever (Jones).

The mode of using quinine for the cure of intermittents may be formulated as follows:

The antipyretic is nearly equally effective whether administered in the interval or during the seizure.

If time is an element of importance, no delay is necessary in order to give the remedy in the stage of apyrexia.

To save the suffering and exhaustion of the febrile movement, the attack should be anticipated, and, if possible, prevented.

As the maximum effect of the quinine is attained in about five hours after being taken, it should be administered this period of time, at least, before the expected paroxysm.

As the elimination of quinine takes place with considerable rapidity, the maximum curative effect is obtained by the administration of the whole amount required in a single dose, rather than by a succession of small doses (Prize Essay).

An intermittent may be successfully treated by giving, during the interval, a number of small doses frequently repeated. The author is convinced by extended observation that a full dose of quinine (ten grains) in the sweating stage, and the same quantity five hours before the time of the next paroxysm, is the more effective method. The anti-periodic property of quinine is increased, and the cerebral effects of large doses diminished, by combination with morphine. It is well known that intermittents, arrested by quinine or other anti-periodics, manifest a tendency to recur about the septenary periods; therefore, ten to fifteen grains of quinine should be administered in anticipation of these recurrent paroxysms, until the third septenary period has passed. Meanwhile, the organs damaged by the malarial infection—intestinal canal, liver, spleen, kidneys, etc.—require appropriate treatment. The action of quinine is much assisted by the continuous administration of arsenic during the intermissions, and until the third septenary period has passed. The unpleasant cerebral effects of quinine are lessened or prevented by the simultaneous administration of diluted hydrobromic acid: ℞ Quininae sulph., ʒj; acid. hydrobromic. dil., ʒij; aqua, ʒxiv. M. Sig.: One or two teaspoonfuls at a dose.

In the treatment of *remittent fever* two modes of using quinine are employed: first, by emetics, purgatives, baths, diaphoretics, etc., to secure a distinct remission when the remedy is administered; second, to give it in sufficient dose immediately, relying on its apyretic effect. The author is convinced that the latter plan is preferable: from twenty to thirty grains in a single dose once or twice each day until the temperature is reduced to normal. This use of the remedy need not interfere with other appropriate medication.

In the so-called *pernicious fever*, it is agreed on all hands that the safety of the patient is secured only by the prompt use of large doses (twenty to sixty grains), and administration by the stomach, rectum, and skin may be in turn or simultaneously resorted to.

In *chronic malarial infection*, important changes have been produced in the intestinal canal, liver, spleen, kidneys, cerebro-spinal axis; the paroxysms of fever occur irregularly; various abnormal manifes-

tations of the infection take place (dumb ague, enlarged spleen, etc.). Under these circumstances, quinine is less curative than when the infection is recent, and the paroxysms will recur from time to time notwithstanding its use, unless these structural alterations are corrected. In chronic malarial disease, salicylate of quinine and salicylate of cinchonidine are especially effective. ℞ Cinchonidinæ salicylat., ʒ ij; acidi arseniosi, gr. j; ferri sulph. exsic., ʒj. M. Ft. pulv. (wafers) no. xx. Sig.: One three times a day. Also: ℞ Chinoidin., ʒ ij; quininæ salicylat., ʒ j; ferri sulph. exsic., ʒj. M. Ft. pil. no. lxxx. Sig.: Two pills three times a day. ℞ Quininæ sulph., chinoidinæ, āā ʒ j; res. podophylli, gr. v; ferri sulph. exsic., ʒ ss. M. Ft. pil. no. lx. Sig.: Two pills three times a day.

In *periodical affections of malarial origin*, quinine is equally as effective as in the periodical febrile diseases, but somewhat larger doses are necessary. A difficulty of diagnosis often arises in these diseases, for the reason that the neuroses are irregularly periodical in their manifestations, when not malarial in origin. The existence of a malarial cachexia, and the more uniform periodicity in the recurrence of the paroxysms, will enable the practitioner to distinguish the neuroses of malarial origin from the other functional disorders of the nervous system. The following group contains the disorders of the sensory system caused by malaria: tic-douloureux, cephalalgia, cervico-brachial neuralgia, cervico-occipital neuralgia, dorso-intercostal neuralgia, lumbo-abdominal neuralgia, mammary neuralgia, crural neuralgia, gastralgia, enteralgia, hepatalgia, nephralgia, hysteralgia, ovaralgia, sciatica, angina pectoris. The following motor disorders, also, are produced by malarial influences: epilepsy, chorea, stricture of urethra, hiccough, laryngismus stridulus, asthma, summer catarrh. These neuroses may occur as an expression of malarial infection, being substituted for the ordinary chill, fever, and sweat, or they may assume the orderly periodical character in consequence of having occurred in an organism already under the influence of the malarial cachexia. If they are of malarial origin, the specific action of quinine will speedily prevail against them. These malarial neuroses require large doses of quinine, and the same fact is true of all irregular manifestations of malarial infection. Ten to twenty grains, according to the severity of the attacks and the obstinacy with which they recur, are necessary, and the paroxysms should be anticipated by the exhibition of the remedy from three to five hours before the expected time. In cases of malarial neuralgia, the curative effect of quinine is enhanced by combination with morphine, either in the same prescription or by simultaneous administration of the latter subcutaneously.

Diarrhœa, dysentery, jaundice, and hypertrophy of the spleen occasionally occur in the periodical form, or are due to the immediate influence of paludal miasm. Under these circumstances quinine af-

fords relief without the use of any other remedy. Very frequently the diarrhœa, dysentery, and jaundice are results of structural alterations in the liver and the glandular apparatus of the intestine, and are not merely functional disorders which quinine may remove. In malarial enlargement of the spleen, quinine is supposed to be especially effective; but quinine exhibits a curative power only in cases of simple enlargement, and does not affect that condition known as "fleshy spleen," or chronic splenitis, of inflammatory origin.

Hæmaturia, when distinctly intermittent and arising from malarial infection, is cured by quinine, but large doses are necessary. According to Karamitsas, sometimes hæmaturia is caused by this agent.

Cases of *cerebral disease*, occurring in weak and anæmic subjects, are sometimes much improved by small doses of quinine. The author has observed great relief by the use of this remedy in the following group of symptoms, occurring in men advanced in life: Headache, vertigo, failure of memory, and despondency, associated with a slow pulse, an atheromatous degeneration of the vessels, puffiness of the eyelids, and dilatation of the superficial veins of the head. From three to ten grains daily may be given with advantage, the effect being to remove that sluggishness of the intra-cranial circulation on which these symptoms depend. In *insanity*, especially the *puerperal form*, when there is much weakness, and the skin is cold and sweating, quinine is very useful. When there is a condition of adynamia—the usual state—in *delirium tremens*, small doses of quinine assist materially in tranquillizing the patient. In that preliminary stage known as "horrors," characterized by restlessness, tremor, nausea, and anorexia, quinine, with a mineral acid, renders important service by restoring the digestive function, and by giving steadiness to the cerebral motor centers.

Although headache (hemisrania) and neuralgia of malarial origin are cured by quinine, by no means equally successful results follow the use of this remedy in ordinary headache and neuralgia. Quinine is largely employed, it is true, in these affections when not caused by malaria, but it is useful only when anæmia is present and is causative. The same remark is true of *epilepsy* and *chorea*.

An attack of *acute catarrh* may often be entirely aborted by a full dose (ten grains) of quinine and morphine (one half a grain), if given at the incipiency of the attack. After the acute symptoms have subsided, quinine is very serviceable in *hay-asthma*. *Diphtheria* being an adynamic disease, quinine is used by the stomach with a view to its restorative action, and in the form of spray to arrest the spread of the exudation in the fauces. The power of quinine to kill bacteria and micrococci renders its local use a rational measure in a disease characterized by an enormous multiplication and diffusion of micrococci.

Laryngismus stridulus, a reflex spasm of the muscles of the larynx occurring in rickety, ill-fed, and anæmic children, may be prevented recurring by the use of quinine in the intervals between the attacks. Quinine is one of the remedies which is used in *membranous croup*, but the reported successes were probably cases of spasmodic croup. There can be no doubt regarding the good effects of quinine in *asthma*, after the severity of the paroxysms has somewhat abated, as an apyretic in the fever which succeeds, and as a restorative tonic. It is also the most useful tonic which can be employed in *chronic bronchitis*, with profuse expectoration (bronchiectasis). The hectic fever and sweats of *phthisis* are prevented by large doses (fifteen to twenty grains) of quinine, but this remedy really has no influence over the course and progress of the disease.

In *skin-diseases*, when there is present a lowered condition of the vital forces, quinine is indicated. It is the most valuable remedy in *erysipelas* and *erythema nodosum*. It is a curious fact that in many subjects a full dose of quinine will cause an erythema, with dilated pupils, phenomena closely analogous to those produced by belladonna. *Ecthyma* and *impetigo*, usually arising in a feeble state of the assimilative functions, are cured by quinine.

Quinine is largely employed in *surgical affections*, to sustain the powers of life during protracted suppuration, and to check the formation of pus. It is the most generally prescribed remedy for *surgical fever*. A full dose of quinine, given before the operation, may prevent the chill and fever which succeed in some subjects to the operation of *catheterization*.

SUBCUTANEOUS AND LOCAL USES OF QUININE.—The increasing use of quinine hypodermatically requires further consideration of this subject. In *pernicious intermittents and remittents*, when life is put in imminent danger, the most speedy and effectual way of introducing the remedy must be employed. Besides the hazards due to the intensity of the poison, an irritable stomach and rectum prevent the introduction of the remedy by either of those channels. The subcutaneous method then becomes most important. Again, in obstinate and repeatedly relapsing intermittents, the introduction of the remedy by the skin imparts to it greater curative power. In *enlarged spleen* (ague-cake), *malarial jaundice*, with great irritability of the stomach, and a catarrhal state of the gastro-intestinal mucous membrane, the subcutaneous method becomes necessary, or, if not essential, is much more effective. Quinine and the sulphate simply suspended are not adapted to subcutaneous use. Several cases of tetanus have been reported from New Orleans (Sale), and two cases occurred in one regiment of the British Indian Army from their use in this way. The salt employed for hypodermatic use should be sufficiently soluble that no undissolved particles be thrown under the skin. Various

solutions have been proposed. The muriate is more soluble than the sulphate—dissolves in twenty-four parts of cold water, and about three parts of alcohol. One grain will dissolve in about fifteen minims of hot water, and in a much less quantity of alcohol-and-water, but alcohol is irritating. Lente's solution, which is much employed in New York, is prepared as follows: ℞ Quininæ disulph., grs. 1; acid. sulphuric. dil., ℥ c; aquæ font., ℥ j; acid. carbol. liq., ℥ v. Solve. This contains six grains to the drachm. Dr. Lente directs that the quinine and water be heated to the boiling-point when the acid is added. The solution is then filtered into a bottle and the carboic acid added. Below 50° Fahr. it must be warmed before using. A solution of kinate of quinine is much used at Guy's Hospital at the strength of one to four. The kinate is obtained by decomposing sulphate of quinine with the kinate of barium. The mode of preparing the solution is as follows: Put into a beaker 3vj of distilled water and 3ij of kinate of quinine, and heat until the salt dissolves, which it does almost immediately, and then add enough distilled water to make up to ℥ j. The disadvantage of so concentrated a solution is the incrustation, by evaporation, of the bottle and syringe with the solid kinate. The sulpho-vinate of quinine is very soluble—one part in three of water at 60° Fahr.—and is readily prepared by double decomposition between the alcoholic solutions of sulpho-vinate of sodium and sulphate of quinine. Gubler advocates the hydrobromate, as follows: ℞ Quininæ hydrobromat., grs. xlvij; aquæ destil., ʒ iv. M. Dissolve by heat if necessary. Five minims contain one grain.

Recently a new compound salt of urea and quinine has been proposed, and it seems to possess distinct advantages over every other preparation: it is designated *quinia bimuriatica carbamidata*, and is formed by Drygin from a combination of twenty parts of muriate of quinine, twelve parts of muriatic acid, and three parts of urea. The resulting salt is soluble in equal parts of water. The utility of this compound is not entirely theoretical. Practical trials made at Hamburg have demonstrated its fitness for hypodermatic use. A fifty-per cent solution has usually been employed, and a half to three syringefuls (℥ xv to ʒ jss) injected. The local irritation is represented as slight. Very favorable reports have been published in respect to the utility of the hydrobromate brought forward by Gubler. In the hands of Raymond, Soulez, and others, intermittents are said to have ceased after two injections of three grains each of this salt. The usual method pursued was to inject one and a half grain of the hydrobromate twice morning and evening, and, although six to twelve grains were usually successful, in one case thirty grains were required. It has also been employed in the treatment of acute rheumatism.

Quinine in solution is applied in various affections of the fauces by atomization. In *diphtheria* especially have good results been produced.

A saturated solution of the muriate or of the bromide may be thus employed. There can be no doubt that a solution of quinine applied to the nares may be very beneficial at the onset of *hay-asthma*, as first shown by Helmholtz. The author has seen several cases benefited greatly; but to achieve success the applications must be thorough and timely. The secret of any good effects it has, is afforded by its toxic action on germs, and possibly on the pollen of certain grasses, to the presence of which the irritation of the air-passages is ascribed. As soon as the first symptoms are experienced, the mucous membrane should be cleared of mucus by means of a nasal syringe, throwing a solution of common salt, muriate of ammonia, or chlorate of potassa, and then the quinine solution should be applied by a camel's-hair brush to the anterior nares, or by the post-nasal syringe to the whole canal.

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AGENTS PROMOTING DESTRUCTIVE METAMORPHOSIS OR INCREASING WASTE.

ALKALIES.

Potassium.—PREPARATIONS: *Potassa*.—Potassa; *potasse*, Fr.; *Kali hydricum*, Ger. Caustic potash. Occurs in cylindrical rods, is very deliquescent, and dissolves in water and in alcohol.

Potassii Acetas.—Acetate of potassium. A white deliquescent salt, wholly soluble in water (100 in 35) and in alcohol (proof spirit 1 in 2). Dose, grs. v— \mathcal{D} j.

Potassii Bicarbonas.—Bicarbonate of potassium. In white crystals, permanent in the air, wholly soluble in water (1 in 3), and having a slightly alkaline taste. Dose, grs. v— \mathcal{D} j.

Potassii Carbonas.—Carbonate of potassium. A deliquescent salt, wholly soluble in water (100 in 75). Dose, grs. ij—grs. x.