APPENDIX

TO

VOLUME SECOND.

MINERAL Waters are complicated in their composition, and, according to the substances with which they are impregnated, produce different effects on the system, and are hence employed to answer different indications. At the same time, they have certain common medicinal relations. They are therefore not easily arranged under the classes of the Materia Medica, when these are established on analogies in medicinal operation. It is also of advantage to give a connected view of their chemical analysis. I have therefore thought it preferable to place them together, and have accordingly referred them to this appendix. The Elastic Fluids that have been employed medicinally, require a similar arrangement, as there is the same difficulty in placing them under the respective classes of medicines; and from the peculiarities in their preparation and mode of operation, the same advantage in giving their history in connection. I have added a few observations on the medical employment of Electricity and Galvanism, to complete the view of what properly belongs to Materia Medica. And, lastly, as connected with the subject, I have subjoined the heads of a lecture, which I have been accustomed to deliver on the doses of medicines, and the rules that regulate extemporaneous prescription.

I.—OF MINERAL WATERS.

Waters, which flow at the surface of the earth, are frequently impregnated with foreign matter, so far as to acquire peculiar taste or odour, to be capable of exerting specific chemical actions, or to produce changes in the state of the living system. Such waters are denominated Mineral, it being usually matter belonging to the mineral kingdom which communicates these powers.

Important medicinal effects are frequently obtained from mineral waters, arising primarily from the operation of the substances which they hold dissolved, though this is no doubt aided by the state of dilution in which they are administered, the action of the water itself as a diluent, and by other external circumstances. The chemical analysis, therefore, of these waters is of importance, as determining the principles in which their active powers reside, and thus enabling the physician to employ them with more advantage and discrimination.

Mineral waters, both in a chemical classification, and considered in relation to their medicinal use, may be arranged under four orders: Carbonated Mineral Waters, or those impregnated with carbonic acid gas; Sulphureous Mineral Waters, or those impregnated with sulphuretted hydrogen; Saline Mineral Waters, or those which hold certain neutral salts in solution; and

CHALYBEATE MINERAL WATERS, or those, the properties of which depend on an impregnation of iron. These indeed are not perfectly insulated, but, in general, those of one division have a certain relation to those of the others, by being likewise impregnated with one or other of the ingredients which these contain. But still each may be classed according to its predominant ingredient, or that which gives it its most characteristic chemical and medicinal powers.

It would be foreign to the object of this outline, to give the minute details connected with the analysis of mineral waters. This properly belongs to a System of Chemistry. It will be sufficient to point out the general modes of analysis, or rather of discovering their principles, and to add to this chemical view, a brief account of their medicinal applications.

I. CARBONATED MINERAL WATERS.—The waters referred to this class are those which contain carbonic acid gas; and to bring them under the appellation of mineral waters, this must be present in such quantity as to communicate certain sensible qualities. Waters impregnated with free carbonic acid gas, sparkle when drawn from the spring, or poured into a glass; they have a taste more or less pungent and acidulous, but become vapid from exposure to the air. Along with the carbonic acid there may be present, and, indeed, generally are present, portions of saline earthy or metallic matter, chiefly carbonates of lime, magnesia, and iron. But the car-

bonic acid in excess still communicates the same sensible qualities, modified, particularly with regard to medicinal powers, by these impregnations.

Carbonic acid in excess, in a mineral water, is discovered, when present in any considerable proportion, by the qualities above enumerated, communicated to the water. It is also easily distinguished, even when in more minute quantity, by chemical tests. Infusion of litmus receives from the addition of the water a red tint, which is evanescent, disappearing from exposure to the air, and more quickly when heat is applied. And lime water produces a milkiness or precipitation; the lime, when the lime water is added in due proportion, forming with the carbonic acid, carbonate of lime, which is insoluble. But the turbid appearance is removed, and the transparency restored, either by adding an additional quantity of the mineral water, the excess of carbonic acid thus communicated rendering the carbonate soluble, or by adding a few drops of nitric or muriatic acid, either of which decomposes the carbonate, and dissolves the lime. By the evanescent redness, carbonic acid is discriminated from any other free acid that a mineral water might hold dissolved; and by the precipitate formed by lime disappearing from the addition of a larger quantity of the mineral water, or of a little muriatic or nitric acid, the fallacy is guarded against that might arise from any precipitation produced by sulphates that the water might contain.

The quantity of carbonic acid contained in the mineral waters is very various. Under a common pressure,

pure water can absorb its own volume of the gas, but the quantity in any mineral water is generally much inferior to this. The quantity is discovered by expelling the gas from a given quantity of the water, by heating it gradually in a retort nearly filled to the neck, receiving the elastic fluid in a graduated jar, over quicksilver, and observing the diminution of volume it sustains, by the introduction of a solution of potash, this giving the volume of carbonic acid gas.

Waters highly impregnated with carbonic acid gas are grateful from their pungency, sit light on the stomach, and in a large dose produce even sensibly a degree of exhilaration; they increase the appetite, and generally have a diuretic effect. They prove useful in dyspeptic affections, from the grateful and moderate stimulus exerted by the carbonic acid on the stomach, aided by the diluent operation of the water, and hence the advantage derived from them in the numerous chronic affections connected with impaired power of the digestive organs. They generally also contain some saline substances, which communicate additional powers, and the operation of these is usually promoted, or at least they are rendered more grateful, by the carbonic acid. Those which contain carbonate of soda, as Seltzer water, prove more powerfully diuretic, and are employed with advantage, as palliatives in urinary calculus, and in the painful discharge of urine from other affections of the urinary organs. Those impregnated with iron are more particularly employed in those diseases in which that metal is

beneficial. Some of the most celebrated mineral waters of Europe belong to this class, such as the Spa, Pyrmont, and Seltzer Water. The Pyrmont contains very nearly its own volume of the gas; the Seltzer, more than half its volume; the Spa, rather less than half the volume: they besides hold dissolved carbonates of soda, lime, and magnesia; and the Spa and Pyrmont have a considerable impregnation of carbonate of iron. Their more minute analysis will be found in the table at the end of this article. None of the mineral springs of this country are much impregnated with carbonic acid; and those which contain any sensible quantity, as the waters of Bristol and Cheltenham, derive more activity from the presence of other substances.

II. Sulphureous Mineral Waters.—These waters owe their distinguishing character to an impregnation of sulphuretted hydrogen, and they are at once recognised by their peculiar fœtid smell. They are transparent when drawn from the spring, but become turbid from exposure to the air, and gradually lose their odour. When strongly impregnated, they redden infusion of litmus, and even in their weakest state give a dark precipitate with solution of nitrate of silver, or acetate of lead, or tarnish the metals.

To estimate the quantity of sulphuretted hydrogen gas contained in these waters, various methods have been employed. The gas is not easily expelled entirely by heat, nor is it easily collected, so as to measure it accu-

rately, water absorbing it, and quicksilver decomposing it: it may also have an intermixture of carbonic acid gas, and the proportion of this is not easily ascertained, both gases being absorbed by the same liquids. The mode which has been followed is to decompose the sulphuretted hydrogen, by adding to the water, either highly fuming nitrous acid, as long as there is any precipitation of sulphur, (this precipitation being occasioned by the oxygen of the acid combining with the hydrogen of the sulphuretted hydrogen), or, according to a method preferred by Kirwan, mixing nitric oxide gas with atmospheric air, in a jar over the water, when nitrous acid is formed, and produces a similar decomposition. The precipitated sulphur is collected on a filter, and from its quantity, the quantity of sulphuretted hydrogen is inferred, 30 grains of sulphur being supposed to be contained in 100 cubic inches of the gas. This estimate, however, of the proportion of sulphur in sulphuretted hydrogen is somewhat uncertain, and the method is liable to fallacy, from the action of the acid becoming weak by its dilution, so as not to precipitate the whole of the sulphur, or, if it be used in excess, from its communicating oxygen, and converting it partially into sulphuric acid.

The sulphurous mineral waters almost uniformly contain saline substances, which modify their powers. From the action of the sulphuretted hydrogen, they are employed more particularly in cutaneous affections; and from the combined action of this and the saline matter, which generally has a purgative effect, they are farther used in

diseases of the digestive organs, dyspepsia, hypochondriasis, torpor of the intestines, and visceral obstructions; and also in scrofulous affections. They are also applied locally in cutaneous eruptions, and the warm sulphurous baths have been in particular celebrated for their efficacy under this form of application. The principal sulphurous mineral waters of this country are those of Harrowgate and Moffat: the former have a large proportion of saline matter, muriates and carbonates. Those celebrated on the Continent are chiefly the warm sulphurous springs of Aix la Chapelle, and Barege.

III. Saline Mineral Waters.—Under this class are comprised those waters in which, without any large proportion of aërial matter, various saline compounds, generally neutral, exist. The salts most usually present are sulphates, muriates and carbonates; and the bases with which the acids forming these are combined are soda, magnesia and lime. Their analysis is accomplished, first, by detecting, by the employment of tests, the acids present and the bases by which these are neutralized; and, secondly, obtaining the entire salts by evaporation, or by the action of certain re-agents.

In these waters, there is often an impregnation of elastic fluid, particularly of carbonic acid, which would modify the results from the application of tests. This, after its nature has been determined by experiment, is expelled by heat, in order to facilitate the farther analysis; and in general also, it is of advantage to reduce the volume

of the water by evaporation, as the operation of tests becomes then much more sensible than under a state of great dilution.

Sulphuric acid, in any state of combination in a mineral water, is discovered with great delicacy by muriate of barytes, the barytes attracting it, and forming a compound not sensibly soluble, the production of which, therefore, gives rise to a turbid appearance, and precipitation. The only fallacy that requires to be guarded against is, that the same apparent results may be produced by carbonic acid present in the mineral water, either in a free or combined state; but this is easily discovered by the precipitation or turbid appearance being removed, by the addition of a few drops of nitric acid, or not appearing if this has been added to the mineral water previous to the addition of the muriate of barytes. Other tests of sulphuric acid have been employed, such as superacetate of lead, and nitrate of mercury; but these are both less dilicate and less accurate.

Muriatic acid is detected by nitrate of silver, the oxide of silver combining with the muriatic acid, and forming an insoluble compound, which gives to the water first a bluish white turbid appearance, and ultimately precipitates. This test is extremely delicate, or detects the most minute quantity of muriatic acid, and in any state of combination whatever. But it is liable to fallacies, against which it is necessary to guard. The principal of these arise from the presence of carbonic acid or sulphuric acid, either of these giving rise likewise to milki-

ness and precipitation on the addition of the solution of silver. The operation of carbonic acid is prevented by previously adding a little pure nitric acid to decompose any carbonate: that of sulphuric acid can be obviated only by removing it by the previous addition of nitrate of barytes, as long as any precipitation is induced. If, on adding to the transparent fluid, after these preliminary experiments, the nitrate of silver, any milkiness is produced, this indicates the presence of muriatic acid. Sulphuretted hydrogen gives a precipitate with this test; but the nature of this is, from its dark colour, sufficiently evident.

Carbonic acid, in a combined state, is detected by muriate of barytes producing a turbid appearance, and a precipitation, which are removed by the addition of a few drops of nitric acid. Waters containing any considerable impregnation, either of alkaline or earthy carbonates, sensibly affect the vegetable colours, changing, when there is no excess of carbonic acid, or when this is removed by ebullition, the colour of Brazil wood, which is red, to a tint of blue, or restoring the blue tint of litmus which had been reddened by the addition of a little vinegar. When the water is considerably reduced by evaporation, a sensible effervescence is excited on the addition of an acid; and during the evaporation, the earthy carbonates are precipitated, while the alkaline carbonates remain dissolved, and are discovered by their power of changing the yellow colour of turmeric to a brown.

These acids are usually combined with soda, lime or

magnesia; and to complete the analysis by the application of tests, these bases must be discriminated.

Lime is detected, with the greatest delicacy of effect, by oxalic acid. The acid indeed with which the lime is combined in the water, when evolved by the action of the oxalic acid, is liable to re-act on the precipitate, and retain it in part dissolved; but this may be guarded against by using oxalate of potash. Magnesia is precipitated by the same acid; but this can scarcely give rise to any fallacy, as this precipitation takes place very slowly, while that with lime is immediate.

Magnesia is precipitated by ammonia partially, and by lime water entirely; the principal fallacy to which both tests are liable is, that argil is also precipitated by them, and though this earth is not of very common occurrence in mineral waters, it is occasionally found. The best method of distinguishing them is to dry the precipitate, and boil gently a solution of potash on it, this dissolving argil, but leaving magnesia undissolved. Succinate of ammonia, it has lately been discovered, precipitates argil, but not magnesia. In using lime water as the precipitant, it is necessary to guard against the fallacy that may arise from the presence of carbonic acid free or combined, with which the lime may unite, and form a precipitate: this may be avoided by removing any carbonic acid by the previous addition of a little nitric acid. Any sulphuric acid also that may be present ought to be removed by nitrate of barytes, as it might unite with the lime, and give rise to a precipitate of sulphate of lime.

Soda, which is the alkaline base almost exclusively found in mineral waters, cannot be discovered by any test, such as that by which we discriminate the preceding ingredients. The presence of it, therefore, is inferred, when the analysis discovers acids in the water, which are not uncombined, and which, at the same time, cannot be inferred from the application of tests to be in combination with earthy bases. It is also discovered in its state of combination with any of the usual acids by evaporation, carried so far, that its salts are obtained crystallized. By the same method the other compound salts, those having lime, magnesia, or argil, for their base, are discovered, and hence evaporation is always employed in combination with the use of tests in conducting the analysis of a mineral water. Different substances separate at different stages of the evaporation, according to their degrees of solubility: the earthy carbonates are usually first precipitated, afterwards the earthy sulphates, at least the sulphate of lime: the clear liquor poured off and allowed to cool, affords the alkaline neutral salts and sulphate of magnesia by crystallization; the muriates of magnesia and lime usually remain dissolved in the residual liquor, and by these separations the analysis is facilitated.

Advantage is also taken of the powers of alkohol, both as a solvent and as a precipitant, to separate these substances. When the water is reduced to a concentrated state by evaporation, the addition of alkohol throws down certain salts, while others remain dissolved; and of those which are precipitated, some are thrown down by a small

quantity of alkohol, or when the evaporation has not been carried far; while others are separated only when the alkohol is added in larger proportion, or when the water is farther evaporated. Thus, sulphate of lime is first precipitated, then carbonate of lime and carbonate of magnesia, afterwards sulphate of soda and sulphate of magnesia, while the muriates in general remain dissolved. In applying the solvent power of alkohol to facilitate the analysis, the water is evaporated to dryness, and this dry matter is submitted to the action of alkohol; the muriates which are present are in general dissolved, while the sulphates and carbonates remain undissolved.

By these operations, too, the quantities of the respective salts contained in a water are determined; the substances separated being either brought to a certain state of dryness, or being dissolved separately in water and crystallized. The quantities are sometimes inferred, too, by estimation from the precipitates afforded by re-agents; the quantity of sulphuric acid, for example, being determined from the weight of the precipitate of sulphate of barytes, obtained by the addition of muriate of barytes; that of muriatic acid from the weight of the precipitate of muriate of silver, obtained by the addition of nitrate of silver; and that of lime from the weight of the precipitate of oxalate of lime; these quantities being inferred according to the composition of these compounds, as they have been determined by the most accurate experiments. In general, these methods require to be combined to insure accuracy, especially with regard to the determination of proportions.

At the same time, it may be doubted, whether the view, which has usually been given with regard to the state in which these substances exist in mineral waters, is just. It has been supposed, that they are dissolved in the water in those forms of binary combination in which they are obtained by evaporation or precipitation; that if muriate of soda, for example, sulphate of magnesia, and carbonate of lime are obtained by these methods, the mineral water held these salts dissolved. Of this, however, there is no proof, and the most correct views of chemical affinity rather lead to the conclusion, that the different acids and different bases exist with their affinities balanced, contributing to mutual neutralization, in simultaneous combination, and that these binary compounds are established only by the exertion of the force of cohesion, and are therefore actually formed by the processes by which they are obtained. If this view be just, the only conclusion that can strictly be drawn from the analysis is, that certain acids and certain bases exist in the mineral water, and it may appear to be superfluous to attempt to determine the quantities of the binary compounds. Still, as reducing the estimation to a standard, this is as useful as any other mode: it corresponds more directly with the results of the experiments which have been hitherto made, and we can, if necessary, infer from the quantities thus determined of the secondary compounds, the proportions of the primary principles.

Saline Mineral Waters are usually aperient, the substances which they hold dissolved being either so far as

can be determined inert, such as the sulphate and carbonate of lime, or being cathartic, as the greater number of the other compound salts. It has always been remarked, too, with regard to them, that their cathartic power is greater than could be supposed from the extent of their saline impregnation, as determined by analysis;—a proof of the influence of dilution in the operation of mineral waters. They are usually employed in diseases where it is of advantage to stimulate the digestive system, the intestinal canal, and the secreting organs connected with it, or where advantage is derived from moderate and continued evacuations. Hence their celebrity in the treatment of some forms of dyspepsia and hypochondriasis, chlorosis, chronic hepatitis, jaundice, and in scrofula. The most noted saline water is that of Sedlitz: that of Seltzer, along with a portion of saline matter, has a large impregnation of carbonic acid, and that of Cheltenham, an impregnation both of carbonic acid and iron.

When these waters are impregnated with carbonic acid, which they frequently are, they become more grateful, and sit easier on the stomach. When they have an impregnation of iron, they acquire tonic powers, and more efficacy as remedies in amenorrhœa, and the other chronic diseases in which this metal is employed.

Sea Water, in strict chemical arrangement, must be regarded as belonging to the class of saline mineral waters, as it holds dissolved merely various neutral salts, chiefly muriate of soda and of magnesia, and sulphate of soda and magnesia, with a little sulphate of lime. It

much exceeds, however, in the extent of impregnation, any common mineral water: the proportion of saline matter varies in different latitudes, according to the temperature, producing greater or less evaporation, and it is liable to be varied by the discharge of large rivers into the ocean. But, on an average, the quantity appears to be about $\frac{1}{19}$, of which, from the experiments of Bergman and Lavoisier, it appears, that about 20 are muriate of soda, 5 muriate of magnesia, 3 sulphates of magnesia and soda, and 1 sulphate of lime. Its medicinal powers are similar to those of the saline mineral waters; from the extent of its saline impregnation, it is more active as a cathartic, and this renders it more stimulating than fresh water as a bath.

IV. Chalybeate Mineral Waters.—These owe their characteristic properties, chemical and medicinal, to an impregnation of *Iron*. The oxide of iron is almost uniformly held dissolved by carbonic acid, the acid being usually in excess; in a few mineral waters, sulphate of iron is present; but these are rare, and are in general too active to be well adapted to medicinal use.

Chalybeate waters have a peculiar styptic taste; they are transparent when taken from the spring, but when exposed for some time to the air, a pellicle forms on the surface, and a quantity, generally minute, of ochry sediment subsides, the water at the same time losing its taste; this change is accelerated by heat.

Iron is discovered, with great facility, by chemical

tests. Prussiate of potash detects it by the blue colour to which it gives rise; infusion of galls by the purple colour which it strikes. The latter test is more delicate than the former, and it is much more accurate; the prussiate of potash being always liable to fallacy, from the difficulty of obtaining it free from iron; hence the infusion of galls, or rather the tincture of galls, ought always to be preferred. The principal circumstance to be remarked with regard to its operation, is, that the purple colour which it strikes, by the gallic acid and tannin of the infusion combining with the oxide of iron, is liable to be altered in its tint by the presence of other substances: alkaline and earthy carbonates in particular render it violet: neutral alkaline salts appear to deepen the purple colour, and sulphate of lime renders the precipitate at first whitish, and afterwards black. Carbonate of lime has a singular effect: if the iron is in a low state of oxidation, it heightens the colour; but when the oxidation is greater, it has the opposite effect; and if the quantity of iron be small, the colour may even not appear on the addition of the test. This fact, discovered by Mr Phillips, enabled him to explain a singular circumstance with regard to the Bath Mineral Water,—that when newly taken from the spring, and while still warm, it gives a purple colour with galls, indicating the presence of iron; while, after exposure for a little time to the air, no colour appears, though no oxide of iron has been precipitated.

By applying the test of galls before and after boiling the mineral water, we are enabled to discover whether

the iron is held dissolved by carbonic or sulphuric acid; the carbonic acid being expelled by the ebullition, and the oxide of iron precipitated, so that after filtration of the liquor when cold, the purple colour does not appear; while the sulphate, though likewise partially decomposed by the ebullition, still so far remains, that a colour not much fainter will be produced. The presence of carbonic or sulphuric acid may also be determined by their usual tests, and sulphate of iron may be obtained by evaporation.

The quantity of oxide of iron may be determined from its precipitation, on exposure to the air; the whole or very nearly the whole of it, when it is combined with carbonic acid, being precipitated, in consequence partly of the escape of the acid, and partly of the iron passing to a higher state of oxidation, so that its attraction to the acid becomes weaker. It has also been estimated from the weight of the precipitate, formed by the addition of prussiate of potash; or, by a more recent and less exceptionable mode, precipitating it by the addition of succinate of soda, and afterwards decomposing the precipitate of succinate of iron, by exposing it to a red heat with a little carbonaceous matter, 100 parts of the oxide obtained by the calcination containing about 70 of iron.

Chalybeate mineral waters are remedies of considerable activity and power. They act as tonics, increasing the strength of the system, raising the force of the circulation, giving tone to the digestive organs, augmenting muscular vigour, and promoting the excretions. They

are of course employed in those diseases in which iron is principally used, amenorrhœa, chlorosis, some states of menorrhagia, leucorrhœa, dyspepsia, scrofula, and various forms of chronic debility. And as iron always succeeds best when given in small doses, and in a state of considerable dilution, the chalybeate waters afford the best form under which it can be prescribed, that which is at once attended with least irritation, and from which the greatest benefit is obtained. The powers of these waters, too, are often aided by the presence of other ingredients. The impregnation of carbonic acid, when it is present in excess, gives them a grateful stimulant quality, which is exerted on the stomach; and saline substances communicate to them an aperient power.

One of the purest chalybeate waters, as will be perceived from the annexed table, is that of Tunbridge. In the celebrated Spa and Pyrmont waters, the impregnation of carbonic acid is so great, as very materially to modify the action of the iron; and in the Cheltenham water, the quantity of active saline matter is such, that it can scarcely be regarded as a chalybeate.

Besides the substances which have been enumerated as forming the preceding classes of mineral waters, there are some principles common to all of them, so as to be occasionally found in those of each class; and there are some also, which are of very rare occurrence, either of which scarcely require more than a concise enumeration.

Atmospheric air is contained in all water that flows at

the surface of the earth, and renders it more grateful and light as drink. It scarcely in its entire state appears to be contained in more than the usual proportion in any mineral water, while in those in which other elastic fluids are present in large quantity, it is probably deficient. Neither does it appear that *Oxygen* gas is ever present in a proportion larger than that in which it exists, as a constituent of the atmospheric air in water. The fact, rather singular, has been established, however, that *Nitrogen* gas is afforded by mineral springs. It had often been observed, that, in the mineral spring at Buxton, a quantity of elastic fluid was discharged with the water, and a portion escaped on exposure from the water itself. This was supposed to be carbonic acid; but Dr Pearson discovered it to be nitrogen gas, mixed with a little atmospheric air, the volume of air amounting to about $\frac{1}{64}$ of the water. It was afterwards discovered by Dr Garnet in the mineral waters of Harrowgate.

Sulphurous acid gas has been found in some hot mineral waters in the neighbourhood of volcanoes, but is scarcely to be looked for in any other situation. The *Mineral acids* have likewise, though rarely, been found uncombined, or at least in excess. *Sulphate of Argil* and *Sulphate of Iron* sometimes occur, arising probably from the oxygenation of aluminous slate impregnated with sulphuret of iron, through which the water has passed. *Muriate of Manganese* has been detected in minute quantity. Lastly, *Silex* exists in solution, especially in hot springs. It is deposited abundantly from the water of the Geyser fountain in Iceland. It is dissolved in the water of the hot

springs of Carlsbad, and Dr Gibbes found it in the Bath waters.

The temperature of mineral waters gives rise to a very important distinction among them. The greater number are at the average annual temperature of the place where the spring is situated; others are considerably superior to this, or are positively warm. This modifies their powers. The warmth of the tepid waters renders them rather more stimulating when swallowed, a glow of warmth being felt in the stomach, and sometimes the head is slightly affected. Externally applied under the form of the bath, the temperature has even a more important influence on their operation, than any impregnation they may have. In some celebrated mineral springs, the salutary powers appear to depend principally or entirely on the temperature, and on the water acting as a diluent, as in the warm mineral waters of Bristol, Matlock, and Buxton, and in the cold spring of Malvern.

In the following table is presented the results of the analysis of the most celebrated mineral waters. I have arranged them as nearly as possible according to the preceding classes, though there is considerable difficulty with regard to some of them, which, from the substances they hold dissolved, belong to one class as well as to another. Thus the Spa and Pyrmont waters belong both to the classes of carbonated and chalybeate waters. I have placed them under the former, as the impregnation of carbonic acid is so very considerable, and gives them perhaps their most important properties. Cheltenham wa-

ter may be placed either as a saline or as a chalybeate water. I have given it the former rank, as the saline matter appears to give it its principal activity. To the four established classes I have added a fifth, those of Pure Waters, or waters so free from any foreign matter that their operation must be ascribed to the fluid acting partly by its temperature, and partly as a diluent. In some of these the analysis indicates a certain portion of foreign matter. But the substances are in general not different from those in common spring water, and are in smaller quantity. I have therefore supposed that they may be arranged under this class, nor have they any of the active powers of the others. There is some difficulty in assigning the place of one of the most celebrated mineral waters, the Bath Water. I have placed it, however, at the head of the pure waters, and immediately after the chalybeate waters, as the impregnation of active matter is inconsiderable, and its operation seems principally dependent on dilution and temperature, modified a little perhaps by the tonic quality of the small portion of carbonate of iron. I have inserted the latest analysis of it, that by Mr Phillips. With regard to the temperature, I have thought it sufficient to add the epithet cold, where the temperature is not above that of the external atmosphere; where it exceeds this, I have added the precise degrees. The proportions of the ingredients are those contained in a wine gallon of the water.

WATERS.		Nitrogen.	Carbonic acid gas.	Sulphuretted hydrogen gas	Carbonate of Soda	Carbonate of Magnesia.	Carbonate of Lime	Sulphate of Soda.	Sulphate of Magnesia.	Sulphate of Lime	Muriate of Soda.	Muriate of Magnesia.	Muriate of Lime	Oxide of Iron.	Silex.	Temperature.
			cub. in.	cub. in.	grains.	grains.	grains.	grains.	grains.	grains.	grains.	grains.	grains.	grains.	grs.	
Carbonated.	Seltzer,		138		32	40	24				140					Cold.
	Pyrmont,		208			80	34.8		44.5	68.6	12.4			4.5		Cold.
	Spa,		104		11.7	35.3	11.7				1.37			4.5		Cold.
	Carlsbad,		32 to 50		39		12	70			34.6			0.125	2.5	165°
Sulphureous.	Harrowgate,	7	8	19		5.5	18.5		10.5		615.5	91	13			Cold.
	Moffat,	4	5	10							36					Cold.
	Aix le Chap,			Supersulphuretted hydrogen.	90		38				40					143
Saline.	Sedlitz,		8			21	6.7		1444	41.1		36.5				Cold.
	Cheltenham,	12.	30.3	3		12.5		480		40	5	12.5		5		Cold.
	Plombieres,				4.4		1	4.7			0.5				2.6	
Chalybeate.	Tunbridge,	5	10.6							1.25	0.5	2.2		1 Sulphate of Iron.		Cold.
	Brighton,		18							32.7	12.2	6		11.2	1.12	Cold.
Pure.	Bath,		9.6				6.4	12		72	26.4			.016	1.6	116
	Buxton,	2					10.5			2.5	1.7			0.25		82°
	Bristol,		30				13.5	11.2		11.7	4	7.25				74°
	Matlock,															66°
	Malvern,															Cold.

The practicability of imitating the mineral waters has engaged the attention of Chemists. With regard to the active saline waters, it is easily done, by dissolving the due proportions of the compound salts in water corresponding to the analysis of the water designed to be imitated. We may also impregnate the solution with carbonic acid gas, and even with sulphuretted hydrogen; and by the medium of carbonic acid, it might receive an impregnation of iron. Directions for conducting these processes have been given by Bergman. But in all these cases, there will be wanting the confidence on the part of the patient in the efficacy of the artificial water, which, if not necessary to its success, is at least requisite to its continued and regular use: the external advantages too, attending the visit to a mineral spring, may not always be obtained. Hence these artificial waters, designed as substitutes for the natural ones, have never been established in use. Water, impregnated with carbonic acid, with the addition of an alkaline carbonate, which is now in general use, may be considered as operating on a similar principle; and to this super-carbonated soda, or super-carbonated potash water, a small quantity of any of the purgative salts is often added with advantage, communicating to the water an aperient quality, while the taste of the salt is covered, and it is rendered more grateful to the stomach.

II. OF THE GASES EMPLOYED AS REMEDIES.

Substances existing in the aërial form might *a priori* be supposed capable of producing important effects on the system, as by respiration they are brought to act directly on the mass of blood, and induce in it chemical changes. They occasion too immediate and important alterations in the functions of life, some of them producing the highest excitement, others occasioning depression and exhaustion of power.

Though the expectations that were at one time formed, with regard to their medicinal efficacy, have not been realized, and the use of them has now been nearly relinquished; yet since they are capable of producing such changes in the state of the functions, and of the general system, and since the proposition must be admitted, that every substance possessed of these powers may be capable of producing medicinal effects, they ought not to be entirely lost sight of, or be discarded from the Materia Medica. In the aërial kingdom, we have actually the two extremes of Stimulant and Sedative Power, in the examples of nitrous oxide and carburetted hydrogen.

The modes of preparing these gases are, in a great measure, peculiar to each of them. The manner of administering them is nearly the same. They may be breathed from a jar placed in water; but this is laborious,

from the effort required to sustain the column of water within the jar. This may be partly remedied, by poising the jar in water, or, more completely, by breathing from the gazometer. But the easiest mode is, for the patient to breathe the gas from a silk bag, to which a tube with a stop-cock is affixed.

The gases that have been employed in medicine, may be considered under the divisions of those which *excite*, and those which *depress* the functions of life. To the former order belong,

Gas oxygenium. Oxygen Gas.
Gas oxidum nitrosum. Nitrous Oxide Gas.

Oxygen gas is procured from black oxide of manganese by heat. A quantity of the oxide is put into an iron retort, connected by a tube with a gas holder, or a large jar filled with water, inverted and placed on the shelf of the pneumatic trough. The retort is exposed to a full red heat; at this temperature the affinity of the oxygen to the manganese is so far weakened by the repulsive agency of the caloric, that a large portion of it is separated from the combination, and assumes the elastic form: the gas is transmitted through water, and is allowed to stand over it for some hours before it is breathed.

As oxygen is so immediately necessary to the support of life, it might be supposed, that when afforded in a more pure and concentrated state than that in which we breathe it in atmospheric air, it would prove a salutary agent of no inconsiderable power. To this inference,

however, independent of any experience, an objection occurs, founded on some experiments made by Lavoisier, and repeated by Davy, which appear to prove, that when animals are supplied with pure oxygen, or with oxygen mixed with a portion of atmospheric air, less of it is actually consumed than in ordinary respiration. This result appears, however, to have arisen from some fallacy in the experiments. Seguin, in subsequent experiments, found that the consumption of oxygen gas, when it is breathed pure, is at least equal to its consumption in ordinary respiration. And more lately, Messrs Allen and Pepys have found that in breathing pure oxygen gas, more of it is consumed in a given time, and more carbonic acid formed, than in breathing atmospheric air; they also observed a diminution in the volume of air, or the disappearance of a portion of it; whence they inferred, that, when oxygen is breathed pure, a quantity of it is absorbed by the blood. The positive action of oxygen, in the respiration of it, in its undiluted form, is also shewn by the effects which result from its inspiration, and still more unequivocally by the fact ascertained by Priestley, Lavoisier, and Davy, that animals confined in air, with an increased proportion of oxygen, die before it is exhausted, and even while the air which they breathe contains more oxygen than common air, and can enable another animal to live. It is obvious, therefore, that the animal dies not from deprivation of oxygen, but from some positive power the gas exerts, and probably, as may

be inferred, from some appearances which present themselves, from its too highly stimulating power.

Oxygen, when respired, acts partly by communicating a stimulating quality to the blood, by which the left side of the heart and the arterial system are excited to action: hence, when its supply by respiration is suspended, the contractions of the heart become feeble, and at length cease, as Goodwyn demonstrated. The phenomena of asphyxia from its abstraction, prove that it likewise exerts some other operation more immediately subservient to the functions of life; for in that disease the functions of life are suspended, while the contractions of the heart still continue, to a certain extent, as the experiments of Coleman have shewn.

The diseases in which oxygen gas has been administered, are principally those of chronic debility,—chlorosis, asthma, scrofula, dropsy, paralysis, and some cutaneous affections. It requires to be diluted with from ten to twenty or more parts of atmospheric air, increasing the proportion of oxygen according to the effects produced. From one to two quarts of oxygen are given, by breathing it in its diluted state, at intervals, in the course of the day. It generally increases the force and velocity of the pulse.

Nitrous oxide gas.—This gas, a compound of oxygen and azote, in the proportion of 37 of the former to 63 of the latter, is most economically obtained, and in greatest purity, from the decomposition of nitrate of am-

monia by heat. When this salt is exposed to a temperature about 400° of Fahrenheit's scale, its principles react on each other, and enter into new combinations. The hydrogen of the ammonia attracts part of the oxygen of the nitric acid and forms water; and the remaining oxygen combining with the azote, both of the acid and of the ammonia, forms this particular compound, nitrous oxide, which is disengaged in the gaseous form. After its production it requires to stand some hours, to deposite a small portion of saline matter, before it is fit to be breathed.

The effects of nitrous oxide gas on the system, when it is respired, are scarcely analogous to those of any other agent. The excitement which it produces is extended to the functions of body and mind with more rapidity and force than that arising from the action of the most powerful stimulants. It is accompanied, too, with effects as various as they are peculiar; it excites usually a peculiar thrilling of the body, with feelings of pleasure not easily described: muscular vigour is increased, so that unusual exertions are made with alacrity and ease, and there is even an irresistible propensity to strong muscular exertion; the mind is also affected: there is usually a high degree of exhilaration, yet even when this is greatest, perfect consciousness remains. What still more marks the singularity of its operation, this high excitement of the functions of life and exhilaration of mind are not followed by proportional languor or debility; the state of the system gradually returns to the healthy standard,

without any apparent waste of power. A substance capable of acting in such a manner, we might suppose, would prove one of our most valuable remedies. The transient nature of its operation must undoubtedly limit its medicinal efficacy; but still, in diseases of extreme debility, we seem justified in expecting from its administration the most beneficial effects. It has not, however, been very extensively employed. In paralysis it has been used with advantage. In diseases of increased sensibility, it may prove hurtful; and when breathed by delicate females, it has, in more than one case, induced hysteric affections. The dose which is requisite to produce its peculiar effects varies from four to nine quarts, which may be breathed pure or diluted with an equal part of atmospheric air. It cannot be breathed undiluted for more than four minutes and a half, insensibility being induced. And it requires to be attended to in its administration, that its effects are considerably different in different individuals. On some, its operation has even been productive of unpleasant consequences, — palpitation, fainting, and convulsions.

Nothing satisfactory can be said as to its mode of action, since we know so little of the connection which subsists between the phenomena of life and the chemical changes which are carried on in the system. The experiments of Mr Davy appear to prove, that it is absorbed by the blood when respired; but, admitting this, we can discover nothing connected with its composition or chemical agency which can lead us to any explanation of its

peculiar effects. We can therefore only mark the dissimilarity of its operation to that of any other physical agent.

UNDER the second subdivision of the Gases,—those which depress the functions of life, might probably be placed all the substances existing in the aërial form, oxygen and nitrous oxide excepted. The following are those which have been medicinally employed:

GAS HYDROGENIUM. Hydrogen Gas.
GAS NITROGENIUM. Nitrogen gas.
GAS ACIDUM CARBONICUM. Carbonic Acid Gas.
GAS HYDROGENIUM CARBURETUM. Carburetted Hydrogen Gas.

HYDROGEN GAS is most easily procured by the action of diluted sulphuric acid on iron or zinc; but as a little acid vapour might be diffused through it, it has been supposed preferable to obtain it, when it is designed to be breathed, by passing water in vapour over pure iron heated to the temperature of ignition. The iron attracts the oxygen of the water, and the hydrogen assumes the aërial form.

Hydrogen gas received into the lungs does not appear to exert any positive deleterious power: all its effects seem referable merely to the exclusion of oxygen. The respiration of it can accordingly be continued for some time, if it is mixed with a portion of atmospheric air,

without any deleterious effect. In a pure state, however, if the ungs have been previously emptied as much as possible of atmospheric air, it cannot be breathed but for a very short time. It quickly occasions a giddiness and sense of suffocation; the countenance becomes livid, and the pulse sinks rapidly, and a state of insensibility is soon induced. When diluted with two-thirds or an equal part of atmospheric air, it can be safely breathed; nor does it appear to produce any very important effect. It occasions some diminution of muscular power and sensibility, and a reduction of the force of the circulation. It has been respired, diluted usually with four or five parts of atmospheric air, in catarrh, hæmoptysis, and phthisis; but its powers seem merely those of a palliative, dependent on the partial exclusion of the stimulating power of oxygen.

Nitrogen.—What has been said of hydrogen applies likewise to nitrogen. It seems to exert no positive action on the system, but to produce any effects arising from its inspiration merely by excluding oxygen. As it is not so easily obtained pure as hydrogen gas, it has scarcely, if at all, been employed.

Carbonic acid gas.—This gas is easily procured from the action of diluted sulphuric or muriatic acid on carbonate of lime (chalk or marble); but to obtain it in a proper state of purity for breathing, it is preferable to decompose the carbonate of lime by exposure to a strong

red heat in an iron bottle. The carbonic acid which is disengaged is collected over water, as it is not immediately largely absorbed by that fluid, and any vapour diffused through it is speedily condensed.

This acid gas, when it is inspired, proves more speedily fatal than nitrogen or hydrogen. It appears, from Mr Davy's experiments on its respiration, to excite spasmodic contraction of the epiglottis, so as to induce suffocation; and it has this effect, even when diluted with nearly an equal part of atmospheric air. Yet the operation of it is more speedily fatal than that of any other agent that acts by occasioning merely suffocation, which would lead to the supposition, that it acts by some positive power,—a supposition confirmed too by the fact, that in animals, in whom the symptoms of life have been suspended by its respiration, the irritability of the heart is entirely destroyed.

The respiration of carbonic acid gas was employed at an earlier period than that of the other gases, and sanguine expectations were formed of it as a remedy in phthisis. In the many cases, however, in which it has been tried, though it frequently proved useful for a time, by lessening the expectoration, diminishing the hectic fever, and acting as an anodyne, there is little evidence of its having ultimately effected a cure. The difficulty, indeed, of employing this and all the other gases, is, that of obtaining their continued operation. In that state of disease existing in the lungs, in the earlier stages of phthisis, much advantage, for example, might probably be derived

from the continued respiration of a reduced atmosphere, while little can be expected merely from its occasional operation. Carbonic acid gas, when employed, was respired diluted with four or six parts of atmospheric air.

Carbonic acid has likewise been employed as a local application to cancer and painful ulceration, and has at least been serviceable as a palliative. A stream of it is directed on the part by means of a flexible tube, taking care to transmit the gas previously through water, if it has been obtained by the action of an acid of carbonate of lime, and confining it for some time over the sore by a funnel connected with the tube. A cataplasm, formed of substances in a state of fermentation, has, in some measure, a similar effect, and is more convenient in its application. A formula for this preparation has now a place in the London Pharmacopœia.

Carburetted hydrogen gas.—The gas which has been used in medicine under this name is obtained by passing the vapour of water over charcoal at the temperature of ignition, in an iron tube. The oxygen of the water unites with one part of the charcoal, forming carbonic acid; the hydrogen combines with another part of it, and forms this species of carburetted hydrogen. The carbonic acid is abstracted by agitating the gas in lime water.

This is the most active of those gases which operate by depressing the functions of life, and is perhaps the most powerful agent of this kind. Even when largely diluted

with atmospheric air, it occasions immediate vertigo, sickness, diminution of the force and velocity of the pulse, reduction of muscular vigour, and in general every symptom of diminished power. It can scarcely be breathed in an undiluted state. Mr Davy found, that at the third inspiration, total insensibility was induced, and symptoms of extreme debility continued for a considerable time. These effects prove its positive deleterious agency.

As a medicinal agent, it is the gas of which the evidence in favour of its efficacy is greatest. In phthisis, in many cases, it unequivocally relieved the symptoms, and at least arrested the progress of the disease; and in diseases of increased action or increased power, much benefit might, from its known operation, be expected from its use. Much caution was found to be requisite in the trials that were made of it, with regard to the dose. At first, one pint of the carburetted hydrogen gas, diluted with twenty parts of atmospheric air, may be respired; the quantity may be slowly increased, and with less dilution, taking care to avoid the production of great vertigo or muscular debility. Not more than from two to four quarts can be taken in the day, even when the patient has been accustomed to it for some time. It is always more powerful when recently prepared, than when it has been kept for some days, a circumstance requiring to be attended to in the regulation of its dose.

An application of the aërial fluids connected with medicine, is that of neutralizing or destroying noxious or contagious effluvia. These effluvia are probably evolved by chemical processes, and must consist of principles in forms of combination subject to chemical agency. It has accordingly been found, that the air of places offensive from the presence of such effluvia is corrected, and its freshness restored, by the diffusion of those acid gases, the operation of which, in changing the chemical constitution of compound elastic fluids, is most powerful. These are Oxy-muriatic Acid Gas and Nitric Oxide Gas. The power of the former in producing these effects appears, from the evidence brought forward by Guyton, to be unquestionable: considerable benefit appears, likewise, from the reports of Dr Carmichael Smyth, to be derived from the latter. It is however probably inferior to the oxy-muriatic acid gas in activity; but it has the advantage, that fumigation with it in the wards of an hospital, or in similar instances, may be had recourse to without the removal of the sick. The one is disengaged from a mixture of muriate of soda, black oxide of manganese, and sulphuric acid; the other from nitre and sulphuric acid, the mixture being put in small earthen cups, and a moderate heat applied to favour the disengagement of the gas.

ELECTRICITY.

The medicinal operation of electricity may be referred to its stimulating power. It produces forcible contractions in the muscular fibre; excites therefore to action, if duly applied, and, when in excess, immediately exhausts irritability. It possesses the important advantages of being easily brought to act locally, and of being confined to the part to which it is applied, without at all affecting the general system, while it can also be employed in every degree of force.

Electricity is applied medicinally under the form of the stream or continued discharge of the fluid, under that of sparks, and under that of a shock; the first being the most gentle, the second being more active, and the last being much more powerful than either of the others. The stream is applied by connecting a pointed piece of wood, or a metal wire, with the prime conductor of the electrical machine, and holding it by an insulated rod one or two inches distant from the part to which it is to be directed. A very moderate stimulant operation is thus excited, which is better adapted to some particular cases than the more powerful spark or shock. The spark is drawn either by applying a metallic knob connected with

a rod in communication with the machine, the operator holding it by a glass handle; or by placing the patient on an insulated stool connected with the prime conductor, and, while the machine is worked, bringing a metal knob within a short distance of the part from which the spark is to be taken; a sensation somewhat pungent is excited, and slight muscular contractions may be produced; these effects being greater or less, according as the spark is more powerful, this being regulated by the distance at which the knob is held, if the machine be sufficiently in action. The shock is given by discharging the Leyden phial, making the part of the body through which it is intended to be transmitted part of the circuit. The shock is of course stronger as the phial is large, and as it is fully or partially charged; the sensation it excites is unpleasant, and the muscular contractions considerable, if it is of moderate intensity.

At the first introduction of electricity as a remedy, it was very highly celebrated for its efficacy in a number of diseases; its use is now confined to a few. In paralysis it is not unfrequently had recourse to, to excite muscular contraction, and perhaps with some advantage. It is usually applied under the form of sparks, the application of it requiring to be continued daily for a considerable time. Sometimes moderate shocks are also employed; but the propriety of this practice is somewhat doubtful. In amenorrhœa, as the stimulant operation can be excited, in some measure, in the vessels which are affected, advantage may be derived from electricity; and it is oc-

casionally used, both under the form of sparks taken from the pelvis, and that of moderate shocks transmitted thro' it. Ophthalmia, and some other varieties of inflammation, have been removed by the electric stream; it has also sometimes succeeded in discussing tumors, and relieving pain. The general rule for the medical employment of electricity is to apply it at first under the milder forms, and gradually to raise it, if necessary, to the more powerful, taking care only not to employ it in too high a state of intensity, but in the greater number of cases rather to expect advantage from its continued and moderate use. In the treatment of paralysis, for example, by the application of electricity, the only rational indication is to excite moderate muscular action with the view of increasing the muscular power; to this, sparks of sufficient strength are adequate, and in employing shocks, there is always some risk of exhausting the irritability of the part through which they are transmitted.

GALVANISM.

THE peculiar power which is generated when two metals moistened or acted on by certain chemical liquids are in contact, at first named Animal Electricity, since Galvanism, has been applied as a remedy in various morbid affections. Its effects on the animal system are such as warrant this application. Its activity is shewn by its exciting, when applied in sufficient intensity, strong sensations in sensible parts, and powerful contractions in parts endowed with irritability.

Between galvanism and electricity there are so many points of resemblance, that they have been considered as ultimately the same power, and there is every reason to admit their identity. Still from the different states in which they exist, their effects on living matter are not precisely similar. The sensation which galvanism excites, though somewhat analogous to that produced by electricity, is still dissimilar; and the action of galvanism appears to be more extended, both to the nervous and muscular systems, than that of electricity, which is more local in its action. The galvanic excitation produces sensations and contractions in parts, which, from disease, or temporary suspension of power, are not sensible to electrical impressions; and the stimulant power which

both exert, appears in galvanism to be greater in proportion to its intensity than in electricity; or the sensations and muscular contractions which the galvanic discharge excites, are more than proportional to its power of producing electrical phenomena. Hence it is the most delicate test by which the presence of irritability can be detected.

The diseases in which galvanism has hitherto been employed, are principally those of the nervous kind. In paralysis, it has been affirmed to have restored the capability of muscular contraction, and consequently the power of motion. Cases of chorea, tetanus, and some other spasmodic affections, have been related, in which perfect cures were accomplished by its application. It appears, in several instances, to have relieved deafness, particularly that species of it arising from torpor of the auditory nerve; and it has been successful in discussing indolent tumors. The transient nature of the operation is, with regard to it, as well as electricity, an obstacle to their advantageous application.

Galvanism is applied by connecting two metallic wires with the two extremities of a galvanic battery, and bringing them in contact with the part affected, so that it shall form part of the circuit of the galvanic discharge: the one wire is kept in contact with the part it touches; the other is alternately applied for a moment, and removed, and this is continued for some time. If the skin is moistened, the galvanic influence is communicated more readily and effectually; and still more so if a small piece

of metallic leaf, as tinfoil, be laid on the parts to which the wires are applied. Sometimes even the cuticle has been previously removed by a blister, but the application of the galvanism is then attended with pain, and this is altogether unnecessary, if a galvanic apparatus of sufficient power be employed. One constructed of plates of zinc and copper, four inches square, and including from 25 to 50 of each metal, is sufficient for the greater number of purposes, a greater or less number of the plates being included in the circuit, according to the strength of the application required. The liquid best adapted to excite it is a solution of muriate in soda, with a little muriatic acid; diluted nitric acid, though rather more powerful, having its power sooner exhausted.

ON MEDICAL PRESCRIPTIONS.

THE principal objects designed to be attained by the Composition of Medicines, are, to communicate an agreeable taste or flavour; to give a convenient form; to correct the operation of the principal medicine, or obviate some unpleasant symptom it is liable to produce; to promote its action, by the substance combined with it exerting one of a similar kind; to obtain the joint operation of two remedies, which have different powers, but which may be required to obviate different morbid symptoms present together; or, lastly, to change their usual effects, and obtain a remedy different from either, by the power which one may have of modifying the action of another.

A prescription has been usually divided into four parts, which compose it,—the *basis*, or principal ingredient of the prescription; the *adjuvans*, or that which is designed to promote the action of the former; the *corrigens*, or that intended to correct its operation, or obviate any unpleasant symptom which it may be apt to produce; and the *constituens*, or the substance which gives to the other ingredients consistence or form. These are not necessarily present in every formula, as some of these purposes may not require to be attained; nor is the division of

much importance, except perhaps as affording the best general rule for regulating the order in which the ingredients of a prescription should be enumerated, the order being conformable to that which corresponds with this arrangement.

The following are the principal circumstances to be attended to in forming a prescription.

1*st*, Simplicity should be attained, so far as is consistent with the objects of the prescription. Nothing ought to enter into the composition which does not add to its virtue, render it less ungrateful, give it a convenient form, or which is not necessary to conceal any particular ingredient; and, in general, the practice of accumulating a number of articles in one prescription is to be avoided, as there is always the risk of one counteracting or modifying the action of another, and the addition of less active substances can do little more than add to the bulk of the medicine, or cause it to sit uneasy on the stomach.

2*dly*, Substances, it is evident, ought not to be mixed together, which are capable of entering into chemical combination, or of decomposing each other, unless it be with the view of obtaining the product of the combination, or decomposition, as a remedy.

3*dly*, Those mixtures are also to be avoided, in which one medicine, by its peculiar action on the stomach or general system, modifies and changes the action usually exerted by another, unless where the object is to obtain the effects of that modified operation.

4thly, The error of contra-indication is to be guarded against, or those medicines ought not to be combined, the virtues of which are not merely different, but are, in some measure, opposed to each other,—an error not very likely to occur with regard to the principal ingredients of a prescription, but which may happen with regard to those of inferior importance.

5thly, The ingredients which are to be mixed, must be such as will mix properly together, so that the form in which the remedy is designed to be exhibited may be easily obtained and preserved.

Lastly, The form under which a medicine is prescribed must be adapted to certain circumstances; principally to the nature of the disease, the nature of the remedy itself, and, as far as can be conveniently attained, to the taste of the patient. Those medicines which are nauseous, which operate in a small dose, or which are designed to operate slowly, are usually given under the form of pill, or sometimes of bolus. Those which are less ungrateful, or the operation of which is designed to be immediately obtained, are given under some liquid form. Tinctures always require to be diluted: infusions or decoctions may in general be given in the state in which they are prepared.

The Doses of Medicines are not reducible to any general rules, from their general similarity of operation, or any other circumstance, and are therefore specific with regard to each substance. But there are certain general circumstances by which their operation is influenced, which require to be attended to in apportioning the dose. These are, Age, Sex, Temperament, Idiosyncrasy, Habit, and Disease.

Age.—From infancy to manhood, a larger dose of any medicine is requisite to produce its effect, in proportion to the advance in life. From manhood to old age, there is a similar gradation with regard to diminution of dose, though in a much less proportion than that which regulates the increase. The following table given by Gaubius has been supposed to shew these proportions.

TABLE.

Let the dose for a person of middle age be 1 or 1 drachm.

For one from xiv to xxi years, it will be	- - -	$\frac{2}{3}$ or 2 scruples.
———	vii to xiv,	— $\frac{1}{2}$ or half a dr.
———	iv to vii,	— $\frac{1}{3}$ or 1 scruple.
——— of	iv years of age,	— $\frac{1}{4}$ or 15 grains.
———	iii ———	— $\frac{1}{6}$ or half a scr.
———	ii ———	— $\frac{1}{8}$ or 8 grains.
———	i ———	— $\frac{1}{12}$ or 5 grains.

Sex.—Women, in general, require smaller doses of any medicine than men,—a difference which is probably owing principally to their greater sensibility from their habits of life.

Temperament.—By temperament is understood a predisposition, derived from original conformation, to be affected in a more peculiar manner by external causes acting on the system; and much laborious investigation has been bestowed in distinguishing the different temperaments, and the diversities to which they give rise. Those of the sanguine temperament are supposed to be more affected by medicines, and therefore to require smaller doses than those of the phlegmatic or melancholic; but in what has been said on this subject there is so much uncertainty and hypothesis, that little reliance can be placed on it.

Idiosyncrasy.—This denotes that disposition in individuals, unconnected with general temperament, to be affected by certain causes, in a manner different from the generality of mankind. Such idiosyncrasies are observed with regard to medicines, as well as to other agents, and, where they are known, may require to be attended to by the prescriber.

Habit.—This has an important influence on the operation of medicines. In general, they lose part of their power by having been long continued, and the doses of them, therefore, require to be enlarged under their protracted use. This is particularly the case with all strong stimulants and narcotics, and is even observed, to a certain extent, in some of the other classes of the Materia

Medica. In a few instances, the reverse has been supposed to hold true, as for example with regard to the saline cathartics.

Disease.—This has an influence on the doses of medicines not less important; the susceptibility to external impressions, and to action, being much varied in morbid affections, and the operations of remedies of course being modified by such variations. The state of susceptibility being in general apparent, when it varies much from the healthy standard, the doses of the medicines administered are regulated accordingly, and this, it is obvious, admits of no general observations, as being entirely dependent on the nature and state of disease.

TABLES

OF

CHANGED NAMES.

TABLES

OF

CHANGED NAMES

IN

THE NEW EDINBURGH AND LONDON PHARMACOPOEIAS.

In drawing up these Tables, it has not been thought necessary to insert the names of the Simple Medicines, as both the proper names of the articles, according to the nomenclature of natural history, and their common or trivial names, are inserted in the index to the work; and thus the old or the new name of any simple substance may be easily found. In these Tables, therefore, the names of the Compound Medicines only are inserted, and the catalogue of them has been extended so far as to include not only the synonyms inserted in the present editions of the London and Edinburgh Pharmacopœias, but a number of older names, once generally established, and still occasionally used. I ought, in the body of the work, to have referred to the very just and forcible observations of Dr Bostock, (Remarks on Pharmaceutical Nomenclature), on the inconvenience attending the innovations in the established language of Materia Medica and Pharmacy, as well as the impropriety of too strict an adherence to the nomenclature of chemistry, and of the adoption of the language of natural history, in the extent to which this has been carried by the Colleges in the late editions of their Pharmacopœias.

TABLE I.

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Acetum distillatum	Acidum acetosum distillatum	Acidum aceticum
Acidum vitriolicum	——— sulphuricum	——— sulphuricum
Ærugo æris	Sub-acetis cupri	Sub-acetas cupri impura
Æthiops mineralis	Sulphuretum hydrargyri nigrum	
Æther vitriolicus	Æther sulphuricus	Æther sulphuricus
Alkali fixum fossile	Soda	Soda
——— —— vegetabile	Potassa	Potassa
——— volatile	Ammonia	Ammonia
Alumen	Sulphas aluminæ	Super-sulphas aluminæ et potassæ
Ammonia præparata	Carbonas ammoniæ	Ammoniæ carbonas
Antimonium	Sulphuretum antimonii	Antimonii sulphuretum
——— præparatum	——— —— præparatum	
Antimonium calcareo-phosphoratum	Oxidum antimonii cum phosphate calcis	Pulvis antimonialis
——— muriatum	Murias antimonii	
——— tartarisatum	Tartris antimonii	Antimonium tartarizatum
——— vitrificatum	Oxidum antimonii cum sulphure	
Aqua ammoniæ acetatæ	Aqua acetitis ammoniæ	Liquor acetatis ammoniæ
—— ——— causticæ	—— ammoniæ	——— ammoniæ
—— cupri vitriolati composita	Solutio sulphatis cupri composita	
—— fortis	Acidum nitrosum dilutum	Acidum nitrosum dilutum

OLD NAMES. NAMES IN THE ED. PH. NAMES IN THE LOND. PH.

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Aqua lixivia caustica	Aqua potassæ	Liquor potassæ
—— lithargyri acetati		—— plumbi acetatis
—— —— —— —— composita		—— —— —— —— dilutus
—— sappharina		Liquor cupri ammoniati
—— styptica	Solutio sulphatis cupri composita	
	vitrificatum	
Argentum nitratum	Nitras argenti	Argenti nitras
Balsamum canadense	Resina liquida pini balsameæ	Teribinthina canadensis
—— anodynum	Tinctura saponis cum opio	
—— saponaceum	—— saponis	Linimentum saponis compositum
—— sulphuris	Oleum sulphuratum	Oleum sulphuratum
—— traumaticum	Tinctura benzoes composita	Tinctura benzoini composita
Butyrum antimonii	Murias antimonii	
Calaminaris lapis	Carbonas zinci impurus	Calamina
Calomelas	Sub-murias hydrargyri	Hydrargyri sub-murias
Calx hydrargyri alba		Hydrargyrus præcipitatus albus
Causticum commune acerrimum	Potassa	Potassa fusa
—— —— —— mitius	Potassa cum calce	Potassa cum calce
Cancrorum lapilli	Carbonas calcis durior	
Causticum lunare	Nitras argenti	Argenti nitras
Cerussa	Oxidum plumbi album	Plumbi carbonas
Cerussa acetata	Acetis plumbi	—— super-acetas

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Cinnabaris factitia	Sulphuretum hydrargyri rubrum	Hydrargyri sulphuretum rubrum
Confectio cardiaca	Electuarium aromaticum	Confectio aromatica
——— japonica	——— catechu	
Crocus antimonii, vel crocus metallorum	Oxidum antimonii cum sulphure per nitratem potassæ	
Creta preparata	Carbonas calcis mollior	
Cuprum ammoniacum	Ammoniaretum cupri	Cuprum ammoniatum
——— vitriolatum	Sulphas cupri	Cupri sulphas
Crystalli tartari	Super-tartris potassæ	Potassæ super-tartras
Decoctum album		Mistura cornu usti
——— chamæmeli, vel commune	Decoctum anthemidis nobilis	
——— lignorum	——— guaiaci compositus	
——— pro enemate		——— malvæ compositum
——— — fomento		——— papaveris
Elaterium	Succus spissatus momordicæ elaterii	
Electuarium lenitivum	Electuarium cassiæ sennæ	Confectio sennæ
——— thebaicum	——— opiatum	——— opii
Elixir paregoricum	Tinctura opii ammoniata	Camphoræ composita
——— proprietatis	——— aloes cum myrrha	Tinctura aloes composita
——— ——— vitriolicum	——— aloes ætherea	
——— sacrum	——— rhei et aloes	

OLD NAMES. NAMES IN THE ED. PH. NAMES IN THE LOND. PH.

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Elixir salutis	Tinctura cassiæ sennæ composita	Tinctura sennæ
——— stomachicum	——— gentianæ composita	——— gentianæ composita
——— vitrioli acidum	Acidum sulphuricum aromaticum	
Emplastrum adhæsivum	Emplastrum resinosum	Emplastrum resinæ
——— attrahens	——— simplex	——— ceræ
——— cantharidum	——— meloes vesicatorii	——— lyttæ
——— cereum	——— simplex	——— ceræ
——— commune	——— oxidi plumbi semivitrei	——— plumbi
——— lithargyri	——— oxidi plumbi semivitrei	——— plumbi
——— roborans	——— ——— ferri rubri	
——— vesicatorium	——— meloes vesicatorii	——— cantharidis
Emulsio communis	Emulsio amygdalæ communis	Mistura amygdalæ
Extractum catharticum		Extractum colocynthidis compositum
Ferri rubigo	Carbonas ferri præparatus	
——— squamæ	Ferri oxidum nigrum	
Ferrum ammoniatum	Murias ammoniæ et ferri	Ferrum ammoniatum
——— vitriolatum	Sulphas ferri	Ferri sulphas
——— ——— ustum	Oxidum ferri rubrum	
Flores benzoini	Acidum benzoicum	Acidum benzoicum
——— martiales	Murias ammoniæ et ferri	Ferrum ammoniatum
——— sulphuris	Sulphur sublimatum	Sulphur sublimatum
——— zinci	Oxidum zinci	Zinci oxydum

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Hepar sulphuris	Sulphuretum potassæ	Potassæ sulphuretum
Hiera picra		Pulvis aloes cum canella
Hydrargyrus acetatus	Acetis hydrargyri	
——— calcinatus		Hydrargyri oxydum rubrum
——— muriatus corrosivus	Murias hydrargyri	——— oxymurias
——— ——— mitis	Sub-murias hydrargyri	——— sub-murias
——— ——— præcipitatus	——— ——— præcipitatus	
——— nitratus ruber	Oxidum hydrargyri per acidum nitricum	——— nitrico-oxydum
——— præcipitatus cinereus	Oxidum hydrargyri cinereum	——— oxydum cinereum
——— sulphuratus niger	Sulphuretum hydrargyri nigrum	
——— sulphuratus ruber		——— sulphuretum rubrum
——— vitriolatus flavus	Sub-sulphas hydrargyri flavus	
Infusum amarum	Infusum gentianæ compositum	Infusum gentianæ compositum
——— rosarum	——— rosæ gallicæ	——— rosæ
Julepum e camphora		Mistura camphoræ
Kali	Potassa	Potassa
Lac sulphuris		Sulphur præcipitatum
— amygdalæ	Emulsio amygdalæ	Mistura amygdalæ
— ammoniaci		——— ammoniaci

OLD NAMES. NAMES IN THE ED. PH. NAMES IN THE LOND. PH.

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Lac assafœtidæ		Mistura assafœtidæ
—— guaiaci		Mistura guaiaci
Laudanum liquidum	Tinctura opii	Tinctura opii
Linimentum anodynum	Tinctura saponis cum opio	
———— aquæ calcis	Oleum líni cum calce	
———— opiatum	Tinctura saponis cum opio	
———— saponaceum	———- saponis	Linimentum saponis compositum
———— volatile	Oleum ammoniatum	———— ammoniæ sub-carbonatis
Lithargyrus	Oxidum plumbi semivitreum	Plumbi oxydum semivitreum
Lixiva	Potassa	Potassa
Lixivium causticum	Aqua potassæ	Liquor potassæ
———- tartari		——— ——— sub-carbonatis
Magnesia alba	Carbonas magnesiæ	Magnesiæ carbonas
———- usta	Magnesia	Magnesia
———- vitriolata	Sulphas magnesiæ	Magnesiæ sulphas
Mel Ægyptiacum		Linimentum æruginis
—— rosaceum		Mel rosæ
—— acetatum		Oxymel
Mercurius	Hydrargyrus	Hydrargyrus
———— calcinatus		Hydrargyri oxidum rubrum
———— corrosivus sublimatus	Murias hydrargyri	———— oxymurias
———— ———— ruber }	Oxidum hydrargyri rubrum per	———— nitrico-oxydum
———— præcipitatus ruber }	acidum nitricum	

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Mercurius dulcis sublimatus	Sub-murias hydrargyri	Hydrargyri sub-murias
——— emeticus flavus	Sub-sulphas hydrargyri	
——— præcipitatus albus		Hydrargyrus præcipitatus albus
Minium	Oxidum plumbi rubrum	
Natron	Soda	Soda
Nitrum	Nitras potassæ	Potassæ nitras
Oleum teribinthinæ	Oleum volatile pini	Oleum teribinthinæ
Oxymel æruginis		Linimentum æruginis
Philonium Londinense		Confectio opii
Pilulæ cupri	Pilulæ ammoniareti cupri	
——— gummosæ		Pilulæ galbani composita
——— rufi	——— aloes cum myrrha	——— aloes cum myrrha
——— thebaicæ	——— ——— opiatæ	——— saponis cum opio
Potio cretacea	Potio carbonatis calcis	Mistura cretæ
Pulvis antimonialis	Oxidum antimonii cum phosphate calcis	Pulvis antimonialis
Pulvis e bolo compositus cum opio		Pulvis cretæ compositus cum opio
——— cretaceus	Pulvis carbonatis calcis compositus	——— cretæ compositus
——— doveri	——— ipecacuanhæ et opii	——— ipecacuanhæ compositus

OLD NAMES. NAMES IN THE ED. PH. NAMES IN THE LOND. PH.

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Pulvis sternutatorius	Pulvis asari compositus	
—— stypticus	—— sulphatis aluminæ compositus	
Resina alba		Resina pini
Rubigo ferri præparata	Carbonas ferri præparatus	
Saccharum saturni	Acetis plumbi	Plumbi super-acetas
Sal absinthii	Carbonas potassæ	Potassæ sub-carbonas
—- alkalinus fixus fossilis	———- sodæ	Sodæ sub-carbonas
—- alkalinus fixus vegetabilis	———- potassæ	Potassæ sub-carbonas
—- ammoniacus	Murias ammoniæ	Ammoniæ murias
—- ———— volatilis	Carbonas ammoniæ	———— carbonas
—- catharticus amarus	Sulphas magnesiæ	Magnesiæ sulphas
—- ———— glauberi	——— sodæ	Sodæ sulphas
—- cornu cervi	Carbonas ammoniæ	Ammoniæ carbonas
—- diureticus	Acetis potassæ	Potassæ acetas
—- glauberi	Sulphas sodæ	Sodæ sulphas
—- marinus	Murias sodæ	—— murias
—- martis	Sulphas ferri	Ferri sulphas
—- polycrestus	Sulphas potassæ cum sulphure	
—- rupellensis	Tartris potassæ et sodæ	Soda tartarizata
—- tartari	Carbonas potassæ	Potassæ sub-carbonas
Saturni extractum		Liquor plumbi acetatis

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Soda purificata	Carbonas sodæ	Sodæ sub-carbonas
—— muriata	Murias sodæ	—— murias
—— phosphorata	Phosphas sodæ	
—— tartarisata	Tartris potassæ et sodæ	Soda tartarizata
—— vitriolata	Sulphas sodæ	Sodæ sulphas
Spiritus ætheris vitriolici	Æther sulphuricus cum alcohole	Spiritus ætheris sulphurici
——— ammoniæ	Alcohol ammoniatum	——— ammoniæ
——— ——— aromaticus	——— ——— aromaticum	——— ——— aromaticus
——— ——— fœtidus	——— ——— fœtidum	——— ——— fœtidus
——— camphoratus	Tinctura camphoræ	——— camphoræ
——— cornu cervi	Aqua carbonatis ammoniæ	Liquor ammoniæ carbonatis
——— mindereri	—— acetitis ammoniæ	——— ——— acetatis
——— nitri dulcis	Spiritus ætheris nitrosi	Spiritus ætheris nitrici
——— —— glauberi	Acidum nitrosum	
——— salis ammoniaci	Aqua ammoniæ	Liquor ammoniæ
——— —— marini glauberi	Acidum muriaticum	Acidum muriaticum
——— vinosus camphoratus	Tinctura camphoræ	Spiritus camphoræ
——— ——— rectificatus	Alcohol	——— rectificatus
——— ——— tenuior	——— dilutum	——— tenuior
——— vitrioli dulcis	Æther sulphuricus cum alcohole	——— ætheris sulphurici
——— volatilis aromaticus	Alcohol ammoniatum aromaticum	——— ammoniæ aromaticus
——— ——— fœtidus	——— ——— fœtidum	——— ——— fœtidus
Succi ad scorbuticos	Succus cochleariæ compositus	

OLD NAMES. NAMES IN THE ED. PH. NAMES IN THE LOND. PH.

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Sulphur antimonii præcipitatum	Sulphuretum antimonii præcipitatum	Antimonii sulphuretum præcipitatum
——— auratum antimonii		
Sulphuris flores	Sulphur sublimatum	Sulphur sublimatum
Syrupus balsamicus	Syrupus toluiferæ balsami	Syrupus tolutanus
——— e meconio	——— papaveris somniferi	——— papaveris
Tartarus crudus	Super-tartris potassæ impurus	
Tartari crystalli	——— potassæ	Potassæ super-tartras
Tartarus emeticus	Tartris antimonii	Antimonium tartarizatum
Tartarum solubile	——— potassæ	Potassæ tartras
——— vitriolatum	Sulphas potassæ	——— sulphas
Tinctura aloes vitriolata	Tinctura aloes ætherea	
——— amara	——— gentianæ composita	Tinctura gentianæ composita
——— aromatica	——— cinnamomi composita	——— cinnamomi composita
——— cantharidum	——— meloes vesicatorii	——— lyttæ
——— ferri	——— muriatis ferri	——— ferri muriatis
——— fœtida	——— ferulæ assæfætidæ	——— assæfætidæ
——— guaiacina volatilis	——— guaiaci ammoniata	——— guaiaci ammoniata
——— japonica	——— mimosæ catechu	——— catechu
——— martis	——— muriatis ferri	——— ferri muriatis
——— melampodii	——— hellebori nigri	——— hellebori nigri
——— opii camphorata		——— camphoræ composita
——— rhei amari	——— rhei et gentiana	

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Tinctura rosarum	Infusum rosarum	Infusum rosæ
——— sacra	Vinum aloes socotorinæ	Vinum aloes
——— thebaica	Tinctura opii	Tinctura opii
——— tolutana	——— toluiferæ balsami	
——— valerianæ volatilis		——— valerianæ ammoniata
Trochisci arabici	Trochisci gummosi	
Turpethum minerale	Sub-sulphas hydrargyri flavus	
Tutia	Oxidum zinci impurum	
Unguentum album	Unguentum oxidi plumbi albi	
——— basilicum flavum	——— resinosum	Ceratum resinæ flavæ
——— cœruleum	——— hydrargyri	Unguentum hydrargyri
——— citrinum	——— nitratis hydrargyri	——— ——— nitratis
——— epispasticum fortius	——— pulveris meloes vesicatorii	Ceratum lyttæ
——— ——— mitius	——— infusi mel. vesicat.	
——— saturninum	——— acetitis plumbi	Ceratum plumbi super-acetatis
Vinum amarum	Vinum gentianæ compositum	
——— antimoniale	——— tartritis antimonii	Liquor antimonii tartarizati
——— chalybeatum		Vinum ferri
Vitriolum album	Sulphas zinci	Zinci sulphas

OLD NAMES.	NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.
Vitriolum cœruleum	Sulphas cupri	Cupri sulphas
——— viride	——— ferri	Ferri sulphas
Vitrum antimonii	Oxidum antimonii cum sulphure vitrificatum	
Zincum ustum	Oxidum zinci	Zinci oxidum
—— vitriolatum	Sulphas zinci	—— sulphas

TABLE II.

NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.	OLD NAMES.
Acetis plumbi	Plumbi super-acetas	Saccharum saturni
——— potassæ	Potassæ acetas	{ Sal diureticus { Lixiva acetata
Acidum benzoicum	Acidum benzoicum	Flores benzoini
——— nitrosum dilutum	Acidum nitricum dilutum	Aqua fortis
——— sulphuricum	——— sulphuricum	Acidum vitriolicum
——— ——— aromaticum		{ Acidum vitrioli aromaticum { Elixir vitrioli acidum
Æther sulphuricus	Æther sulphuricus	Æther vitriolicus
Alcohol	Alcohol	Spiritus vinosus rectificatus
Alcohol ammoniatum	Spiritus ammoniæ	Spiritus ammoniæ
——— aromaticum	——— aromaticus	——— aromaticus
——— fœtidum	——— fœtidus	——— fœtidus
Ammonia	Ammonia	Alkali volatile

NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.	OLD NAMES.
Ammoniaretum cupri	Cuprum ammoniatum	Cuprum ammoniacum
Aqua acetitis ammoniæ	Liquor ammoniæ acetatis	Spiritus mindereri
—— ammoniæ		Aqua ammoniæ causticæ
—— carbonatis ammoniæ	——ammoniæ carbonatis	Spiritus cornu cervi Aqua ammoniæ
—— potassæ	——potassæ	—— lixivia caustica Lixivium causticum
Carbonas ammoniæ	Ammoniæ carbonas	Sal ammoniacus volatilis — cornu cervi
——— calcis	Creta preparata	Creta alba Lapilli cancrorum
——— ferri præparatus		Rubigo ferri præparata
——— magnesiæ	Magnesiæ carbonas	Magnesia alba
——— potassæ	Potassæ sub-carbonas	Sal alkalinus fixus vegetabilis — tartari
——— sodæ	Sodæ sub-carbonas	Sal alkalinus fixus fossilis Soda purificata
——— zinci impurus	Calamina præparata	Lapis calaminaris
Decoctum guaiaci compositus		Decoctum lignorum
Electuarium aromaticum	Confectio aromatica	Confectio cardiaca
——— cassiæ sennæ	——— sennæ	Electuarium lenitivum
——— catechu		Confectio japonica

NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.	OLD NAMES.
Electuarium opiatum	Confectio opii	Electuarium thebaicum
Emplastrum meloes vesicatorii	Emplastrum lyttæ	Emplastrum vesicatorium
——— oxidi ferri rubri		——— roborans
——— plumbi semivitrei	——— plumbi	——— commune
——— resinosum	——— resinæ	——— adhæsivum
——— simplex	——— ceræ	——— cereum
Emulsio amygdalæ communis	Mistura amygdalæ	Emulsio communis
Murias ammoniæ	Ammoniæ murias	Sal ammoniacus
——— et ferri	Ferrum ammoniatum	Flores martiales
——— antimonii		Butyrum antimonii
——— hydrargyri	Hydrargyri oxymurias	Hydrargyrus muriatus corrosivus
——— sodæ	Sodæ murias	Sal marinus
Nitras argenti	Argenti nitras	Causticum lunare
——— potassæ	Potassæ nitras	Nitrum
Oleum ammoniatum	Linimentum ammoniæ	Linimentum volatile
——— lini cum calce		——— aquæ calcis
——— sulphuratum	Oleum sulphuratum	Balsamum sulphuris
Oxidum antimonii cum phosphate calcis	Pulvis antimonialis	Antimonium calcareo-phosphoratum
Oxidum antimonii cum sulphure per nitratem potassæ		Crocus antimonii, vel crocus metallorum

NAMES IN THE ED. PH. NAMES IN THE LOND. PH. OLD NAMES.

NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.	OLD NAMES.
Oxidum antimonii cum sulphure vitrificatum		Vitrum antimonii
Oxidum ferri nigrum		Ferri squamæ
——— —— rubrum		Ferrum vitriolatum ustum
——— hydrargyri per acidum nitricum	Hydrargyri nitrico-oxydum	Hydrargyrus nitratus ruber
——— hydrargyri cinereum	——— oxidum cinereum	——— præcipitatus cinereus
——— plumbi album	Plumbi sub-carbonas	Cerussa
——— ——— rubrum		Minium
——— ——— semivitreum	——— oxydum semivitreum	Lithargyrus
——— zinci	Zinci oxydum	Flores zinci
——— —— impurum		Tutia
Phosphas sodæ		Soda phosphorata
Pini abietis resina	Pix arida	Pix Burgundica
—— balsameæ resina	Terebinthina canadensis	Balsamum canadense
—— laricis oleum	Oleum terebinthinæ	Oleum terebinthinæ
Potassa	Potassa	{ Alkali fixum vegetabile { Causticum commune acerrimum
——— cum calce	Potassa cum calce	Causticum commune mitius
Potio carbonatis calcis	Mistura cretæ	Potio cretacea
Pulvis carbonatis calcis compositus	Pulvis cretæ compositus	Pulvis cretaceus
Soda	Soda	Alkali fixum fossile.

NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.	OLD NAMES.
Solutio sulphatis cupri composita		Aqua styptica
Spiritus ætheris nitrosi	Spiritus ætheris nitrici	Spiritus nitri dulcis
Sub-acetas cupri	Ærugo	Ærugo æris
Sub-murias hydrargyri	Hydrargyri sub-murias	Calomelas Hydrargyrus muriatus mitis
Sub-sulphas hydrargyri flavus		Turpethum minerale
Succus spissatus momordicæ elaterii		Elaterium
Sulphas aluminæ	Alumen	Alumen
——— cupri	Cupri sulphas	Vitriolum cœruleum
——— ferri	Ferri sulphas	Sal martis Vitriolum viride
——— magnesiæ	Magnesiæ sulphas	Sal catharticus amarus
——— potassæ	Potassæ sulphas	Tartarum vitriolatum
——— potassæ cum sulphure		Sal polychrestus
——— sodæ	Sodæ sulphas	— glauberi
——— zinci	Zinci sulphas	Vitriolum album
Sulphur sublimatum	Sulphur sublimatum	Flores sulphuris
Sulphuretum antimonii	Antimonii sulphuretum	Antimonium
——— antimonii præcipitatum	——— sulphuretum præcipitatum	Sulphur antimonii præcipitatum ——— auratum antimonii
——— hydrargyri nigrum		Æthiops mineralis
——— ——— rubrum	Hydrargyri sulphuretum rubrum	Cinnabaris factitia
——— potassæ	Potassæ sulphuretum	Hepar sulphuris

——————— potassæ	Potassæ sulphuretum	Hepar sulphuris

NAMES IN THE ED. PH.	NAMES IN THE LOND. PH.	OLD NAMES.
Syrupus toluiferæ balsami	Syrupus tolutanus	Syrupus balsamicus
Super-tartris potassæ	Potassæ super-tartras	Tartari crystalli
Tartris antimonii	Antimonium tartarisatum	Tartarus emeticus
——— potassæ	Potassæ tartras	Tartarum solubile
——— potassæ et sodæ	Soda tartarizata	Sal rupellensis
Tinctura benzoes composita	Tinctura benzoini composita	Balsamum traumaticum
——— camphoræ	Spiritus camphoræ	Spiritus vinosus camphoratus
——— muriatis ferri	——— ferri muriatis	Tinctura martis
——— opii ammoniata	——— camphoræ composita	Elixir paregoricum
——— saponis	Linimentum saponis	Linimentum saponaceum
——— saponis cum opio		⎧——— opiatum ⎩——— anodynum
Unguentum nitratis hydrargyri	Unguentum hydrargyri nitratis	Unguentum citrinum
——————— acetitis plumbi	Ceratum plumbi super-acetatis	——————— saturninum
——————— pulveris meloes vesicatorii	——— lyttæ	——————— epispasticum fortius
——————— resinosum	——— resinæ	——————— basilicum flavum

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LATIN INDEX.

A

FINIS.