PREPARATIONS OF SULPHUR.

PURE SULPHUR, according to Sir H. Davy's experiments, is a triple compound of oxygen, hydrogen, and a peculiar unknown base. It unites readily with metals, some oxides, earths, and the fixed alkalies, forming compounds which have been denominated *sulphurets*. These are formed by the fusion of the substances in a dry state; and the compounds require to be carefully preserved from the atmosphere, as they attract moisture from it, deliquesce, and are decomposed. When, however, the union of sulphur and alkaline or earthy bases is effected by means of water, the products are not simple *sulphurets*, but sulphurets combined with sulphuretted hydrogen, and have been named *hydrogureted sulphurets*. They are equally susceptible of decomposition by exposure to the air as the sulphurets.

OLEUM SULPHURA'TUM.[1] Lond. *Sulphurated Oil.*

"Take of washed sulphur, *two ounces*; olive oil, *a pint*. Add the sulphur gradually to the oil heated in a very large iron pot, and stir the mixture after each addition till they have united." *Edinburgh.*

"Take of olive oil, *eight parts*; sublimed sulphur, *one part*. Boil them with a gentle heat in a large iron vessel, stirring constantly, until they unite."

Great attention is required in these processes to prevent the mixture from boiling over, or its vapour from catching fire. If either of these accidents occur, the combustion may be stopped by instantly covering the pot with a close lid. The iron pot should be sufficient to contain thrice the bulk of the ingredients.

Qualities. — The odour of this solution of sulphur is extremely fœtid, and the taste acrid. It is of a reddish brown colour; has a thick consistence; and when heated emits sulphureted hydrogen. When it is much concentrated, the sulphur crystallizes in octohedrons.

Medical properties and uses. — Sulphureted oil is stimulant, and externally detergent. It was formerly regarded as balsamic, and recommended in catarrh, asthma, and phthisical affections; but its internal use is now properly exploded. It is sometimes still externally applied for cleansing foul ulcers. The dose was from ♏ v. to ♏ xxx. taken in water.

POTA'SSÆ SULPHURE'TUM. Lond. *Sulphuret of Potash.*[2]

[1] Balsamum Sulphuris simplex, P. L. 1745. Huile sulphur (*F.*) Oleo sulfurato (*I.*)

[2] Kali Sulphuratum, P. L. 1787. Sulphure de Potasse (*F.*) Schwelflichtes Kali (*G.*) Solfuro di Potassa (*I.*)

"Take of washed sulphur, *an ounce*; subcarbonate of potash, *two ounces*. Rub them together, and place the mixture over the fire in a covered crucible until they unite."

SULPHURETUM POTASSÆ. Edin.

"Take of subcarbonate of potash, *two parts*; sublimed sulphur, *one part*. Rub them together, and put them into a large covered crucible, to which, having adapted a cover, apply the fire cautiously, until they melt. Preserve the mass in a well-closed vessel."

SULPHURETUM KALI. Dub. *Sulphuret of Kali.*

"Take of subcarbonate of kali, sublimed sulphur, each *two ounces*. Having mixed them together, put them into a crucible, and having adapted to it a cover, expose it to a fire gradually raised until they unite."

This sulphuret cannot be properly formed by following the directions of any of the Colleges; for, to render the combination complete, it is necessary to expose the subcarbonate in a crucible to a red heat, previously to its being rubbed with the sulphur: the water of the subcarbonate is thus dissipated, and at the same time a portion of the carbonic acid is expelled, both of which, when not driven off, alter the product. When the fusion is effected, the mixture is to be poured upon a marble slab, and, as soon as it concretes, the mass must be broken in pieces and preserved in a closely-stopped bottle.

Qualities. — Well prepared sulphuret of potash is inodorous while dry; but when moistened or dissolved in water, a partial decomposition of both the water and the sulphuret is effected, and it emits the fœtid odour of sulphuretted hydrogen. It has an acrid bitter taste; changes the vegetable blues to green; is hard, brittle, breaking with a glassy fracture, of a liver-brown colour, and stains the skin brown.[1] By exposure to the air it attracts moisture; its colour changes to a pale green, the fœtid odour noticed above is emitted, and it is gradually converted into hydroguretted sulphuret of potash, combined with a small portion of sulphate of potash. It is also decomposed by all the acids, the sulphur being precipitated; and in a violent heat the sulphur sublimes, leaving the potash.

Medical properties and uses. — Sulphuret of potash is expectorant and diaphoretic. It has been frequently given in chronic asthma and chronic catarrh, without much benefit; but has been found useful in arthritic, rheumatic, and herpetic affections; and in combination with cicuta as a palliative in cancerous cases.[2] It has also been employed in France, for the cure of scabies, in the form of an ointment made with one part of

[1] Hence its old name, *Hepar Sulphuris.*

[2] *Pearson's Practical Synopsis, &c.* i. 283.

the sulphuret, 16 of soap, and 32 of oil. From a theory founded on its chemical action on metallic salts out of the body, it has, also, been strongly recommended as an antidote against arsenical, saturnine, and mercurial preparations, when these have been taken in doses sufficient to produce deleterious effects; but it has hitherto been too seldom employed to ascertain its real value in these cases.

The usual dose is grs. iij. or grs. iv. combined with soap, in the form of pills, for the first-mentioned cases; or from grs. v. to grs. x. as an adjunct to cicuta in cancer, given several times a day.

SULPHUR LOTUM. Lond. *Washed Sulphur.*[1]

"Take sublimed sulphur, *a pound.* Pour upon it boiling water, that the acid, if there be any, may be entirely washed away; then dry it."

SULPHUR SUBLIMATUM LOTUM. Edin. *Washed sublimed Sulphur.*

"Take of sublimed sulphur, *one part*; water, *four parts.* Boil the sulphur for a short time in the water; then pour off this water, and by repeated affusions of cold water, wash away all the acid: lastly, dry the sulphur."

Dublin.

"Let warm water be poured upon sublimed sulphur, and the washing be repeated as long as the water employed shall appear acid. This is known by means of litmus. Dry the sulphur on bibulous paper."

In subliming sulphur, a small portion of it is apt to be acidified, by attracting the oxygen of the heated air of the vessels, or the chamber in which the process is conducted. The quantity is however very minute, and is completely removed by the above processes; and the sulphur does not afterwards undergo any change from exposure to the air at the ordinary temperature of the atmosphere.

SULPHUR PRÆCIPITATUM. Lond. *Precipitated Sulphur.*[2]

"Take of sublimed sulphur, *a pound*; fresh burnt lime, *two pounds*; water, *four gallons.* Boil the sulphur and the lime together in water; then filter the liquor through paper, and drop into it as much muriatic acid as may be sufficient to precipitate the sulphur. Finally, wash this with repeated affusions of water, until it becomes tasteless."

In the first part of this process, a hydrogureted sulphuret of

[1] Flores Sulphuris loti, P. L. 1787. Soufre lavé (*F.*) Schwefel (*G.*) Zolfo lavato (*I.*)

[2] Lac Sulphuris, P. L. 1720. Sulphur precipitatum, P. L. 1787. Soufre précipité (*F.*) Schwefelniederschlag (*G.*) Zolfo Precipitato (*I.*)

lime is produced, by the combination of the lime and sulphur occasioning a decomposition of a part of the water, the hydrogen of which unites with a portion of the sulphur, and forms a hydrosulphuret; while the oxygen with another portion forms sulphuric acid that combines with part of the lime: and thus the solution contains a small portion of sulphate of lime, and a sulphuret of lime combined with sulphureted hydrogen. This hydroguretted sulphuret is then decomposed by the muriatic acid, which unites with the lime, and forms a soluble muriate, while the sulphur is precipitated, and sulphureted hydrogen gas disengaged.

Qualities. — Precipitated sulphur is white, with a very slight greenish tinge. When heated in a retort in a low heat, it acquires the colour of common sulphur, and water is deposited in the beak of the retort; from which circumstance, and the same degree of whiteness being produced when sulphur is sublimed into a vessel filled with steam, there is reason for supposing that precipitated sulphur owes its whiteness to the presence of a little water. It differs in no other respect from sublimed sulphur, and is an unnecessary refinement for the sake of appearance in the composition of ointments.

AQUA SULPHURETI KALI.[1] Dub. *Water of Sulphuret of Kali.*

"Take of sublimed sulphur, *half an ounce;* water of caustic kali, *nine fluid ounces.* Boil them together for ten minutes, and filter through paper. Preserve the preparation in well stopped phials. The specific gravity of this liquor is, to that of distilled water, as 1120 to 1000."

The name given to this preparation conveys an erroneous idea of its nature. When an alkaline sulphuret is dissolved in water, changes exactly similar to those we have mentioned (*Sulphur præcipitatum*) as taking place during the solution of an earthy sulphuret occur, altering the character of the product; and as the same happen by the direct combination of sulphur with a liquid alkali, this preparation is not a simple aqueous solution of sulphuret of potash, but, *in fact*, a solution of *hydrogureted sulphuret of potash*, or sulphuret of potash combined with sulphureted hydrogen.[2]

Qualities. — This solution has a slightly fœtid odour, and a nauseous, acrid, bitter taste. Its colour is reddish yellow, approaching to deep orange; its feel soapy; and it stains the cuticle a greenish black. Acids decompose it, precipitating the sulphur, and disengaging a portion of sulphureted hydrogen

[1] Liquore di solfuro di Potassa (*I.*)
[2] It was formerly denominated *Liquid Hepar*, or *Liquid Liver of Sulphur.*

gas; and it is also decomposed by exposure to the air, the oxygen of which being absorbed by the sulphur forms sulphuric acid, which produces a sulphate with the potash; so that in process of time the whole is changed into a solution of sulphate of potash. Hence the necessity of preserving it in well stopped phials.

Medical properties and uses.— This solution does not differ in its medicinal properties from the solid sulphuret of potash. It is, however, chiefly employed as an external application; and as such has been found very beneficial in tinea capitis, scabies, and herpetic eruptions. When given internally, the dose is from ♏ xx. to ʒiſs. twice a day.

HYDRO-SULPHURETUM AMMONIÆ. Edin. *Hydro-Sulphuret of Ammonia.*

"Take of water of ammonia, sulphuret of iron, of each *four ounces*; muriatic acid, *eight ounces*; water, *two pounds and a half*. Pour the acid previously mixed with the water, on the sulphuret, and transmit the gas evolved, through the water of ammonia. Preserve the solution in well stopped phials."

SULPHURETUM FERRI. Dub. *Sulphuret of Iron.*

"Take of filings of iron, *six ounces*; sublimed sulphur, *two ounces*. Mix them, and expose them in a covered crucible to a gentle heat until they unite."

HYDRO-SULPHURETUM AMMONIÆ. Dub. *Hydro-Sulphuret of Ammonia.*

"Take of sulphuret of iron in coarse powder, *four ounces*; muriatic acid, *seven fluid ounces*; water, *two pints*; water of caustic ammonia, *four ounces*. Put the sulphuret of iron into a matrass, and gradually pour over it the acid diluted with water; and in a proper apparatus transmit the gas evolved from it through water of ammonia. Toward the conclusion of the operation apply a moderate heat to the matrass."

The proportions of the ingredients ordered in the Dublin formula for producing the sulphuret of iron enable them to unite at a low heat; and the combination is attended with a brilliant ignition, which takes place without the presence of air. The compound is of a grey colour intermixed with yellow, resembling bronze; has a metallic lustre, and a crystalline texture, with a considerable degree of brittleness, and when pulverized yields a black powder. According to Proust, 100 parts of it consist of 62·5 of iron, and 37·5 of sulphur.[1] The addition of the diluted muriatic acid, by oxidizing the iron, enables it to decompose the water, the hydrogen of which dissolving, part of the sulphur escapes, in the form of sulphuretted hydro-

[1] *Journal de Physique*, liii. 89.

gen gas, which combines at a low temperature with the ammonia of the solution through which it is made to pass. Mr. Cruikshank [1] advises the sulphuret of iron to be prepared "by raising a piece of iron in a smith's forge to a white heat, and then to rub it against the end of a roll of sulphur; the iron, at this temperature, immediately combines with the sulphur, and forms globules of pyrites (*sulphuret*), which should be received into a vessel filled with water; these globules are to be reduced to powder, and introduced into the proof, to which a sufficient quantity of the muriatic acid is to be added." Various other means have been also recommended for the preparation of the sulphuret; but the process directed by the Dublin College is easy and perfectly adequate for the purpose.

Qualities. — Hydro-sulphuret of ammonia is of a dark green colour; has a very fœtid odour, and an acrid disagreeable taste. It is decomposed by the acids.

Medical properties and uses. — This preparation is a powerful sedative, lessening the action of the stomach, and of the arterial system in a remarkable degree; and even in moderate doses producing sickness, vomiting, and vertigo. It was first proposed as a remedy by Mr. Cruikshank, with the view of diminishing the morbid appetite and powerful action of the digestive organs, which attend those labouring under diabetes mellitus; and its subsequent use has been confined to the treatment of that disease. The dose to an adult should not at first exceed ℿv. or ℿvj. given in a large tumbler of water, three or four times a day; and the number of drops should be gradually increased, until a slight degree of giddiness takes place, when any further increase must be stopped.

AQUA SULPHURETI AMMONIÆ. Dub. *Water of Sulphuret of Ammonia.*

"Take of lime recently prepared, muriate of ammonia in powder, each *four ounces*; sublimed sulphur, hot water, of each *two fluid ounces*. Sprinkle the water on the lime, in an earthen vessel, and cover it until the lime fall to powder; mix this when cold by trituration with the sulphur and muriate of ammonia, avoiding the vapours; then put the mixture into a retort, and distil with a strong heat suddenly raised. Preserve the liquor thus obtained in a phial closely stopped with a glass stopper."

In this process the lime decomposes the muriate of ammonia, attracting its acid, and forming a muriate of lime, while the disengaged ammonia unites with the sulphur, one part of which, however, is converted into a hydro-sulphuret, by hydrogen

[1] *Rollo on Diabetes and Lues Venerea.*

arising from partial decomposition of the water, which, combining with the sulphuret of ammonia, thus produces a hydrogureted sulphuret of ammonia. It was formerly known by the name of *Fuming Liquor of Boyle*, having been first prepared by that philosopher.

Qualities. — This liquid is of a deep orange-colour, has a strong ammoniacal fœtid odour, and emits white fumes, owing, as Berthollet ascertained, to an excess of ammonia. The addition of an acid precipitates sulphur, and occasions the disengagement of sulphureted hydrogen gas. It consists of hydro-sulphuret of ammonia holding an excess of sulphur, which it gradually deposits, losing the property of fuming, and is then a nearly pure hydro-sulphuret of ammonia.[1]

We are ignorant of any medicinal use to which this preparation has been applied.

VEGETABILIA.

VEGETABLES.

THE collection of vegetables cannot be attended to by the apothecary, and, consequently, the directions necessary for that purpose are of less importance to him than a knowledge of the botanical characters of plants, and the appearances they assume when they are collected under proper circumstances and well dried: for inert plants are often introduced by the collectors among those which possess the most active properties; and from a careless or an improper mode of drying them, the medicinal virtues of the majority of plants are altogether destroyed. When, however, opportunities permit the apothecary to be his own collector, these should not be neglected; and the collection and drying of some plants, particularly foxglove and hemlock, should never be left to the common collector. The following general directions are therefore given in the London Pharmacopœia for collecting vegetable substances.

"VEGETABLES are to be gathered from the soil and situations where they spontaneously grow, in a dry season, and when no dew is upon them: they are to be collected every year, and any which shall have been longer kept are to be thrown away."

"ROOTS, for the most part, are to be dug up before their stems or leaves shoot forth." This direction may be followed when the roots are cultivated; but if the prior directions be attended to, it is not easy to conceive by what means the roots

[1] *Thomson's Chemistry*, 4th edit. iii. 380.