

PART III.

PREPARATIONS AND COMPOSITIONS.

CHAP. I.—SULPHUR.

SULPHUR SUBLIMATUM LOTUM. *Edin.*

Washed Sublimed Sulphur.

Take of

Sublimed sulphur, one pound;

Water, four pounds.

Boil the sulphur for a little in the water, then pour off this water, and wash away all the acid by affusions of cold water: and, lastly, dry the sulphur.

Dub.

Let warm water be poured upon sublimed sulphur, and the washing be repeated as long as the water, when poured off, is impregnated with acid, which is known by means of litmus. Dry the sulphur on bibulous paper.

SULPHUR LOTUM. *Lond.*

Washed Sulphur.

Take of

Sublimed Sulphur, a pound.

Pour on it boiling water, so that the acid, if there be any, may be entirely washed away; then dry.

As it is impossible to sublime sulphur in vessels perfectly void of air, a small portion of it is always acidified and converted into sulphurous or sulphuric acid. The presence of acid in sulphur is always to be considered as an impurity, and must be removed by careful ablution. Sulphur is directed to be kept in closed vessels; and Dr Powell says, that in an open drawer, its superior surface becomes manifestly acid on long

keeping ; but when thoroughly washed, sublimed sulphur is not acted upon by the atmosphere ; there is therefore no particular reason for preserving it from the action of the air ; for if, on keeping, it become moist, it is because the sulphuric acid has not been entirely washed away.

SULPHUR PRÆCIPITATUM. *Lond.*

Precipitated Sulphur.

Take of

Sublimed sulphur, one pound ;

Fresh lime, two pounds.

Water, four gallons.

Boil the sulphur and lime together in the water, then filter the liquor through paper, and drop into it as much muriatic acid as may be necessary to precipitate the sulphur. Lastly, wash this by repeatedly pouring upon it water till it becomes insipid.

THIS process is a considerable improvement upon that in the preceding Pharmacopœia, being more economical, in the proportion of 3 to 1. A solution of sulphuret of lime is first prepared ; it is then decomposed by muriatic acid, which unites with the lime, expels sulphuretted hydrogen gas, and precipitates the sulphur, which is easily purified by ablution from the very soluble muriate of lime. The quantity of lime, used in forming the sulphuret, though reduced in the edition 1815 from three pounds to two, is still somewhat too large. Mr Phillips found that 10 parts of sulphur dissolve only about 4.5 of lime.

Precipitated sulphur, though much more expensive, does not differ in its medical properties from well-washed sublimed sulphur. Its paler colour is owing to its more minute division, or, according to Dr Thomson, to the presence of a little water ; but from either circumstance it derives no superiority to compensate for the trouble and disagreeableness of its preparation, unless its whiter colour be considered as an advantage in the preparation of ointments.

SULPHURETUM POTASSÆ. *Edin.*

Sulphuret of Potass.

Take of

Carbonate of potass,

Sublimed sulphur, each eight ounces.

Triturate them well together, put them into a large coated crucible, fit a cover to it, and having applied live coals

cautiously around it, bring them at length to a state of fusion.

Break the crucible as soon as it has grown cold, take out the sulphuret, and keep it in a well-closed phial.

Lond.

Take of

Washed sulphur, one ounce ;

Sub-carbonate of potass, two ounces.

Triturate them together, and place them in a covered crucible over the fire until they unite.

SULPHURETUM KALI. Dub.

Sulphuret of Kali.

Take of

Sub-carbonate of kali,

Sublimed sulphur, each two ounces.

Mix and put them into a crucible. Fit a cover to it, and expose them to a heat, gradually increased, until they unite.

There exists a very strong affinity between sulphur and potass, but they must be united in a state of perfect dryness ; because, if any moisture be present, it is decomposed, and alters the nature of the product. If potass be employed, it will unite with the sulphur by simple trituration, and will render one-third of its weight of sulphur soluble in water. If sub-carbonate of potass be used, as directed by the colleges, it is necessary to bring the sulphur into a state of fusion ; it then acts upon the sub-carbonate, and expels the carbonic acid. It is evident, that to saturate the same quantity of sulphur, a larger proportion of carbonate of potass than of potass is necessary. The London college now agrees with the Dublin in using two parts of sub-carbonate ; the Edinburgh uses only one. Gottling directs only one part of carbonate of potass to two of sulphur : and to save the crucible, he directs the mixture, as soon as it melts, to be poured into a heated mould, anointed with oil. If the fusion be not very cautiously performed, the sudden extrication of so large a quantity of carbonic acid gas is apt to throw the melted matter out of the crucible, and may be attended with unpleasant consequences. La Grange projects one part of sulphur upon one and a half of potass in fusion, and keeps the compound melted half an hour before he pours it out. If the heat be too great, and the crucible uncovered, the sulphureous vapour is apt to inflame ; but it is easily extinguished by covering it up. For the preparation of precipitated sulphur, Hermbstadt proposes

to obtain the sulphuret of potass, by heating together in a crucible four parts of sulphate of potass with one of charcoal powder. The charcoal is converted into carbonic acid gas, and the sulphate into sulphuret.

Sulphuret of potass, properly prepared, is of a liver brown colour, and was hence formerly called *Hepar sulphuris*. It should be hard, brittle, and have a vitreous fracture. It has an acrid bitter taste, and the smell of sulphur. It is exceedingly prone to decomposition. It is deliquescent in the air, and is decomposed. It is very fusible, but a strong heat separates the sulphur by sublimation. The moment it comes in contact with water, there is a mutual decomposition. Part of the sulphur becomes acidified, deriving oxygen from the water, and forms sulphate of potass. Part of the hydrogen of the water decomposed, combines with another portion of the sulphur, and escapes in the form of sulphuretted hydrogen gas: another portion of the hydrogen combines with a third portion of the sulphur, and remains in solution, united with the alkali, in the state of hydroguretted sulphuret of potass. By acids, sulphuret of potass is immediately decomposed; the acid combines with the potass, sulphuretted hydrogen gas is expelled, and the sulphur is precipitated.

AQUA SULPHURETI KALI. *Dub.*

Water of Sulphuret of Kali.

Take of

Sublimed sulphur, half an ounce;

Water of caustic kali, nine ounces, by measure.

Boil for ten minutes, and strain through paper. Keep the liquor in phials well corked.

The specific gravity of this liquor is 1120.

The Dublin college have thus, besides the sulphuret of potass, a preparation which is exactly similar to a solution of it in water. When sulphur is boiled in a solution of caustic alkali, a portion of the water is decomposed; the oxygen forms, with some of the sulphur and potass, sulphate of potass, and the hydrogen, with the remainder, hydro-sulphuret of potass. The former being difficultly soluble, is precipitated and separated by filtration. The solution must be well preserved from the action of the air, which gradually decomposes it, forming sulphate of potass.

Medical use.—Hydro-sulphuret of potass is an exceedingly nauseous remedy; but it is used internally as an antidote to metallic poisons, to check excessive salivations from mercury, and in cutaneous affections. Externally, it is used against tinea capitis, and in psora. I have long been in the

habit of using with success in the psora and psoriasis of infants, a bath prepared by dissolving sulphuret of potass in water.

HYDRO-SULPHURETUM AMMONIÆ. *Ed.*

Hydro-Sulphuret of Ammonia.

Take of

Water of ammonia, four ounces ;
Subject it, in a chemical apparatus, to a stream of the gas which arises from
Sulphuret of iron, four ounces,
Muriatic acid, eight ounces, previously diluted with two pounds and a half of water.

SULPHURET OF IRON is conveniently prepared for this purpose from

Purified filings of iron, three parts,
Sublimed sulphur, one part,
Mixed and exposed to a moderate degree of heat, in a covered crucible, until they unite into a mass.

SULPHURETUM FERRI. *Dub.*

Sulphuret of Iron.

Take of

Filings of iron, six ounces ;
Sublimed sulphur, two ounces.
Mix 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 ounces, by measure ;
Water, two pints ;
Water of caustic ammonia, four ounces.
Put the sulphuret into a matrass, then gradually pour on the acid diluted with the water, and in a proper apparatus transmit the gas evolved, through the water of ammonia. Towards the end of the operation apply a gentle heat to the matrass.

SULPHURETTED hydrogen is capable of combining with different bases in the manner of an acid. In the present preparation, it is combined with ammonia, and is obtained by decomposing sulphuret of iron by muriatic acid. As soon as the acid, by its superior affinity, separates the iron from the

sulphur, the latter immediately re-acts on the water, the oxygen of which forms, with one portion of it, sulphuric acid, while the hydrogen dissolves another portion, and forms sulphuretted hydrogen gas. The combination of this with ammonia is facilitated by reduction of temperature, and by making it pass through a column of the water of ammonia, by means of an apparatus, such as Woulfe's, or Nooth's. The ammonia very readily assumes a greenish-yellow colour, from the absorption of the sulphuretted hydrogen.

Trommsdorff has proposed, that the sulphuretted hydrogen gas should be obtained by the decomposition of sulphuret of potass; but in this way its formation is too rapid to be easily managed. Gottling says, that the acid should be added gradually, and that the whole must be constantly agitated. But these precautions are rendered less necessary, by diluting the acid to the degree directed by the Pharmacopœia. Mr Cruickshank, who first suggested the use of hydro-sulphuret of ammonia in medicine, directs the sulphuret of iron to be prepared by heating a bar of iron to a white heat in a smith's forge, and rubbing against the end of it a roll of sulphur. The iron, at this temperature, immediately combines with the sulphur, and forms globules of sulphuretted iron, which should be received in a vessel filled with water. It is, however, more conveniently obtained in the manner directed by the college. Proust has proved that iron is capable of combining with two proportions of sulphur. At a high temperature, 100 parts of iron combine with 60 of sulphur, and form a compound of a dull blackish colour. In this state, it is fit for the production of sulphuretted hydrogen gas. At a lower temperature, the same quantity of iron takes up 90 of sulphur, acquires a greenish-yellow colour, and in every respect resembles native pyrites. This cannot be decomposed by acids, and is therefore unfit for the production of gas; but it may be reduced to the state of iron sulphuretted to the minimum, by exposing it to a sufficiently high temperature, or by melting it with half its weight of iron-filings. It was probably from not attending to the different states of sulphuretted iron, that some of the German chemists failed in their attempts to procure from it sulphuretted hydrogen gas, and had recourse to sulphuret of potass.

Medical use.—Hydro-sulphuret of ammonia, or, more correctly, sulphuretted hydrogen of ammonia, acts powerfully on the living system. It induces vertigo, drowsiness, nausea, and vomiting, and lessens the action of the heart and arteries. It therefore seems to be a direct sedative. According to the doctrine of the chemical physiologists, it is a powerful disoxy-

genizing remedy. It has only been used in diabetes, by Dr Rollo and others, under the name of Hepatized ammonia, in doses of five or ten drops twice or thrice a-day.

AQUA SULPHURETI AMMONIÆ. *Dub.*

Water of Sulphuret of Ammonia.

Take of

Fresh burnt lime,
Muriate of ammonia in powder, each four ounces;
Sublimed sulphur,
Warm water, each two ounces, by weight.

Sprinkle the water upon the lime, placed in an earthen vessel, and cover it up until the lime falls to powder, which, as soon as it is cold, is to be mixed by trituration with the sulphur and muriate of ammonia. Put the mixture into a retort, and distil with a sudden and sufficiently strong degree of heat. Keep the liquor thus obtained in a phial, accurately closed with a glass stopper.

The second process of the Dublin college is totally different. The ammonia and sulphuretted hydrogen are presented to each other in a nascent state, and with the undecomposed part of the water pass over into the receiver, while, in the retort, the lime remains combined with sulphuric and muriatic acid.

The hydro-sulphuret of ammonia was formerly called the *fuming liquor of Boyle*. It is of a dark red colour, and is extremely fetid. It differs from the hydro-sulphuret of ammonia, prepared by the preceding process, in containing a portion of uncombined alkali, to which, according to Berthollet, its property of emitting fumes is owing, and in the last portions which come over being in the state of a hydroguretted sulphuret. It soon, however, is converted into a hydro-sulphuret, by losing its excess of ammonia and sulphur. It is decomposed by all acids, and almost all metallic solutions.

CHAP. II.—ACIDS.

ACIDUM SULPHURICUM DILUTUM. *Ed.*

Diluted Sulphuric Acid.

Take of

Sulphuric acid, one part;