

in any case, a second portion of the powder shall be reserved in the event of accident, or failure.

Place the powdered ore in a Florence flask, and pour upon it, carefully, and in small portions at a time, about two ounces of *aqua regia*, diluted with an equal bulk of water, apply a gentle heat until all soluble matter is dissolved, adding more acid and water, if necessary. The changes which may take place under the action of the acid will be as follows:—

Gold will be entirely dissolved, being converted into the tetrachloride. Silver will be found with the insoluble portion as a chloride. Iron, or copper pyrites, will be decomposed, the metal going into solution. If the matrix of the ore be a calcareous or magnesian rock containing carbonic acid effervescence will take place, with evolution of the carbonic acid, the lime or magnesia being dissolved. Silica or quartz remains unacted on.

The solution must now be decanted from the residue, or filtered through a piece of paper, or through a tuft of cotton wool placed in the neck of a glass funnel, and the undissolved portions carefully washed—the washing being mixed with the original solution. This clear solution must be boiled to about one-fourth its bulk with the occasional addition of a little muriatic acid for the purpose of decomposing any nitric acid which might be present. Otherwise, a small amount of *aqua regia* might be formed which would be very injurious in the next part of the process, in redissolving the precipitated gold. To the solution add a few ounces of water, and put it in a clear glass vessel. Next prepare a solution of sulphate of iron, by dissolving a few crystals in water, and filtering. Add this solution to the first, stirring with a glass rod—if gold be present it will be at once precipitated by the iron as a chocolate brown powder, and must be allowed a sufficient time to subside, when the clear liquor can be poured off, and the gold collected and weighed; or fused into a button, with borax, before the blowpipe. When the solution of gold is very dilute a blue violet color will be observed, by transmitted light, which is perceptible when the gold does not exceed one part in six hundred and forty thousand parts of liquid.

If it is desirable to estimate the amount of silver present in the ore, the undissolved residue—which we have said consists of silica and chloride of silver—must be digested with a little strong liquor ammonia, which will dissolve the chloride. The solution must be diluted with water, and a few drops of hydrochloric acid added. The silver will be again precipitated in white flakes, as chloride; it may be estimated as three-fourth silver.

In cases where the iron or copper pyrites is large, and the gold is present in small quantities, another method of assay is advisable. It may be performed by treating the powdered ore, at once, with dilute nitric acid (one part acid to one of water), and heating until all soluble matter is dissolved; decant the clear liquor and wash the residue with water, adding the washings to the solution. This solution will contain all the metals present except gold—and in some cases lead. The silver can be precipitated by hydrochloric acid, and estimated as before. The copper can be readily estimated by inserting in the solution, from which the chloride of silver has been separated, a few pieces of bright iron, the metal will all drop out and can be washed and weighed.

Heat the residue containing the gold and silver with dilute *aqua regia*, the gold will be dissolved. The solution must now be evaporated to dryness and the metal reduced with a little borax, in the blow-pipe flame: the minute globule of gold must be detached from the flux and carefully weighed.

(TO BE CONTINUED.)

GOLD MINES OF TRANSYLVANIA.—Dr. GUSTAVE TSCHERMAK has read before the Imperial Geological Institute a very complete account of the gold mines of Transylvania. It appears the precious metal is found disseminated in almost imperceptible particles in the trachytic rocks in the environs of Falatlna and D'Abud Banyu, where it is still worked by the most primitive methods. There are 300 families or partnerships, consisting each of three individuals, or thereabouts. A thousand quintals of the rock yield about 8,500 grains of pale yellow gold, which contain a little silver. The rilled debris of the crystalline rocks found in the valley of l'Aranyos is carefully washed, and yields about half an ounce of gold to 31,000 quintals of stuff. This gold is of a deeper colour and contains less silver. They also find gold in a peculiar freestone (*Carpathiques bocardes*), which is of a pale color like that found in the trachytes. The gold mines of Transylvania have been worked from the earliest historic times, yet they still furnish above 2,000 lbs. avoirdupois annually.—*English Mechanic*.

Preparations of Conium, Hyoscyamus and Belladonna.

At a recent meeting of the British Pharmaceutical Conference, D. Hanbury, F.R.S., the President, in alluding to the recent lectures of Dr. Harley, said:

Dr. Harley's experiments on conium seem to me a model of careful therapeutic research. The results are of great interest, proving conclusively that the drug is an active medicinal agent, but one of which the pharmaceutical preparations have been so defective and uncertain, that the efficacy of the medicine had come to be regarded as very questionable. The dried leaf of henlock was found by Dr. Harley to be of little, if any, value; the tincture, whether made from leaf or fruit, to be

inert (except from its alcohol), and the extract to be so weak in conia that is required to be given in doses of 30 to 40 grains to produce the least effect. The only preparation which retains the active principle of the drug in sufficient quantity is the *preserved juice*, which, given in the dose of from 2 to 8 drachms, is a safe and valuable medicine. As to belladonna, Dr. Harley considers that its medicinal powers are wholly resident in atropine, a substance which I, as a druggist, may remark is far more satisfactory to handle than a liquid conia, or a highly deliquescent solid, such as hyoscyamine. Dr. Harley finds that its activity is destroyed by fixed caustic alkalis—an observation previously made, as you will remember, by Dr. Garrod, who also pointed out the impropriety of combining hyoscyamus with a caustic alkaline solution, such as *liquor potassæ*. The action of an alkali on atropine is not instantaneous, in fact, the power of the atropine is not apparently diminished when freshly mixed. If, as is probable, the same observation holds good for hyoscyamus, it allows of that drug being administered with potash, provided the two are mixed at the moment of taking the dose, or perhaps it would be still better to give them separately.

The Phenomena of Supersaturation.

For a very long period the phenomena of supersaturation in saline solutions have perplexed chemists. Mr. Charles Tomlinson, F. R. S., has been experimenting and theorising upon the subject, and has communicated to the Royal Society his conclusions and the grounds upon which they are based. We have only room to give the conclusions which, if substantiated, are important and interesting to the chemist.

The conclusions arrived at by Mr. Tomlinson are: (1) That a number of hydrated salts from supersaturated solutions and remain so even at low temperature simply from the absence of a nucleus to start the crystallization. (2) That a nucleus is a body that has a stronger adhesion for the salt than for water which holds the salt in solution, a state of things brought about by the absence of chemical purity. (3) That three or four salts from supersaturated solutions which in cooling down deposit a modified salt or one of a lower degree of hydration than the normal salts. (4) That this modified salt is formed first by the deposit, in small quantity, of the anhydrous salt, which entering into solution, forms a dense lower stratum containing less water than the rest of the solution, in which lower stratum the modified salt is formed. (5) That salts of a low degree of hydration from supersaturated solutions, which on reduction of temperature, or by the action of a nucleus, deposit the excess of salt that held the solutions supersaturated, leaving them merely saturated.

CURIOUS EFFECT OF THALLIUM.—This substance has the property of entering the circulation, and producing the most offensive odor to the perspiration of the parties taking it. Dr. Bunsen was compelled to absent himself from society for four weeks on this account. This one property will kill it for all practical use in medicine. Its action is similar to zinc and iron on the economy, acting as a tonic, and producing, in large doses, severe headache.—*Druggists' Circular*.