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three first have been found to exceed in quantity the copper and iron, are only accidental ingredients; and therefore, since they do not affect the crystalline forms of the fahlerz, which are invariably tetrahedral, it may be inferred, that they are only mechanically mixed, not chemically combined with the copper, iron, and sulphur.

ART. XII. *Analysis of the Copper Ore, described in the preceding Paper.* By Richard Phillips, F.R.S.E. F.L.S., &c.

I. HAVING ascertained that the constituents of this ore are copper, iron, arsenic, and sulphur, I boiled 100 grains of it reduced to powder in nitric acid, until the whole of the metallic matter appeared to be dissolved. Fourteen grains remained unacted upon by the acid; of these a large portion was evidently pure sulphur; by heat nine grains were volatilized, and five remained, which were merely silica, that had been mechanically mixed with the ore.

II. The nitric solution was decomposed by potash, and being heated with excess of it, peroxide of copper and iron were precipitated together. This mixed precipitate was washed until it ceased to be alkaline, and was then dissolved in nitric acid. To the solution ammonia in excess was added; by this, peroxide of iron was precipitated, and the peroxide of copper held in solution; the former being separated, washed and ignited, weighed 13.3 grains, equivalent to 9.26 of iron.

III. The ammoniacal solution of copper was heated, and when the greater part of the ammonia was expelled, potash was added to the solution; and, by continuing the heat, peroxide of copper was precipitated, which being washed and ignited, weighed 56.6 grains, equivalent to 45.32 of copper.

IV. The alkaline solution obtained in III, and the water employed to wash the mixed precipitate of oxide of copper and iron, were evaporated together, and then saturated with nitric acid. This solution contained the sulphur and arsenic converted into acids, and combined with potash. Nitrate of barytes being added, sulphate

was precipitated, which, being washed and ignited, weighed 126 grains, equal, according to Dr. Wollaston's scale, to 17.14 of sulphur, which, added to 9, before obtained, =26.14. After this an accident happened to the solution, which prevented the separation of the arsenic acid; therefore,

V. One hundred grains of the ore were again treated with nitric acid; with the silica 11 grains of sulphur were obtained, and the nitric solution was decomposed by excess of potash as before, in order to separate the oxide of copper and iron.

VI. The alkaline solution being saturated with nitric acid nitrate of barytes was added to it, as long as precipitation took place. The precipitated sulphate of barytes being washed and ignited, weighed 150 grains, =20.4 sulphur, which, added to 11, separated without acidifying, =31.4; the mean quantity of this and the first experiment being 28.74.

VII. To the solution from which the sulphuric acid had been separated by nitrate of barytes, nitrate of lead was added as long as arseniate of lead was thrown down; and this, when washed and ignited, weighed 53 grains.

According to Dr. Thomson, 21.25 of arseniate of lead contain 7.5 of arsenic acid, equivalent to 4.75 of arsenic; if then, 21.25 give 4.75; 53 of arseniate of lead will indicate 11.84 of arsenic. It appears from these experiments, that this ore consists of nearly

Silica	5.
Iron.....	9.26
Copper	45.32
Sulphur	28.74
Arsenic	11.84
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	100.16

In performing this analysis, some circumstances occurred which I think worthy of notice. In a preliminary experiment, I endeavoured to separate the copper from the iron by means of ammonia, without previously separating the arsenic acid; this I found impracticable, for it appeared that the arseniate of iron, at first precipitated, was eventually dissolved by the ammonia. In some treatises on chemistry, the arseniate of barytes is described as an insoluble salt: this, as may be deduced from

what I have stated, is not the case. I first tried it by pouring a solution of arseniate of potash into one of nitrate of barytes ; no precipitation occurred, but, upon standing some days, very delicate feathery crystals of arseniate of barytes were formed, which exhibited the prismatic colours with a splendour equal to that of the noble opal. I have since attempted, but without success, to reproduce the salt having this appearance.

Although the compounds of sulphur with copper and iron are well known, so much obscurity prevails as to the composition of the sulphurets of arsenic, that I shall not venture to offer any observations as to the mode in which these substances are combined ; but it will, I think, be evident, when the analysis, crystalline form, and other properties of this compound, are considered and compared with previously described copper ores, that it is essentially different from all of them. To mark this difference, as well as to offer a tribute of respect to departed merit and genius, my brother and myself propose to distinguish it by the appellation of **TEN-NANTITE**.

ART. XIII. *An Account of the violent and destructive Storm of the 23d of September, 1815.* By John Farrar, Professor of Mathematics and Natural Philosophy in the University at Cambridge. From the *American Philosophical Transactions*.

THIS storm was very severely felt throughout a greater part of New England. It was most violent on and near the coast, but does not appear to have extended far out at sea. It was preceded by rain, which continued to fall for about twenty-four hours, with a moderate wind from the N. E. Early in the morning of the 23d the wind shifted to the east, and began to blow in gusts accompanied with showers. It continued to change toward the south and to increase in violence while the rain abated. Between nine and ten o'clock A. M. it began to excite alarm. Chimneys and trees were blown over both to the west and north, but shingles and slates, that were torn from the roofs of buildings, were carried to the greatest distance, in the direction of about three points west of north. The greatest destruction took place between