



On kermes mineral

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differences,—how can it be said that between the Cephalopoda and the Vertebrata there is an *identity of composition*, a *unity of composition*, without perverting the terms of language from their most obvious sense? I shall bring back these facts to their true expression, when I say that the Cephalopoda have many organs which are common to them with the Vertebrata, and which in them perform similar functions; but that these organs are differently arranged with relation to each other, and are often constructed in another manner;—that in them they are accompanied by several other organs which the Vertebrata have not;—while the latter have also on their part several which are wanting in the Cephalopoda.”

M. Cuvier announces to the Academy other communications in which he will examine various other principles, various other laws set forth by different naturalists. But in order that these readings may not be confined to idle metaphysical questions, he will take care always to connect them, like the present one, with some ascertainment of facts from which the science may derive advantage.

M. Geoffroy-Saint-Hilaire heard the Memoir of M. Cuvier with the greatest pleasure: he was delighted to see the discussion opened upon the grand principle whose existence he asserts. He will reply, and will state precisely what he means by *unity of organic composition*. In the mean time he thought it necessary to remark, that it was not he who had sought to apply this principle to the Mollusca, but MM. Laurencet and Meyraux; it is therefore for them to support their views against the observations of M. Cuvier. For himself, called on to form a judgement of this view, which appeared to him ingenious, he has only said what he thought of it, without wishing to take upon himself the responsibility of it. “I shall make,” continued M. Geoffroy, “a single remark on the subject: You have heard the long enumeration of the organs which the Cephalopoda have in common with the Vertebrata. Now at first sight it seems to me much more difficult to conceive how animals which have so many similar organs could be arranged on different plans, than to comprehend how, in spite of the difference of distribution which appears at first sight to exist among them, it could be possible to conceive them as arranged on the same plan.”—*Le Globe*, No. 10.

[The discussion has been continued at various sittings of the Academy, down to that of the 12th of April. We shall endeavour to present our readers with a view of the remainder in our next and following Numbers.—EDIT.]

ON KERMES MINERAL. BY M. GAY-LUSSAC.

According to the latest researches of M. Berzelius, and those of M. Rose, kermes mineral is merely common sulphuret of antimony, the colour of which is owing to its state of minute division.

Not being perfectly satisfied with the proofs adduced in support of this composition, I made some experiments, which have induced me to form a different opinion, and which approximates the idea that the greater number of chemists have entertained, particularly since the researches of M. Robiquet. These experiments are very ancient; and

and I should content myself with the publicity which I have given to them in my lectures, if M. Henry, jun., who has lately published an interesting memoir on kermes, had not left me some observations to add. I shall distinguish the precipitates formed by sulphuretted hydrogen in a solution of antimony from kermes, properly so called, because their natures are very different.

The orange red precipitate, obtained by passing sulphuretted hydrogen into a solution of emetic tartar, is an hydrated protosulphuret of antimony. In fact, neither weak muriatic acid nor tartar separates any oxide from it; and when solution is effected, it is always accompanied with the disengagement of sulphuretted hydrogen.

This sulphuret when dried at 212° Fahr. contains some water, but not in quantity sufficient to form an hydrosulphuret; it is gradually expelled up to 446° ; at this point it contains no more, and becomes black; when rubbed on paper it gives black marks. It appears to me analogous to hydrated peroxide of iron, which loses its water gradually, becoming more and more brown, as the temperature rises, and assuming a red colour only when it has lost all its water.

Sulphuretted hydrogen produces also a red precipitate in the solution of permuriate of antimony, but it differs from that obtained from emetic tartar or the protomuriate; it is an hydrated persulphuret, which heat decomposes into sulphur, which is volatilized and black protosulphuret, similar to the preceding. It is to be observed, that the black sulphuret obtained by calcining the orange-red sulphuret, is less fusible than the native black sulphuret; it resists the action of a spirit-lamp.

It is well known that kermes varies in colour, at least, according to the mode adopted in preparing it. It is that obtained by the process of Cluzel (*Annales de Chimie*, tom. lxiii. p. 122), upon which my observations will be made. We shall be greatly deceived if we suppose that because kermes still yields something to water, after numerous washings, it is pure only when it ceases to do so; for if we were to wash the subacetate of copper, and many other salts, till water ceased to dissolve any portion of them, they would be completely decomposed. The fact is the same with kermes, too much washing alters its nature. At what point then ought we to stop? This is readily discovered by employing the smallest possible quantity of water in the washings, and in continuing them only until the residue, supposing the water to have no chemical action upon it, contains only one-thousandth or a ten-thousandth of foreign matter.

Kermes mineral, thus washed, has the following properties:—dilute muriatic acid, tartaric acid and bitartrate of potash, take protoxide of antimony from it without disengaging sulphuretted hydrogen; when dried for a long time at 7° , and even at 212° , it still contains water; heated by a spirit-lamp it becomes black, and yields water, which, as observed by M. Robiquet, is slightly ammoniacal. At a higher temperature it fuses and swells up, on account of a little sulphurous gas which is disengaged. When in layers upon glass, it gives it a deep red colour, and rubbed upon paper it gives a reddish-brown colour: it is more fusible than the black sulphuret obtained by the calcina-

tion of the hydrated orange sulphuret. If a current of hydrogen be passed at a low red heat over kermes deprived of moisture by heat, much water and sulphuretted hydrogen are obtained, and the antimony is reduced; but, as already observed, the residue possesses an alkaline re-action. After these various experiments, it is unquestionable that kermes contains oxide and sulphuret of antimony, and it ought to be considered as an oxisulphuret. The quantity of water obtained by decomposing it with hydrogen is variable; but it may be considered as composed of one proportion of protoxide of antimony and two proportions of protosulphuret. In fact, I obtained 0.9 of the proportion of protoxide; and M. Henry by another process found the difference still less.

It is equally certain that kermes mineral precipitated from the alkaline sulphurets which held it in solution, is an hydrate. It loses water gradually as the temperature is raised, and appears black when deprived of it; but in my experiments I did not obtain a definite proportion.

When potash, soda, or their carbonates act upon black sulphuret of antimony, their oxygen goes to the antimony, with which it forms protoxide, and the sulphur of the antimony takes the place of the oxygen of the alkali: thus it is that no kermes is obtained by boiling sulphuret of antimony with sulphuret of potassium saturated with sulphur; but by means of acid, a yellowish orange precipitate is formed in the solution, which when heated yields sulphur and becomes black. The golden sulphuret gives a similar result.—*Ann. de Chim. et Phys.* tom. xlii. p. 88.

THORINA AND THORINUM. BY BERZELIUS.

In the Phil. Mag. for November last, we noticed Berzelius's discovery of a new earth or rather metallic oxide, to which he gave the name of Thorina: we add the following particulars respecting it. Thorina hardens in the fire, and it becomes difficult to powder it. Its specific gravity is greater than that of any other earth, and almost equal to that of oxide of lead, being 9.402. It is infusible and unalterable by the blowpipe *per se*. With borax it dissolves extremely slowly and the resulting glass is not transparent, but it may be so saturated as to become milky on cooling. It dissolves slowly with salt of phosphorus, and carbonate of soda does not dissolve it at all.

One hundred parts of thorina appear to consist of

Thorina	88.16
Oxygen	11.84

and one hundred parts of hydrate of thorina of

Thorina	88.25
Water	11.75

The weight of its atom, according to Berzelius, is 884.9; hydrogen being unity, we may perhaps assume it to be 70.

Thorina is distinguished from other earths principally by its combination with sulphuric acid; in this combination, heat precipitates a salt, which by cooling slowly, but completely, redissolves. It is, however, to be observed with respect to this re-action, that it does not occur