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On the composition of paraffin

M. Lewy

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interesting to the readers of the Philosophical Magazine to state, that in the autumn of the year 1839, whilst engaged in a mineralogical examination of a part of the country in the neighbourhood of Kenmare, County Kerry, I discovered a few specimens of this rare mineral in the carboniferous limestone of that district; and more recently, when surveying in the vicinity of Bristol, I have succeeded in obtaining it in tolerable abundance from the same formation in several localities. It occurs either coating the faces of the minor joints, or filling up small crannies at the points where several joints intercept each other; in the latter situations the pieces sometimes weigh nearly half an ounce, in others it appears merely as a fine film.

This interesting mineral has been described as occurring in small masses in the lavas of Madeira and other volcanic districts, and also as existing under very dubious circumstances at Alston in Cumberland, in minute globules in the interior of small lumps of *slaggy galena* within reach of the surface.

Inclosed you will find specimens of the metal exactly in the state it was found.

I am, Gentlemen, your obliged Servant,

THOMAS AUSTIN, Jun.,
Mineral Surveyor.

1 Paul Street, Kingsdown, Bristol,
Dec. 31, 1842.

ON THE COMPOSITION OF PARAFFIN. BY M. LEWY.

Paraffin has already been subjected to the researches of various chemists; according to the analysis of M. Jules Gay-Lussac, its composition is the same as that of olefiant gas; its chemical equivalent has not hitherto been ascertained, because it does not form any compounds whatever.

M. Lewy states that his experiments were performed in the laboratory of M. Dumas, to whom he was indebted for the various specimens of paraffin employed in his analyses; some of them were prepared by M. Malaguti from the bituminous schistus of Autun, and from various kinds of wax. Some specimens of rough paraffin were purified by M. Lewy himself by repeated treatment with alcohol and æther, then distilling the products and again crystallizing them in ætherized alcohol.

The paraffin thus obtained was perfectly white, and had the form of pearly scales. Its density was 0.89, it fused at about $85\frac{1}{2}^{\circ}$ Fahr.; it may be distilled without alteration, and its boiling point appears to be between 694° and 712° of Fahrenheit.

The mean of eight analyses gave as the composition of paraffin,—

Carbon.....	85.03
Hydrogen.....	14.87—99.90.

This composition the author remarks does not agree with that of olefiant gas, and the simplest formula which can be deduced from it he states to be $C^{20}H^{42}$, which gives

Carbon	85.10
Hydrogen	14.89—99.99.

With the intention of ascertaining the condensation of the elements of the equivalent of paraffin, M. Lewy attempted to determine its density in the state of vapour; this operation requires many precautions, for paraffin undergoes incipient decomposition at a temperature but little higher than that of its boiling point; it is difficult not to obtain some carburetted hydrogen gas, of which the eudiometric analysis must be performed in order to calculate with greater exactness the density according to the data of the experiment; when however the operation is carefully conducted, the paraffin remains white in the receiver, and analysis indicates no alteration in it. The results of three determinations did not sufficiently agree to admit of proving the equivalent of paraffin with certainty. The numbers oscillated between 10 and 11·8. All that can be stated with certainty is, that the molecule of paraffin contains at least 40 equivalents of carbon.

Taking the composition as $C^{40} H^{24}$, calculation will give the following numbers:—

$$\begin{array}{rcl} 40 \text{ vol. of vapour of carbon} & = & 33\cdot728 \\ 84 \text{ vol. of hydrogen} & = & 5\cdot779 \\ \hline & & 39\cdot507 \\ & & 4 \end{array} = 9\cdot879.$$

Assuming the formula $C^{48} H^{100}$, we shall have

$$\begin{array}{rcl} 40 \text{ vol. of vapour of carbon} & = & 40\cdot32 \\ 100 \text{ vol. of hydrogen} & = & 6\cdot88 \\ \hline & & 42\cdot20 \\ & & 4 \end{array} = 11\cdot8$$

This formula gives

$$\begin{array}{rcl} C^{48} & \dots\dots\dots & 3600 & \dots\dots\dots & 85\cdot20 \\ H^{100} & \dots\dots\dots & 625 & \dots\dots\dots & 14\cdot78 \\ \hline & & 4225 & & 99\cdot98 \end{array}$$

numbers which agree equally well with the experiments.

M. Lewy remarks, that it is evident that the formula for paraffin requires to be verified by means less subject to error; he states also that he has made several attempts to obtain products derived from paraffin by the influence of several chemical agents; chlorine has a marked action, and yields under favourable circumstances a crystalline body which contains much chlorine.

An examination of the products derived from paraffin, as well as researches on wax and its relation to paraffin, will undoubtedly furnish new data for establishing the equivalent of paraffin.—*Ann. de Chimie*, Juillet 1842.

ANALYSIS OF HUMAN BONES. BY BERZELIUS AND BY MARCHAND.

The analysis of Berzelius has not we believe been very recently performed, but that of Marchand has; we give them both that they may be compared.

<i>Berzelius</i> .—Cartilage completely soluble in water	32·17
Vessels	1·13