

If, however, this analogy were perfect, we would anticipate that the action of oxygen, partially ozonised, would not have produced death, as the amount of ozone in these experiments certainly did not exceed 10 per cent. As it was, all we have observed is that the animal only lives a somewhat longer time in ozonised oxygen than in ozonised air. We are thus induced to regard ozone as having some specific action on the blood, or in the reflex nervous arrangements of respiration, that future experiments may elucidate.

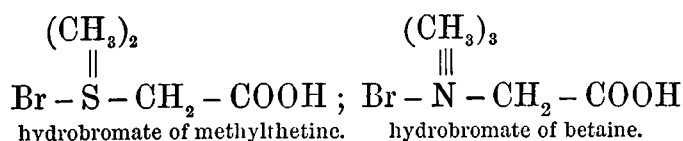
4. On a Compound formed by the addition of Bromacetic Acid to Sulphide of Methyl, and on some of its Derivatives. By Professor Crum Brown and Dr E. A. Letts.

(*Abstract.*)

The sulphine compounds discovered by v. Oefele, indicate that, notwithstanding the difference of atomicity, there exists an analogy between sulphur and nitrogen, these compounds corresponding to the salts of the ammonium bases not only in chemical properties but also in physiological action.\*

The research, the results of which are communicated in this paper, was undertaken with the view of examining this analogy in some other directions.

It seemed reasonable to suppose that, as the nitrile bases, such as trimethylamine and strychnia unite with chloracetic acid to form compounds such as hydrochlorate of betaine and of glycolyl-strychnia, the sulphides of the alcohol radicals should act in a similar way. Experiments show that this is the case—bromacetic acid acting readily on sulphide of methyl to form a beautifully crystallised compound to which the authors give the name of hydrobromate of methylthetine. Analyses proved this substance to have the composition corresponding to the formula  $C_4H_9SBrO_2$  which is that of the sulphur analogue of the hydrobromate of betaine.



This view of its constitution is confirmed by its reactions.

\* Brown and Fraser, “*Proc. Royal Soc. Edin.*,” March 4th, 1872.

In addition to this substance, which served as a starting-point for the research, the nitrate, the chloroplatinate, the chloraurate, the bromaurate, and compounds formed by the action of the hydrobromate on the oxides of mercury, copper, and lead, on ammonia and on ethylate of sodium were examined.

Corresponding addition products of sulphide of ethyl were also prepared, but owing to the extremely deliquescent character of the hydrobromate of ethyl-thetine, attention was chiefly devoted to the derivatives of the methyl compound.

Iodacetic ether does not form an addition product with sulphide of methyl. The reaction here takes a different direction, free iodine and iodide of trimethylsulphine being produced. The authors are engaged in the investigation of this reaction, and also of the products of the oxidation of the thetine compounds.

#### 5. Note on the Various Possible Expressions for the Force Exerted by an Element of one Linear Conductor on an Element of another. By Professor Tait.

In the *Quarterly Mathematical Journal* for 1860, I gave a quaternion process for obtaining in a very simple manner, from Ampère's experimental data, his well-known expression for the mutual action between two elements of currents. As one of the data the assumption was made, after Ampère, that the action is a force whose direction is that of the line joining the middle points of the elements, *i.e.*, it was assumed that the necessary equality of action and reaction holds, not merely for two closed circuits but, for each pair of elements of these circuits. I promised in that paper to publish a more general investigation, in which no such assumption should be made; but I was prevented from doing this by having seen a reference to a memoir by Cellerier, in which it was stated that such an investigation had been given. I did not, till very recently, succeed in getting any information about that memoir, none of which seems indeed to have been printed except a very brief extract in the *Comptes Rendus* for 1850, vol. xxx., giving no details: but the subject was recalled to my memory by Clerk-Maxwell's *Treatise on Electricity, &c.*, in which there is an investi-