'science,' to those studies which employ the method freely, as to other studies in which quantitative measurement or statistics play a part and in which objective verification is practicable. Would it not be preferable to coin some other term to denote the former—a suitable one could surely be found in the writings of Philo of Alexandria, who excelled in the method of research under discussion.

C. W. HUME.

14 The Hawthorns,
Finchley, London, N.3,
Dec. 31.

I HASTEN to reassure Capt. Hume. No right-minded anthropologist would regard the argument framed by him as scientific. A science need not be judged by its camp followers and aberrant devotees. Mathematical demonstration is possible only in proportion to the degree of abstraction. The criterion of proof in each science depends upon the character of its subject matter and the potentialities of the methods which that subject matter admits. To estimate the conclusiveness of a proof, apart from the general rules of logic, in any given subject must therefore, to a considerable extent, depend upon knowledge and training. Capt. Hume's example is not well chosen. The connexion between Christianity and Mithraism, as well as other forms of paganism, is dependent not upon one or two resemblances, which might be fortuitous, but upon a series of similarities sufficiently close to warrant their being regarded as identities, quite apart from the admission of the early Christian Church that borrowing and assimilation had taken place.

THE WRITER OF THE ARTICLE.

Blue Rock Salt.

IT was suggested by Prof. Baly that the blue colour of certain specimens of rock salt from Stassfurt might be explained by a difference in energy content between the blue and the ordinary colourless salt, and that this difference might be manifested by a difference in the heats of solution of the two varieties.

That there must be a higher energy content in the blue form was shown by heating some of the blue product to about 350° C. in an electric muffle in a dark room. A distinct glow was observed soon after dropping a blue crystal on the floor of the muffle, and after the glow ceased it was found that the blue colour had disappeared without disintegration of the crystal. Colourless portions of rock salt, taken from different parts of the same sample, showed either no glow at 350° C. or only the faintest trace, which was probably due to the presence of a few specks of blue salt enclosed in the white.

No light was emitted on dissolving blue salt in water, nor could any radiation be detected by a panchromatic plate.

Several series of experiments were carried out on the relative heats of solution of the blue and colourless salt, in an adiabatic calorimeter, and by using the same range on the Beckmann thermometer throughout each series, any error due to scale inaccuracy was eliminated. These experiments resulted in a difference of only about 0·5 per cent, the blue portions having a smaller negative heat of solution, as was to be expected. This corresponds to a difference of only two thousandths of a degree between the falls in temperature on solution of the blue and white portions under the best conditions that could be attained.

Experiments were also carried out on the relative heats of solution of purified sodium chloride and of specimens of blue salt prepared by means of cathode rays, in the hope that a larger difference in the heats of solution might be obtained than in the case of the natural product. The difference was now found to be 1·5 per cent; but this cannot be directly compared with that obtained in the case of the Stassfurt halite, because the artificially prepared blue salt was found to give an alkaline solution, whereas the natural variety gives a neutral one. This points to a liberation of heat due to a reaction between metallic sodium and water, and it is therefore not justifiable to rely on the heat of solution as a measure of the energy associated with the coloured state in the case of the artificially prepared blue salt.

Whilst the investigation shows that there is a very slightly greater energy content in the coloured than in the colourless halite, the difference was found to be too small for accurate determination.

(During the preparation of pure sodium chloride it was observed that by fusing it in a platinum vessel in air, a product was obtained which invariably gave an alkaline solution. This is contrary to statements in the literature, and the matter is being further investigated both for sodium chloride and other similar compounds. The results will be published in a separate communication.)

F. C. GUTHRIE.

The Chemical Laboratories,
University, Liverpool.

Newly Discovered Superconductors.

AT the Glasgow meeting in September last of the British Association, I read a paper on investigations on superconductors which I am carrying out in the cryogenic laboratory, Leyden, in co-operation with Prof. van Aubel, of Ghent, and Mr. J. Voogd, of Leyden. In my opinion, the superconductivity of the metals is not only connected with the electron configuration in the atoms, but also with the atomic weight and perhaps with the zero-point energy (*vide* W. J. de Haas, *Journal de Physique*, **9**, 9; 1928). From this point of view the following investigations may be interesting.

Recently we have investigated not only pure metals, but also combinations of two metals in relation to superconductivity. First, combinations of a superconducting metal with a non-superconducting one, namely, copper, silver and antimony with the superconducting tin, bismuth with the super-conducting thallium. The combinations of antimony with tin and of bismuth with thallium become superconductors. The resistance of Ag_3Sn diminishes continually from about 3·4° abs. to 1·3° abs., without vanishing, however. (The resistance of the 'classical' superconductors diminishes within a temperature interval of $\frac{1}{30}$° to $\frac{1}{50}$° from a measurable to an unmeasurable value.) Perhaps this combination represents a transition case, as the combination of copper with tin (Cu_3Sn) does not become superconducting.

I formed the opinion, however, that combinations of two non-superconducting metals could also form a superconductor. The atomic weights of the metals considered are: copper, 63·57; silver, 107·88; tin, 118·7; antimony, 120·2; gold, 197·2; mercury, 200·6; thallium, 204·0; lead, 207·2; bismuth, 208. The eutectic alloy of gold–bismuth was chosen. As to their atomic weights, these two metals lie just below and just above the group of the heavy superconductors respectively. (The numbers of the electrons in the outer layers for gold, mercury, thallium, lead, bismuth, are 1, 2, 3, 4, 5 respectively.)

Again, in co-operation with Prof. van Aubel, who had prepared the samples, and with Mr. Voogd, the resistance–temperature curve was determined. The combination gold–bismuth really becomes superconducting. The fall of the resistance is very great. The