

### A Remarkable Meteor on November 24.

I WAS much interested in seeing Dr. Rambaut's letter describing a brilliant meteor seen at Oxford on the evening of November 24. I was travelling along the London to Oxford road at the time, and when passing through Stokenchurch (seventeen miles from Oxford) was suddenly aware of a pale green light of sufficient intensity to be quite noticeable even when looking down at the road. On looking up I saw the meteor just as it disappeared. It presented the appearance of a luminous green ball of about one-quarter the sun's diameter, though this can only be regarded as quite an approximate estimate. My first impression was that the phenomenon was an unusual type of meteor, but on account of the brilliant green colour I immediately afterwards came to the conclusion that it must have been a rocket, and therefore did not unfortunately note the exact time or careful particulars as to the position. I should estimate that the meteor lay about N.N.E. when I saw it, but that the altitude was somewhat greater than the  $17^\circ$  given by Dr. Rambaut. The agreement in time and place was, however, sufficiently close to leave no doubt that it must have been the same phenomenon. The intensity of the illumination may be judged from the fact that the light was quite noticeable to one not looking up towards the sky at the time.

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Meteorological Office, South Farnborough Branch,  
December 1.

I REGRET to have to have to point out a mistake in my letter printed in NATURE for November 27 (p. 372). The altitude of the meteor should have been given as  $27^\circ$ , not  $17^\circ$  as there stated.

As the error appears in my copy, I fear I must bear all blame for it.

ARTHUR A. RAMBAUT.

Radcliffe Observatory, Oxford, December 1.

### THE BRITISH RADIUM STANDARD.

AN account of the preparation and testing of an international radium standard was given in the issue of this journal for April 4, 1912 (vol. lxxxix., p. 115). It will be remembered that a radium standard containing 21.99 milligrams of pure radium chloride was prepared by Mme. Curie for the International Committee. At a meeting in Paris the standard of Mme. Curie was compared with another independent standard prepared in Vienna by Professor Hönigschmidt, and the two were found to agree well within the limits of accuracy of measurements by the  $\gamma$  ray method. The preparation of Mme. Curie was accepted by the Committee as the International Standard, and was deposited in the Bureau du Poids et Mesures at Sèvres, near Paris. At the same time it was arranged that the Vienna preparation should be retained in Vienna as a secondary standard. Arrangements were made to allow Governments to obtain duplicates of the international standard. For this purpose the Austrian Government generously offered to provide the radium required at a considerable reduction in price. It was arranged that duplicate standards should be prepared and tested in Vienna in terms of their secondary standard, and then sent on to Paris to be tested again in terms of the international standard. In all six duplicate standards have

now been prepared for different Governments, and the independent standardisations of the radium content in Vienna and Paris has been found to be in remarkably good agreement. The comparisons of the quantities of radium is made by means of the penetrating  $\gamma$  rays, and it is a striking testimony to the accuracy of this method that the independent measurements have agreed so closely, although widely differing experimental arrangements have been employed in the two places.

It will be remembered that Dr. Beilby, F.R.S., very generously defrayed to Mme. Curie the cost of the radium forming the international standard, and thus relieved the International Committee of the necessity of collecting special funds for this purpose. Immediately after the fixing of the international standard, arrangements were made in this country to obtain a duplicate standard to be placed in charge of the National Physical Laboratory at Teddington. Dr. Beilby again stepped in in a very generous manner and agreed to defray the expense of acquiring the British radium standard, which was delivered to the National Physical Laboratory a few months ago. The British radium standard does not differ much in radium content from the international standard, containing about 20 milligrams of pure radium chloride.

A circular has now been issued by the National Physical Laboratory, stating that they are prepared to standardise preparations of radium and mesothorium in terms of the international standard, and a detailed list of testing charges has been issued. In the beginning, the Laboratory has very wisely confined itself to undertaking the standardisation of strong preparations of radium and mesothorium only. The comparison with the British standard will be made by  $\gamma$  ray methods. Tests on radio-active minerals, radio-active waters and other materials of weak activity, will not be undertaken at the moment, though, no doubt, arrangements will be made as the new radio-active department progresses to undertake some work of this character in the future. The Laboratory sends out a certificate that the active material under examination shows a  $\gamma$  ray activity equivalent to a certain weight of metallic radium, but no guarantee is given of whether the activity is due to radium itself, for it is well known that it is not easy to distinguish without special tests between preparations of radium and mesothorium. Preparations of the latter are standardised by expressing their  $\gamma$  ray activity at the time of testing in terms of a definite weight of metallic radium in radio-active equilibrium. Both the Reichsanstalt and the National Physical Laboratory express the activity of their preparations in terms of metallic radium, and not in terms of bromide or chloride. This appears to me a very wise step, for it is obviously more definite and scientific to express the results in this form. It is also very desirable that all radium should be bought and sold in terms of metallic radium, thus avoiding the uncertainty that some-