overlooked in the general theory of inheritance. I am fully aware that I shall be accused of flat Lamarckism; but a nickname is not an argument.

MARCUS M. HARTOG.

Cork, March 6.

A Fine Meteor.

A FINE meteor was visible here to-night at 6.36 p.m. It fell perpendicularly almost due north-north-east, disappearing about 20° above the horizon, and was then as nearly as possible of the brilliancy and colour of Venus, which was shining in the south-west at the time. Length of path, I think, about 20°, but I am not positive that I saw the beginning of it.

B. WOODD SMITH.

Hampstead Heath, N.W., March 11.

Bishop's Ring.

I AM informed by Miss E. Brown, of Cirencester, that she saw Bishop's ring in full day-time as recently as last month, not far from 12 o'clock one day, the sun being hidden behind a cloud at the time. It appeared very similar in extent, as well as colour, though not intensity, to what it did after the Krakatau eruption. Also another day she noticed something like it when looking at the sun simply through a dark glass.

I have very occasionally myself in the last few years seen a somewhat similar phenomenon, but duller and dirtier in colour than Bishop's ring usually was, and which gave me the impression of being lower down in the atmosphere than that. I attributed this to smoke or some other local impurity. It would appear that the phenomenon seen by Miss Brown, out in the country, cannot have been thus caused; but I suppose that she must really have seen the corona produced by volcanic dust, through an exceptionally pure lower atmosphere.

Sunderland, March.

T. W. BACKHOUSE.

The Philosophical Transactions.

Most people who interest themselves in science would be glad to possess a complete set of the Philosophical Transactions. But in the first place complete sets are scarce, and in the second it would be much too expensive for ordinary people; furthermore, it is not in everyone's library that room could be found for its reception. Now, Drs. Hutton, Shaw, and Pears have brought out a first-rate abridgment of this valuable publication from its commencement to the end of the year 1800. May I venture to suggest that the Royal Society would be doing a good work by publishing on the same lines a continuation up to the year 1900? If they commenced now, and brought out a volume at intervals, the whole thing might be completed in the early years of the twentieth century. The cost ought not to be very great, and probably nearly every free library would subscribe.

S.

ON THE COMPOSITION OF WATER.¹

DURING the past year I have continued the work described in a former communication on the relative densities of hydrogen and oxygen (Roy. Soc. Proc., February 1888, vol. xliii. p. 356; see also NATURE, vol. xxxvii. p. 418), in the hope of being able to prepare lighter hydrogen than was then found possible. To this end, various modifications have been made in the generating apparatus. Hydrogen has been prepared from potash, in place of acid. In one set of experiments the gas was liberated by aluminium. In this case the generator consisted of a large closed tube sealed to the remainder of the apparatus; and the aluminium was attached to an iron armature so arranged that, by means of an external electro-magnet, it was possible to lower it into the potash, or to remove it therefrom. The liberated gas passed through tubes containing liquid potash,² corrosive sublimate, finely powdered solid potash, and, lastly, a long length of phosphoric anhydride. But the result was disappointing, for the hydrogen proved to

be no lighter than that formerly obtained from sulphuric acid.

I have also tried to purify hydrogen yet further by absorption in palladium. In his recent important memoir (*Amer. Chem. Journ.*, vol. x. No. 4), "On the Combustion of Weighed Quantities of Hydrogen and the Atomic Weight of Oxygen," Mr. Keiser describes experiments from which it appears that palladium will not occlude nitrogen—a very probable impurity in even the most carefully prepared gas. My palladium was placed in a tube sealed, as a lateral attachment, to the middle of that containing the phosphoric anhydride; so that the hydrogen was submitted in a thorough manner to this reagent, both before and after absorption by the palladium. Any impurity that might be rejected by the palladium was washed out of the tube by a current of hydrogen before the gas was collected for weighing. But as the result of even this treatment I have no improvement to report, the density of the gas being almost exactly as before.

Hitherto the observations have related merely to the densities of hydrogen and oxygen, giving the ratio 15'884, as formerly explained. To infer the composition of water by weight, this number had to be combined with that found by Mr. Scott as representing the ratio of volumes. The result was—

$$\frac{2 \times 15'884}{1'9965} = 15'914$$

The experiments now to be described are an attempt at an entirely independent determination of the relative weights by actual combustion of weighed quantities of the two gases. It will be remembered that in Dumas's investigation the composition of water is inferred from the weights of the oxygen and of the water, the hydrogen being unweighed. In order to avoid the very unfavourable conditions of this method, recent workers have made it a point to weigh the hydrogen, whether in the gaseous state, as in the experiments of Prof. Cooke and my own, or occluded in palladium, as in Mr. Keiser's practice. So long as the hydrogen is weighed, it is not very material whether the second weighing relate to the water or to the oxygen. The former is the case in the work of Cooke and Keiser, the latter in the preliminary experiments now to be reported.

Nothing could be simpler in principle than the method adopted. Globes of the same size as those employed for the density determinations are filled to atmospheric pressure with the two gases, and are then carefully weighed. By means of Sprengel pumps the gases are exhausted into a mixing chamber, sealed below with mercury, and thence by means of a third Sprengel are conducted into a eudiometer, also sealed below with mercury, where they are fired by electric sparks in the usual way. After sufficient quantities of the gases have been withdrawn, the taps of the globes are turned, the leading tubes and mixing chamber are cleared of all remaining gas, and, after a final explosion in the eudiometer, the nature and amount of the residual gas are determined. The quantities taken from the globes can be found from the weights before and after operations. From the quantity of that gas which proved to be in excess, the calculated weight of the residue is subtracted. This gives the weight of the two gases which actually took part in the combustion.

In practice, the operation is more difficult than might be supposed from the above description. The efficient capacity of the eudiometer being necessarily somewhat limited, the gases must be fed in throughout in very nearly the equivalent proportions; otherwise there would soon be such an accumulation of residue that no further progress could be made. For this reason nothing could be done until the intermediate mixing chamber was provided. In starting a combustion, this vessel, originally full of mercury, was charged with

¹ A Paper read at the Royal Society, by Lord Rayleigh, Sec.R.S., on March 7.

² Of course, this tube was superfluous in the present case, but it was more convenient to retain it.