

reduced to 0.3 per cent. of the amount originally present, and less than 1 part of iron in 100,000 is present. In order to obtain zirconia, the basic sulphate may be dried and ignited; or it may be suspended in water and treated with an alkali with the production of zirconium hydroxide, the latter compound is then washed, dried, and ignited. In either case, the final product contains from 98 to 99 per cent. of zirconium dioxide; silica and a smaller amount of alumina are also present.

J. S. H.

On the Supposed Weight and Fate of Radiations. SIR OLIVER LODGE (*Phil. Mag.*, April, 1921).—This, the first article in a monthly number of the great British magazine, should, in justice to the author be read in the light of the opening sentences. "In regions where our ignorance is great, occasional guesses are permissible. Some guesses occur in this paper: let an apology for them be understood.

"If light is subject to gravity, if in any real sense light has weight, it is natural to trace the consequences of such a fact. One of these consequences would be that a sufficiently massive and concentrated body would be able to retain light and prevent its escaping."

The author then works out the mathematics of the problem and draws the conclusion, "We find that a system able to control and retain its light must have a density and size comparable to

$$\rho R^2 = 1.6 \times 10^{27}$$

where ρ is the density and R the radius, both in c. g. s. units." "It is hardly feasible for any single mass to satisfy this condition; either the density or the size is too enormous." "If a mass like that of the sun could be concentrated into a globe about 3 kilometres in radius, such a globe would have the properties above referred to; but concentration to that extent is beyond the range of rational attention. The earth would have to be still more squeezed into a globe 1 centimetre in diameter." The suggestion is made that a stellar system might meet the conditions. "The question has often been asked, What becomes of all the radiation poured into space by innumerable suns through incalculable ages? Is it possible that some of it is trapped, without absorption, by reservoirs of matter lurking in the depths of space, and held until they burst into new stars? And a further more important question begins to obtrude itself: What happens to light when, in free though modified ether, it is stopped relatively to a gravitational mass? Does it retain its energy, mainly on rotational form, tie itself into electrons, and add to the mass of the body?" After an examination of this problem the author proceeds, "So if 10 cubic millimetres of earth-sunshine could be checked and condensed till its density was 10^{12} it might be converted into an electron of mass 10^{-27} gramme."

G. F. S.