The images, naturally, were not comparable with those shown on a modern cinema screen, but the likenesses were unmistakable. The person whose image was transmitted sat in a flood of brilliant light. Mr. Baird has now developed a method by which the image of the person is transmitted although he is in complete darkness. This result is obtained by flooding the 'sending' room by infra-red rays. On Nov. 23 last, Mr. Baird gave a demonstration to Mr. W. R. Crookes and me. One of us stayed in the sending-room with a laboratory assistant in apparently complete darkness. In the receiving-room, on another floor, the image of the assistant's head was shown brilliantly illuminated on a screen, and all the motions he made could be readily followed.

These images were not outlines or shadowgraphs, but real images by diffusely reflected rays. The application of these rays to television enables us to see what is going on in a room which is apparently in complete darkness. So far as I know, this achievement has never been done before.

We had the impression that the image on the screen was not quite so clearly defined as when visible rays were used, but we easily recognised the figures we saw, and made out their actions. The direct application of Mr. Baird's invention in warfare to locating objects apparently in the dark seems highly probable, but I hope that useful peace applications will soon be found for it.

ALEXANDER RUSSELL.

Faraday House,
Southampton Row, W.C.1,
Jan. 28.

Relativity and the Observer.

IN Mr. Bertrand Russell's article in the new volumes of the "Encyclopædia Britannica" entitled "Relativity: Philosophical Consequences," there occurs the following sentence: "The 'observer' who is often mentioned in expositions of relativity need not be a mind, but may be a photographic plate or any kind of recording instrument." I should like to know how far Mr. Russell can claim to be in agreement with physicists on this point. For my own part it would seem to make complete nonsense of the theory. As I understand the principle of relativity, every object which can be observed, including the measuring rods and clocks which are used to observe, not excepting the retina of the observer's eye, undergoes transformation when the observer passes from one system of reference to another. If it is not so, if there be one piece of matter which can claim to be privileged, be it only a single electron, what, I ask, is the use or meaning of the principle?

However, I propose a simple test. Will Mr. Russell—and any one who thinks he is right—read the article by Mr. J. H. Jeans on "Relativity" which immediately precedes his own article, and wherever he finds the word observer, make the substitution "photographic plate or any kind of recording instrument," and see if he can make sense of the principle.

I agree that the observer need not be a mind if by mind is meant anything over and above the simple spiritual or ideal act of observing, but the observer most certainly cannot be the observer's body or a part of his body or the instrument he uses, for no particle of such material structure possesses any privilege in the physical world. Surely if it did the principle of relativity would be superfluous, for the privileged object would itself provide an absolute system of reference.

H. WILDON CARR.

405 West Adams Street,
Los Angeles, California, Dec. 22.

The Continuity of Existence.

RECENTLY, in an address to the British Academy, Prof. T. Percy Nunn propounded the idea that the existence of an electron is not necessarily continuous, and that when an electron revolving in an orbit about a nucleus changes to another orbit, it is possible that the electron goes out of existence in the first orbit and comes again into existence in the second orbit. It is of interest that Planck's theory that action is not a continuous entity but consists of discrete quanta leads to a similar conclusion.

A point of our ordinary space has in Einstein's fourfold world a record that is called its world line. As a bundle of energy such as an atom or electron or nucleus has extension, it is appropriate to call its record in the fourfold its world-filament. Since energy integrated through an interval of time is action, this filament of the atom is action; and the atom or energy is the section in which our space cuts the filament.

In this picture action is represented as a continuous filament. This representation contradicts Planck's theory, and the picture must be amended in order to conform. The filament must be replaced by a series of quanta dotted along a line.

Consider now what happens as our space travels through the fourfold world. In some positions it will intersect a quantum of the series dotted along the line; in other positions it will miss. The atom or bundle of energy, being the intersection of the action by our space, will exist when our space intersects a quantum, and will not exist when there is no intersection with a quantum. In other words, as our space travels through the fourfold (that is to say, as time passes) the atom or bundle of energy keeps flashing into existence and out again. D. B. MAIR.

Double-Image Effect in Transparent Microscopic Spheres.

IN a paper published by us in the current number of the *Proc. Roy. Soc.* on the "Scattering of Light by Individual Particles in Smoke," we have directed attention to a double image effect exhibited by transparent microscopic spheres. As a result of further experiments we have found that the explanation of the effect given requires some modification. One of the images is due to reflection from the surface of the sphere instead of to internal reflection. As was suggested to us by Prof. Tyndall, this can be seen by placing a small bulb containing a gold sol in the beam of light from an arc, when one image is coloured red and may be seen to be due to refraction through the sol, whilst the other is white and is produced by reflection from the surface of the sphere.

H. S. PATTERSON.
R. WHYTLAW-GRAY.

Helium or Helion?

MAY I invite the opinion of readers of NATURE as to the desirability of changing the name of element No. 2 from helium to helion? This element was christened at a time (1868) when its existence was recognised on the strength of the D_3 line in the chromosphere, and when, in view of the proximity of this line to the D lines of sodium, it appeared not improbable that it was a metal. Now that helium has been isolated, liquefied, and even solidified, we know that it is typically non-metallic, exactly like argon and the other inert gases discovered in later years, and now placed in group O of the Periodic System. Its present name, therefore, is anomalous.

J. NEWTON FRIEND.

Municipal Technical School,
Birmingham, Dec. 9.