paper knife. This inevitably means *so many more papers left unread.*

While on the subject of referees, I should like to protest against the impatience of many secretaries, who seem to expect the poor referee to neglect his university duties at a minute's notice and to give up his whole time to preparing a report for return post.

If Mr. Basset were to start a "British Journal of Mathematics and Physics" without adopting the referee system or some equivalent, what would he do when X. Y. Z. sent him a paper disproving the existence of gravitation, when L. M. N. wrote proving that the ether consisted of jerk-backs of energy, or when P. Q. R. called men of science fools for not agreeing with his view that the sun's photosphere was composed of diatoms of electricity?

All the same, a journal of the kind suggested, if published of a convenient size, and with the pages cut, would fill a distinct want which certainly exists. G. H. BRYAN.

Euclid's Definition of a Straight Line.

I HAVE long thought that by the words ἐξ ἴσου, commonly translated *evenly*, Euclid means *symmetrically*. The symmetry can be tested by turning the line over; for instance, the edge of a flat ruler is straight if, when turned over, it coincides with its original position.

If a long rigid body is rotated, while two points, one in each end, retain their places, every line of particles joining the two fixed points describes a surface of revolution, which is symmetrical (in the sense intended) with respect to the two fixed points. The innermost of all such surfaces is of vanishing breadth, and is Euclid's straight line.

J. D. EVERETT.

11 Leopold Road, Ealing, March 29.

Spawning of the Plaice.

WITH reference to the letters of Prof. Herdman and Mr. W. Wallace as to the commencement of the spawning of the plaice this season, it may be stated that in the Moray Firth plaice were found spawning in the last week of December, and that spawning is not yet completed. The time mentioned is rather earlier than usual for this district, and it is not unlikely that spawning has been accelerated by the mild winter. T. WEMYSS FULTON.

Aberdeen, March 29.

Fossil "Rain-drops."

THE preservation of impressions of rain-drops in slabs of Triassic marl has always presented some difficulty, since mud that was soft enough to receive such impressions would seem too soft to retain them.

I have to-day, at the borders of a flood plain, in a back-water of the Dorn Valley, near the Cherwell, seen exactly similar impressions in some stiff marly clay from which the flood water has lately subsided, where the surface of the tongues of clay is covered with the foot-prints of herons, rooks and smaller birds, with sun-cracks gradually widening until the clay curls into separate flakes, and the characteristic "rain-drop" pittings dispersed over the surface upon which no rain has fallen since the water subsided. This led me to seek another cause for these peculiar marks, and I soon found their origin. The film of mud over sand was in some cases still covered with about an inch of quiet water, and the decaying vegetation in the mud had given rise to innumerable bubbles that rested unbroken upon the mud bottom, like the bubbles adhering to the sides of a tumbler of soda-water. As the water very slowly leaves these bubbles some of them break, and some become coated (by surface tension, I suppose) with a thin film of mud which strengthens the dome, so that they can become larger, as they also become flatter, and sink slightly into the tenacious mud, which then contracts slightly away, so that the diameter of the circle is enlarged. When at length they disappear, they leave circular pits behind them in the half dried mud with a slightly raised ring edge, and finally, when the mud has completely dried, these shallow rounded pittings present exactly the appearance of Triassic "rain-drops" amongst the sun-cracks and foot-marks already alluded to.

I have not seen any such explanation of these "rain-drops," but it seems to remove a difficulty.

Oxford, March 19. E. C. SPICER.

THE USE OF LIGHT AND OTHER RADIATIONS IN THE TREATMENT OF DISEASE.

ONE of the most interesting fields of medical research at present is the investigation of the therapeutic properties of various rays, and although much has been accomplished in a few years, there is promise of a still greater future for this development of the healing art. Any advance in medical science is of the greatest moment to the general public, and cannot be too widely known, and in this respect this branch of therapeutics has had a measure of publicity which is probably unique, but which is not altogether free from harm. The discussion of purely medical details, and the description of "cures" of apparently hopeless cases in the columns of the lay Press, have unfortunately led to misconception and to terrible disappointment to many sufferers.

The fact that certain rays of light possess special physiological properties has been long known, and valuable papers on the subject were presented to the Royal Society as far back as 1872 by Downes and Blunt. But the credit of rendering the knowledge obtained by these and other observers of practical value in the treatment of disease belongs to Finsen, of Copenhagen. His first work was to show that the chemical rays of light, the violet and ultra-violet rays of the solar spectrum, have a deleterious influence upon the eruption of small-pox, and this led him to introduce the red light treatment for this disease. The patient is confined to an apartment from which the chemical rays are excluded by means of red curtains. For the treatment to be successful the curtains must be thick enough to exclude the chemical rays as completely as they are excluded by the photographer from his plates and films. In a patient under these conditions the ordinary course of the small-pox eruption is modified, the fever of the second stage is lessened, and the scarring is infinitesimal. It is not claimed that the mortality from this terrible disease is materially diminished by the light treatment, for in a certain proportion of cases there is no hope from the first, but in a large majority suffering is diminished, convalescence is easier, and disfigurement is slight.

Finsen's next work was the development of the light treatment for lupus. Lupus vulgaris is a very chronic destructive disease of the skin and mucous membranes caused by the bacillus of tubercle, the microbe which attacks and destroys the lungs in consumption. The chemical or actinic rays are here the therapeutic agents used. These rays have a definite germicidal power, and they are also capable of setting up a peculiar form of inflammation. They are the cause of sun-burns and of pigmentation of the skin from exposure to the sun's rays. In the treatment of lupus the rays of the sun, or, more conveniently in northern climates, those of a powerful electric arc light, are concentrated by means of lenses upon the diseased area. For the lenses rock-crystal must be used, because ordinary glass obstructs the passage of a considerable proportion of the rays in the ultra-violet part of the spectrum. When the sun's rays are used a light filter is employed to cut out as far as possible the heat rays at the red and yellow end of the spectrum. The light filter is a hollow lens filled with a solution of methylene blue or an ammoniated solution of the sulphate of copper. If the electric light is used the light filter is now dispensed with, as the proportion of heat rays is much less than in the rays of the sun. Even with the light filter a certain proportion of heat rays pass, and in using either the sun or the arc light it is found necessary to cool the surface under treatment. This is effected by placing in contact with the area treated an apparatus through which a current of cold water is constantly passing,