sixtieth part of a day's destruction in the Formby Channel, it is a wonder that there are any left.

A point emphasized in the review, but seemingly missed by Mr. Walker, is that the young fish are always promptly returned to the sea by the Solway shrimpers, and the fact that the industry flourishes in spite of the delay so caused shows that the destruction which ensues from the practices described by Mr. Walker is quite unnecessary. Dr. Fulton has experimentally proved that the proportion of young flat-fish of a certain size (say above an inch) that would not survive if returned to the sea is small, so that it is evident that Mr. Ascroft's "axiom that 90 per cent. of fish that come on board a boat is destroyed" holds good from no fault of the trawl itself, but simply from a discreditable carelessness on the part of the man.

Mr. Walker's experiences at the mouth of the Dee show that the shrimps and the young soles (species ?) have different habitats in that river, so that his suggestions as to the limitation of shrimp-trawling seem rather superfluous, since it may be supposed that the trawler would fish where he knew he could get shrimps, and not go out of his way to catch what he did not want. I have noticed myself on the west coast of Ireland that the minute post-larval flat-fish, smaller than those dealt with by Fulton, and which are undoubtedly killed by the meshes of the shrimp-trawl, were never taken on ground frequented by shrimps, where, indeed, as one may judge from the relations of the two forms in captivity, the weaker would have a poor chance of surviving.

Everyone will agree with Mr. Walker that it is most necessary to ascertain the habitat of the young fish at different times of the year, and to this end the energies of the Marine Biological Association in England, the Fishery Board in Scotland, and the Royal Dublin Society in Ireland, have been for some time directed; and the assistance that might be rendered by a series of observations by one possessing the experience and opportunities of Mr. Walker would be incalculable. Until, however, our knowledge on the subject is much more complete, I question the advantage of strewing boulders about the bottom of the sea. Even if they remained to accomplish their purpose of interfering with trawling, there is the danger that they would form an attractive shelter, not to the young flat-fish that stand in no need of it, but to some of their natural enemies.

Dublin, December 27, 1891. ERNEST W. L. HOLT.

A New Precessional Globe.

To facilitate the understanding of the effects of precession, I have made a new arrangement of the celestial globe. A globe mounted in the new way can give a representation of the starry heavens for every place on the earth, and for any date, both past and future.

The globe is fastened in a ring, so that it can be turned round an axis that goes through the poles of the ecliptic, but can also be fixed in any position by a pair of screws. The amount of turning is to be measured by a divided circle.

The ring above mentioned—which we will call ring I.—is movable in another ring (ring II.), round an axis, which forms a right angle with the axis formerly mentioned. The inclination between ring I. and ring II. can be measured by an index; it must equal the obliquity of the ecliptic.

Ring II. is fastened finally in a third and extreme ring (ring III.), so that it can be turned round an axis which forms an angle of 90° with the axis of ring II. Ring III. is mounted on a stand with a horizon-circle, so that its axis can be inclined at pleasure to the plane of the horizon-circle. The inclination may be read on a scale engraved on ring III.

To adjust the apparatus to show the firmament at any appointed place and time, one must place ring III. so that its inclination towards the horizon-circle equals the latitude of the place. Then ring II. must be turned so that its plane coincides with the plane of ring III. The angle between I. and II. must be equal to the obliquity of the ecliptic at the appointed time. Finally, the globe must be turned round the axis which goes through the poles of the ecliptic, till the point of the heaven, which is the celestial pole for the time appointed, comes under the axis round which ring II. turns in ring III. If the globe is then fastened in ring I., and ring I. in ring II., with screws, by turning the globe in ring III. one can see at a glance which stars are setting and rising, and which are always above the horizon.

By making Vega, for example, the celestial pole (14,000 A.D.), one can see immediately that for the latitude of London at that remote period, the Cross would be seen at the southern horizon, and that Sirius then did not rise at all. K. HAAS.

Vienna.

Simple Proof of Euclid II. 9 and 10.

IN NATURE of December 24 (p. 189) a simple proof of Euclid II. 9 and 10 is given, which it is stated is believed to be new. It may therefore be of interest to your readers to know that these proofs are given in an edition of Euclid which we have now in the press. As the author, Mr. Brent, is resident at Dunedin, New Zealand, we are unable to state whether he lays claim or not to any originality in respect to them: in any case, as he has been engaged in mathematical teaching for many years, these and similar proofs of other propositions in Euclid II. have clearly been more widely employed than has been supposed. PERCIVAL AND CO

34 King Street, Covent Garden, London, January 4.

THE ALLEGED DISCOVERY OF A BACILLUS IN INFLUENZA.

FROM the behaviour of influenza as an epidemic, it seems not unreasonable to suppose that it may have as its cause a living and multiplying organism; and when influenza reappeared, after an interval of many years, in the latter part of 1889, and more especially since its communicability from person to person, formerly disputed, has come to be generally admitted, the public mind, medical and lay, has been in expectation of the announcement that a specific microbe had been discovered as the cause of the disease.

Even in diseases, however, of which the characters point most strongly to a parasitic microbe as their cause, the discovery of such an organism is by no means an easy matter. Thus, no micro-organism has as yet been identified as the cause of small-pox, although this disease is always more or less with us; breeds true; has distinct characters, and a definite localization on the skin; and propagates by a contagion which retains its activity for very long periods—circumstances which point to a specific organism as its cause, and might be thought to facilitate its discovery.

From *a priori* considerations we must suppose the properties of the hypothetical influenza microbe to be as follows. The diffusibility of the poison through the air shows that it must be very minute and readily suspended. For the same reason it must belong to the class of aërobic organisms, *i.e.* those for whose existence oxygen is necessary, or at any rate not hurtful. It must multiply with extreme rapidity. It must be capable of multiplying in the bodies, or secretions, of human beings; and probably also in some medium or media outside the human body—perhaps on damp ground-surfaces, or in confined air laden with dust and organic matter. One can hardly suppose it capable of multiplying in pure air, as it would lack pabulum; perhaps, as Dr. Symes Thompson suggests, particles of organic dust floating in the air may serve as rafts for it to live on. As, however, influenza prevails under the most opposite conditions of season, climate, and weather, our supposed microbe, if it can live in the air, must be able to flourish under a great range of temperatures and degrees of humidity. I am not aware of any instances of long retention of contagion, such as would lead us to postulate the possession by our microbe of resting spores. From these considerations we might have expected that it would be more likely to turn out to be a micrococcus than a bacillus.

From what is known of the pathology of some other diseases of microbic origin, as tetanus and diphtheria, it seems possible that the immediate cause of the symptoms of influenza may be the presence in the blood and tissues, not of the microbe itself, but of the poison