

of Rosse, the Earl of Crawford and Balcarres, Drs. Wagner, Schjellerup, Ball, and Backlund, and Professors Klinkerfues and Brediction. American astronomers have also done their full share; papers having been contributed by Dr. Peters, and Professors Pickering, Holden, Todd, Wright, and Stone. We express the hope that *Copernicus*, as a high-class journal for the publication of astronomical papers, may at some future time be re-issued under the same management as before.

### LETTERS TO THE EDITOR.

\* \* \* Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.

#### 'Illusive memory.'

THE subject presented in *Science* for March 7 (p. 274) under the above heading, by Mr. Osborn, if an obscure, is certainly an interesting problem in psychology. Its scientific treatment, however, will probably require a much wider range of investigation than that proposed by the writer. He has indicated 'two widely different theories' in explanation of the mental phenomenon: a third hypothesis appears to have escaped him.

Plato, as is well known, recognized this peculiar condition of the mind, and made use of it as an evidence of pre-existence,—a fancy embodied in the familiar lines of the poet:—

"Our birth is but a sleep and a forgetting:  
The soul that rises with us, our life's Star,  
Hath had elsewhere its setting,  
And cometh from afar:  
Not in entire forgetfulness,  
And not in utter nakedness,  
But trailing clouds of glory, do we come."

If, now, we substitute for Plato's conception of an individual personal experience the more prosaic one of ancestral experience, we shall have, in brief, the third hypothesis,—the partial continuity of consciousness through genetic descent, instead of through metempsychosis or transmigration. From this aspect, the problem of the irreferable impressions of vague reminiscence would not fall under the class of *erinnerungs-täuschung*, or 'illusive memory,' at all.

The modern reference of all the varied 'instincts' of animal life to the simple physiological datum of the heredity of a limited experience and memory, would naturally lead us to anticipate some such exhibition in the human race; nay, rather to wonder why we do not find such experiences much more pronounced and abundant. Notwithstanding the enormously greater expansiveness of cerebral action in man than in his lower fellow-creatures, the long-continued or reiterated impressions of a far-reaching ancestry would seem to justify the induction that 'intuitions' (so precious to the metaphysician) should be manifested in particular channels in a much stronger and more decisive form than we actually observe. Here, then, is a negative psychologic problem calling for explanation, and well deserving a careful comparative investigation.

To satisfactorily test this 'third hypothesis' is undoubtedly an extremely difficult undertaking, both by reason of the usual 'haziness' of these Platon-

ic reminiscences, and of the rare opportunities of authentic verification of special parental or avar collections. The question, however, is one of such biologic importance, that it merits an even laborious research; and, if in only one or two instances a clear evidence of such transmitted memory in man could be established, it would justify the inference that many similar cases are referable to the same principle.

The inquiry should include the antecedent experiences of grand-parents as well as of parents: since there is reason to believe that avar heredity is *relative* more frequent than direct parental heredity; or, in other words, that there is a tendency to 'alternate generation' running through the animal kingdom.

Washington, March 13.

W. B. T.

#### 'The oldest living type of Vertebrata,' Chlamydoselachus.

In *Science*, No. 57, p. 275, my friend, Professor Cope, falls into the error of placing among the species of the genus *Diplodus* Ag. (re-named *Didymodus* by Cope) the 'peculiar selachian' recently discovered, and described by me in these columns. With the specimen before him, he would be the last man to make such a mistake. And no doubt he will thank you for giving the space necessary to a correction.

The most important of the characters on which the genus *Diplodus* was founded by Agassiz (1843, *Poisons fossiles*, iii., pp. 204, 209), that by which it is separated from *Hybodus*, *Sphenonchus*, and *Cladodus*, is a greater development of the secondary cones of the teeth, while the median cone remains rudimentary or comparatively undeveloped. This is not the case with *Chlamydoselachus*: it is not the secondary, but the median, cone in which is found the greatest development; agreeing in this respect with Agassiz' genera *Hybodus*, *Sphenonchus*, and *Cladodus*, in which "le cône médian l'emporte sensiblement sur les cônes latéraux, et se développe en quelque sorte à leur détriment." In the teeth of *Chlamydoselachus*, the cone at either side of the median is a mere rudiment. If the new selachian was to have been placed in either of the fossil genera mentioned, it should have been *Cladodus*. Mr. Cope says of *Didymodus*, 'The species possess two, three, or four denticles.' Of course, a second thought will increase the number so as to include *Chlamydoselachus*, which has more than four.

The propriety of placing living species in fossil genera of so long ago on account of resemblances in a single organ, such as a tooth only of a selachian, is to be questioned. The teeth do not give satisfactory clews to structure and shape of other organs, or of the body itself, in the majority of the sharks and skates. This is evident enough on comparison of the teeth of *Carcharias*, *Alopias*, *Zygaena*, *Squatina*, *Torpedo*, *Scyllium*, *Raja*, *Triakis*, *Disceus*, *Mustelus*, *Trygon*, *Pristis*, *Potamotrygon*, *Rhinobatus*, *Dicorobatus*, and others. It would be hardly worth the while to separate recent genera by the number and position of fins, or shape of body, and then make them equal to the same fossil genus on account of some similarity in teeth. Material in my possession will enable me, as soon as the necessary drawings can be made, to prove conclusively that *Chlamydoselachus* does not belong to the genus *Didymodus* of Cope (= *Diplodus* Ag.), and that it was hardly safe to announce *Didymodus* as the 'oldest living type of Vertebrata' until more was known about *Chlamydoselachus*.

S. GARMAN.

Cambridge, March 17.