

Letters to the Editor.

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Biological Terminology.

ACTUALLY we are now talking about biological method. In his last letter (NATURE, July 28, p. 680) Sir Archdall Reid makes three appeals to me. My own contribution to the discussion has been confined to a defence of systematic biology, and I have no authority to answer for any "sect of biologists." But surely most of us accept the principles of scientific work that he lays down; most of us realise that our interpretations are mere working hypotheses; and most of us are always on the look-out by observation or experiment for those crucial facts which shall confirm or upset our hypotheses. My own difficulty has been either to devise a question that should be universally accepted as crucial, or, having devised one, to elicit the relevant facts. Biologists who can experiment with their material are certainly in a better position to perform both these operations than is one who can only observe portions of extinct animals. The distinguished author whom Sir Archdall Reid quotes merely uses a little more force in making essentially the same remark. But he can defend himself—if he cares to.

If, then, there are "sects" among biologists, I should be inclined to ask: Which of them does not employ—or, rather, attempt to employ—crucial testing? Apparently Sir Archdall Reid does not study the periodicals with which I am familiar; but possibly, as a medical man, he reads *Parasitology*. I, too, happened to look at its last number, and I observed an inquiry by Mr. P. A. Buxton into the specific distinctness of the mites responsible for three forms of mange. A form known as Norwegian crusted scabies has been the subject of divergent views, and "it is," says Mr. Buxton, "much to be desired that someone who is fortunate enough to see a case should infect a few volunteers in order to discover whether ordinary itch or the crusted variety is induced, and whether, after one or two generations, the mites can in any way be distinguished from typical *S. scabiei* var. *hominis*." This is an application of the crucial test; but Sir Archdall Reid may retort that it is only another of the lakes in an Africa of malpractice, and since I cannot swamp your pages with all the other lakes I must leave him to wander in the desert.

Sir Archdall Reid offers to help me on the question of recapitulation; but I would ask him first to explain his "glaring truism." He writes, "Variation is the sole cause of non-inheritance, etc." Surely "variation" in this sense is but another name for "non-inheritance," and the rest of his sentence therefore merely states that the offspring resembles the parent when it does not differ from it. But if there is any other meaning in the sentence, then I would remind him that whether "like exactly begets like when parent and offspring develop under like conditions" is just one of the questions that divide biologists. A germinal change would be a change of the conditions, and is therefore excluded. Either "the glaring truism" is an identical proposition, or it is a statement actually disputed. In neither case is it the same as the statement that, "apart from variations, offspring tend to recapitulate the development of their parents." If Sir Archdall Reid thinks that it really is the same, he is scarcely the man to dispel our

difficulties. Those difficulties are not implicit in either of his "truisms." F. A. BATHER.
August 14.

The Fauna of Scottish Lochs.

IN Mr. B. B. Woodward's interesting letter on the occurrence of *Pisidium Clessini* in Loch Ness (NATURE, August 4, p. 715) he does not mention the depth at which his specimens were found. Loch Ness, in the deeper parts of which *Pisidium* has been dredged on more than one occasion, is a very deep lake in which different zones of life undoubtedly occur. In Lake Biwa, in Japan, the Palæartic *P. casertanum* is found only at considerable depths (17-30 fathoms), and it is probable that in Scotland *P. Clessini* lives still deeper.

Last month (July) I spent investigating the fauna, and especially the molluscs and sponges, of two comparatively shallow lakes in Perthshire, Loch Lubnaig and Loch Vennachar. No evidence was obtained in either lake of the occurrence of a deep-water fauna or of the existence of molluscs at greater depths than 70 ft., at which a *Pisidium* (probably not *P. Clessini*) was fairly common; but the area below 100 ft. is there very small. The only other molluscs common in the two lakes were *Limnaea peregra* and "*Ancylus fluviatilis*," both of which also occur in the streams that flow out of them. The facies and habits of the *Limnaea* in the two lakes are different. I hope to discuss the reasons why elsewhere.

Thirteen years ago I directed attention to our ignorance of the fresh-water sponges of Scotland. Since then nothing further has been published, though Mrs. Scharff (Miss Jane Stephens) has given us an admirable account of the Irish species. In Loch Lubnaig the abnormally low water of last month afforded unusual opportunities for the study of these interesting organisms. Three species (*Spongilla lacustris*, auct., *S. fragilis*, Leidy, and *Heteromeyenia Ryderi*, Potts) were found, mostly in the form of small, thin films on the lower surface of stones that would have been almost inaccessible in ordinary circumstances.

I may also mention another interesting observation made at Loch Vennachar, namely, that a Tubificid worm common at the edge of the lake has the habit of encysting in the earth when the water retreats. Each cyst contains from one to twelve individuals closely coiled and in a state of apparent torpor. When the cysts are placed in water the wall bursts and the worms emerge in a lively condition.

N. ANNANDALE.

Isle of Ulva, Argyllshire.

Magnetic Double Refraction in Smokes.

THE letter from Prof. Elihu Thomson on "A Novel Magneto-optical Effect" which appeared in NATURE of June 23, p. 520, suggested to me that the phenomena were associated with magnetic double refraction.

I used a Nernst lamp with a vertical wire; a parallel beam of light, polarised through a Nicol with the principal section at 45°, passed along a diameter close to the superior plane of a circular plate coil disposed horizontally; and, finally, a second Nicol crossed with the first.

At the bottom of the coil was arranged in a convenient way an arc lamp with metallic electrodes, able to give large quantities of smoke when carrying 30 amperes and 140 volts. A copper pipe, coaxial on the top with the coil, conveyed the fumes on the side of the magnetic field crossed by the polarised light, and was disposed so as to prevent disturbing light from the arc in the observation space. The coil