

In this way, if the observation that after the removal of the old timber in Nevada the water-flow was more even be correct (which I hesitate to accept), it would find explanation in this, that the stumps and roots decayed and thereby increased the channels for the percolation of surface waters.

In conclusion I would say, that geological structure and soil conditions may be such, that percolation takes place readily even without the additional aid of a forest growth, when the effect of the latter may become irrelevant, although as a rule it may be accepted as a result of forest removal and exposure of soils, when new growth is at the same time prevented by fires and by sheep herding, that all soils become gradually more compact and less penetrable; that then more water goes over the surface and less remains for subdrainage and that ultimately the change is felt in the riverflow.

B. E. FERNOW.

WASHINGTON, D. C.

#### ZOOLOGY AND BIOLOGY.

TO THE EDITOR OF SCIENCE: It is astonishing to find in your columns the assertion, p. 634, that the Johns Hopkins University sends out 'Doctors of Philosophy in Biology,' for you might have learned so easily that no such degree is known among us.

The examining board recommends for the degree of Doctor of Philosophy those students who have satisfactorily completed a course of study which this board has previously approved; and among all those who have been recommended for this degree during the last twenty years not a single one has presented himself for examination in biology, although many have been examined in various branches of biological science.

W. K. BROOKS,

*Professor of Zoölogy in the Johns Hopkins University.*

BALTIMORE, April 28, 1896.

[The criticism of Professor Brooks is directed against a letter signed by Professor Conway MacMillan, of the University of Minnesota. SCIENCE is not responsible for the opinions of its correspondents. ED.]

#### THE USE OF THE TOW-NET FOR COLLECTING PELAGIC ORGANISMS.

EDITOR OF SCIENCE: I have so frequently seen the first use of the tow-net as a means for collecting pelagic organisms placed to the credit of Johannes Müller that I suspect many zoölogists are, as I was till recently, ignorant of the fact that Eschscholtz employed the apparatus some twenty years earlier than Müller did.

In Eschscholtz's 'Review of the Zoölogical Collection,' appended to the second volume of 'A new Voyage round the World,' by Otto von Kotzebue, I find the following on page 327: "The calms near the equator afford an abundant harvest to the zoölogist, the tranquil water presenting an immense variety of marine animals to his view, and allowing him to take them with little trouble in a net. The open woolen stuff used for flags offers the most convenient material for making these nets, as it allows the water to run through very quickly and does not stick together. A short wide bag should be made of this stuff, which may be stretched upon the hoop of a cask, and the whole fastened to a long, light pole. From the height on which we stand above the water it is impossible to perceive the smaller animals; the best way, therefore, to catch these is to hold the net half in the water, as if to skim off the bubbles of foam from the surface; then, after a few minutes, if the net is drawn out, and the interior rinsed in a glass of fresh seawater, one may frequently have the pleasure of seeing little animals of strange forms swimming in the glass. In the course of ten days I obtained, in this way, thirty-one different species of animals."

Eschscholtz does not tell us exactly when he began this kind of collecting; but the voyage on which he did it was during the years 1823, '24, '25 and 26; and as the above quotation is taken from the account of his observations in the tropical Atlantic before reaching the coast of Brazil, it certainly relates to the earlier part of the voyage.

In the last one of his series of papers on the development of Echinoderms, published in 1852, Müller tells us that he had used the tow-net 'vielen Jahren mit dem besten Erfolge.' The 'vielen Jahren,' I suppose, refers to the years during which he was prosecuting his beautiful