

Waal's equation is used, the truth is only approximated. In these various experiments we shall (granting the validity of the objection) be "doing harm to young experimenters" unless we stress the slight systematic departures from the laws which are being studied.

As Professor Thompson points out, the instruction sheet which is doing the harm is in good company. It can even boast of companionship with classic works such as Poynting and Thomson's "Properties of Matter" and with the "Dictionary of Applied Physics." The question can therefore in all fairness be asked whether we should not be doing greater harm by diverting the student's attention from the fundamentally important law than we are doing in ignoring departures from the law which have no practical significance.

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A HERMAPHRODITIC VIVIPAROUS OYSTER OF THE ATLANTIC COAST OF NORTH AMERICA

WHILE engaged in scallop studies at the U. S. Bureau of Fisheries Laboratory, Beaufort, N. C., in 1925, my attention was drawn to a small oyster which became so numerous on the scallops of one particular shoal as to be a scallop pest, if not a scallop enemy. Its general external appearance was not sufficiently different from that of the common oyster of commerce [*Ostrea virginica* Gmelin (= *elongata* Solander)] to suggest specific distinctions and it was at first assumed to be that form. Therefore, my surprise may be imagined when on October 6 I saw an individual throwing out large numbers of minute, active specks which were shell-bearing bivalves suggestive of oyster larvæ. Soon others were found to be doing the same. Numerous individuals were then secured and placed in separate dishes for observation. In the course of a few days nearly all these threw out shelled larvæ, some of which were kept alive for many days and made moderate growth for a time. The larvæ bore considerable resemblance to those of the oviparous *Ostrea virginica* but were larger for a corresponding stage of development, as judged by shell shape.

That these small oysters were not *Ostrea virginica*, having been thus demonstrated, an effort was made to identify them. The range limits as given by Dall (U. S. National Museum, Bulletin 37) eliminated all but the common oyster and *Ostrea equestris* Say and thus indicated the latter species to be the one under observation.

The specimens were found to correspond well with

Say's description and in one important respect with his figure. Later specimens were identified by W. H. Dall as *Ostrea equestris* Say.

Specimens, generally fixed in picro-aceto-formal, were secured at intervals through the fall, winter and spring and were imbedded, sectioned, stained and studied. The study is being continued.

In the meantime a few words as to conditions found and indications arising therefrom may not be out of place. Notes from examinations of sectioned specimens are as follows: October 6, embryos in the mantle cavity, in the gonad a few mature or nearly mature eggs and vast numbers of sperms; January 12, well-developed "ovarian" eggs and a few sperms; February 12, a narrow zone of germ cells, the sex of which has not been made out; February 16, sperms fully developed (spermatozoa) and very abundant small eggs fairly numerous; April 2 (two specimens), eggs immature and not very numerous; April 13, small eggs and larger eggs fairly numerous; April 29 (two specimens), large eggs fairly numerous, small ones not numerous, vacated areas present, sperms in various stages fairly numerous. On June 5 a specimen was found with objects in the mantle cavity which appeared to be eggs surrounded by sperms. On June 9 two apparently uninjured oysters cast out great numbers of larvæ, apparently till empty of them. One of these and the individual examined June 5 have been preserved for future study. The other is being kept in the hope that its condition may be determined at a later date.

I take these data to indicate an alternating hermaphroditism with overlapping similar to that described for the European *Ostrea edulis*, another viviparous oyster. Because summer specimens have not been examined, it is impossible to say whether spawning, for the species or "colony," is long drawn out or occurs at clearly separated intervals but more than once a year. A multiple cycle of eggs and sperm production per year per individual does not seem out of the question.

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SCABLAND MOUNDS OF EASTERN WASHINGTON

ON the channeled scablands of eastern Washington are found thousands of nearly circular mounds composed of different material than would be formed from the weathering of the basalt that is the chief bedrock of this region. The mounds only occur on top of the bare basaltic rock of the Columbia Plateau. They never occur on granite, schists or quartzite that occasionally outcrops. Neither do they occur on the

loessial hills of Palouse soil or in peat swamps scattered through the scablands.

The mounds average practically circular. Careful measurements failed to show any greater elongation in one direction than another. The highest point of the mounds is the center. They thus differ in shape from ordinary sand dunes. The mounds are of all sizes, from a few feet across to over one hundred feet and average around thirty to forty feet in diameter. They rarely exceed three or four feet in height above the scabrock. The material composing them is loess like and differs so markedly from soil formed from basalt that little of it can be derived from that source. It appears to have been brought in from elsewhere and deposited by the wind. The source of the material was probably the soft lake beds of the Ellensburg formation of south central Washington and the finest outwash material of the glacial period. Where I have studied the mounds in the northern half of the scabland area they practically without exception occur above a depression in the basalt. The depression is sometimes shallow, making the cross-section of a mound lens-like; in other cases it has steep sides like a pothole. In either case the basalt under the mound is very little weathered and makes a sharp contact with the mound. Such weathering as occurred resulted in chipping off small fragments of the basalt from the sides of the depression which are scattered through some of the mounds, chiefly in their lower part.

The work of Bretz (*Jour. of Geol.*, Vol. 23, pp. 139 to 149, Vol. 31, pp. 617 to 649) on the channeled scablands shows that the Spokane flood from a rapidly melting ice sheet removed the surface soil from the basalt and by the suction of the swirling torrent plucked out from the stream beds great chunks of the jointed lava, leaving its surface in a highly pitted condition. We only find the mounds in places where the basalt's surface contains depressions. The mounds are found in the midst of level areas, on the sides of hills, at the edge of rock terraces and even on top of small isolated hills of basalt. They occur both in the timbered and treeless parts of the scablands. In fact, they may occur anywhere on the bare basaltic rock and never elsewhere in this region. Their absence from the surface of crystalline rock is accounted for by the fact that such rock is denser and that potholes or other depressions were not worn into its surface. A considerable number of mounds have been cut through in road and railroad cuts, and a few wells and vegetable pits have been dug in them. Besides examining such, I have trenched several others. In the areas so far examined I have invariably found that the mounds occur over a depression in the scabrock. In the bottom of the depression there may be

gravel and a few boulders washed in by the Spokane flood and some chips of basalt from the weathering of the sides; aside from this the depression is filled with the loess that composes the mound that rises above it. Some of the depressions are shallow with gentle slopes, others are many feet deep with steep sides. A well in one case was dug twelve feet deep in a mound below the level of the scabrock without striking bottom.

Apparently at the close of the Spokane flood the basaltic lava was left with a decidedly pitted surface, the depressions of which had about the same dimensions in various directions. Sediment accumulated first in such depressions. Vegetation started growing on the sediment and retained the wind-blown material until the entire depression was surrounded and surmounted by a mound. The fine material of the mounds holds moisture better than the scabrock and the depression beneath is a storehouse of moisture which helps to promote a vigorous plant growth. It seems probable that the mounds were chiefly formed soon after the glacial period, although the much more luxuriant growth of grass on them to-day than on the bare basalt would permit additional wind-blown material to be caught and retained. Mounds have been reported outside the channeled scablands on the basalt of the Columbia Plateau but have not been examined by the writer. It would be of interest to learn if these mounds occur above natural depressions in the lava. It also may be that some lens-shaped mounds reported from other sections of the United States may be found to have grown as the result of more luxuriant vegetation in them, catching and holding wind-blown material until the mounds were formed.

The mounds are of economic importance to the inhabitants of the scablands. They provide the best available grazing aside from certain peat swamps. Corn, melons, sweet clover, potatoes and garden truck flourish when planted on the mounds, as the plants draw on the moisture in the soil that fills the depressions. It is difficult, however, to cultivate most of the mounds, due to their small size.

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FURTHER ON AERIAL SOUNDS IN YELLOWSTONE PARK

SINCE the publication of my note in your issue of July 30, my attention has been called to a much fuller and more important article on the phenomenon I described, written by Dr. Edwin Linton and published in *SCIENCE* (old series) for November 3, 1893. I suppose that I must have seen this article at the time,