

lineata Say, and colored figures of the three larval stages are given on plate 17, facing page 146, of more than ten of the species. Elsewhere (pp. 164, 219) general statements to this effect occur. Three larval instars are therefore implied for all, or almost all, of the species of the genus. And it is to this statement, in so far as it concerns the species *decemlineata*, that I desire to call attention.

Rearings of this species, both in nature and the laboratory, carried on in Georgia in 1906 and in Ohio in 1907, showed in both places four larval instars, all of which were distinct, and which have been described.² These rearings involved a total of not more than seventy specimens, and while this is very small in comparison with the large total reared by Tower, I can not think otherwise than that they represent the average for the species, and were not exceptions. All of the lots were small and under normal conditions, and the rearings were made especially with the view of determining the duration and number of the larval instars, so that errors in observation were eliminated. As Dr. Tower had other objects in view, I believe his observations in this respect were faulty, at least one ecdysis being overlooked in the larval development of *decemlineata*; and if in that species then as well perhaps in the others, though I am not concerned with them here.

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WASHINGTON, D. C.,
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EVEN PERFECT MEASURING IMPOTENT

THE attention of geometers should be directed to a remarkable article by Dr. R. L. Moore, of Princeton, whose extraordinarily elegant proof of the redundancy of Hilbert's axioms first appeared in *The American Mathematical Monthly*.

The new article, in the *Transactions of the American Mathematical Society*, Vol. 8, No. 3, pp. 369-378, July, 1907, is also a perfecting of the work of the Hilbert school, but

² Girault and Rosenfeld, *Psyche*, XIV., 1907, pp. 47-52.

reaches new results so unexpected, so profound as to be nothing less than epoch making.

We knew that the so-called laboratory method for mathematics, the "measuring" method, was rotten at the core, since mathematics is not an experimental science, since no theorem of arithmetic, algebra or geometry can be proved by measurement.

Our argument was sufficiently cogent: that the theorems of mathematics are absolutely exact, while no human measurement ever can be exact.

But Dr. Moore shows that even granting the impossible, granting the super-human power of precise measurement, we could not thereby ever prove our space Euclidean, ever prove it the space taught in all our text-books.

The title of his article is: "Geometry in which the Sum of the Angles of Every Triangle is Two Right Angles." But, omitting the Archimedes assumption, if this postulate be substituted for Euclid's, there results a geometry not necessarily Euclidean. Nevertheless, no human being confined therein could ever distinguish it from a Euclidean space even though he were supplied with instruments which could decide for him whether any two sects were exactly equal.

The Euclidean space would contain other points, points ideal or *ultra* as regards this "angle-sum" space.

But, most extraordinarily, no *ultra* point is ever between two ordinary points.

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SPECIAL ARTICLES

PLANKTON FISHING OFF THE ISLE OF MAN¹

DURING recent years a good deal of attention has been paid by naturalists in various parts of the world to the *quantitative* distribution of organisms in the sea. It is obvious that exact information in regard to such a matter may be of enormous importance in connection with the fishing industries. Notable methods of work, and instruments for

¹ Read before Section D (Zoology) of the British Association meeting at Leicester on August 6, 1907.