be no lack of correspondence in their teachings. This truth is now receiving a signal confirmation by the discovery of fossil plants in marine shell-bearing deposits, especially in the Lower Cretaceous of Portugal, of Texas, and of California. Neither is the 'botanical time piece' either too slow or too fast, and the organic pendulum has always swung in perfect unison on both sides of the Atlantic. LESTER F. WARD.

WASHINGTON, D. C.

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The Rôle of Water in Growth. C. B. DAVENPORT.

In developing tadpoles of various amphibia the amount of water contained was determined at short intervals between the time of hatching and midsummer. These determinations showed that during the first week or two of development the amount of dry substance in the embryo remains nearly absolutely the same as it is in the just-hatched larva, where it constitutes little less than half of the whole weight. During this period the immense increment in weight which accompanies the outlining of the form of the larva and its organs is due almost solely to imbibed water. It is the specific imbibition of water then which determines the direction of differential growth in the developing tadpole. As in plants this 'grand period of growth' is followed by one of histological differentiation, during which the absolute (and relative) quantity of dry substance increases rapidly.

The Structure and Function of the Midgut in Terrestrial Isopods. J. P. MCMURRICH.

The general result of the study of the Isopod midgut may be summed up as follows:

1. The so-called 'midgut' of the terrestrial Isopods is of ectodermal origin and is in reality a portion of the proctodæum.

2. It is lined by an impervious layer of chitin.

3. The cells which compose it possess no definite boundaries and form an epithelial syncytium.

4. The fibrils which traverse the cells from the basement membrane to the layer of chibin are, throughout the greater part of their extent, of the same material as the basement membrane, their central ends, however, being apparently chitinous. They are not protoplasmic, as Ide has maintained.

5. The nuclei frequently show great irregularities of form; these irregularities are sometimes due to injury, but in other cases appear to be normal and to indicate a power of amœboid movement.

6. The conjugation of the nuclei, described by Ryder and Pennington, does not occur.

7. Fragmentation of the nuclei occurs as a degenerative change, but amitosis for growth or regeneration, if occuring at all, is infrequent.

8. The increase in size of the 'midgut' appears to be due not to an increase of the *number*, but to an increase of the *size*, of the cells present at the close of embryonic life.

9. Feeding experiments indicate that the midgut does not possess an absorptive function; it merely serves for the passage of undigested material to the exterior.

A paper giving in detail the evidence on which these conclusions are based is in the hands of the editor of *The Journal of Morphology*.

The Result of the Suspension of Natural Selection as Illustrated by the Introduced English Sparrow. H. C. BUMPUS.

Over 1,700 eggs were critically examined, and 'curves of frequency' were drawn to illustrate the differences between the European and American specimens. It was found that the American eggs presented a much greater amplitude of variation than the European, that they were smaller and that they were of a strikingly different shape.

* Concluded from page 392.

The bearing of these facts upon the current theories of degeneration, panmixia, etc., were indicated.

The American eggs ranged in length from 18 mm. to 26 mm., while the shortest and longest European eggs measured respectively 18.5 mm. and 25 mm. The typical American eggs, moreover, had an average length of approximately 21 mm., while the European eggs averaged at least 1 mm. longer.

The ratio of breadth to length, *i. e.*, the ratio of the lesser to the greater diameter, showed much greater sphericity on the part of the American eggs, though also in respect to this feature the American eggs presented a much greater amplitude of variation.

The extremes of variation in shape and color were determined by a process of 'disinterested selection.' After having placed a secret mark upon each American egg, the eggs of both countries (863 American and 863 British) were thoroughly mixed together in a single tray. A disinterested person was then requested to select from the mixture 100 eggs that appeared to him to present extremes of shape variation. If eggs from the two countries were equally variable, of course approximately the same number from each would be selected, and if the American specimens were more variable, more American eggs would be selected. The result was in harmony with the evidence derived from the comparison of length and the ratios of breadth to length. Of the selected eggs, eighty-one were American and only nineteen were English, over four times as many of the former as of the latter.

The same method was adopted for the determination of color variation and with the result that eighty-two of the examples of extreme color variation were found to be American and only eighteen British. It was pointed out that this large proportion of extreme color variation on the part of American eggs was not only interesting in itself, but that when the figures are compared with those representing extreme variation in *shape* the significance of both results is enhanced. Not only is the preponderance of variation among American eggs very obvious, but in both cases, in shape and in color, it is almost precisely the same.

It was concluded that the data, whether gathered from comparisons of length, ratio of breadth to length, shape or color, all point in the direction of a general structural modification.

On the Plankton of Brackish Water. G. W. Field.

Investigations of the Plankton are now being carried on at the Marine Laboratory of the Rhode Island Experiment Station at the Great Salt Pond, near Point Judith, in South Kingston, R. I. It is intended to continue the observations, both summer and winter, for a term of years.

The pond is about five miles long and comparatively narrow. Its area is estimated at 1,500 acres. At the northern end, where the river enters, the water at the surface is quite fresh (specific gravity 1.000); at the bottom it is slightly saline (specific gravity 1.0055). The south end communicates with the sea. The specific gravity of the water at the outlet is 1.025. At points between the north and south ends of the pond are found all intermediate degrees of salinity.

Examination of the number of organisms per litre shows that the number is greatest in those areas where the specific gravity is between 1.008 and 1.020 (*i. e.*, the middle portion of the pond), and that in passing in either direction, southerly towards the ocean, or northerly towards the river, the number diminishes.

The most important constituents of the Plankton, named in order of the number of individuals, are: diatoms and algal débris;