

PRELIMINARY ACCOUNT OF THE DEVELOPMENT OF ETHEOSTOMA. BY A. B. ULREY.

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EMBRYOLOGY OF THE CUPULIFERA. BY D. W. MOTTIER.

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VARIATION IN ETHEOSTOMA. BY W. J. MOENKHAUS.

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BLOOD CORPUSCLES OF THE VERY YOUNG HUMAN EMBRYO. BY D. W. DENNIS.

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EMBRYOLOGY OF THE FROG. BY A. J. BIGNEY.

The embryology of the frog is an old subject, yet few of our smaller institutions and many of the larger colleges and even some universities often do but little work on the frog in this line. The material is so abundant that it seems that it ought to be studied some at least even in our high schools. One difficulty in the way, and perhaps the greatest, is a good method of manipulation. Many find this trouble and give up almost in despair.

It is the chief object of this paper to present what I consider the easiest and best method of manipulation. By this method even the inexperienced student or the amateur may soon be able to do fairly good work.

Eggs obtained very early in the morning may show the first process in maturation, viz.: the formation of the polar bodies. This can be observed better in the Amblystoma, or even more easily in the common pond snail, the *Dymnacus* or *Physa*.

In order to preserve the eggs for permanent mounting or sectioning, they should be killed and partially hardened in alcoholic-picro-sulphuric acid. The alcohol used in this solution should be 30 per cent. The eggs should remain in this solution from six to twelve hours, depending upon the age of the egg. Before putting them in this solution, most of the gelatinous substance should be removed by a needle or similar instrument. Next wash a few minutes in 30 per cent. alcohol, then transfer to 50 per cent. for an hour, then to 70 per cent. for two to four days.

The 70 per cent. alcohol passes through the membrane covering the egg and pushes it a short distance from the egg proper, so that it can easily be clipped with a pair of sharp scissors, and the egg is readily removed. If the alcohol is much

stronger than 70 per cent. it will not cause this swelling of the membrane. After this the eggs can be dealt with after the regular methods.

To study the segmentation the eggs may be kept in a watch-glass, and examined with a strong lens or low power of the microscope. The formation of the furrows can be studied up to the 32-celled stage with practically no difficulty, and with some care to the 128-celled stage. Eggs at the various stages may be killed, hardened and sectioned so as to show the internal changes, the formation of the cleavage cavity, the archenteron, notochord and other organs that appear from time to time. In the process of clearing the eggs it is best to use cedar oil rather than turpentine, for the latter tends to make them even more brittle than they are.

The general progress of this development is too well described in text-books to merit any further account here. I am indebted to Prof. Th. H. Morgan, of Bryn Mawr college, for most of the above points. I have carefully tested them, and can recommend them without restricting qualifications.

Another interesting field in the study of these eggs is to separate the segments in the early stages of segmentation and observe the result. It has been found that in the two-celled stage each segment will form a perfect animal, but only about half the normal size. This has been tested as far as the eight-celled stage, each segment continuing its development, but forming specimens much smaller than ordinarily, the effects of pressure upon the developing eggs causing them to segment in a different manner. Other points of interest might be suggested, but these are sufficient to call attention to this important subject.

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POISONOUS INFLUENCE OF VARIOUS SPECIES OF CYPRIPEDIUM. By D. T. MAC-DOUGAL.

At the last December meeting of the Academy a short paper was presented by the writer detailing some observations tending to show that *C. spectabile* and *C. pubescens* have an irritant action on the human skin. This paper was printed in full in the "Minnesota Botanical Studies," Part 1, 32, 1894.

The interest in the matter shown by the comment of the scientific and daily press and by the large amount of correspondence received, was such that a series of tests were planned which would place the entire matter beyond all question or doubt.

It had been suggested by ingenious correspondents that the poisonous effects experienced by the writer in handling *C. spectabile* in a swampy location, may have been due to the action of some of the poisonous plants, such as *Rhus*, usually