tion; the second, that perspective motives are operative in the neighborhood of the vertical, their further influence being prevented by the fact that the ends of the oblique are tied to the points *a* and *b*; the third, that the eye, in passing along the oblique, is solicited by the vertical, and the more resolute effort requisite to keep to the original path causes an apparent increase of the angle, the curving of the line being due to a conflict between the increase of the acute angles and the fixity of the outer ends of the oblique.

Which of these explanations shall we accept?

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SOME RECENT AND IMPORTANT EXPERIMENTS WITH THE EGGS OF THE SEA URCHIN.

THE well-known experiments of Boveri in which egg fragments were fertilized apparently gave evidence that the union of female cytoplasm with a spermatozoan may be followed by segmentation and development, but the proof is very inconclusive. It was left for Yves Delage to complete the evidence.

In a late communication to the French Acadamy* Delage states that he has succeeded in dividing the egg of *Strongylocentrotus lividus*, not *en masse* by shaking, as has been done heretofore, but by hand beneath the microscope and in such a way that there can be no doubt as to the fragments obtained being parts of the same egg. He was able to see that the nucleus was contained in one part and not in the other, which was, therefore, composed of ovulary cytoplasm. A whole or uninjured egg was placed beside the fragments and spermatozoa introduced into the drop of water in which the experiments were performed.

Sexual attraction manifested itself with equal energy by all objects. The controle egg and the two fragments were fecundated. A little later segmentation began, appearing first in the controle, a little later in the nucleated and still later in the nonnucleated fragment. The rapidity of segmentation was greatest in the controle and least in the nonnucleated, so that when controle was in the stage 8 or 16 the nucleated fragment had developed to stage 4 and the nonnucleated to stage 2. In the drop of water the development could not be of long duration, but in one case it was successfully carried through three days. At the end of this time the controle formed a typical gastrula. The nucleated fragment had developed so that the only difference apparent was its smaller size. The nonnucleated fragment also developed into a gastrula, but with the enteric and blastocœlic cavities very much reduced, owing, no doubt, to the smaller size of the fragment. In all cases a vitelline membrane appeared about the blastomeres. Some of the larvæ were fixed and stained, and the nuclei and nucleoli found in the cells from the nonnucleated to be no smaller than those in the cells from the nucleated fragment.

From these experiments Delage deduces the following very important conclusions:

1. The ordinary definition of fecundation must be rejected as being too strict. The union of the female and the male pronuclei certainly takes place, but it is not essential to development.

2. Fol's conclusions as to the union of the two pronunclei and of the demi-ovocenters with the demi-spermocenters must be cast aside. For, as the experiments show, the absence of an ovocenter is not an obstacle to development.

3. The theories in which fecundation is explained as the saturation of a female nuclear polarity by a male nuclear polarity must likewise be dismissed, and also those theories regarding the formation of the polar gobules as for the purpose of ridding the female nucleus of all male elements.

* *Comptes Rendus*, CXXVII., 15 pp., 528–31.

4. It is likewise necessary to reject the theories in which the male element is regarded as supplying the chromosomes subtracted in the formation of the polar globules. In giving up part of its nuclear matter the egg does not become *ipso facto* incapable of ulterior development, since an ovulary cytoplasm provided with a number of chromosomes and a mass of chromatin equal to that which it had originally, but of paternal origin, is capable of forming an embryo.

5. Sexual attraction is not confined to the nucleus.

6. In fecundation there are two things to be considered: (*a*) The communication to the egg of a vital energy that permits it to segment and develop. (*b*) The communication to the product of advantages resulting from amphimixy and from the possession of hereditary characters.

On the second of these two questions no light is thrown by the experiments, but on the first there is, showing that the theories of fecundation reconcilable with it are those representing this phenomenon as the bearing by the male element of special energetic plasma (*kinoplasma*) contained in its sperm center.

7. There is no specific structure in the ovulary cytoplasm, the conservation of which is a condition of development. If a structure exists it is conditioned by mutual reactions of the parts and is capable of reestablishing itself when it has been altered.

8. Boveri's celebrated experiments, so warmly contested by Seeliger, are confirmed by the removal of the most serious objection to their validity, namely, the impossibility of cytoplasmic development without a nucleus.

F. C. Kenyon.

AMERICAN ORNITHOLOGISTS' UNION.

The Sixteenth Congress of the American Ornithologists' Union convened in Washington, D. C., on Monday evening, November 14th. The business meeting was held at the Army Medical Museum. The public sessions, commencing Tuesday, November, 15th, and lasting three days, were held at the U. S. National Museum, the Central High School and the Cosmos Club.

Robert Ridgway, of Washington, D. C., was elected President; Dr. C. Hart Merriam, of Washington, D. C., and Charles B. Cory, of Boston, Vice-Presidents; John H. Sage, of Portland, Conn., Secretary; William Dutcher, of New York City, Treasurer; Charles F. Batchelder, Frank M. Chapman, Ruthven Deane, Drs. Jonathan Dwight, Jr., A. K. Fisher and L. Stejneger, and Mr. Witmer Stone, members of the Council. By a provision of the by-laws, the ex-Presidents of the Union, Drs. J. A. Allen and Elliott Coues, and Messrs. William Brewster and D. G. Elliot, are *ex-officio* members of the Council.

One active, one corresponding and one hundred and one associate members were elected—the largest number in any one year except one since the Union was founded. As in the previous year, a large percentage of the new associate members were women, a direct result of the Audubon Society movement, and of the present interest taken in the study of birds by the teachers in the public schools.

Mr. Witmer Stone's paper on 'Some early Philadelphia Collectors and Collections' was of special value from a historical point of view. New facts regarding Peale's Museum, Audubon, John Cassin and the early workers in ornithology in this country were given.

Wednesday afternoon and evening were devoted to papers illustrated with lantern slides. Through the kindness of Professor W. B. Powell, Superintendent of Schools of Washington, a hall at the Central High School was placed at the disposal of the Union and its friends for the afternoon. The first communication was by Mr. Frank