its sternum—all died. The average oscillation of variation around an ideal mean was also shown to be almost invariably in excess for the birds which perished, and the conclusions arrived at were as follows:

The birds which perished were not simply accidental sufferers from the severity of the storm, but were birds which were physically disqualified for enduring the intensity of the New England climate, as expressed by the storm of February 1st, and they were consequently eliminated by natural agents. The result of this elimination produced in this particular locality a colony of birds measurably different from those existing before the storm, that is, the action of natural selection resulted in the elimination of the unfit and the survival of the fit.

On the Anatomy of the Spermatozoon of Invertebrates. G. W. FIELD. (With demonstration of the apical body.)

THE widest diversity in the form of the spermatozoon is found among the different groups of the invertebrated animals. Closer examination shows that there is, however, one type of form which obtains in by far the greater majority of species, and that the aberrant forms are peculiar to those species which have either become parasitic, *e. g.*, certain worms and arthropods, or which have acquired specially modified secondary sexual organs, *e. g.*, lobster, crayfish, *Limulus*.

The common type is the familiar tailed form, prevalent one in the groups Cœlenterata, Vermes, Echinoderma, Mollusca, Arthropoda and Tunicata. The three general divisions are usually distinct and readily recognizable Rarely the spermatozoa of all the species studied have a special structure or apical body at the anterior tip of the head. It has been variously described as (1) an adaptation for boring into the egg; (2) a remnant of the cytoplasm; (3) fluid expressed from the nucleus upon shrivelling; (4) a micropore surrounded by 'Ringkörper;' (5) an apical button present in the unripe spermatozoon; (6) the sperm centrosome. The first five opinions seem to have little importance when considered in connection with the origin of this apical body. While the opinion of myself and others that it is the sperm centrosome is refuted by the weight of evidence that the sperm centrosome comes from the middle piece of the spermatozoon, yet, so far as I know, the function of this apical body has not been noted by any of those who have studied so successfully the fertilization process. Since it has the same microchemical reactions and the same origin as as the middle piece, it would appear as if its fate must be of considerable consequence. I have found this apical body in more than forty species, representing all the groups from the Cœlenterates to Amphioxus (including Toxopneustes). By others it has been found in upwards of twenty additional species.

The fact that the apical body is present in the spermatozoon of well-nigh every species studied indicates that it has some very special significance which should not be overlooked by workers on the phenomena of fertilization.

The Middle Piece of the Urodele Spermatozoön. J. H. MCGREGOR. (Read by title.)

The Origin of the Yolk in the Egg of Molgula. HENRY E. CRAMPTON, JR.

THE author presented the principal results of an extended study upon the early history of the ascidian oöcyte, considered from a chemical as well as from a purely morphological aspect, made by means of carefully controlled aniline staining supported by artificial digestion and other tests. It was found that the cell-body at the beginning of enlargement of the primary oöcyte presents no albumen reaction. There is, however, a small albuminous gran-