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THE NEURO-EMBRYOLOGIC STUDY OF BEHAVIOR: PRINCIPLES, PERSPECTIVE AND AIM[1]

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EMBRYOLOGY as a scientific method arose in the domain of morphology. Although there were early physiological and chemical observations upon the embryo, these were relatively casual. It was in the interest of explaining the structure of the animal body that embryology acquired a technique of its own and attained to the dignity of a biological science. Embryology as a growing science, however, is now through and through physiological. Witness, for example, the experimental schools of Spemann, of Harrison, of Child, and the tomes of Needham on "Chemical Embryology." Embryology has in fact gone afield to explore every nook and cranny, every crook and turn of the developing organism experimentally, physiologically, chemically; and even the problem of animal behavior is now being attacked by numerous investigators with the method of this originally morphological science. It is this latter field of investigation that engages our attention at this time.

The behavior of embryos is not of exclusively recent interest. Movements of snails within the egg were studied by Swammerdam; mussels and oysters, by Leeuwenhoek (1695). Even earlier than this (1651) William Harvey gave an account of movements of the chick during the early days of incubation. After Harvey, however, a century elapsed before the next important contribution was made on the movements of the chick embryo. This was by Beguelin (1757), to whom is accredited the notable accomplishment of keeping the embryo alive in the opened egg for fifteen days. In the earlier part of the nineteenth century, von Baer (1828) experimented upon the sensitivity and contractility of the fetal membranes of the chick, although it remained for Vulpian (1857) to establish the distinction between

[1] Address of the president of the American Association of Anatomists, Cincinnati, April 13, 1933.