Prof. Sven Hörstadius
Professor of Zoology, University of Uppsala, Sweden

Summary of scientific research

The main lines of my research have been experimental embryology of sea urchin and of amphibian eggs and larvae, see list of main publications 1973 and 1950-1969, respectively.

The sea urchin eggs (0.1 mm) are famous objects for research. The fertilized egg first forms an empty ball, the blastula, then an invagination at the back end forms the digestive tract and skeleton-forming cells – gastrula. We know that two forces stand against each other, the animal force decreasing towards the opposite vegetal pole from which the vegetal force decreases towards the animal pole. The vegetal material invaginates and gives rise to skeleton cells and the invaginating digestrive tract.

The capacity of single cells or cell groups has been studied by isolation or transplantation experiments. The isolated cleavage cells of 2- and 4-cell stages give typical small larvae because they all contain the same proportions of animal and vegetal material. By removal of certain parts along the egg axis or particularly by transplanting cells or cell groups, light has been thrown on the conditions for normal as well as divergent development. (1967-77 together with L. Josefsson, Copenhagen, 6 papers on morphogenetic substances in sea urchin eggs).

Probably the first known case of species character with cytoplasm from one and nucleus from another species, and reverse, were obtained after fertilizing eggs, from which the nucleus had been removed, with sperm from another species (1936).

The Neural Crest, etc., 1950 (see "List of main publ.") was written, as after the 1946 paper together with Sven Sellman, many wanted a book on its contributions also to so many other organs than the nervous system and the cranium.

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