J. H. ORTON & C. AMIRTHALINGAM. Notes on Shell-Deposition in Oysters. With a Note on the Chemical Composition of "Chalky" Deposits in Shells of *O. edulis*. By H. O. BULL. — Journ. Mar. Biol. Assoc. (N.S.) Vol. XIV. pp. 935—954. 1927.

This paper contains the results of preliminary studies on shell depositions in oysters. A detailed explanation is given of the distribution of the so-called chalky shell-deposits on the internal faces of the valves in *O. edulis* and *O. angulata*. It is a well known fact that internal shell areas may often be observed on which the crystalline nacreous layer is replaced by an apparently amorphous, soft, white mass. The distribution of these areas in the shells is such that it seems to be the function of the chalky deposits rapidly to fill in grooves, hollows etc. In *O. edulis* of medium age the chalky deposits usually occur over the exhalant chamber, and, according to the authors, this is due to the mantle here often being extended and contracted, for which reason it is of importance that the inside of the shell should be flat. All these chalky deposits therefore must be considered as due to local unsuitabilities of the contour of the shell, and as formed to adapt the shape of the shell to the changing needs of the animal. Deposits of conchyolin and pigmentation in *O. edulis* are further shortly discussed. Also in this paper it is stated that the shell has two growth periods, spring and autumn, and observations are set forth which indicate that crystalline depositions cease in *O. edulis* at a temperature of about 11° C. This latter observation will, if confirmed, be of a certain practical importance. The problems treated in this paper concerning shell-depositions and development and growth of shell are as yet in many respects far from solved; the present paper therefore rightly arouses great interest.

R. SPÄRCK.

J. H. ORTON. Observations and Experiments on Sex-Change in the European Oyster (*O. edulis*). Part I. The Change from Female to Male. — Journ. Mar. Biol. Assoc. (N. S.). Vol. XIV. pp. 967—1045. 1927.

The present paper contains the first part of a detailed record of investigations of the sex and the breeding-habits of *Ostrea edulis*, carried out by Dr. ORTON during a long period. The main results are partly known already from a long series of preliminary reports published in "Nature". In the now published first part the change from female to male is discussed and some further elucidation given as to the sex and breeding of the oyster. Some previous observations made in Holland and the Limfjord (for instance that male-spawning is the first to set in; that the proportion of ripe females often diminishes in the course of summer) are confirmed. Results of investigations of the gonad in 702 "sick" oysters are further presented, to the effect that after egg-spawning sex-change sets in in the course of few hours, causing the individual in question to develop spermatozoa. Thoroughly and convincingly the author states how the sperm development after egg-spawning is very quickly increased in relation to the progressive age of the gonad, reckoned from the instant of egg-spawning. These investigations fully confirm the view formerly set forth by the author as well as the reviewer that all oysters after spawning nor-

mally pass into a male phase. It is likewise confirmed that oysters mainly spawn either as males or as females.

Results are further presented of the examination of the gonad in 444 oysters at intervals after they have emitted their larvæ. From this material it appears that the male-phase following the egg-spawning lasts at least one month, and decreases in the course of the following month when egg-development once more sets in. If the egg-spawning takes place late in the summer the male-phase will probably last all through the winter. At twelve months from the last egg-spawning a considerable number of individuals will once more have become functional females. The reviewer cannot help remarking that this result, which is supported by a large statistical material, is in perfect agreement with the view expressed by him in his paper on the sex-change of the oyster.

Finally the author has some remarks on the physiology of sex in *O. edulis*, and sets forth the hypothesis that the sex-change of the oyster may be due to variations in metabolism. With our present knowledge of the physiology and cytology of the oyster I should not think it possible to give any definite answer to this question. But the hypothesis does not seem at all improbable. From other sides it has been stated that temperature appears to be of great importance to the rate of development of the different phases, which seems to indicate that rhythmic variations of metabolism must be taken into consideration. With regard to the author's mention of MANOILOV's chemical reaction for sex as possibly important for future investigations of sex-change in the oyster, attention must unfortunately be called to the fact that several experiments have proved this reaction to be of small value in this connection.

Without doubt the results contained in this paper are valuable and based on thorough investigations, but it cannot be denied that the many details and the large statistical material make it less easily read. It may also seem astonishing that no information at all is given as to temperature and other hydrographical factors on the beds from which the oysters are dredged. Some mention of nourishment and stomach-contents at the different phases might also be of some importance. The announced continuation of these researches will be awaited with great interest.

R. SPÄRCK.

ILMARI VÄLIKANGAS. Planktologische Untersuchungen im Hafengebiet von Helsingfors. I. Ueber das Plankton, insbesondere das Netz-Zooplankton des Sommerhalbjahres. 298 S., 6 Tafeln. — Acta Zoologica Fennica, I, 1926.

Die Untersuchungen der letzten Jahre über Brackwasserbiologie haben immer deutlicher gezeigt, dass es hier eine Reihe interessanter Probleme zu lösen gibt, welche sowohl von einem rein hydrobiologischen Standpunkt als in Bezug auf die Abwasserfrage von hervorragender Bedeutung sind. Denn nicht nur der Chemismus des Mineralisierungsvorganges der organischen Verunreinigungen sondern auch die dazu erforderliche Tätigkeit der Abwassermikroorganismen, hauptsächlich Bakterien, farblose Flagellaten und Ciliaten, werden mehr oder weniger von den im Brackwasser vorhandenen Meeressalzen beeinflusst. Im einzelnen ist von den