

ABSTRACTS OF MEMOIRS

RECORDING WORK AT THE PLYMOUTH LABORATORY

BONE, Q., FENAUX, R. & MACKIE, G. O., 1977. On the external surface in Appendicularia. *Annales de l'Institut océanographique*, **53**, 237–244.

The external surfaces of different species of *Oikopleura* and *Fritillaria* were examined at the light and electron microscope level, and it is shown that the latter genus does not possess the flattened epithelial cells characteristic of *Oikopleura*. Instead, a (fibrous) outer layer is found in *Fritillaria* which is supposed to be formed by the breakdown of an original epithelial cell layer. This outer layer does not propagate skin impulses, and touching *Fritillaria* does not evoke escape responses, as does touching *Oikopleura*.

BONE, Q., FLOOD, P. R., MACKIE, G. O. & SINGLA, C. L., 1977. On the organization of the sarcotubular systems in the caudal muscle cells of larvaceans (Tunicata). *Acta zoologica*, **58**, 187–196.

The structure of the sarcotubular systems of the caudal muscle cells is described in various larvaceans. In *Oikopleura* there is both a transverse tubular system and a sarcoplasmic reticulum; there are internal couplings between the two and also sarcolemmal couplings. In *Fritillaria* (and probably also in *Kowalevskia*), a transverse tubular system is lacking, and there are only sarcolemmal couplings with the sarcoplasmic reticulum, which is related to the mitochondria as well as to the myofilaments. The significance of these differences is discussed, and it is concluded that the arrangement of the sarcotubular systems is related to muscle fibre thickness; within the Tunicata, these systems do not indicate phylogenetic relationships.

CLARKE, M. R., 1977. A brief review of sampling techniques and tools of marine biology. In *A Voyage of Discovery*. [George Deacon 70th Anniversary Volume] (ed. M. Angel), pp. 439–469. Pergamon Press.

Marine biology is the study of every aspect of life in salt water, from upper tidal limits to deep sea, from water surface to within the bottom sediments, from bacteria to whales, from chemical composition to species distribution, from the equator to the poles. Such a broad study advances over a wide front by application of mathematics, physics, chemistry, engineering, electronics as well as biology itself. Dependence on non-biological subjects is nowhere more evident than with basic techniques of observation and collection of living organisms. The enormous diversity of problems can only be attacked by a correspondingly enormous diversity of techniques of observation, collection and analysis. Each problem requires a different approach; obviously bacteria and whales cannot be sampled in the same way: less obviously a net fished horizontally, vertically or obliquely will select species in different ways so giving a different picture of what is present in the water. There is no universal method of observation or collection. Each biologist must have a clearly defined aim and must endeavour to find the gear and the method to fulfil this aim. Limitations of the gear must be studied and only questions should be asked which the sampling technique can answer – obvious but sometimes subtly ignored. While a review of techniques and tools of marine biology should perhaps start with a list of aims, such a task is impossible for such a broad subject and we must be content with an appraisal of the most commonly used methods and their limitations.

COOPER, L. H. N., 1977. Studies by the American CLIMAP group considered as a foundation for understanding Quaternary events on the continental shelves peripheral to Great Britain and Ireland. In *A Voyage of Discovery*. [George Deacon 70th Anniversary Volume] (ed. M. Angel), pp. 681–692. Pergamon Press.

Hypotheses for the cold periods of the Quaternary concerned with stationary permanent firn-fields in the English Channel and Celtic Sea needed more supporting evidence. This has now been

provided by the members of the United States CLIMAP group. However, their method of Q-mode factor analysis was read at first with severe reservations. These have now vanished but only after a critical study of the literature of pelagic foraminiferans and publication of a study of the foraminiferans recovered from the Greenland–Iceland–Norwegian Sea.

It is suggested that these methods developed by the CLIMAP group and still in process of rapid development provide the means for studies in the lands bordering the eastern North Atlantic of first the Devensian (Weichselian, Midlandian) and then of the seven major cold cycles recognized in the Atlantic as having occurred in the last 600 000 years.