

National Academy of Sciences. Dr. Roger Revelle, chairman of the committee, lists in his general introduction the "three related objectives—human welfare, scientific advance and international scientific co-operation". He says that biologists can "contribute uniquely to human welfare only by advancing scientific understanding, and the basic premise of the International Biological Programme is that the growth of understanding will be accelerated by international co-operation among the world's biologists". Dr. Revelle explains that in the United States the U.S. National Committee will work closely with the Interagency Coordinating Committee responsible for the efforts of federal agencies in this field.

So far, the work planned for the International Biological Programme, which will last for five years or thereabouts, consists chiefly of conferences. The Committee on Environmental Physiology has plans for six conferences on specific topics during 1967. The Committee on the Productivity of Marine Communities is planning five conferences on a regional basis. Others of the seven sections of the IBP have plans for various regional conferences and of others organized around specific subjects. From the outline programme, it is clear that the organizing committees are at this stage keeping a prudently open mind about the kind of work which can most usefully co-ordinate the work of individual laboratories in the years ahead. At the same time, the organizers are anxious that working scientists should formulate proposals for research in the areas of science considered to be most in line with the objectives of the IBP. Although the IBP is not itself a grant-giving agency, it does intend to scrutinize research proposals to see whether they accord with the aims of the IBP. Evidently the U.S. National Committee is hoping, however, that its certificate will carry weight. Time will no doubt tell.

## Out of the Record

*The Zoological Record* seems to have allowed its centenary to slip by with uncommon lack of ceremony. The *Record* was established in 1864 to keep zoologists informed of the most recent researches in their subject and has led a very chequered career. It started as the private undertaking of the publisher Mr. Van Voorst, under the editorship of Dr. Albert Günther, passed to the Zoological Society of London, thence to the Royal Society and finally back again to the Zoological Society, which now both compiles and publishes it. Early in its career when private enterprise failed, a Zoological Record Association had to be established to keep the publication solvent, and for several years the British Association provided an annual grant of £100 in its support. Expenses are now met in part by donations from institutions and individuals in the British Commonwealth and the United States, from the International Union of Biological Sciences and the Naples Zoological Station.

The *Record* is an annual compilation from more than 4,000 journals and is divided into twenty sections. Eighteen of these deal with a class or family of animals, and the other two with "Comprehensive Zoology" and a "List of New Genera". The information is presented in the form of three indexes. There is a bibliographical index arranged alphabetically under authors, with titles of research papers given in French, German or

English. The subject index is arranged under broad headings, and in the latest volume for "Pisces" the economics section includes, for example:

"Fisheries research.—Aspects of marine fisheries research, Lucas; tropical fisheries research, McConnell; freshwater fisheries research, Pentelow."

"Effects on fishes of industrial effluents.—Effect of heated effluents, Alabaster; effects of sewage effluents, Lloyd; Young; . . ."

A systematic index provides information relevant to a particular species or to groups of the phylum concerned together with details of new taxa.

## Molluscan Structure

THE growing number of scientists engaged on research on the Mollusca, and the suitability of these animals as experimental material, was plain at the international symposium held last week under the auspices of the Zoological and Malacological Societies. There were contributions on such varied topics as the molluscan fauna of the rain forests of the Solomon Islands, the fine structure of muscle and the bivalved gastropods. The gaps in knowledge of excretion in this phylum were dealt with by another speaker, and workers from the Free University of Amsterdam and the University of Southampton emphasized the neurosecretory activities of gastropods. Professor G. A. Kerkut and his associates from Southampton described aspects of the fine structure of the brain of *Helix* and the pharmacology of certain of its neurones, while speakers from Professor J. Lever's Department in Amsterdam gave accounts of studies of the nervous system of *Lymnaea*. Investigations of neurosecretion in the Mollusca are, as yet, in their preliminary stages, but they represent an important new field in which neurosecretion may be more closely related to the activity of the whole animal.

A new theory to account for the mechanism of calcification of the molluscan shell was put forward in a stimulating paper by P. S. B. Digby. Observations on the mussel *Mytilus edulis* have indicated that at the growing margin of the valves, the outer surface of the periostracum is acid and the inner is alkaline. Measurements of potential across this superficial membrane, which consists of quinone tanned proteins, showed that the outer side becomes increasingly negative and the inner positive as the mantle edge exerts suction on the permeable periostracum and outer layer of the valve around the shell margin. The membranous periostracum acts as a semi-conductor and electronic charge is considered to flow through the material. Calcification is attributed to electrode action at the inner side of this membrane producing alkalinity which precipitates lime. The process of calcification of the molluscan shell was thus thought to be comparable with that of the crustacean cuticle and of mammalian bone, in that they all represent electrochemical processes.

In a contribution on the burrowing activities of bivalves, E. R. Trueman pointed out how the shell of these animals operates as the basis of a hydraulic system by means of which the strength of the adductor muscles is used in digging by the production of high hydrostatic pressures. He suggested that the bivalved form of the shell may be an adaptation for active burrowing into or over soft substrates.