

## OLD WORLD

# Restrictions on Marine Research Come Closer

AFTER more than 100 hours of official meetings, countless corridor and coffee cup negotiations, and eight sweaty weeks in Geneva, the future of marine scientific research is still as much in danger as ever. The preparatory meeting for next year's Law of the Sea Conference (which is due to meet in Santiago in April if events in Chile in the last few days do not cause postponement) spent some part of its time in one of its sub-committees attempting to define scientific research and trying to decide how free it should be. At the end of the day a definition of research emerged, and several proposals were put forward as to how it should be conducted, but no guarantee that there will not be much tighter controls than currently exist emerged.

Scientific research is only one of many issues that faced the preparatory committee (the largest committee in the United Nations' history) during July and August. In essence next year's conference is intended to sort out the whole of the law of the sea, a brief that not only includes fishing and mineral and hydrocarbon rights in territorial waters, the so-called patrimonial waters, on the high seas and on the deep ocean floor, but also includes issues such as pollution, the establishment of an International Seabed Authority, defence—and scientific research.

The nub of the problem as far as science is concerned is that a block of the developing countries (notably the South Americans and some African states) are demanding that the proposed International Seabed Authority should regulate all scientific research on the high seas. Expeditions would have to be licensed by the authority, would have to carry an international observer and would have to submit their results to the authority before publication. This proposal is prompted by the fear that oceanography has largely economic, and possibly military, ends—a fear that is not much assuaged by the extent to which the United States Navy has in the past financed oceanography in the USA.

Hand in hand with these threatened restrictions on scientific research on the high seas comes the possibility of an extension of the restrictions on research closer to land. At present the only areas in which marine research is tightly limited is in territorial waters—the three or twelve mile strips just off shore. In these waters each country has complete sovereignty. Permission is needed for

research to take place, and while it is usually granted there are increasingly complaints from oceanographers about the difficulty of acquiring such permission quickly enough.

This regime is, however, likely to be extended. A number of developing nations took the stance early in the preparatory meetings for next year's conference (meetings that began five years ago) that patrimonial seas should be established that extend for 200 miles or to the outer edge of the continental shelf, whichever is the greater. In this area the country with the adjoining coastline would have rights over fishing and mineral and hydrocarbon resources, but would not have total sovereignty.

At present, under the 1958 Geneva convention, permission is already needed for research on the floor of the continental shelf, but research on the water column and its contents is unrestricted.

If the present proposals before the UN committee are approved, however, scientific research on the water column will also be subject to the adjoining coastal state's permission.

At first this proposal for a 200-mile patrimonial sea met with considerable opposition from the developed countries, but now it has received backing to a greater or lesser extent not only from the developing countries but also from Australia and Canada while even the UK has indicated some willingness to accept similar wide limits for resource rights. Attempts are still being made to protect scientific research, and the United States has tabled a proposal that those undertaking research should simply have to notify the relevant state a fixed number of days before the expedition arrives. This would mark a considerable relaxation of the current regime in territorial waters. But as one

## EDUCATION

### Mastering Doctorates

by our Correspondent

THE provision of 7,000 new postgraduate places in universities during the current quinquennium could be overgenerous unless the emphasis in research degrees is changed from PhDs to MScs, according to Professor B. A. Cross of the University of Bristol. At a symposium on the future of the postgraduate in the next decade, held at Leckhampton, the graduate college of Corpus Christi College, Cambridge, last week, Professor Cross, who is to become director of the Agricultural Research Council Institute of Animal Physiology at Babraham from April next, attacked the rapid growth of PhD student numbers, and accused the universities of "acquiescing to academic inflation". As a result the value of the PhD is being undermined and government money is being wasted, he said. Departments tend to acquire large numbers of PhD students as a status symbol, only to choose the PhD subject for the student and then to use him at least partly as a research assistant. Supervisors are also reluctant to give adverse reports on their students, even to the extent that they will help out with experiments and write the student's thesis.

PhD students, Professor Cross said, "use a lot of time, resources, energies and spiritual reserves of the academic staff who can usually be more creative

working with collaborators and post-doctoral fellows."

The answer to the problem, according to Professor Cross, is to develop a binary system of postgraduate education in which more students take MSc courses which allow the student to acquire new techniques and to make a disciplined attack on a problem. This suits better the needs of industry where often science is important but creativity is not. PhDs are needed much less by industry than by the universities.

Supervisors should not have to take on large numbers of PhD students, and need train a PhD student to replace them only once or twice in their thirty years' work. "We do not need a supervisor to produce six PhDs a year if we define the holder of a PhD as a creative scientist". As it is, 60% of current PhDs become invisible to science after graduating as they enter other careers, and the research councils and the Department of Education and Science could have saved a great deal of money by allowing these people to take MSc instead of PhD courses.

The key to the problem is to test a student's motivation while he is still an undergraduate. Research projects undertaken in first degree courses reveal those students with creative minds who have problems they want to solve, Professor Cross said. "I am very impressed with the abilities of undergraduates to make original discoveries; research should start at honours degree level".