

NEWS AND VIEWS

World Weather Watch

THE fifth World Meteorological Congress, meeting in Geneva from April 3 to 28, has some important decisions to make. Most important of all to the 300 delegates from the weather services of United Nations countries will be the programme for the World Weather Watch, an attempt to cover the whole world with an adequate network of meteorological stations. At the moment the developed countries and air routes and terminals are well served with weather information, but there are large areas of ocean and land which are not served at all. New developments in numerical forecasting, and the hope of extending the range of forecasts for up to 14 days, have made this situation intolerable to meteorologists. The World Weather Watch is an attempt to do something about it.

To produce forecasts for more than a few days ahead, it is necessary to know meteorological conditions throughout the world. This will involve new stations in developing countries and on isolated islands. Weather ships are expensive, so methods may be developed for using merchant ships to provide weather information. Balloons are already being used, and sometimes stay up for as long as six months, with solar batteries providing the power to transmit information to stations on the ground. In a few years satellites may take over. Another serious gap in knowledge is at the interface between the oceans and the atmosphere; buoys anchored in the sea may help to fill this gap. For short range forecasting it is reasonable to ignore completely the energy input from the sea to the atmosphere, but for long range forecasting it becomes absolutely vital.

There are clearly a number of technical problems to be solved before all these techniques can be put into action. More immediately, there is the problem of how it is going to be paid for. The budget up for approval for the next four years amounts to almost \$13 million, while the cost of the weather watch may amount to several hundred million dollars annually. The majority of this will continue to be paid by developed countries as part of their own weather services, but if new stations are to be set up in underdeveloped parts of the world, the money will have to come from somewhere. Different financing arrangements, either in the form of aid to underdeveloped countries or as substantial subventions to the W.M.O. itself, may be necessary. Much time will doubtless be spent discussing this at Geneva.

Boom in the Sea

THE groundswell of support for marine science in the United States is strengthened by the first report of the National Council on Marine Resources and Engineering Development (U.S. Government Printing Office, Washington, 60c.). The President, for whom the report is also a proof that he has not been neglecting his responsibilities to explore and exploit the oceans, urges in his introduction that Congress should respond generously to the budget request for an increase from \$409 million to \$462 million in federal support for oceanography in the year immediately ahead. The

National Council itself, whose chairman is the Vice-President and which includes several members of the United States Cabinet, emphasizes that since its creation in June 1966 it has made only a start on the development of a long-term strategy. The council is plainly anxious to encourage two tendencies already apparent in the statistics—the increase of the percentage of federal support for civil as distinct from military purposes, and the increase in the amount spent on technology as distinct from pure research. Nine fields of activities have been singled out for special attention, and the importance attached to international co-operation may be gauged from the way in which Dr. Edward Wenk, executive secretary of the council, is trudging around the capitals of Europe with Mr. Hubert Humphrey. But this is frosting on the cake. The council is also proud of the extra \$40 million to be spent each year on a number of applications of oceanography, mostly on the development of machines and techniques for moving about at great depths, and on the more thorough but conventional exploration of the sub-polar regions. The seriousness of the programme for submarine exploration is clear from the table in the report which names thirty-two of the research submarines which will start (or will have started) work in the years 1964–69, and which will be able to operate at depths as great as 20,000 ft. The council is evidently hoping that private industry in the United States will play an increasingly important part in this work.

The council's enthusiasm has most clearly been tapped, however, in the sections of the report which argue that the sea could become a much more prolific source of protein. A five-fold increase of protein production from the sea is held up as a rough target, and the council is hoping to encourage a programme in which fish protein concentrate or fish flour, recently declared innocuous by the Food and Drug Administration (see *Nature*, 213, 643; 1967), will be tried out on a big scale. As a source of protein, the council reckons that fish flour will be roughly two-thirds the cost of dried milk and one-sixth the cost of frozen chicken. In another liberal venture, the council is hoping to encourage a programme designed to control sea pollution (to which end U.S. Army engineers will build a gigantic model of Chesapeake Bay), and some of this interest is likely to spill over into town planning and the better use of the coastline. If only half of these good works are successful, the council will also be able to boast of having created a precedent. For, after all, it has no money of its own but only influence, and it operates in a field in which the vested interests are traditionally powerful and quarrelsome. If events show that it is possible in this way for the Administration to co-ordinate its interests in oceanography without setting up a separate operating agency, the pattern is likely to commend itself more widely—and vice-presidents will no doubt be more busily occupied as chairmen of the co-ordinating councils.

Help for the Teachers

THE Secretary of State for Education and Science, Mr. Anthony Crosland, and the National Union of Teachers seem to be nearer agreement on a subject which has bitterly divided them in the past—auxiliary help for teachers within the classroom. At least they