

Mandapam Camp, Tamilnadu, South India, from January 12 to 16. Twenty-five scientists from ten foreign countries, as well as forty Indian members, attended; the United States sent ten delegates, France five, Germany four and other countries, including Brazil, Indonesia, Singapore and Britain, one each.

As well as excursions to raised reefs on Rameswaram Island and to modern reefs and sand cays in the Gulf of Mannar, the programme included sessions on productivity and trophic structure of reefs; the distribution of organisms on reefs and the problems of field survey; reefs of the Indian Ocean; reef invertebrates; fish in the reef ecosystem, and reef geomorphology. Much of the work reported was carried out in the Indian Ocean, by the Germans in the Red Sea and Maldivé Islands, and by the French at Tuléar in Madagascar. There were several papers on the Royal Society's research programme at Aldabra Atoll, and there was also great interest in data presented by Indian workers on reefs in South India, the Laccadives and Andamans. A second group of papers reported work carried out in the Tuamotu Islands by the French in connexion with the recent nuclear test programme at Mururoa Atoll.

Two papers were especially significant in the context of the introductory address sent by Sir Maurice Yonge on the productivity of coral reefs. L. Muscatine (California) produced further evidence for the *in vivo* translocation of photosynthetic products of zooxanthellae—unicellular algae—in the reef coral, where they live symbiotically, to the coral tissue and skeleton. R. E. Johannes and S. L. Coles (University of Georgia) found that, on Bermuda reefs, in spite of the well known specialization of corals as carnivores, zooplankton is insufficiently abundant to constitute a significant energy source for the corals. They suggested that zooplankton act as an important nutrient source, but that energy requirements must be met from other sources.

The Mandapam meeting revealed that current work on coral reefs is diverse and expanding. The delegates called for further studies on several Indian Ocean island groups, including the Maldives, Laccadives, Andamans, Nicobars and Chagos, about which little is now known. The need for comparative studies of reefs was stressed, and the problems arising from the state of taxonomic work were outlined again. It was agreed that similar international symposia should be held at intervals of three years at centres of reef studies, and an *ad hoc* committee under the chairmanship of Dr D. R. Stoddart (Cambridge) was set up to make preparations for the next symposium. The proceedings of the Mandapam symposium will be published by the Marine Biological Association of India.

MARINE MAMMALS

Success in the Sea

from a Correspondent

At a time when the conquest of "inner space"—the marine environment—is beginning to receive closer scrutiny, it is interesting to look again at the mammals that have long overcome the problems now facing man of life in the sea. R. J. Harrison, professor of anatomy at the University of Cambridge, has worked on these animals for the past twenty years, and the fruits of his

labour were demonstrated on February 20 at a public lecture at the University of Newcastle entitled "Diving Seals and Dolphins".

Seals can remain submerged for longer than half an hour, a period of time several orders of magnitude greater than that possible for other more terrestrial mammals. Professor Harrison has found that when these animals dive, their heart rate slows considerably. The respiratory centres of the brain have a decreased sensitivity to carbon dioxide, but towards the end of the dive the heart rate increases and tethered animals begin to struggle to reach the surface. On surfacing, the rate increases above the normal surface level (about 90 beats/min) until normal blood concentrations of oxygen are attained. The blood volume is relatively greater than in other mammals and most of this is accommodated in the enlarged posterior venae cavae and in a large sub-diaphragmal sinus. The connexion between this sinus and the heart is surrounded by a large sphincter associated with the diaphragm and supplied by the right phrenic nerve. The closure of this sphincter on diving restricts the venous return of blood to the heart when the heart beat is slowed. Seals are also able to maintain a venous partial pressure of oxygen almost equal to that in the arterial system.

Both seals and dolphins are often social animals and have vocal "languages". More importantly, seals probably use sonar echo-location, and dolphins are past masters at the art. Dolphins do not possess vocal cords but the larynx is extended into the posterior nares and abuts against the epiglottis. The passage of air through the slit so formed into inflatable nasal sinuses is responsible for sound production, while the oesophagus bifurcates around the larynx, enabling the animal to eat and vocalize at the same time. The forehead is actually a greatly enlarged upper lip forming a complex organ of muscle and fat known to whalers as the melon. This seems to be a lens capable of focusing the sound waves. Professor Harrison thinks that the asymmetry of the head with the right side skewed anteriorly enables the animal to triangulate the origin of echoes more accurately.

Recordings of the sounds produced by these animals were remarkable to hear, but the most memorable were eerie wailing calls, sounding like badly pitched bosuns' pipes, produced by Weddel seals swimming beneath the polar pack ice. These calls are social and are thought to assist in the location of blowholes which may be as much as four miles apart.

Dolphins, in spite of their predatory nature, show no aggression towards man. They are, on the contrary, positively friendly and their intelligence and resistance to caisson sickness—brought on by a too rapid decrease in air pressure—make them very suitable as messengers; an ability which may in the future make them useful allies in man's efforts to live beneath the seas.

IMMUNOLOGY

More Immunosuppressives Needed

from our Social Medicine Correspondent

ANTILYMPHOCYTIC serum, which has caused so much excitement in organ transplantation and which appears to have something in common with Ehrlich's "magic bullet", is not the end of the road as far as prevention