

exclusiveness and pretentious airs are disastrous to sciences as they must be to society, whose problems are created by science. With a view, therefore, to bring about a closer relationship between scientific and social workers, the British Association is proposing to establish a new organisation, a Society for the Study of the Social Relations of Science. At the forthcoming meeting of the British Association at Cambridge, the proposal for the formation of a society of

this nature is expected to be discussed, and we envisage that a definite scheme will be put forward for organising the scientific workers into a comprehensive body who would devise a mechanism for the application of scientific knowledge in promoting social well-being and betterment. Time is not far off for India to establish international affinities with these movements which, we hope, will point the way for a better and a happier world state.

## The Fisheries of India.

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IT is now thirty years since the late Sir K. G. Gupta submitted to the Government of Bengal his report on the fisheries of the province. In this report he asked for a systematic survey of each district under expert supervision and on definite lines "and the results are sure to be valuable and far-reaching".

Sir K. G. Gupta's report may be read with advantage even to-day, since he draws attention to many problems affecting the fisheries of the province which still require investigation and elucidation. In 1915 the first Madras Fishery Bulletin was published by Sir F. A. Nicholson. It dealt with papers from 1899 relating chiefly to the development of the Madras Fisheries Bureau. In 1937 Dr. Sundara Raj published the administration report for the year 1935-36. Between those two dates the Madras Fisheries Bureau has published a long list of papers and reports dealing with the fisheries of that province.

In 1910 Mr. Kiran Chandra De published at Shillong, a valuable and interesting report on the fisheries of Eastern Bengal and Assam, and there are other provincial reports which it is not essential to specify more exactly.

Now while these various reports are very interesting and some are extremely valuable, there is one obvious defect and that is the lack of co-ordination due to the fact that the fisheries are controlled by the Provincial and not the Central Government.

On the first of July, 1916, the Zoological Survey of India was inaugurated so that it came of age last July, when its twenty-first birthday was attained. Apart from maintaining the zoological collections of the

Indian Empire in the Indian Museum at Calcutta, one of the chief tasks of the Survey was to obtain the fullest possible information about the systematic and geographical zoology of the Indian Empire and to place this information at the disposal of inquirers.

Outside scientific circles it is not widely known that the Secretary of State for India in Council publishes volumes dealing with the Fauna of British India including Ceylon and Burma. If we look up the volumes dealing with fish we find that they were published as long ago as 1889, the author being the late Francis Day; who also published reports on the Fresh-water Fish and Fisheries of India and Burma (1873), and the Sea Fisheries.

It is interesting to note that a second edition of the volumes on Fish in the Fauna of India is in the course of preparation by Rai Bahadur Dr. Sunder Lal Hora. This edition, which will have to be entirely rewritten to be effective, will extend to at least five volumes. It will be seen, therefore, that there are several independent bodies interested in the Fish and Fisheries of India, namely the Zoological Survey of India, the Provincial Governments and the Secretary of State. Now, although much information has already been obtained as a reference to the above-mentioned reports will show, it is obvious that very much more remains to be done and that there is urgent need for further investigations and particularly for co-ordination.

How can this best be secured?

Nearly every civilised country in Europe, America and Africa with important fishery interests has a central fishery bureau or department either directly working as a



government department or directly controlled by such a branch.

India with its vast rivers, estuaries, tanks and ponds on the one hand, and its enormous coast line and marine fish on the other hand, with enormous potentialities for development, simply cannot afford to drop behind. The development of markets for fresh fish, with the allied problems of transport and ice, the preservation of fish whether by canning, smoking or other process, the investigation of the fish-oils and other by-products such as fish-meal and manure, all offer problems requiring urgent investigation and offering results of immediate practical value.

This problem was considered in the year 1938 at a combined meeting of the Indian Science Congress Association and the British Association for the Advancement of Science held in Calcutta, when the sections of Zoology, Medical Research, Veterinary Research, Entomology and Agriculture held a joint session. Following this the Zoology Section passed the following resolution:—

"This meeting of the Zoology Section of the Indian Science Congress Association in session at Calcutta, urges upon the Government of India the necessity and importance of constituting an all India Department of Fisheries for the development of the fishery resources of Indian waters on scientific lines. It is of opinion that the commercial development of the fisheries of India should be accompanied by the scientific investigation of fishery problems by means of a carefully planned programme of co-ordinated scientific investigation of fishery problems, which can most easily be controlled by one central authority for All-India, leaving to the separate Provincial Governments the task of administration of the fishery laws and regulations.

It is further of opinion, that, unless development of the fishery resources of Indian waters is carried out with due regard to the scientific principles which form the basis of successful fishery developments, there will be grave danger of irreparable damage to the fisheries concerned."

As an example of what can be done to assist the fisheries by a properly constituted central bureau subsidised by the Government, let us take Japan.

Japan now produces annually half-a-million cases of canned crabs, worth over two million pounds sterling. In 1937 Great Britain imported 39,220 cwts. of canned "crabs" from Japan worth £333,773. This so-called crab is not a crab at all but a species known as *Paralithodes camtschatica* and is not to be compared in quality or flavour with the prawns of the Bay of Bengal and the Gangetic Delta,

Great technical difficulties were met with in the first attempts to can these crabs and it is in a very large degree due to government subsidized research that this great Japanese fishing industry has been built up in comparatively few years.

Last year Great Britain imported canned Norwegian sprats to the value of £ 263,309.

In the Bay of Bengal there are enormous shoals of fish resembling the sardine and far superior in flavour to the sprat. The Kokile (*Clupea kunzei*) of the Telugu fishermen is a case in kind. In some countries there is an enormous demand for salted mackerel. Here again the Bay of Bengal can supply the demand. The Kanagurta (*Scomber microlepidotus*) is an excellently-flavoured fish.

The home market for fish is quite inadequately developed. There is scope for much research into the best methods of conveying fish, either fresh or lightly cured, to the home markets.

Many people have an idea that Indian waters are devoid of fish of good flavour and high nutritious value. There can be no greater mistake. There are Indian fish which compare favourably with the best in the world. There are no better fish anywhere than the Hilsa, Bhekti, Topsis and the "Bombay Duck". The crabs, shrimps and prawns are unsurpassed. There can be no doubt whatever that the material is there. What is wanted is proper investigation so that these immense resources may become available for the benefit of the community. There is only one way, in India as in other lands, and that is, the scientific investigation of fish and fish products on the lines so successfully established in the United States of America, Japan and most European countries.

This was fully recognised by the experts who attended the Science Congress in Calcutta last January. Prof. Tattersall, Lt.-Col. Sewell, Prof. de Beaufort and others supported the resolution outlined above.

It is to be hoped that the Government of India will establish a Central Bureau of Fisheries at an early date so that the immense wealth of Indian waters at present lying dormant and undeveloped may be developed rationally. India is fortunate today in having available men like Dr. Hora, Dr. Prashad and Dr. Sundara Raj with considerable experience in fish and fishery matters who could assist in the formation and development of any organisation formed to develop the fisheries of the country.