children that education hopes to reach the parents and society, and it must be remembered that every child who leaves the school unwillingly is a missionary for education, and everyone who leaves it in a contrary frame of mind is a dangerous force on the other side.

We cannot enter here into all the general and special aspects of educational reform, but can only indicate its general principles and the future policy of its control and management. If we think of education in all its bearings and its nature, as lifelong, as interpenetrating all occupations, as teaching every man and woman of doing their work in a better and more intelligent way, as co-extensive with the entire field of social activities, then education should be autonomous in its own territory. This reform being effected, all else will follow.

Madras Fisheries Department.

AS in the previous years, the Administration Report of the Madras Fisheries Department for the year 1934–35 marks another year of continued progress in the working of the Department under the able and enlightened guidance of its Director, Dr. B. Sundara Raj. The year was one of prosperity to the fishing industry on both the West and the East Coasts in spite of the fact that sardine, the most important shoaling fish of the Presidency, was absent during the year and the mackerel was only moderately abundant.

For the students of Indian ichthyology, both pure and applied, the Report is a regular mine of information regarding the progress in our knowledge of the bionomics of some of the principal food fishes of India. During the year under report the discovery of the breeding grounds of the oil-sardine (*Sardinella longiceps*) and the direct proof of the establishment of Catla (*Catla catla*) in the Cauvery river are announced, and it is a pleasure to note that the persistent efforts and the continued application on the part of departmental officials have been crowned with success. One can now confidently hope that the utilisation of the knowledge thus gained will lead to a much greater prosperity to the fishing industry of the Province.

It is also a matter for gratification that the spawning season, eggs and early stages of the half-beak (*Hemirhamphus georgii*) have been worked out and it should now be possible to deal more adequately with the important seasonal fishery of this species in the Palk Bay. A great advance has been made in the breeding of *Etroplus* and it has been proved that it can thrive in ponds where the elimination of natural enemies, such as murrel, snakes and frogs, is not practicable. This fact renders the fish very suitable for stocking ponds, etc.

As was to be expected, the adverse effects of the construction of the Mettur Dam are now being gradually felt in the decrease of the fisheries of the Cauvery below the dam. Unfortunately throughout India no attempt is made to reconcile the needs of the fisheries and of the irrigation projects; the latter invariably lead to the deterioration of the former, resulting in the undermining of a valuable source of food supply.

According to the Director, "The most noteworthy result of technological research is the production for the first time of sardine oil with a vitamin A potency equal to one-fourth that of cod liver oil and the discovery of four other Indian sea fish which yield oils with a high vitamin A content. The remarkable fact has also been ascertained that South Indian shark liver oil is more than 4·2 times as potent in vitamin A as cod liver oil." These researches indicate that a very valuable source of vitamin A will soon be brought within the reach of the poor people leading ultimately to a great improvement in their health.

Besides the fisheries (*sensu stricto*), the Department achieved considerable success in the rearing of Pearl oysters and the possibilities of the production of culture pearls in India on a commercial scale can now be visualised. It is, however, regretted that two and a half years of cultural experiments in the Pulicat edible oyster beds had to be terminated abruptly owing to a disastrous drought during the year under report. All the same, these experiments have furnished precise data concerning the zone at which maximum spatfall occurs and the reason for such occurrence. The Chank market showed a glut and very little business was done, but in spite of the fall of revenue from this fishery, research on Chank Fisheries was continued with considerable success.

The activities of the Department comprise, besides administration and scientific research, supply of biological specimens to universities and educational institutions in India, anti-malaria work by the introduction of larvicidal fishes, socio-economic work such as education of fishing people, establishment of co-operative societies for their benefit, etc., propaganda in the form of rural pisciculture, exhibitions, etc., and fishery legislation. Under the heading of "Publications" attention may be directed to *Bulletin on Marketable Fishes* and *A Popular Account of Fishery Activities* which, when published, will greatly enhance the prestige of the Department and will enable the lay public to evaluate for itself the advantages it can receive from the proper working of a scientific fisheries department.

The Expenditure and Revenue of the Department shows an adverse balance of Rs. 1,27,086–4–1, but when the vast advantages the Department confers on the fishing people and the production of a healthy, nutritious diet for the general public are taken into consideration, the subsidy of a lakh and a quarter of rupees from the Provincial revenues seems insignificant. But it seems that in spite of considerable efforts on the part of the Department the real significance of the fisheries is still not fully realised. In the opening paragraph of the introduction the Director says that "indications are not wanting that Fisheries as a latent source of food and wealth has not so far received adequate recognition. Within the last fifteen years the question of the continuance of the Department as a national service has been pressed on Government's attention on no fewer than six occasions. The findings of the census of 1931 that agriculture has reached its maximum production under present conditions and the Presidency can no longer feed itself, is a serious warning to the country that attention should now at least be directed to fisheries as the only other prime source of food-supply, and as a valuable addition to the country's wealth." It may here be recalled what Surgeon-Major Francis Day observed in his *Report on the Fresh Water Fish and Fisheries of India and Burma* (p. ccxxxvii). He stated "how great must be the moral responsibility of legislators, who, living amongst a population such as exists throughout India, more than half of whom would consume fish could they procure it, have permitted the depopulation of the fresh-water fisheries, and allowed the destruction of so great a source for the supply of animal food. Now that it clearly appears millions would eat fish could they obtain it, surely the re-population and future protection of these fisheries will be considered an important subject for consideration as a means of supplying loss of physical powers and nervous energy." The value of this unlimited food-supply of high quality becomes inestimable during famines when crops fail owing to floods or drought. Attention may here be directed to the fact that the Royal Commission on Agriculture made strong recommendations for the economic exploitation of the fisheries in India principally with the idea of improving the physique of the agriculturists whose ill-balanced diet received the attention of the Commission.

Dependence of the "Visibility" of an Object on its Apparent Size.

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IN choosing suitable objects at different distances as landmarks for making observations on "visibility" in meteorological practice, one of the conditions that is considered desirable is that the objects should subtend at the eye of the observer about the same angle. It is also generally known that other conditions remaining the same, an object of smaller angular size ceases to be visible at a shorter distance. In order to obtain some definite information regarding the manner in which our estimate of visibility would be affected if the size of the object is allowed to vary, some experiments were carried out during the last few months in the grounds of the Fergusson College, Poona. The objects under observation were square sheets of white paper pasted on a large blackboard. This ensured uniformity of background and similarity of illumination. The size of the board was about $5' \times 4'$. Five different sizes of paper were used, the sides of the squares being 2·75 cm., 5·5 cm., 11 cm.,