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WE have read the triennial report of the Zoological Survey of India for the years 1932-35 with considerable interest. This document recently issued by the Director presents in a concise and readable form the principal activities in which the departmental officers were engaged during the period covered by the report, and also indicates how the curtailment of grants has affected the progress of investigations. The work of the Scientific Surveys and the knowledge which they advance deserve the attention of governments and also of the public in greater measure than is generally accorded to them. The researches which they undertake are always of great intrinsic importance and frequently of real practical interest, but almost invariably, the value of scientific investigations is neither understood nor appreciated. Scientific work in India suffers from lack of proper exponents who can interpret its significance and its bearing on the practical problems of life in the language of the people. Many of the discussions initiated in the Indian Legislative Chambers on important public affairs have a scientific background, and decisions reached have frequently no relation to the proper appreciation of the development and the progress of science in its application to practical ends. It is needless to observe that the intelligent understanding and discussion of many administrative problems necessitates a fairly comprehensive knowledge of the scientific principles involved in their theoretical and practical aspects, and in their bearing on economics and politics as well as on social and legislative measures.

One of the ways, in which the work of the Surveys can be brought prominently before the public, is to extend and co-ordinate the existing Scientific Surveys where such co-ordination is desirable, and to establish a Committee of Scientific Advice. If such a Committee is formed on a representative basis, it should accept the responsibility of promoting discussion in the Council Chambers of Federal India on scientific subjects in their application to economic policy and national well-being. It may be necessary to organise periodical addresses by scientific authorities to the principal political parties, and to assist government in all administrative measures and acts involving the application of modern scientific knowledge. An organisation occupying the

status and fulfilling the duties of the Parliamentary Science Committee in Great Britain is already overdue in India, and the sooner we establish a definite link between Science and Government on the one hand, and Science and Society on the other, the sooner shall we secure the orderly progress of knowledge and the continuous improvement of the economic and social condition of the country. One of the most important truths which the Committee will have to impress on the public and government will be that scientific departments differ in their spirit and character from the administrative branches, and that investigations in the former should proceed uninterrupted by the fluctuations of financial assistance. Our civilisation has progressed by the increasing exploitation of the resources of animate and inanimate nature, and the wealth of the world increases in proportion to such exploitation. The reason why the industrialists invest more money in scientific research when their income falls, is that they live in a competitive world. Starving the scientific departments virtually implies extinction of the industry concerned. But governments as producers of wealth have no competitors, and their attitude towards scientific research correspondingly differs. Like all industrial organisations, government ought to find it more profitable to stimulate the means of earning increased revenue through scientific research, than to resort to the hackneyed policy of enhancing taxes during the recurring periods of financial depression. It is this aspect of administrative policy that the Committee of Scientific Advice that we have proposed should inculcate in the mind of government and the public. Until the political parties realise the imperative necessity of the substitution of such a financial doctrine in the place of the one now pursued, Scientific Surveys are liable to inhibitions of grants.

In the opening paragraph of the report the Director of the Zoological Survey observes that, as a consequence of the scheme of retrenchment applied to his department, the field investigations by the officers were greatly restricted, important research activities curtailed and the staff reduced to a maintenance basis. However the achievements of the Survey during the period reported, form an impressive record comparable with any previous term not affected by financial stringency. This was rendered possible by the unstinted devotion to work already in progress, but there must, however,

be a limit to the exertion of unrelieved energy and enthusiasm. The improvement in the financial position of the Government of India offers hope that the grants to the Zoological Survey will speedily be restored to the original scale, without which the arrears of work must continue to exist, and fresh investigations cannot be undertaken. That the work carried on in the Zoological Survey is of such importance as to be recognised abroad is evident from the fact that two of its officers, Dr. S. W. Kemp and Lt.-Col. R. B. Seymour Sewell, were selected to lead oceanographical expeditions sent out by Great Britain within the last ten years. The wealth of research material and the facilities for investigation of practically every species of problem available in the Survey attract Zoologists from foreign countries, besides large numbers of research workers from the Indian Universities and other scientific institutions.

The main feature of scientific progress is the close and steady co-operation between different groups of investigators, since the discoveries in any branch of science find ready application in apparently unrelated departments of knowledge. We have several research institutions in India equipped and maintained by government subsidies, and prevention of overlapping of effort and of duplication of expenditure is a problem worth consideration. In what directions and to what extent intimate co-operation can be secured so as to save expenditure, and to secure at the same time concentrated action, must be one of the duties of the Committee of Scientific Advice already suggested. There are several directions in which the economy of Government grant and of the effort of investigators could be effected. For instance quite a considerable volume of taxonomic work in entomology is done at the different agricultural and forest research institutions in India, and also under the auspices of the Medical Research Fund Association. It would be advantageous, and in certain respects even necessary, to centralise this department of enquiry, as far as possible, at a single institution possessing the requisite laboratory and library facilities, and adequate reserve collections for comparative study. The experience and knowledge of the officers of the Survey and of the members of the subordinate staff when co-ordinated with those working in other research institutes should prove an invaluable implement for the elucidation of problems in which field

work forms the basis of all entomological investigations. Extension of the Entomological Section of the Zoological Survey of India would appear to meet all the demands, provided it gains affiliation and co-ordination of the work carried on in the different centres in such fields of investigation as co-operation would advance. Similarly for the more intense ichthyological research in India, the Fish Section of the Zoological Survey of India could be strengthened to considerable advantage, to which the fisheries departments in the provinces might contribute their experience and knowledge. We are not thinking of the centralisation of research, but only examining the possible advantages of creating a central body where problems in economic zoology could be investigated from a broader and comparative standpoint, and in the elucidation of which the provincial research institutes could honourably co-operate. What we want is research *rapprochement*. This is gradually being established by the Zoological Survey in undertaking detailed investigation in connection with the shell fisheries in the Andamans and their economic exploitation; the identification of the animals of economic importance from the medical or sanitary point of view for the Calcutta School of Tropical Medicine, the Forest Research Institute, Dehra Dun, the Imperial Institute of Veterinary Research, Muktesar; the identification of the human and animal remains excavated at Harappa, Mohenjo-daro and other chalcolithic sites in Sind, and the anthropological work connected with the last Census operations. On account of retrenchment, the survey officers have been assigned work which ought to be properly entrusted to the members of subordinate staff, and if they are released from the routine business, they ought to be able to undertake considerably more useful investigations in addition to the legitimate duties connected with their respective office.

The Zoological Survey of India is entrusted with the care and maintenance of the zoological and ethnological galleries of the Museum which in their richness and variety have few parallels in the East. Lack of funds has affected this department quite as seriously as the other sections of the Survey. The official view of the Museum is that it is generally a place for the gratification of the eye, and the message of the exhibits is therefore permitted to remain sub-conscious. It is essentially an educational institution carefully devised for popular enlightenment.

It is also a place of reference. Want of proper care and attention due to attenuated staff, and of periodical additions in a bright and attractive form which naturally implies expenditure of money, must rob this section of the Zoological Survey of its power to instruct the visitors and of its usefulness to research students. In 1933, the Director of Zoological Survey was able through the munificence of Dr. S. C. Law to organise an exhibit of storks in a replica of their natural surroundings, and other groups of animals can be exhibited similarly, provided sufficient funds are placed at the disposal of the authorities. In addition to increased grants from governments, the Museum of the Survey should have a large endowment without which further improvements become difficult. The Museum is a great national institution, the usefulness of which is capable of being extended by organising a series of popular lectures on scientific subjects. The presence of foreign scientists who visit the Zoological Survey may be utilised for supplementing the excellent resources which the institution already possesses for inaugurating the scheme of popular addresses in a manner similar to those organised by the Royal Institution of Science and Technology in South Kensington.

The Zoological Survey is now under the direction of Indian scientists and in spite of the limitations imposed by retrenchment, they completed several important pieces of research, and started a large number of interesting investigations during the period under review. It seems to us that in addition to laboratory and field investigations, special branches of research in experimental and economic zoology should be organised when funds become available. No institution in India has such material resources and wealth of experience and knowledge for organising these new departments, as are possessed by the officers of the Survey, and the value of the results of such enquiries for promoting the material prosperity of the country must manifestly be multitudinous. It is true that the work of the Survey is increasing far too rapidly to be handled by the existing staff, and we should be reluctant to make proposals likely to add to their burden. The Zoological Survey is already engaged in important economic problems, but nevertheless the field of investigation is capable of enlargement. Our knowledge of economic ornithology and mammalogy of India is imperfect, and there are gaps in our

information regarding economic pisciculture and entomology. From the triennial report of the Director, we understand that he has submitted to the Government of India proposals for the extension of the department and increase of grants, and, in considering these proposals, we have no doubt that the authorities, while Indianising the services, will also provide them with the necessary means of maintaining their high standard of efficiency and traditional reputation.

Control of Drugs in India.

THE menace of drug adulteration and of traffic in spurious drugs prevalent in India at the present time was the subject of an address by Lieut.-Col. R. N. Chopra, before the Calcutta Rotary Club last month. The speaker showed that the market in India was being flooded by unscrupulous traders with drugs and chemicals of defective strength and impure quality and that potent remedies such as sera, vaccines, gland products and compounds of arsenic and antimony were being freely sold to the public without their quality being tested. The practice was a great menace to the public health and called for prompt institution of efficient safeguards to ensure the quality and authenticity of medicinal preparations offered for sale to the public. There is no doubt that India is *par excellence* the dumping ground for every variety of quack medicines and adulterated drugs manufactured in all parts of the world and that her markets are glutted with useless and deleterious drugs sold by unqualified chemists who are themselves a public danger. That this state of affairs has been going on for some years is shown by the fact that in 1930 the Government of India appointed a small *ad hoc* committee under the chairmanship of Lieut.-Col. Chopra to explore and define the scope of the problem and to make recommendations. The committee started work in October 1930, toured all over India and received a large mass of varied and voluminous evidence both written and oral. It considered carefully and systematically all aspects of the question and in April 1931, made comprehensive and far-reaching recommendations. It is nearly five years since the committee completed its labours and made its report but no action has been taken by the Government and the speaker showed that the position has gone from bad

to worse. There is no doubt that all classes of drugs, those belonging to the British Pharmacopœia, those not officially recognised by the pharmacopœia but known and approved medicines including the group of biological products such as sera, vaccines, preparations of animal glands, organometallic compounds, and lastly the group of patent, proprietary and secret remedies are all equally affected. Col. Chopra went into detail of how these different groups were affected and described what was the effect of the substitution of genuine medicinal products by rubbish, which, according to him, has now reached a very serious stage. In diseases such as pneumonia, diphtheria, etc., it may make all the difference to the life of the patient whether he is getting a drug of proper strength or an adulterated or useless preparation. In the case of the complicated organometallic compounds, if they are not properly prepared and tested and in a state of absolute purity, their use will be positively dangerous and fatalities may occur. In the case of biological products incalculable harm may follow the use of products which are improperly prepared or stored. The injection of faked insulin in cases of diabetic coma may lead to the death of the patient. Much harm may result from the use of patent and proprietary and secret medicines in negative as well as positive ways. A patent medicine might be injurious and cause direct harm as in the absence of control some of the constituents may be positively dangerous. Some medicines might have the effect of masking early symptoms of serious and grave diseases and, assuaging them for a short period result in delay of scientific diagnosis and treatment. Col. Chopra performed a public duty of prime importance in bringing to their notice the grave danger the people are running in the absence of control over medicinal preparations. He emphatically pointed out that the Government is morally bound to take steps to rectify the present state of affairs.

The remedy has been suggested by the Drugs Enquiry Committee. The scheme put up by that Committee, which has been generally accepted as being sound and effective, consists of two parts, namely legislation and the machinery to collect and test drugs. As regards the first part, it is a matter of common knowledge that there is no enactment in the Indian legislature at the present time which aims directly at the