



A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

*"To the solid ground
Of Nature trusts the mind which builds for aye."*—WORDSWORTH.

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Zoology in India.

THE Report of the Zoological Survey of India¹—
 a phoenix which has arisen from the ashes of
 the old Indian Museum—gives first impressions of a
 peculiarly felicitous service. Looking cursorily over
 its pages we see visions of a zoological and ethno-
 graphical museum that might have been designed by
 Socrates for inclusion in Plato's Republic: a museum
 of which the Guardians are biologists—philosophers—
 —and the fiduciary appanages of which occupy a minor
 position as Auxiliaries: a museum where the Guardians
 do not always work within walls and upon what fortune
 may bring, but have freedom (within the omnipotent
 tether of the Treasury) to wander where they will in
 order to study and collect for themselves from the
 living stream of Nature.

Closer attention to the Report, however, slightly
 qualifies these attractive visions. The officers of the
 Museum are indeed the field-officers of the Survey, and
 they can indeed work in commodious laboratories upon
 material that they have studied and gathered in its
 natural environment in fair places of their own choice.
 Yet they are not quite happy. There are, says the
 Director, so few of them, and they are so imperfectly
 furnished with trained and responsible assistance, that
 they cannot take enough advantage of their golden
 opportunities, but have to spend "an undue proportion
 of their time" in the mere mechanical care, not so much
 of the housed collections, as of the very bottles in
 which the specimens are preserved. So the young
 Department has to endure such bitter taunts as "that
 it does no solid work, but merely names specimens,"
 and "has neglected its opportunities."

Analysis of the Report gives abundant evidence that
 these taunts are but wild and whirling words. The
 staff of the Survey, besides naming specimens, has in

¹ Report of the Zoological Survey of India for the years 1920 to 1923.
 (Calcutta: Superintendent of Government Printing, India, 1923.) One
 rupee, or 2s.

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the three years under review produced, or caused to be produced, more than 150 scientific papers. Now we all are aware that mere outflow of printed matter from a Government department may have various significations and interpretations, according to circumstances, and also that a good deal of subsidised "research work" is not of very high character or of very serious purpose. Many of the publications here recorded, however, are additions of permanent value to the general stock of knowledge and also have important applications to practice. Among those of a more obvious scientific interest are the series of "notes" on Crustacea, by Dr. S. W. Kemp, which are really the finished material for a critical catalogue; the numerous and varied biological papers by Dr. B. Prashad; and the ichthyological series, also rich in biological interest, by Dr. S. L. Hora.

More particular attention may be directed to several papers on the gastropod molluscan fauna of the Indian Empire, which, in addition to their scientific value, have an important bearing upon practical affairs. In the economy of Nature, it is one of the distressing functions of gastropod molluscs to serve as nurses and distributors of a great tribe of parasitic trematodes, and, among these, of the terrible blood-flukes that so variously, so grievously, and so obstinately afflict mankind in many tropical and subtropical countries. The papers in question include, among others, the "materials" for a revision of the fresh-water gastropod mollusca, by Dr. Annandale, the "*Cercariæ Indicæ*" of Major R. B. Sewell, and the report on a survey of the molluscs and their trematode parasites by both authors in collaboration. Major Sewell's monograph, which extends to nearly 400 pages of text and is illustrated by 32 coloured plates and numerous text-figures, is in the opinion of an expert parasitologist the finest contribution to our knowledge of this important group of parasites that has ever been produced at one individual effort. Should the extending employment of Indian troops in neighbouring countries infected by blood-flukes threaten ulterior consequences for India, the knowledge embodied in these papers will enable the danger to be handled rationally.

Notwithstanding the home-keeping obstructions complained of, a large amount of well-conceived field-work has been accomplished. In connexion with the general survey of lacustrine life and the particular investigation of the fresh-water molluscan fauna, expeditions have visited various lakes in Burma, Kashmir, and Kumaon, in one case accompanied by an artist to figure living forms. An expedition of a mainly scientific character, and having rather unexpected scientific results, was made to the unexplored Siju cave in the Garo Hills of Assam.

The training, as subsidised "research assistants," of promising young Indians is a praiseworthy educational experiment that further illustrates the enterprising spirit that animates the Zoological Survey of India. So far as the supply of young men having the necessary aptitudes goes, the experiment has been justified, but the difficulty is to find employment for them afterwards. Here we meet, on another road, the Director's complaint of an insufficient staff: the harvest is plentiful, the labourers are there, but the Indian Government cannot supply the gear.

Those who like to think of zoology as essentially a humanising study—a science above all others whereby man may learn to know himself as he really is, an animal, although the beauty of the world and the paragon of animals—do not care to be for ever harping on its value for material ends. There is, however, one of the many economic applications of zoology, namely, its application to hygiene and the public health, in which its humane definition suffers no perdition. From this aspect it is astonishing that a Government having the care of three hundred million souls, most of whom till the soil and live more or less at the mercy of the teeming populations of the jungle, is not supremely anxious to discover all that can possibly be known about that jungle life. For if we would name the diseases that, far beyond all others, undermine the health and shorten the life of the native inhabitants of India, we should have to specify diseases that are directly caused by, or spread by, or both caused and spread by animals, or animalcules, or by both in combination; *i.e.*, are caused in some way by jungle life that by taking thought can be mastered.

To argue that the causes of these preventable diseases were not discovered but were only corroborated and clarified by zoologists, and that since some particular facts are now known any service that zoology can render to the cause of public health is accomplished, is to misunderstand the lesson. The truer argument is that these discoveries have lifted the horizon over new and imperfectly surveyed tracts of pathology and hygiene, in the exploration and occupation of which enormous service can be rendered by concurrent accurate and comprehensive zoological investigations. The general value to India of the sanitary institutions of the West is beyond question; nor is there any doubt that in India, as in other parts of the British Empire that lie within the tropics, the sanitary principles that should find their widest and happiest application are those that are based on knowledge of the kind that is best gathered in the course of an adequate and well-administered zoological survey.

Of course, it may be argued that to the millions of India both zoology and hygiene are things equally

indifferent; that the uneducated masses do not know what zoology is, and, when they think of European dealings with their health, think now of quinine and of the miraculous surgery that restores the blind man's sight, and now of the tyrannical "Sirkar" who would defile them by vaccination; and, therefore, that in the presence of such deplorable ignorance it is almost impious to talk about zoology and its hygienic applications. These arguments, however, are merely the stock of the unbeliever. It may be argued that in times like the present a poor country like India cannot afford to spend money on a luxury like zoology, even with its distinct promise of help in elucidating the problems of human disease. This no doubt would be a good argument if a very large sum of money were required, or if parsimonious treatment of an enterprise holding out a rational and well-justified promise of that kind were really economy. As, however, neither of these alternatives is true, we hope that every encouragement will be afforded to the continued activities of the Zoological Survey of India.

The Alcohol Problem.

The Action of Alcohol on Man. By Prof. E. H. Starling. With Essays on (1) Alcohol as a Medicine, by Dr. Robert Hutchison; (2) Alcohol and its Relations to Problems in Mental Disorders, by Sir Frederick W. Mott; (3) Alcohol and Mortality, by Prof. Raymond Pearl. Pp. vii+291. (London: Longmans, Green and Co., 1923.) 12s. 6d. net.

IN this book, Prof. E. H. Starling and his collaborators, Dr. R. Hutchison, Sir Frederick Mott, and Prof. Raymond Pearl, have described the action of alcohol on the body both in health and disease. Whereas most of the book is taken up with a scientific but popular discussion of the problem, Prof. Starling has come to certain definite conclusions, on the basis of the facts described, which will cause comment and possibly opposition, and these will be dealt with first. He states that "moderate quantities might be taken throughout adult existence without interfering with bodily health or efficiency, and are sufficient to obtain beneficial results and to produce the increased pleasure in living which are the objects of the employment of alcoholic beverages." It is important to add that 35 c.c. is regarded as a "moderate" quantity of alcohol. This is contained in half a bottle of light wine, or in a pint and a half of ale, or in three ounces of whisky (30 under proof). This "moderate" quantity may be drunk with impunity, according to Prof. Starling, after the work of the day is finished. It will diminish a man's power of muscular co-ordination

and other complex processes, but will not influence his behaviour or his powers of comporting himself with propriety as a member of society. On the other hand, if a man drinks alcoholic beverages during the day-time, he ought to take such quantities as will not materially influence his judgment and other mental processes, and in this case, not more than 12 c.c. of alcohol, in the form of a glass of beer or a wineglass of claret, should be taken at lunch. These are some of Prof. Starling's conclusions.

Many people would probably agree that, if all who now drink to excess took their liquor in these quantities and at the times recommended, there would be no such thing as an alcohol problem, and there would be no more reason for the publication of this book than one dealing, say, with the action of sausages on man. Unfortunately, alcohol is a big human problem because it is drunk in immoderate measure by large numbers of people, so that, as pointed out in the book, the expenditure on alcoholic drinks is 8 guineas per head per annum. If it is also true that only 16 guineas per head is spent annually on food, Prof. Starling will find it difficult to get great support for his statement that the expenditure on alcohol in Great Britain "does not seem disproportionate" even if we take into consideration that half of the 8 guineas reverts to the State. If the cares of the world are so intolerable that they require this expenditure on alcoholic beverages in order to increase the pleasure of life and to diminish the frets and worries of daily existence, then either those who do not drink to this extent have a very wrong view of life or else such an expenditure is a great social mistake.

It would be wrong, however, to emphasise too strongly Prof. Starling's conclusions on what might be described as the social problem of alcohol, for in most of the book he discusses in very readable and balanced language the physiological action of alcohol. It would be difficult for any one, whatever his views on the social problem, to have anything but praise for this part of the volume. Where necessary a certain amount of description of normal physiological processes is given in order to enable the general reader to understand how alcohol affects the body in a particular respect. Thus, in describing the action of alcohol on digestion, a brief but adequate account of the normal processes of digestion makes it possible for the reader to get a view of how the substance influences digestion at different stages, so far as our present knowledge goes. There is also an account of the functions of the nervous system in the chapter on "The Action of Alcohol on Human Behaviour." In this case, it would have been interesting if Prof. Starling had also discussed our present knowledge—slight though it be—