

these 16,000,000 would consume annually 135,411,328,000 insects. Such figures require some thinking about before we can realise or form any true conception of the vast quantities that are included in such measures. It is impossible fully to realise the millions of insects and caterpillars that birds destroy just at the season of the greatest agricultural activity.

Wherever insectivorous birds have been destroyed there has followed an increase or plague of injurious insects. Scores of cases are on record, such as the destruction of woodpeckers and tits in the forests of Saxony and Brandenburg prior to the year 1798, in France in 1859-60, in Nebraska between 1865-77, and in Russian Siberia in 1893-94.

An anonymous writer stated a short time ago: "Some of the very greatest friends that our nation has are being destroyed without mercy. If the British Navy were threatened with destruction, a great cry would rise from the people, but only whispers are heard now and then about the slow destruction of a defensive force upon which most of our prosperity depends."

Surely we shall not appeal in vain to the various agricultural and horticultural organisations of this country to bring the weight of their influence to bear on a matter so vital to the country's interests. If the cultivation of the land has to prove profitable, it can do so only by preserving and utilising every factor that is favourable to crop production, and so long as economic entomology and ornithology remain neglected or only of academic interest in the United Kingdom, it behoves us to awaken and to take heed where we stand, or for some years to come our land will groan with the cry of desolation, due to our apathy and the ignorance and neglect of the ways and habits of our insectivorous birds, and the wanton destruction of what has ever been Nature's means of adjusting the complications of animal life, which man in his ignorance is seeking to pervert.

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INDIAN INDUSTRIAL PROGRESS.

TWO publications¹ have recently been received which would indicate that decided progress is now being made in industry in India, owing to the stress involved under war conditions. The Indian Munitions Board undertook its formal duties as a Department of the Government of India in April, 1917, its primary function being the utilisation to the utmost extent of Indian resources in materials of all kinds required for the prosecution of the war.

When considered from a broad aspect, the munitions for a modern army cover practically all the wants of a civil community, with the addition of the special weapons, the armies' munitions, etc., which are employed by the soldier or sailor in actual fighting operations. With the enormous

armies which are now used in warfare, the scale of operations is such that the wants of these fighting men necessarily compete with the requirements of civil life; hence the necessity for departments which will be able to cover the whole aspect of the economic and other life of a country. India has hitherto been mainly an agricultural country, but with the operations of war preventing supplies reaching India from England and other countries, it has become essential that many manufactured articles, which were formerly solely imported into India, must now, or, at all events, so long as the war lasts, be largely manufactured in India itself.

It is probably not too much to say that, owing to the influence of the war, India has already made progress which would otherwise have occupied almost a generation, and the Report on the Indian Munitions Board now available shows that its activities have been manifold.

The Indian Munitions Board was fortunate in being able to secure as its President Sir Thomas Holland, who was formerly for some years Director of the Geological Survey of India, and happened to be in India as head of an Industrial Commission which was engaged in developing India's industrial resources. The Board consists of the President, Sir Thomas Holland, assisted and advised by four members; and it is attached to the headquarters of the Government of India. At headquarters the work is divided into a number of well-defined branches, each branch being under the administration of a Controller. There are also provincial organisations in the different parts of India, and nine Controllers of the principal provinces, provided with proper deputies and assistants, have been appointed.

The provincial Controllers are responsible for utilising local industries which are not within the sphere of the special branches at headquarters. The organisation, therefore, appears to be fairly complete. The subjects dealt with under the control and supervision of Government are very varied, but the main object of these changes appears to be the utilisation of all indigenous materials and their exploitation so far as possible. As indicating the diverse activities now being carried on by the Indian Munitions Board, it may be mentioned that such special subjects as the following are now being worked at:— Timber supplies and resources, hides, tanning, and leather, the chemical and metallurgical industries of India, the potash salts in India suitable for chemical manufactures, manufacture of organic chemicals, essential oils, and perfumes, glycerine manufacture, wood distillation, indigenous dyes, etc. It would hence appear that great developments may be expected in future in the industries of India.

In connection also with the Indian Munitions Board, a conference was called by it for the consideration of the reorganisation of chemical research in India, the meeting being held at Lahore on January 8 last. This was attended by the majority of qualified and skilled chemists in

¹ "Indian Munitions Board Handbook" and "Proceedings of a Conference for the Consideration of the Organisation of Chemical Research in India, held at Lahore, January 8, 1918." (Simla: Government Monotype Press.)

India, and appears to have been a great success. At the present time, what is under consideration is the form of reorganisation which would be best; but it would appear that it is possible that economic research departments may be recognised under a director-general of chemistry with deputy directors for various special branches of economic science, and that all chemists in Government employ should be included in the service, the reorganisation being intended, of course, to increase the output of work and to prevent overlapping. Thus, if there were a director-general of chemistry in India, the deputy directors working under him would include a deputy director for agriculture and a deputy director for forest products, while the provincial agricultural and forest men of science would work in co-ordination with their brethren in other provinces under instruction from, and in general consultation with, their particular deputy director. Apparently, there would also have to be separate directors, say, for organic chemistry and also in charge of mineral chemistry, etc. If this were carried out properly India might make extremely rapid progress in industry and commerce, and in such a way that its future may be revolutionised.

NOTES.

FROM a White Paper published on July 10 we learn that among the Supplementary Estimates for the year ending March 31, 1919, is the sum of 1,000,000*l.* which is to be devoted through the Board of Trade to the purpose of assisting the dye-making industry. This is the first instalment of a total sum of 2,000,000*l.* to be provided in the shape of loans and grants to be spread over three years, and divided as follows:—1,250,000*l.* in loans at not less than 1 per cent. above the Bank rate, with a minimum of 5 per cent., repayable in twenty years or earlier if the profits of the manufacturer are more than 9 per cent.; 600,000*l.* in aid of extensions of plant and buildings; and 150,000*l.* in grants in aid of research. It will be remembered that early in 1915 a grant of 1,000,000*l.* was made to one firm at Huddersfield, out of which was created the company known as British Dyes, Ltd. This, not unnaturally, created a feeling of dissatisfaction on the part of those dye-making firms which received nothing. The sum mentioned is to be distributed among these firms, besides the substantial amount allocated to the purposes of research. Presumably the 100,000*l.* given for this purpose in 1915 has been spent, but it would be interesting to know how and by whom the money has been used and with what results, in view of the fact that the central research laboratory originally contemplated has never been erected, nor the Technical Committee announced in July, 1915, called into existence.

WE publish this week an article dealing with recent advances in scientific plant-breeding, in which the remarkable progress made in recent years, especially in India, is described. As a pendant to this article we may invite attention to the announcement made in Parliament by the President of the Board of Agriculture on July 18 that active steps have been taken with a view to the establishment at Cambridge of an Institute of Agricultural Botany, the primary function of which will be the breeding and distributing of improved varieties of agricultural crops. The scheme in question was very fully described by Mr. Lawrence

Weaver, of the Board of Agriculture, at a meeting of the Agricultural Seed Association held on July 15. It appears that the new institute will be modelled on the famous Swedish plant-breeding station at Svälof, and that its activities will be to follow two distinct lines, one of which will be purely scientific, while the other will have a commercial outlook. More precisely, the scientific wing will be concerned with the producing of pure cultures of new varieties on the field-plot scale; the economic wing will deal with the growing and distribution on a large scale of these varieties. Presumably, on the Svälof model, the scientific side will oversee the operations of the commercial to the extent of guaranteeing the purity of the stocks distributed by the latter. It has been announced that subscriptions towards the establishment of the new institute, amounting in the aggregate to upwards of 30,000*l.*, have already been received, including a sum of 10,000*l.* down and 2000*l.* a year for five years from the firm of Sir Robert McAlpine and Sons. It has also been announced that the Board of Agriculture will provide the necessary buildings and equipment. It is most gratifying to have this evidence of the growing appreciation by the public of the value of scientific work in economic directions. The new institute may be confidently expected to have a profound influence on the future development of British agriculture.

THE question of the payment for the services of scientific men working in connection with the industrial research associations, being formed on the lines suggested by the Department of Scientific and Industrial Research has been raised in the House of Commons by Sir William Beale. Though the associations could make remuneration to scientific men appointed to serve on advisory committees, or to specific posts constituted by them, they were not authorised to pay them for services as members of councils or boards of management. It has now been decided by the Board of Trade that this condition may be abrogated, and payment can be made after approval by the Department of Scientific and Industrial Research. Sir William Beale's question, asked on July 18, and Sir Albert Stanley's answer, are as follows:—*Sir William Beale*: To ask the President of the Board of Trade whether he is aware of the conditions under which scientific men are asked to serve on the councils or boards of management of industrial research associations formed under the direction or with the approval of the Board to carry out or promote scientific and industrial research, in consequence of the rules and practice prescribed by the Board of Trade to discourage payment for such services rendered by scientific men other than reimbursement for out-of-pocket expenses; and whether the Board has taken or will take steps to enable such further reasonable remuneration to be paid as will attract to or at least make possible for such research committees as are being formed in connection with the Department of Scientific and Industrial Research the co-operation, advice, and assistance of scientific men of undoubted capacity to render valuable services whose position and means do not enable them to do so on mere compensation for out-of-pocket expenses. *Sir Albert Stanley*: In dealing with applications for licences under the provisions of section 20 of the Companies Consolidation Act, 1908, due provision is made for the payment of reasonable remuneration to members of the council of management of such industrial research associations with the approval of the Department of Scientific and Industrial Research.

THERE is a strongly expressed opinion among those engaged in the fisheries industries that the time has