

Scientific Work of the Fishery Board for Scotland.¹

AMONGST the points of scientific interest in the report for 1923 of the Fishery Board for Scotland are the facts pertaining to the continued abundance of all kinds of fishes, swarms of small haddocks especially being noted. Thus the total capture was little short of that in 1919, though exceeded by that in 1920 when the rush of boats was at its height. Herrings show no sign of diminution even under the unfavourable conditions of capture, the returns much exceeding those of the previous year, and almost reaching those of 1913.

The work of the scientific staff includes a paper of special interest by H. Thompson on "Problems in Haddock Biology," which has already been noticed in NATURE (August 30, p. 333).

Alex. Bowman treats of Arnoglossus and especially of what he thinks a post-larval *A. imperialis* (with a coloured figure). He remarks that *A. laterna* has a similar distribution to the sole (*Solea vulgaris*), and asks what are the factors which have prevented its establishment on the East Coast of Scotland by Nature or by transplantation. The sole has always, however, occurred sparingly on the East Coast in such bays as St. Andrews, and the transplantation of about 600 from Scarborough to this bay has had little effect on its abundance. He points out that other species of Arnoglossus enter by the Strait of Dover and reach the Skager Rack and the Cattegat, whereas he thinks *A. imperialis* must have reached the northern North Sea (where 3 young specimens were found) from the Atlantic, and that they do not survive. Possibly investigations both of the life-histories of the several species and of the various currents may afford further information. The efforts by the same author to locate the areas in which the herring spawn by the capture of what he terms "spawny" haddocks which "are well fed and plump of form, and have a characteristic bloom on the epiderm which masks the black pigment," seems to be somewhat far-fetched, for, whilst no less than 80 boxes of large haddocks may be caught where the herrings spawn, no more "bloom" occurs on those with their stomachs full of ova than on those caught by the liners on other grounds. Again the cod, which feeds on the ova of the herring no less greedily than the haddock and even scoops up quantities of gravel with this food, presents no external change. No doubt such investigations are useful on unknown ground—though the external changes are more or less imaginary.

In a careful contribution on the use of the Petersen grab, A. C. Stephen perhaps makes too much of

¹ Forty-second Annual Report, Fishery Board for Scotland, being for the year 1923. (Edinburgh: H.M. Stationery Office, 1924.)

this instrument, which, though a useful adjunct to other methods of ascertaining the fauna of the seabottom, such as the dredge and the trawl, falls far short of the revelation a single storm will disclose on the beach. Not all the elaborate calculations of this and that species per square yard brought up by the grab will add more to our knowledge than the storm. It is curious that neither Pecten nor Nephrops (the rich food of the cod) seems to have come in the way of this instrument in the area of the Firth of Forth.

An interesting digest of the summer herring fishery of 1922 is made by H. Wood, whose observations and the accompanying map point to the occurrence of shoals in the same areas from June to September, the shoals perhaps differing in their composition, but still affording good catches. He found that the northern large herrings spawned before the southern, and he makes remarks on the spawning areas and the times of spawning, an intensive period being the end of August.

An elaborate and interesting paper is that by Prof. D'Arcy Thompson on the trawling statistics of Aberdeen from 1917 to 1921, in continuation of that issued in 1917, the period comprising two of the War years and three of unusual activity. These statistics again emphasise the fact that the old East Coast fishing grounds are as productive as formerly, the value of the catches being more than doubled, and this in face of the usual pessimistic views of the sea-fisheries. Whilst the post-War catches were much above the average, it is noteworthy that in 1917 the captures of codlings rose considerably, indeed were greater than in any previous year, and continued at a high level until 1920. Cod were much in the same condition. Haddocks, which had been rather scarce in 1914 and 1915, went beyond pre-War levels in 1916 and continued to increase until 1919, the average per voyage being nearly four times that of 1913, and, though diminished in 1920 and 1921, were still above pre-War catches. The advocates for accumulation during the War would point to this as proof of their theory, but such irregularities have often occurred previously and will occur in the future.

An important addition to the scientific equipment of the Fishery Board is the new Research Laboratory, a brick building of one story, with various rooms for the staff, besides a museum and library. It is within easy reach of the Bay of Nigg and Torry Harbour, Aberdeen. The Fishery Board apparently at present assumes responsibility for these researches, which do it credit, but perhaps in future it would be well if, as in the case of the Royal Society, the caution were prefixed that the Board does not accept responsibility for the views of the authors. W. C. McINTOSH.

Science and the Instrument Industry.¹

THE British Scientific Instrument Research Association is fortunate in that most of its members are, by the nature of their work, in constant contact with research, and consequently in a position to know what it implies, and understand its methods and results. Many of these participating firms have, in fact, long been in the habit of carrying out original investigations in their own laboratories. They realise, therefore, the lines along which advance is possible and desirable, and, what is most important, they have had experience in formulating their problems in a scientific manner. On the other hand, the research staff of the Association has learnt to envisage the

problems put before it from the manufacturer's point of view, and to adapt itself to practical needs and the limitations imposed by the necessity of economic production. The efficiency of this staff is very largely due to the good fortune of the Association in having as its director of research Sir Herbert Jackson, who is not only known for a variety of pioneer investigations in the realms of pure and applied science, but has also had a particularly wide experience of matters concerning instrument design, and of the psychology of the manufacturer. The Association is largely a body of his shaping, and he has made it a scientific instrument for the setting and solving of problems fundamental for the industry concerned.

The sixth annual report of the Association has just

¹ The Sixth Annual Report of the British Scientific Instrument Research Association, for the Year 1923-24. (London: 26 Russell Square, W.C.1.)

appeared. At the end of it will be found a list of twenty-nine research reports which have been issued to members, to whom, of course, they are confidential. This is necessary to protect the participating firms against both foreign competitors and those British firms, fortunately few, which have elected to remain outside. Very fittingly, both on account of the intrinsic importance of the subject to the instrument industry, and because the director is the leading authority on the chemistry of glass in Great Britain, a large number of these reports deal with problems concerning optical glass, such as the production of special glasses, including one asked for by the Admiralty; the preparation of neutral and coloured glasses; and the stabilising of polished glass surfaces, that is, the rendering of such surfaces immune from secular changes and the effects of climate. This problem of stabilisation, and many of the other optical glass questions, are of particular importance to the fighting services, which depend so much on the use of optical instruments in a variety of conditions. The fighting services are represented on the Council of the Association by representatives appointed by the Department of Scientific and Industrial Research, and their presence emphasises one of the services which the Association renders to the nation. Evidence of the activity of the Association on the electrical side is offered by researches on magnetic properties of materials used for galvanometer suspended systems, and on certain X-ray problems.

That the importance of the work done is realised by the Department of Scientific and Industrial Research, which controls the Research Associations, is indicated by the recent history of the Association, contained in the present report. The Association has completed the first six years of its existence, and with them the period of its initial grant. After investigations of the work of the Association by a special committee, including such experts as Sir Richard Glazebrook and Sir James Walker, the Department has resolved to offer an annual block grant of 10,000*l.* on certain conditions which have been accepted, so that the Association has already entered upon its second grant period. This period is characterised by certain administrative changes, among which the most important are those which bring the fighting services into closer touch with the Association, making them virtually members.

The value of the Association to the instrument industry is not easily overestimated. Apart from the actual researches which it carries out, it is often able to answer questions straightway from the knowledge which it has accumulated. It acts as a centre of scientific activity, and has effectively introduced a spirit of co-operation among the participating firms, which is of the greatest promise for the future ability of the industry to excel foreign competitors. The trust reposed in the director by all the members leads to a collaboration which would otherwise be quite impossible owing to trade rivalry, and there has already been an intercommunication of trade processes which has greatly benefited, for example, the various optical firms. Different firms, working in close touch with the research staff, have carried out in their own works and laboratories particular researches for which they have special facilities, and the results have been freely put at the disposal of all members. This policy has already led to the production of certain instruments equalling, if not surpassing, those put on the market by foreign firms which, before the War, were supposed to be unapproachable.

Between the National Physical Laboratory and the Association there exists a goodwill which is evidenced by the collaboration which has already taken place over the question of testing lenses by the Twyman

interferometer and over certain other problems, such as the production of resistance wire. The Laboratory has always been a source of strength to the instrument maker in a variety of ways, but in the Association he has an engine which enables him to help himself in a way which no outside body can do. Round the council table and in the sub-committees the members can thrash out questions both of technical design and of policy, avoid duplications of effort, and hear from one another and from outside members practical criticism and practicable suggestions, while the work of the research staff not only solves individual problems but also keeps constantly before them the high ideal of producing instruments not as good as, but better than, any yet on the market.

The Botanic Garden, Copenhagen.

PROF. OSTENFELD has prepared as a jubilee publication an account, referred to below,¹ of the history and resources of the Botanic Garden at Copenhagen. The contents of the work include many details of historical interest, while the botanist looking around for a continental school of botany will find much useful information in its pages.

The Botanic Garden, now fifty years old, is the successor of one that, dating back to the close of the eighteenth century, had become inadequate. Until 1871 the site was part of the old fortifications of the city, but by 1874 about twenty-four acres were transformed. The old moat, rounded off, still exists as a lake, the view-point from which one sees the features of the garden extending in pleasant vistas up the rising ground on every side. Here the stately greenhouses, there the rock-garden, and in the background one or other of the scientific and public buildings which adjoin the garden. In recent years the trees have been collected into a special arboretum at Sorø, thus allowing space for a considerable extension of the rock-garden, and for special sections. Thus in the "Danish quarter" miniature chalk cliffs harbour the plants of Møen, and on other rocks and soils the native Danish plants are seen in their normal environment.

The biological section is occupied by typical growth-forms such as might be expected in the home of Eugene Warming. The extensive glass-houses, in a compact block of more than 2000 square metres, include the higher palm-houses and lower ranges where tropical plants, orchids, aquatics, and other groups are housed. The more noteworthy plants, indoor and outdoor, are illustrated in the jubilee volume from photographs. The botanical museum shelters a mass of material, including special Danish, Arctic, and West Indian collections. The list of herbaria, more than two pages, is useful for any proposing to utilise them. The library of 25,000 volumes has been enriched by numerous donations. The Botanical Laboratory, dating from 1890, is a spacious block which is illustrated by a plan and photographs.

This home of Danish botany has been directed during the past fifty years by Joh. Lange, F. Didrichsen, E. Warming (1885-1911), and C. Raunkiaer, who was succeeded last year by C. Hansen Ostenfeld. The lists of staff include W. Johannsen, L. Kolderup Rosenvinge, F. Borgesen, and many others whose work has enriched the literature of botany. Copenhagen has many advantages as a centre for the study of northern floras, and this memoir will prove a useful source of reference.

¹ "Botanisk Have gennem 50 Aar, 1874-1924." By C. Hansen Ostenfeld. Pp. 101. (København: G.E.C. Gads Forlag, 1924.) n.p.