

and northern forms occurs. Following these Washington meetings the delegates dispersed, many of them returning to New York for embarkation, others visiting other parts of the country. The well-known authorities on cave insects, Dr. René Jeannel of Paris and Dr. Candido Bolívar of Madrid, started for an exploration of the great caves of Indiana and Virginia in company with Mr. Herbert Barber and Dr. Harold Morrison of the U.S. National Museum.

I should not, perhaps, write of the address of the president of the Congress at Ithaca, since I held that office myself, but that the principal theme of the address was the necessity for a reform in the teaching of zoology in the colleges and universities, so that entomology should receive vastly greater attention.

As it happened, the fourth day of the meeting coincided with the eightieth birthday of Dr. W. J. Holland. A dinner was given him by some of his scientific friends and admirers, and he was elected one of the fifteen honorary members of the International Congresses. Dr. S. A. Forbes, the dean of the economic entomologists of the United States, now eighty-four years of age, was also made an honorary member. The Congress also adopted resolutions of sympathy and respect addressed to Prof. J. H. Comstock of Cornell (aged seventy-nine) and Dr. E. A. Schwarz of Washington (aged eighty-three).

Other resolutions were passed by the Congress.

By far the most important step taken in regard to entomological nomenclature was a resolution by the Congress conferring upon the Committee of Nomenclature of the Entomological Congress judiciary powers to hand down opinions on cases of entomological nomenclature in accord with the International Rules of Zoological Nomenclature. It is understood that the entomological committee and the International Commission will co-operate; that in the future the Committee will handle most of the cases of entomological nomenclature and will refer to the International Commission only those cases involving pronounced differences of opinion, or undetermined principles, or the relations of nomenclature in entomology to nomenclature in other groups.

The Congress also adopted certain definite recommendations regarding family names, these recommendations to be referred to the International Commission with approval; and it referred certain other proportions to the Commission without prejudice.

I have attended fourteen international congresses of scientific men, and I have never seen at any of them such great enthusiasm and so obvious a spirit of hearty co-operation. Surely mutual understanding among the scientific men of the world is fostered greatly by these gatherings and makes for world peace.

L. O. HOWARD.

### The Fisheries of Australia.

A RECENT statement from the Australian Development and Migration Commission throws light on the interesting position of the fishing industry in Australian waters.

The history of this industry shows a succession of failures to establish what should be a thriving part of Australian life. In 1907 the Commonwealth Government appointed a director of fisheries and provided a research trawling vessel, the *Endeavour*, to investigate the possibilities of trawling in the southern seas. After a number of experimental cruises, during which it was established that valuable fishing grounds existed in the Australian Bight and off Cape Howe, the *Endeavour* was lost at sea with all hands, including the Director of Fisheries, in December 1914. The trawler was not replaced, and little further was done by the Commonwealth Department of Fisheries.

In 1915 the New South Wales Government decided to establish a State trawling industry with seven steam trawlers as the nucleus of a trawling fleet. Despite the fact that some of the richest trawling areas in the world, namely, those extending southwards from Port Stephens to Gabo Island, were revealed by the operations of the State trawlers, the venture was not a commercial success, and in 1923 the trawlers were disposed of to a number of private companies. These companies have since successfully exploited the Sydney and Newcastle fish markets and show signs of extending their fields of operation. Queensland also undertook State trawling in 1919, and good trawling areas were located between Cape Moreton and Caloundra. In other States, however, the fishing industry has failed to develop to the degree shown possible by fish imports. It is an anomaly, indeed, that a nation which imports annually fish valued at more than £1,500,000, and has an adequate supply of good edible fish around its coast, should fail to exploit such excellent natural resources.

This feature has been clearly realised by the Development and Migration Commission, which deals with the development of industry within the Commonwealth, as a prior necessity for increased migration.

At the instance of the Commission, the first Australian Fisheries Conference was held in September 1927. This was attended by representatives of the Commission, of the Commonwealth Council for Scientific and Industrial Research, and of the departments of fisheries of the various Australian States. It was decided that a complete programme of development must include not only trawling and related industries, but also studies of transport, distribution, and marketing of fish, of uniform laws and regulations affecting the capture of fish, and of factors of destruction in fisheries. The establishment of marine biological stations and the cultivation of oysters, crayfish, and turtles were also considered. After a thorough discussion of the position in each of these branches, committees were appointed to go fully into each subject and to make recommendations to the second Australian Fisheries Conference, which is to be held during this year.

The field borders, on one side, those questions in marine biology to be studied by the British Association Expedition to the Great Barrier Reef, and on the other, economic investigations of trawling and the difficult problems of transport and distribution.

These terms of reference are clearly very wide and, in the present inquiries, close attention is being given to the mass of knowledge and experience which has been accumulated in European and American fisheries. While much of the data from these sources is capable of direct application to Australian conditions, there are numerous scientific and commercial problems which are peculiar to the southern waters.

Refrigeration applied to fish taken from Australian sea waters does not always give the same satisfactory results as when fish from colder and less saline waters are treated. Thus, although Atlantic salmon may be satisfactorily stored in a frozen state for up to two years, it has been stated that the Australian flat head becomes practically worthless after removal from a few months of cold storage. The reason for this difference is not clear, but it appears to be partly dependent on marine temperature and salinity. In

this case there is scope for useful research to determine the proper relations between temperature and salinity of sea-water and the best conditions for refrigeration of fish taken therefrom.

At the Conference held last year, the need for extending the pioneering researches on fishing grounds carried out by the *Endeavour* was considered in relation to the establishment of marine biological stations. It is a regrettable fact that there is an almost entire absence of trustworthy information about the seasonal migrations of the native fishes, their spawning habits and life histories, their growth-rate and ecology generally. As a result of the Conference, it now seems likely that in addition to a research trawling unit being provided at an early date there will be a vigorous advance, backed by the universities within the Commonwealth, on the marine biological problems in Australian waters. The visit of the present British Association Expedition to the Great Barrier Reef will undoubtedly have a stimulating influence in this direction.

Transport and distribution of fish in such an area as the south-eastern portion of Australia present perhaps the greatest hindrance to the rapid development of the fishery industry. Briefly, the problem is to develop that measure of co-operative organisation between fishery concerns, transportation agencies, and marketing bodies necessary for rapid and economic distribution from the three large centres of population—Sydney, Melbourne, and Adelaide—to the sparsely populated country districts. It is rightly felt that in Australia, until the problem of distribution is solved, research directed towards the increase of supplies is premature.

Governmental participation in industrial affairs nowadays trends rather to the removal of those factors hindering developments than towards State trading. It is in this spirit that the two Commonwealth Government departments—the Development and Migration Commission and the Commonwealth Council for Scientific and Industrial Research—are co-operating with State authorities to bring the light to economic and scientific problems affecting fishery developments in Australian waters and to point the way to their solution.

A. S. F.

### Royal Photographic Society's Exhibition.

THE annual exhibition of the Royal Photographic Society is now open at 35 Russell Square, and admission is free. It closes on Oct. 13. We are glad to see that our oft-repeated desire that in the scientific and technical division the general appearance of the exhibits should be considered as secondary to their classification is this year acted upon to a certain extent, and to that extent the work of the student examining them is facilitated. What is now needed are a few cross-references in the case of exhibits that might belong to more than one section. For example, under the heading "Spectrography" there is only one item, but it would be entirely wrong to suppose that this is the only example of spectrographic work.

The Astronomer Royal has sent a photograph that shows the relative intensity of the principal doublet in the violet (*H, K*) and the diffuse doublet in the infra-red of the calcium chromospheres. The photograph was taken with a diffraction grating in the reflecting spectrograph with the slit tangential to the edge of the lens. The infra-red is of the first order and the violet of the second order, and they were photographed simultaneously, using light filters to exclude overlapping spectra. The 'astra' light filter is a new filter by Ilford, Limited, for use when photographs

are taken with visually corrected refracting telescopes. It eliminates the secondary spectrum to a very considerable extent. Mr. A. Coleman demonstrates the advantages of this filter by photographs taken with and without it. Ten examples of Zeeman effects (the effect of a magnetic field on lines of the spectrum) are shown by Mr. A. S. M. Symons of the Imperial College of Science. Messrs. Green and Freeman show a series of Fabry and Perot interferometer fringes.

Of the numerous examples of photomicrography, the most notable are of slowly cooled steel by Col. N. T. Belaiew at magnifications of 200 and 2000, which illustrate the deformation of crystals of cementite under the influence of internal stresses due to an allotropic transformation in the matrix. Other interesting points with regard to the nature of these crystals are clearly shown. Dr. G. H. Rodman has two series of nearly thirty each, showing the life history and structure of the greenhouse white fly and of *Zygina (Erythroneura) parvula* respectively, the latter being a pest that has lately become very prevalent at Kew and in greenhouses round London. Each is accompanied with rather long descriptive and explanatory notes.

The present possibilities of the photography of bullets in flight are well shown by Mr. Philip P. Quayle of Ohio. Spark photographs of the firing of a 0.30-calibre Springfield show the state of affairs (1) as the bullet emerges from the muzzle, (2) when the bullet has travelled about 6 inches, and (3) when it is about 18 inches from the muzzle. Similar photographs of the firing of a 12 gauge Winchester shot gun, full choke, show the charge as it leaves the muzzle and at distances from it of 4 inches and 12 inches and at 11 yards.

Some fine examples of X-ray photography are contributed by Kodak, Limited; Ilford, Limited; and Dr. J. H. Mather. Kinematography, photography in colours, photography from the air, telephotography, and practically every branch of photography are well illustrated in the exhibition.

The trade section of examples and apparatus seems to be rather larger than usual, a good deal of the apparatus being designed specially for scientific work. A light of standard quality for testing photographic negative materials is contributed by The British Photographic Research Association. This exhibit comprises a standard lamp, and a colour filter as worked out by Messrs. R. Davis and K. S. Gibson, of the Bureau of Standards, Washington, to make the light similar to ordinary average daylight.

### University and Educational Intelligence.

LEEDS.—The foundation-stone of the new buildings will be laid by the Duchess of Devonshire on Oct. 2. After the ceremony a congregation will be held in the Great Hall of the University to confer the honorary degree of Doctor of Laws on Her Grace, Sir. A. E. Bain, Mr. Alexander Campbell, and Mr. Morton Latham.

WE have received from the Bradford Technical College a prospectus of diploma and special day courses for 1928-29, including three- and four-year diploma courses in textile industries, chemistry, dyeing, civil, mechanical, and electrical engineering, physics, and biology. Special courses in advanced study and in training in the methods of research, special courses involving full-time attendance during one or two years, and part-time day courses are also offered. The relations of the College with industrial firms have of late been extensively developed by the arrangement of visits to local chemical and dyeing works.