INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS

THE seventh General Assembly of the International Union of Geodesy and Geophysics was held at Washington, D.C., during the period September 4–15, 1939, after the declaration of war upon Germany by Great Britain and France, consequent upon the German invasion of Poland. It was therefore probably the last of the series of great international scientific conferences of the period following upon the War of 1914–18. The choice of Washington as the place of the seventh assembly was made at the sixth assembly, in Edinburgh, in 1936. At Washington the invitation of Norway to the Union, to hold its eighth assembly in that country, was formally accepted, for 1942 or as soon thereafter as conditions in Europe permit. The first five assemblies of the Union were held at Rome, Madrid, Prague, Stockholm and Lisbon.

On August 30, when the political crisis was already nearing its height, the president and secretary of the Union, Dr. D. la Cour (Denmark) and Brigadier H. St. J. L. Winterbotham (Great Britain), after consulting the American Organizing Committee and other colleagues then in Washington, cabled to all adhering organizations intimating that the assembly would be held, but that its activities would be confined to scientific matters only. This last decision was subject to the approval of the executive committee of the Union, and was later agreed to; it was made because many of the expected delegates would be absent from the assembly, either because, having crossed to America, they had been recalled (as was the case with the whole French delegation and many of the British delegates, including most of those in the service of the Government), or, having started, did not proceed to their destination (as happened to the delegation from Germany, with the exception of one member who had travelled earlier to Washington), or had cancelled their journey before leaving. The business thus excluded from the original agenda included the discussion of administrative matters and of the proposed amendments of statutes, and also the election of new officers and executive committees for the Union and its seven associations. The existing officers were continued, as an emergency measure, until such time as a postal ballot seems desirable and feasible. Hence, for the present, the above-mentioned officers of the Union continue in office, as also those of the associations, as follows (*P*=president, *S*=secretary): Geodesy: (*P.*) Meinesz (Holland); (*S.*) Perrier* (France). Seismology: (*P.*) Heck (U.S.A.); (*S.*) Rothé* (France). Meteorology: (*P.*) Chapman (Britain); (*S.*) Bjerknes (Norway). Magnetism: (*P.*) Fleming (U.S.A.); (*S.*) Goldie* (Britain). Oceanography: (*P.*) Helland-Hansen (Norway); (*S.*) Proudman (Britain). Volcanology: (*P.*) Michel-Lévy* (France); (*S.*) Signole* (Italy). Hydrology: (*P.*) Lütschy* (Switzerland); (*S.*) Diénert* (France).

The vice-president of the Association of Hydrology, Prof. Slettenmark (Sweden), was present and presided over its meetings; the Association of Volcanology was entirely without officers present, and Dr. L. H. Adams (U.S.A.) was chosen as acting president.

Brigadier Winterbotham returned to England before the assembly opened, and Dr. W. Bowie (president of the Union at the Edinburgh Assembly) was chosen as acting general secretary of the Union; the work of the five absent secretaries of Associations was also undertaken by American delegates.

*These officers were not present.

At present, about thirty-two countries adhere to the Union, and twenty of these were represented at Washington (Argentine, Belgium, Canada, Chile, Columbia, Denmark, Eire, Finland, Germany, Great Britain, Greece, Holland, Japan, Mexico, Norway, Poland, Rumania, Sweden, Switzerland and the U.S.A.). Visitors were present also from Bulgaria, Dominica, Hungary, India, the Philippines and Venezuela (non-member States). The United States naturally provided the largest section of members present, numbering approximately three hundred (with a hundred non-members); the number of other members present was about ninety-five (with about twenty-five non-members); thus the Assembly was one of the largest yet held. The absence of French and Italian delegates (and Russian visitors, as at Edinburgh) was much regretted.

In accordance with the decision not to discuss new administrative questions, the associations adopted no schemes involving new expenditure, and agreed to continue their financial management and programmes along the lines heretofore followed, so far as the available funds allow. Fortunately, the Union (and some of the associations in addition) has accumulated a certain reserve of unexpended money, and with its aid it is hoped that, despite the probable reduction of subscriptions accruing during the next year or two, the work of the Union and its associations can to some extent be continued until peace is restored.

The interest of the United States Government in the Assembly was shown not only by the financial provision which (with other assistance) enabled the American organizing committee (president, Dr. R. M. Field, secretary, Dr. J. A. Fleming) to make the excellent arrangements that helped so much towards the efficient conduct of the meetings. The Government, which during the development of the crisis clearly indicated its wish that the Assembly should be held, showed its good will also by an address of welcome from Mr. Cordell Hull, Secretary of State, at the opening meeting of the Union; moreover, the President, Mr. F. D. Roosevelt, received the Union officers and the presidents of the associations, together with Dr. Field, at the close of the Assembly. The closing words of Mr. Cordell Hull may be quoted here:

"If is my fervent hope, which the people of this country share, that the day may soon come when the statesmen of the world will take a leaf from the book of the scientists and solve international political problems in the same dignified and friendly spirit."

The scientific meetings of the Associations, and of the Union's Inter-Association Commission on Continental and Oceanic Structure (president Dr. Field), were held at the George Washington University, the new and older premises of which, generously placed at the Union's disposal, proved very satisfactory and convenient. The absence of administrative business enabled the full time of the Assembly to be devoted to scientific discussion, including several joint meetings between two or more associations, such as are rendered desirable by the ever more closely interwoven problems in the different departments of geophysics. At the end of the Assembly, when

reports on the work of the seven associations and the Commission were presented, it was on all sides agreed that the scientific discussions had been most useful and successful, and that the Assembly had been as valuable as it was harmonious. Apart from the exchange and clarification of knowledge by the reading and discussion of scientific reports and papers (many of which had been circulated in full or in abstract beforehand), the associations were able to perform useful business in arranging for the continuance, in some cases with useful modifications or extensions, of international enterprises of geophysical importance, which they organize or support. Valuable and instructive scientific excursions, and visits to American scientific institutions, also took place during or before the Assembly.

Personal meetings and discussions between fellow-workers in geophysics, from different countries, form another important contribution which such international assemblies afford to scientific progress. These were facilitated not only by the formal meetings, but also by the public and private hospitality which were dispensed to delegates, with the proverbial American warmth and generosity. Recollection of the kindness thus received from our American hosts will long be treasured in our memories.

The president and general secretary of the Union were honoured during the Assembly by the conferment of the doctorate of the George Washington University.

The Pan American Institute of Geography and History (director, Dr. P. C. Sánchey, Mexico) co-operated with the Union and held three meetings of its executive committee during the Assembly, at which many matters of interest to geodesists and geophysicists were discussed. S. CHAPMAN.

WORK OF THE WATER POLLUTION RESEARCH BOARD

A PART of the programme arranged for the Conference of Delegates of Corresponding Societies during the Dundee meeting of the British Association was a discussion on river pollution. Sir Robert Robertson, chairman of the Water Pollution Board of the Department of Scientific and Industrial Research, had prepared a statement of the work of the Board for presentation to the discussion, from which the following account has been prepared. Details will be found in the reports of the Board published by H.M. Stationery Office.

TRADE EFFLUENTS

Beet-sugar factory effluents. The evil due to these effluents can be avoided by passing the effluents through a biological filter, similar to that used on sewage disposal works. It is also practicable, however, to avoid the discharge of effluent by simple treatment by sedimentation, and addition of small quantities of lime so that the waters can be re-used in the factory.

Milk-factory effluent. This effluent, which is highly polluting and may be inimical to fish-life, since it removes dissolved oxygen from the water, has been demonstrated to be capable of complete purification by two methods: that of biological filtration, in which two percolating filters in series are employed, and the sequence of the two filters is periodically changed, and by the activated sludge process. The former method has been adopted in a number of factories. Fish can live in the treated effluents.

STUDIES OF RIVER POLLUTION

The River Tees. A river was chosen which is substantially unpolluted in its upper reaches, then polluted by sewage from a large town, and finally contaminated by sewage and trade effluents in its estuary. The Tees was formerly an important salmon river; it was found that in their progress down the Tees to the sea the smolts were poisoned in thousands. There has been no study made of a river's life-history so intensive, from the different aspects, chemical, biological, and hydrographical. In the non-tidal reaches the effects of sewage were studied on the chemical composition, and animal and vegetable life of the river, and on the seasonal changes with respect to the self-purification of the river. Similarly, in the estuary, these effects were observed on the composition of the water and estuarine life. An interesting conclusion was reached that the hitherto unsuspected cause of the death of smolts was due to cyanide from the coke-ovens; and methods of avoiding this were suggested, and to some extent have been adopted. This intensive study of a river from source to sea may be taken as an authoritative model for future investigations of other rivers.

The Mersey Estuary. Possibly as a result of its successful investigation of the I ər Tees, the Board was asked to carry out an invest on on the effect of the discharge of crude sewage from Liverpool and other towns in the district on the presumed silting-up of the estuary of the Mersey. This work, on which a comprehensive report has been made, involved nearly four years investigations by hydrographers, chemists, and biologists, and its findings, which are unequivocal, have been accepted by the interested bodies. It was found that the volume of the estuary is subject to periodical changes, but that the alleged shrinkage in the volume and hardening of the bed could not be attributed to the discharge of sewage into the estuary.

WATER SUPPLY

Two aspects of water supply have engaged the attention of the Board: the base-exchange process for softening water, and the question of prevention of contamination of drinking water by lead.

Base-exchange process. The effect of the various substances used for this process has been examined, and quantitative determinations have been made of the efficiency of the substances on the market, as well as of others, including treated natural clays. A remarkable discovery has been made whereby suitably prepared artificial resins can be used to remove both acidic and basic radicals from water.

Prevention of contamination by lead. A study of