The Seventh Pacific Science Congress

Knowles A. Ryerson[1]

University of California, Davis

THE SEVENTH PACIFIC SCIENCE CONGRESS convened in Auckland and Christchurch, New Zealand, February 2 to March 2, 1949, marking a resumption of these important gatherings after an interruption of ten years occasioned by the war. Two hundred twenty overseas delegates from 16 countries and their colonies and dependencies and a New Zealand registration of more than 400 made up the attendance.

The congress met in a world marked by the impact of war, a world shrunk by shortening communication and transportation lines. Its theme, drawn from the terrible destruction of human and material resources, and the compelling necessity to meet the increasing demands of an industrialized age, was conservation on an international scale. The human race is in sight of the end of many of its usable resources, and must take stock and plan their intelligent use for the benefit of all mankind. For the first time in these congresses, problems of food supply and world population received more than passing comment. The problems of the Pacific are those of the world.

In 1939, when the Sixth Congress was held, war was just beginning in Europe. The mood of the Seventh Congress, meeting when the war was over but the peace was still far from settled, was vastly different. The necessity of cooperative teamwork by scientists of all nations, and recognition of their joint responsibility for building up a society in which men the world over might live in freedom, colored the many joint symposia. The world race against ignorance, limited food resources, and increasing world population was stressed again and again. It was expressed concretely in terms of the urgent necessity for intelligent use of sea and soil, for public health measures, and for extension of the social sciences.

The Congress opened with a plenary session, at which reports were made by eleven standing committees: *Oceanography, Protection of Nature, Volcanology, Soil Survey and Classification, Mountain Structure, Classification and Utilization of Land, Forestry, Economic Entomology, Blood Groups, Seismology,* and *The Distribution of Terrestrial Faunas in the Inner Pacific.* Following the plenary session nine divisions initiated their several programs: *Anthropology; Botany; Geology, Volcanology and Geophysics; Meteorology; Oceanography; Public Health and Nutrition; Social Sciences; Soil Resources, Forestry and Agriculture;* and *Zoology.* A special division on *Organization of Research* was set up to consider and coordinate research proposals and projects recommended by each of the nine divisions.

The interdependence of the different scientific disciplines was emphasized by the sixty-odd symposia, and the many informal joint discussions on common problems. This interrelationship is well illustrated by the problems of mutual responsibility for dependent peoples in the Pacific area; anthropology, agriculture, public health and nutrition, and social sciences were all involved in considering satisfactory solutions to the problem of the island native in a rapidly changing world. The importance of international weather services to agriculture, transportation (both surface and air) and general human welfare, and means for implementing such needed objectives formed an active area of discussion.

The problem of insect pests and diseases spread by the airplane—the great harm to agriculture and the even greater threat of human disease—brought together specialists in entomology, botany, agriculture, public health, social sciences and anthropology.

Organization of research to meet the challenge of a changing world received the serious consideration of every division and resulted in a series of strong recommendations at the final plenary session for a concrete program, outlining specific projects to be initiated.

It was recognized that any effective program presupposed a permanent secretariat organization to function between sessions of the congress in aiding the standing committees. Accordingly the council approved a change in the constitution of the Pacific Science Association providing for a minimum secretariat if and when funds permit and competent personnel can be secured.

Trained personnel was also recognized as a basic necessity in carrying out any research program. The exchange of qualified students and staff members, as a powerful aid in this direction, was a subject consid-

[1] Chairman, Pacific Science Board, National Research Council, and head of the U. S. Delegation to the Seventh Pacific Science Congress.

ered by several of the sections. The Fulbright program for the exchange of scholars was discussed in relation to those Pacific countries party to it. The officer attached to the U. S. Embassy and charged with Fulbright matters arrived in New Zealand during the congress and contributed much to the clarification of the program and its relation to Pacific research.

The social implications of science and their application to a rapidly developing world were recognized in the devoting of an entire session of the division of social science to this subject. There was also a panel discussion of the topic by a group of delegates at an evening public meeting. Recognition of the social effects of scientific discovery served as a common uniting thread running through the sectional sessions. The basic relationship of science to human progress and civilization was a constantly recurring theme.

More than 500 papers were presented during the congress. They covered a wide range, from the beginning discussion in anthropology on "The Native Reaction to an Invading Culture and Its Bearers" to the closing discussion in zoology, on "Factors Influencing the Fresh Water Development or Production of Salmon." Pending publication of the full proceedings, a few brief paragraphs may serve to summarize the deliberations of the several divisions.

Anthropology. The discussions in the section centered around the general topic of administration and welfare, including contemporary cultural changes among Pacific peoples. These considerations involved studies of the spread of peoples and cultures and included the problems of Indonesia and Australia. Much material was drawn from surveys made during and since the war in the Japanese mandated territory, and the coordinated Micronesian project carried out by the Pacific Science Board of the National Research Council. The presence of Sir Peter Buck at the Congress, and his active participation in the discussions, added much to the vividness of the program.

The problems of anthropology are inseparable from those of public health and nutrition, agriculture, and social science, as well as those of the specific science groups. Symposia in which the several sections participated were especially fruitful in clarifying the interrelated human problems facing government agencies responsible for governing dependent peoples.

Among the studies recommended jointly by this section and that of social sciences were ethnographical studies in those areas wherein detailed information is lacking. Pilot studies of the process of social and cultural change, and population studies and their relation to land, education, and economic future were especially urged.

Botany. In the botanical program major emphasis was placed on morphology, taxonomy, and distribution of Pacific marine algae, including vertical distribution with relation to the tidal factor. The industrial and agricultural utilization of marine algae also received considerable attention. Of outstanding interest was a joint program of botany and zoology considering protection of nature and conservation in the Pacific.

Research in plant ecology and vegetation science aimed at solving problems of conservation of natural resources, of rare and scientifically interesting species, and of vegetation types, was strongly recommended. More botanical exploration was also urged, to fill in the gaps of the Pacific flora still imperfectly known.

Geology, Volcanology, Geophysics. With the congress meeting in an area of peculiar geologic interest which could be drawn upon for much concrete illustration, a wide range of topics were considered. The mineral resources of the Pacific, the geological history of the Pacific basin, seismology emphasized through local demonstrations by an obliging nature, and terrestrial magnetism were emphasized. There were a number of discussions on cosmic relationships, radiophysics, and the physics of the upper atmosphere, involving auroral studies and cosmic rays. Interest reached well out beyond the earth in the discussion of recent investigations of radiofrequency radiation from both sun and moon, radio echoes from meteors, and observations on galactic noise. The discussions on volcanology were highlighted by a convenient, full dress, violent eruption of the volcano *Nguaruhoe* during the field trip of the North Island. Among the important recommendations from this section were those for additional seismological stations to be set up in the Pacific, to fill in gaps now handicapping uniform investigations. A bore hole 16,000 feet deep at Bikini was recommended to establish stratigraphical and paleontological sequences, to aid in the interpretation of geophysical records, and to furnish observations on temperature and related problems.

Meteorology. The discussion of this section reflected the marked developments of the war years, especially in the Pacific, in emphasizing the need for adequate reconnaissance forecasting of rainfall, hurricanes, and typhoons. A strong recommendation for a more adequate network of meteorological stations in the Pacific was made. The importance of a complete upper air meteorological section from pole to pole (from the North Pole through Alaska, the Pacific Islands, and New Zealand to Antarctica) was stressed, in order that adequate data on the problem of general air circulation would be available.

Oceanography. The oceanographic program provided the first opportunity to discuss the immense

amount of oceanographic data accumulated during the war. Particular attention was given to the development and application of the new instruments—of which the Bathy-Thermograph is an outstanding example—for speeding up oceanographic investigations. It was pointed out that in spite of the great mass of data already available there are still immense areas of the ocean, especially outside the regular shipping lanes, that need to be explored. It was urged that these be investigated as soon as possible, using the modern facilities and techniques now available.

The sessions also heard reports on the activities and plans of marine laboratories in the Pacific, together with preliminary results of the Swedish Deep Sea Expedition and plans for the Danish Oceanographic Expedition in the South Pacific.

One of the very gratifying features of this congress was the emphasis placed on the interrelationship of physical and chemical oceanography with meteorology, geology, and fisheries. A number of joint sessions were held at which members of two or more sections pooled their specialized knowledge to the advantage of all. These were especially noteworthy in connection with discussions on "The Harvest of the Sea," the conservation of fisheries and whaleries, with all their national and international implications.

Public Health and Nutrition. Because of their direct bearing on the welfare and the continued progress of all the peoples of the Pacific, primitive and more advanced, the discussions of this section were especially significant. The war had provided new knowledge and experience in regard to a number of the important diseases—especially filariasis, leprosy, leptospirosis, malaria, schistosomiasis, and related diseases. These diseases and the general problems of nutrition and dental caries received excellent and critical appraisal. As an outgrowth of these discussions an urgent recommendation was made that a Pacific epidemiological center for the correlation of information on diseases be established. Systematic food analyses of native foods, using modern techniques, were recommended, along with surveys of diet and food habits. Surveys of disease-carrying insects, fungi, and viruses were also recommended.

The joint session with the sections on anthropology, agriculture, and the social sciences, in which health and nutrition problems of dependent peoples, the changing agriculture, and the special problems of mixed bloods and their relation to administration were all thoroughly considered, was among the most significant discussions of the entire congress.

Social Sciences. As has already been indicated, much of the program of the social science section was carried out in conjunction with the sections on anthropology, agriculture and public health. These discussions centered around administration and welfare, and included consideration of contemporary culture changes of Pacific dependent peoples. The economic and power resources of the Pacific were reviewed in relationship to future developments of the area and their impact on dependent peoples. Wide variation in language and dialect has imposed special problems in education. Mass media of communication among dependent Pacific peoples and their relation to education were the subject of an important group of discussions in the section.

The social implications of science, so much in the forefront of the world's thinking today, were presented in a series of papers at a half-day session of this section. In addition a panel discussion, participated in by five speakers representing different disciplines, was presented as one of the evening public programs.

In cooperation with anthropology, this section strongly recommended the principle of team research in meeting the social, economic, and health problems of Pacific peoples, and indicated specific areas where these team research programs should be undertaken. A proposal for making such a coordinated attack in Samoa was recommended.

Soil Resources and Agriculture. In these sessions there was extensive discussion leading to recommendations on methods and techniques for soil classification and mapping, and their relation to land use. As a basis for planning economic development, an early estimate of soils in the Pacific usable for agricultural and forestry purposes was urged. Conservation of soil was to a large extent included in the general discussion of conservation and the protection of nature. Field trips emphasized the importance of conservation measures in relation to local agriculture. Special air and field reconnaissance studies were carried out by visiting scientists at the request of New Zealand officials, in order to make good use of the experience of Canadian and U. S. specialists in this field.

Under the general heading of "Improvement of Agricultural Production in the Pacific Area," both livestock and field crop production were considered. The importance of introducing and maintaining high grade genetic stocks was stressed, and the extensively developed pasture system of New Zealand, with its high productivity on a sustained basis, was especially studied from both the animal and plant point of view. In addition to the special papers in this section, joint symposia with anthropology and social sciences and zoology also considered agricultural deevlopment, as has already been indicated. The urgent problem of

insect pest and disease surveys was given special consideration and execution of the surveys was urged at an early date in order to determine what potential hazards are present in unexplored islands. Plant diseases, especially virus infections, and insects and other vectors at work in the Pacific were examined.

Forestry. Under the general heading of "Forestry Problems of the Pacific" a comprehensive series of papers outlined the complex picture of forestry in this area, especially in tropical latitudes. The application of tree selection was well exemplified in local New Zealand practice. C. S. Larsen of Denmark, a world authority on tree breeding, and M. Maurice Leloup of France, director of the forestry subdivision of the Food and Agricultural Organization, added breadth and depth to the discussion. In the joint symposia on protection of nature, the vital place forestry held was strongly emphasized. The need for preserving native species in stand areas before these species became extinct was strongly stressed. More fundamental research in the fields of ecology and plant physiology was urged, particularly studies relating to silviculture requirements and management practices. Field trips in the different New Zealand forest areas were used for graphic demonstrations of problems under discussion. New Zealand presents an excellent example of exotic trees' spreading and replacing native species, largely podocarps, in timber production. Representatives of timber buyers, saw milling firms, timber growers' associations, and forest tree seed producers also attended the conferences so that theoretical and practical considerations were blended in the program.

Zoology. Because of the number of papers submitted and the extent of the fields involved, this section divided into subdivisions on zoology and economic entomology. The discussions of the zoologists centered about distribution, biogeographical provinces, whaling, and fisheries. The importance of fisheries in the economic life and food supply of Pacific peoples was thoroughly discussed in its many aspects.

The entomologists concerned themselves primarily with means for preventing further dissemination of pests dangerous to the agriculture of the Pacific area. The high light of the conference was a symposium on biological control of weeds, probably the first ever held. Australia and New Zealand have pioneered this method of attack, and Hawaii and Fiji have also achieved valuable results. In California the biological control of St.-John's-wort (*Hypericum perforatum* L.) is now developing in a most promising way. Intensified surveys on insect pests and diseases of agricultural crops, designed to increase protection against their spread, were recommended.

Much of the general discussion of the section was devoted to the problem of conservation and protection of nature, in cooperation with other sections of the congress. A sense of urgency was felt—time is running out while vestiges of many island species of animal and plant life disappear.

Organization of Research. The special division set up under the chairmanship of R. S. Allan,[2] for the study of the organization of research, brought together the recommendations from each of the other divisions, correlated them, and presented them for discussion and adoption at a closing plenary session. Some of the recommendations in specific fields have already been mentioned. Attention was also given to the need for improved training of young scientists and better working facilities for trained scientists, for more recognition and adequate support for museums and collections as research aids. A strong recommendation urged that expeditions provide for the preparation and preservation of their collections. Strong emphasis was placed on the use of teams of scientists for best results in projects involving social problems in which several related disciplines are concerned.

Special mention should be made of the varied and exceptionally well-organized intersession and postsession field trips which so thoroughly supplemented the discussion of the sections. For the overseas delegates they made possible seeing in a relatively short time the outstanding features of New Zealand's unusual flora and fauna, its spectacular volcanic and thermal regions, mountains, and glaciers, its highly developed agriculture, and the progress of its Maori people and their integration with the national life of New Zealand.

The far-reaching implications of the congress were evidenced by the presence of a representative of Unesco, Ging Tsi Wang, three representatives of the Food and Agricultural Organization, and four observers from the Research Council of the South Pacific Commission. The largest overseas delegation was from the United States,[3] and was comprised of 65 members; of these 41 were from the mainland, 11 from Hawaii (including U. S. government scientists based there), 4 from the Trust Territory, and 9 from Japan (4 from SCAP, 4 from the U. S. Air Force Airweather Service, and 1 from the U. S. Fisheries program in the

[2] Professor of geology, Canterbury College, and chairman of the Christchurch committee for the congress.

[3] For organization of the U. S. delegation and its transportation by air to and from New Zealand, principal thanks are due to Harold J. Coolidge, executive secretary of the Pacific Science Board of the National Research Council, whose energy and good humor made for an effective U. S. representation.

Philippines). The delegates represented 11 universities, 5 museums and institutions, and 12 U. S. government civil and military organizations. The 25 delegates of the National Research Council and delegates from 15 other organizations, including the armed forces and civilian scientists, were provided air transport from the mainland of the U. S., Hawaii, and Japan. A widely representative delegation was thus made possible through the effective cooperation of the Military Air Transport Command and the Air Weather Wing of Japan.

On the way down to the Congress a group of U. S. delegates spent a memorable 24 hours at American Samoa on the invitation of the Governor, Captain Vernon Huber, U.S.N. They were received with great hospitality and had an excellent opportunity to look over the various activities of this American outpost in the South Pacific as well as to discuss local scientific problems with the administrative officials and scientists working there.

On the return trip, at the official invitation of the French Government, 27 U. S. delegates made a 24-hour visit to Noumea as guests of the Territory of New Caledonia and the *Institut Francais d' Oceanie.* The American group was officially received by the Governor-General and had an opportunity to visit the various laboratories of the *Institut,* which occupy the buildings of a former U. S. Naval Hospital, and to make brief but interesting field trips accompanied by various members of the *Institut* staff. The Secretary-General of the South Pacific Commission welcomed the delegates at his new headquarters located in the former U. S. Army building ,which was widely known during the Pacific War as the "Little Pentagon." The hospitality extended by everyone in the New Caledonia visit was in the best French tradition, and will be long and gratefully remembered.

Admiral D. C. Ramsey, Commander in Chief of the U. S. Navy in the Pacific and High Commissioner for the Trust Territory, arranged for a special flight for the U. S. geologists from Honolulu to the island of Hawaii to study volcanic activities. F. G. Oberhansley, superintendent of the Hawaiian National Park and the delegate of the National Park Service to the Congress in New Zealand, arranged the ground tour to "Volcano House." The trip added one more special opportunity to enlarge field experience and was especially appreciated.

For the splendid organization of the congress, all credit is due its officers—the president, R. A. Falla; the secretary-general (and chairman of the Auckland committee), Gilbert Archey; the chairman of the Christchurch committee, R. S. Allan; the treasurer, S. Cory Wright; the secretariat assistants, and their associates on the committees. Herbert E. Gregory, U. S. member of the Pacific Science Council, was an honorary vice president—a well-deserved recognition of his veteran service in the congresses. The task of the officers was especially difficult because of the lapse of ten years between congresses, the lack of any adequate continuing secretariat, and the great distances involved.

The congress gave special praise to the press and radio for the uniform excellence of their reporting service, which was thorough, accurate, balanced, and understanding.

The warmhearted, generous hospitality everywhere at hand surrounded the sessions with a friendly atmosphere that captured all.

The Royal Society of New Zealand and through it, the government and the people of New Zealand have reinstituted again the Pacific Science Congress, as an effective agency in scientific endeavor in the Pacific area. They have set a high standard for future congresses.