



*Research Program in the Biological Sciences
At the Seventh Pacific Science Congress,
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THE SEVENTH PACIFIC SCIENCE CONGRESS, sponsored by the Pacific Science Association, was held in Auckland and Christchurch, New Zealand, from February 2 to 23, 1949. Ten sections had been organized, as follows: Geology (including Volcanology and Geophysics); Meteorology; Oceanography; Zoology; Botany; Soil Resources, Forestry and Agriculture; Anthropology; Public Health and Nutrition; Social Sciences; Organization of Research. The first nine sections each elected a committee which sent its recommendations on to the group on Organization of Research.

The biological sciences are primarily involved in the specific fields of botany and zoology. They also play a prominent role in oceanography, soil resources, forestry, agriculture, nutrition, and even anthropology, public health, and the social sciences. However, only the botany and zoology recommendations will be considered here.

In a recent article (1), Dr. Knowles A. Ryerson, chairman of the Pacific Science Board (National Research Council of the United States) and head of the United States delegation to the Congress, made a general review of the

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meeting and cited the problems which had been the object of major emphasis. It is remarkable that many of the sections felt the necessity for a permanent secretariat to lend continuity to the work of the Pacific Science Association. The protection of natural resources was also given considerable attention by various sections.

The recommendations of the Botany and Zoology groups fall under three principal headings: taxonomy, ecology, and the organization of institutions.

The members of the committee were the following: *Botany*—W. R. B. Oliver (New Zealand), C. Skottsberg (Sweden) H. J. Lam (Holland), N. A. Burges (Australia), F. R. Fosberg (U.S.A.), G. M. Smith (U.S.A.), P. Dansereau (Canada), J. Wood (Australia), E. J. Godley (New Zealand); *Zoology* (general)—L. R. Richardson (New Zealand), K. P. Schmidt (U.S.A.), B. J. Marples (New Zealand), D. Miller (New Zealand), M. W. F. Tweedie (Malaya), W. A. Clemens (Canada), H. Waring (Australia); *Zoology* (protection of nature)—H. J. Coolidge (U.S.A.), L. G. M. Baas-Becking (South Pacific Commission), R. Heim (France), F. R. Fosberg (U.S.A.), J. T. Salmon (New Zealand), C. Skottsberg (Sweden), D. L. Serventy (Australia), O. L. Austin (U.S.A.).

TAXONOMY

THE BOTANY GROUP listed the following areas for further exploration, by order of importance:

1. New Guinea, the Bismark Archipelago, the Solomon Islands, the Santa Cruz Islands, the New Hebrides, the Admiralty Islands;
2. The Polynesian outliers in Melanesia, especially Rennell, Bellona, Sikiana, Tikokia, Ontong Java;
3. The Marquesas, the Gilbert Islands, Wallis and Horn Islands, the Cook Islands (except Raratonga);
4. Tonga, the Northern Marianas (north of Saipan), the smaller islands of the Carolines and Fiji, the low islands of the Western Pacific from the Danger and Union Islands westward.

It was felt that many gaps existed in our knowledge of these areas, some of which are almost completely unknown, and that an adequate understanding of biogeographical relationships was impossible until they were filled. The urgency of botanical and zoological inventory is the greater because of increas-

ing human interference and the rapid disappearance of many species from their native habitat. According to present views, much of the Pacific flora seems to have been derived from New Guinea (listed as No. 1 above), which for that reason should be awarded high priority. It was further suggested that with the cooperation of Australia and the United States of America the special committee for the investigation of the New Guinea flora, which formerly existed in Holland, be revived.

The contribution of ethnobotany to an understanding of Polynesian migrations makes the recording of native plant-names (accompanied by a well-authenticated specimen!) a most significant feature of floristic exploration.

Intensive cytotaxonomic studies were also urged, especially as a test to the status of species recorded as identical in widely separated Pacific areas. This technique and others (ecological, genetic, historical-geographical) should also be applied to introduced species with a view to explaining their irregular distribution.

The cryptogams of the Pacific area, especially the bryophytes, lichens, and fungi, have been sorely neglected. It is hoped that field work will be carried out by specialists of these groups, rather than random collections made by workers in other fields. Considerable attention and discussion centered about the marine algae, on which a good deal of work has, and is being, done. Their economic importance was stressed and evaluated, and research pertaining to distribution and adaptation was reported upon in the course of a symposium.

The Zoology section recommended immediate study of the unique fish fauna of Lake Lanao (Mindanao) because of the installation of a hydroelectric plant, of Lakes Lindo and Posso (Celebes) because of the introduction of exotic species.

A more complete inventory of weeds and pests (plant and animal) was urged with the idea of improving quarantine policies.

The Zoology section established a standing committee for Systematic Zoology. It also changed the committee for Economic Entomology to a standing committee for Entomology.

ECOLOGY

DIVERSE PHASES OF ECOLOGY were considered, with and without relation to conservation.

Extensive investigation of recent climatic and soil evolution was en-

couraged in order to provide a sounder basis for a new ecological approach to the study of animal and plant migrations and associations. The microbiology of soils in the tropical and subtropical Pacific areas offers an almost virgin field.

Experimentation with quadrat methods and application of phytosociological concepts to tropical and subtropical Pacific areas represents a much-needed development. Species-area statistics should also be compiled on both regional and ecological bases.

Zoologists and botanists both urged the desirability of pilot studies involving complete floristic and faunistic inventories against the background of a thorough ecological survey over small areas, preferably islands. Such an enterprise would necessitate the cooperation of scientists from different fields and institutions working, if possible, together and at the same time.

Another recommendation concerned the desirability of preliminary physiognomic-structural descriptions of Pacific areas even in the absence of complete floristic inventories. It was argued that structural units, even when not backed by considerable taxonomic identification of their components, show relation to climate, soil, and degree of evolution of vegetation. It was therefore urged that vegetation types of the Pacific equatorial, monsoon, high altitude, subtropical forest, and savana areas (among others) be studied structurally with a view to approaching such relationships.

The bearing of all phases of phytogeographic and ecological work on conservation was repeatedly emphasized and its lack in the Pacific areas as a whole was deplored. The preservation of both communities and individual species of animals and plants depends largely on the protection of their habitat. How narrowly confined to a given set of conditions these organisms and associations are, we do not at present know. A striking and much discussed instance of this is the kauri tree (*Agathis australis*) and the kauri forests of New Zealand. Several members of the congress made declarations to the radio and the press on the subject. (e.g., H. H. Chapman, H. E. Gregory, S. N. Wyckoff, P. Dansereau in the *Christchurch Star-Sun*, Feb. 16, 1949, and in *The Press* (Christchurch), Feb. 18, 1949). The arguments for and against lumbering of the Waipoua Forest, the only large remaining stand of virgin kauri, were debated. A resolution was finally passed to the effect "that the Congress impresses upon the New Zealand Government the great importance

of the Waipoua Kauri Forest as a sample of an unique plant association of which there is no similar example in existence, and that the Government be therefore urged to preserve absolutely intact and to maintain thus indefinitely a sufficient area surrounded by a suitable zone."

Such a resolution is unsatisfactory to a certain extent, inasmuch as the "sufficient area" and "suitable zone" were precisely the main point of argument. In fact, the naturalists, ecologists, botanists, and foresters who pleaded for a maximum of protection felt all along that they were defending the case not only of the kauri but of other species and other badly menaced associations. There was ample proof of that in the all-too-familiar ring of the arguments opposed to conservation. Each man was obviously assuming a position he had taken before in sadly similar circumstances.

On the other hand, the congress expressed its "satisfaction at the rapid application of conservation measures by the New Zealand government in setting aside the habitat area of *Notornis hochstetteri* and in the steps taken to restore the fauna and flora of the Three Kings Islands by the destruction of introduced pests." It further urged other governments to promote similar legislation to protect *Rhinoceros sondaicus* (West Java), the sea-otter (Kurile Islands), Steller's albatross (Bonin Islands), the Laysan rail (Laysan Island, Hawaii), the Kagou (New Caledonia), and the fauna of the Galapagos Islands and Lauai Island (Hawaii).

Most members of the congress felt that the Pacific Science Association should inform the governments of the countries concerned of the misgivings of scientists on the subject of conservation. Three further resolutions were passed to implement the preceding: that funds derived from wildlife (fishing licenses, etc.) be used for research on wildlife; that importation of exotic species (especially by dealers) be more severely regulated; that more control be exerted on the use of pesticides (especially when sprayed from the air).

INSTITUTIONS

UNANIMOUSLY THE MEMBERS of the congress agreed that no furtherance of the policies supported was possible unless implemented by consistent coordination of research.

Foremost was the desire for a permanent secretariat of the Pacific Science Association. Also more combined action between the standing committees and the South Pacific Commission, UNESCO, FAO, and the International Union

for the Protection of Nature. For instance, the standing committee on Pacific Conservation was designated to cooperate with UNESCO and IUPN in the forthcoming World Conference on the Protection of Nature.

The Botany section passed a resolution to the effect "that the South Pacific Commission be asked to recommend that the Bishop Museum be adequately staffed to serve as a clearing house for collections of Pacific plants."

It was deplored by many, who had had wide experience in Pacific areas, that funds were more readily available for the launching and organizing of new expeditions than for the care, identification, study, and publication of results on materials already collected. The existing institutions which have shown an interest in the Pacific and where studies have been carried on are understaffed (as far as these purposes are concerned) and can offer no inducement to young scientific workers who would specialize in taxonomy and ecology of plants and animals of the Pacific region. The choice of the Bishop Museum in Honolulu as a "clearing house" seemed especially indicated in view of its outstanding contributions to Pacific science. But other centers must also be established or reinforced.

The Zoology section proposed seven sections within each of which a major museum should be specifically dedicated to the above-mentioned purposes: Indo-Australian Archipelago (Malay Peninsula to Solomon Islands, including the Philippines); Pacific Coast of East Asia (including Japan, Formosa, the Kuriles); Northern Pacific; Mid-Pacific (Micronesia, Polynesia, Melanesia); Pacific Coast of North and South America; Australia (including sub-antarctic possessions); New Zealand (including sub-antarctic possessions).

The Zoology group asked for the appointment of a committee on museums and the foundation of one or several marine biological stations to be well coordinated with oceanographical researches. The new National University of Australia (Canberra) was encouraged to give considerable development to studies in comparative physiology, because of "the exceptional opportunity afforded by the fauna of the Australasian region."

On many points, other sections sent in recommendations that supported those of the biologists and naturalists. The forestry group, for instance, strongly urged further fundamental studies in the pathology, physiology, and genetics of trees and in the ecology of forests.

The Seventh Pacific Science Congress was a success in more ways than one. The many significant contributions and lectures which were delivered have

not been mentioned here; nor have the many enlightening discussions, and interesting visits and trips. The organizers of the congress, principally Dr. R. A. Falla, Dr. G. Archey, and Dr. R. S. Allan, had made it possible, after the long interval and the many uncertainties of the war, for scientists to gather and take stock of the present state of their knowledge in many fields and to plan joint action for the future. There is a genuine feeling among the participants that the resolutions mentioned above, as a result of much thought and discussion, were not arrived at in a spirit of academic speculation but with very real achievements in view. This can only be borne out if the support of scientists in all Pacific countries is available.

LITERATURE CITED

- (1) Ryerson, K. A. 1949. The Seventh Pacific Science Congress. *Sci.*, 109 (2839): 529-533.