ORGANIZATION OF SCIENTIFIC RESEARCH IN LATIN AMERICA

A REGIONAL meeting to discuss the organization of scientific research in Latin America was held during October 3-7 in the Central University of Venezuela, Caracas. The meeting was arranged by the Unesco Science Co-operation Office for Latin America, under the patronage of the Ministry of Education and the University of Venezuela. Heads of national research councils, rectors of universities, deans of science faculties and senior scientists from Argentina, Bolivia, Brazil, Chile, Colombia, Cuba, Ecuador, Mexico, Peru, Uruguay and Venezuela had been invited to attend, and the World Health Organization and the National Academy of Sciences of the United States sent observers. The meeting was held at the Central University.

The president of the Republic, Sr. Rómulo Betancourt, spoke briefly at the opening ceremony, welcoming the delegates with the assurance that they would find in the Venezuela of to-day complete freedom for the development of scientific research. Among other speakers were Dr. Establier, head of the Unesco Science Co-operation Office for Latin America; Dr. Rafael Pizani, Minister for Education, and Dr. Francisco De Venanzi, rector of the Central University.

The meeting elected Dr. Venanzi as its chairman. The working sessions were opened by a review of the general tendencies of scientific research in Latin America by Prof. Bernardo Houssay, president of the Council for Scientific and Technical Research of Argentina. This paper provoked a valuable discussion which formed a background for the other papers presented at the meeting.

The paper by Dr. David Stichkin, rector of the University of Concepción, Chile, on funds available for scientific research, with special reference to equipment, was the one which caused least discussion, since the meeting was unanimous in concluding that the amounts at present available were notably insufficient. It was recommended that Governments should accept as a target the allocation of 2 per cent of the national budget for scientific research.

During the discussion of the paper by Dr. Mario Gonzalez (Cuba) on the basic and applied sciences, it became clear that the meeting did not wish to emphasize the distinction between the two, and preferred to think of science as a whole, recommending that firms in industry and agriculture should strengthen their links with research and teaching institutions in view of the profound effect which science has on modern commercial life.

Prof. Houssay introduced the question of national research councils, which exist in only a very few Latin-American countries, including the Argentine, Brazil and Mexico. The other Governments of the region were recommended to give serious thought to the advantages of establishing research councils, and Unesco was asked to provide information to Governments about the functions and possible types of organization of research councils.

Dr. Marcel Roche, director of the Venezuelan Institute of Scientific Research, presented a paper on

the career of the research worker. He analysed and compared the careers offered by the research councils of Argentina, France and Venezuela. It was thought that the arrangements adopted by the Argentine and Venezuelan Councils, whereby their staffs were able simultaneously to accept teaching posts, was valuable in the Latin-American scene, since it made maximum use of the small scientific man-power available, and kept the research worker in touch with universities and youth. This subject was very closely related to the next one discussed, the shortage of teaching and research personnel in Latin America, which was introduced by Dr. Rodolfo Talice, dean of the Faculty of Science in the University of Montevideo.

One of the topics of greatest interest at the meeting was the paper by Dr. Paulo Sawaya, dean of the Faculty of Philosophy of the University of São Paulo, on the results of the adoption in certain universities and institutions of the full-time system. Most universities and research organizations permit their staffs to hold one or more posts outside the organization, and the virtues and vices of this system form one of the most hotly debated subjects in scientific circles in Latin America. The meeting recommended that Governments and universities should establish the full-time system as the ideal in research and higher teaching posts, and that they should provide salaries and working conditions adequate for this purpose.

Unesco has encouraged and assisted the formation of regional research centres, such as that for mathematics in Buenos Aires, and of groupings of research centres, such as the Latin-American Council for Cosmic Radiation. Dr. Ismael Escobar, head of the Cosmic Ray Physics Laboratory at Chacaltaya, Bolivia, introduced this topic, the discussion of which led the meeting to call on Unesco to continue its efforts in this field, so that teams of research workers might be brought together, animated by the desire to achieve Latin-American unity in research.

Dr. De Venanzi analysed the attitudes of Governments and of public opinion towards scientific research problems in Latin America. Though much improvement has occurred in the past few years, a great deal remains to be done. The meeting felt that the Press, radio and television had a paramount part to play, and hoped that ways could be found to establish training in scientific journalism. In this connexion, delegates were happy to note the complete and accurate coverage of the meeting in the Caracas Press.

In Latin America, fellowships tenable in more scientifically developed areas will, for some time to come, provide the principal source of higher training for research workers in many fields. Dr. E. Beltran, Under-Secretary for Forestry and Game Resources in Mexico, discussed the subject in all its aspects. An increase in the number of fellowships granted by governments and other agencies was recommended, as well as greater emphasis on instruction in foreign

languages, since language deficiencies frequently prevented full benefit from fellowships. The paper by Dr. M. A. Garrido Malo, dean of the Science Faculty in San Marcos University, Lima, was on a closely allied subject—exchange of scientists between Latin-American countries. Unesco was asked to publish its *Boletín* with greater frequency, so that news of courses, special facilities, visits of foreign scientists, etc., might be more rapidly disseminated, and all laboratories were exhorted to use to the utmost the facilities offered.

The subject of scientific documentation in Latin America was introduced by Dr. Manuel Sadosky, vice-dean of the Science Faculty in the University of Buenos Aires. A lengthy discussion led to a series of recommendations: that Unesco should make a survey of scientific journals in Latin America, with the object of formulating a plan for rationalizing them; that the Mexican Scientific Documentation Centre should make its services more easily available to scientists in other countries; that more national scientific documentation centres should be established, that Governments should grant free postal services to scientific journals; and that financial

help might be given to a select number of journals.

The final subject on the agenda was a review of Unesco's science programmes, particularly that of the Latin American Science Co-operation Office in Montevideo. Dr. Establier described proposals to be debated at the general conference of the Organization held in Paris in November, and also outlined a series of long-term projects which might be undertaken by the Montevideo office. Among these was one for an International Andean Year, during which teams of specialists in different fields would attack the problems of this vast mountain chain which so profoundly affects living conditions in those countries through whose territories it runs. Another proposal was for a full-scale operation towards rationalizing scientific journals. A third would deal with the problems of the unproductive areas of the seas, lakes and rivers of the continent. At the end of this discussion Dr. Establier received the warm congratulations of the meeting, both for the way he has directed Unesco's science activities in Latin America, and for the organization of the meeting.

B. A. HOUSAY

INTERNATIONAL OPERATIONAL RESEARCH

FROM its War-time start in Britain, operational research has become an international movement. The first conference on this basis was held three years ago at Oxford. It led to the establishment of the International Federation of Operational Research Societies, of which the chief architect was Sir Charles Goodeve, who was elected its first general secretary. Under his guidance the Federation continues to expand. Great Britain has acted as the Federation's first 'foster' society, an office which shortly passes to America; and France was designated 'host' society for the second of the triennial conferences, called at Aix-en-Provence during September 5-9. The Société Française de Recherche Opérationnelle has discharged its duties with grace and efficiency, at a conference presided over by its own president, Prof. G. T. Guilbaud.

The Second International Conference on Operational Research had the object of surveying the whole scene, and its organizers limited the attendance to 350 delegates. Representation at the national level was strictly allocated according to the sizes of national societies, who themselves had the invidious task of selecting their delegations from long lists of applicants. The programme was determined in outline by a committee which appointed leading workers in this field as sponsors of more than twenty sessions; each sponsor was responsible for designing and presenting his own session, for inviting some papers, for selecting others from among those submitted freely, and for taking the chair at his session at Aix-en-Provence. These arrangements led to a more tightly controlled conference than is customary at this level, and were intended to produce a coherent pattern, high-quality material, and authoritative discussion.

Delegates arrived from no less than twenty-three countries; and although two-thirds of them were drawn from America, Britain and France, there was

plenty of evidence that significant operational research efforts have been mounted in at least a dozen more countries. The extent of the applications of operational research to-day might have surprised those who first embarked on the attempt to apply the methods of science to the strategic problems of war. But there are strategic problems in all managerial situations, and eighty papers presented at Aix-en-Provence attest to the fact that operational research has by now penetrated into the intricacies of most of them.

The conference opened with a plenary session dealing with the methodological aspects of operational research. Whispers were heard complaining that once again the subject had succumbed to mere introspection, to a self-conscious preoccupation with its own anatomy. Most scientists in the field of operational research would agree, however, that a subject devoted to scientific investigation of the methods of management has something to gain from the examination of its own. Thus it proved. The session brought out clearly the fact that the goals of an organization are various and not necessarily consistent, that they are constantly changing, and that they reflect a process of learning to survive by adaptation. It follows that crude statements of aim, such as 'maximum profit', which have often been naïvely emulated by equally crude scientific models, are inadequate. There are always ways of estimating and comparing organizational efficiency, but they require experimentation on possible models and not merely experimentation within some plausible model. The sensitivity of a top-level decision to explicit assumptions about likely circumstances is itself an object of study; but its sensitivity to implicit assumptions about goals is still more important. For this reason the model of an adaptive organism adjusting itself to its environment is valuable, and much was said about attempts to use scientific descriptions of biological learning and