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THE INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY

Report of the Secretary-General

1. The General Assembly, in resolution 810 (IX) on "International co-operation in developing the peaceful uses of atomic energy", adopted by unanimous vote on 4 December 1954, decided "that an international technical conference of Governments should be held, under the auspices of the United Nations, to explore means of developing the peaceful uses of atomic energy through international co-operation and, in particular, to study the development of atomic power and to consider other technical areas - such as biology, medicine, radiation protection, and fundamental science - in which international co-operation might most effectively be accomplished".
2. The present report is submitted in pursuance of the provision in the resolution requesting the Secretary-General to "circulate for information a report on the conference to all Members of the United Nations, and to other Governments and specialized agencies participating in the conference". In accordance with its rules of procedure, the full proceedings of the Conference including all conference papers whether or not presented orally, will be published and distributed in due course. In this report, therefore, no summaries of conference papers or records of the discussions are included.
3. In the planning, preparatory work and conduct of the Conference, the Secretary-General was assisted by the Advisory Committee provided for in the resolution, whose composition was as follows: Dr. J. Costa Ribeiro (Brazil), Dr. W.B. Lewis (Canada), Dr. Bertrand Goldschmidt (France), Dr. Homi J. Bhabha (India), Academician D.V. Skobel'tzin (Union of Soviet Socialist Republics), Sir John Cockcroft (United Kingdom), Dr. I.I. Rabi (United States of America).

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The Committee met with the Secretary-General on three occasions: at Headquarters from 17 to 28 January 1955, in Paris from 23 to 27 May and in Geneva from 3 to 5 August.

4. With the advice of the Advisory Committee and in accordance with the provision of the resolution whereby "all States Members of the United Nations or of the specialized agencies" were to be invited to participate in the Conference, the Secretary-General, on 1 February 1955, issued invitations to participate in the International Conference on the Peaceful Uses of Atomic Energy to be held in Geneva from 8 to 20 August 1955. The invitations were extended to the Governments of the sixty States Members of the United Nations and to twenty-four countries which, though not Members of the United Nations are members of one or more of the specialized agencies.

5. In further pursuance of the resolution, "competent specialized agencies" such as the Food and Agriculture Organization, the International Labour Organisation, the World Health Organization and the United Nations Educational, Scientific and Cultural Organization were consulted concerning plans for the Conference. On 3 February, each of the ten specialized agencies was informed by the Secretary-General that its co-operation and participation in the Conference were invited to the extent of its interest in the subject-matter.

6. In the course of the first session of the Advisory Committee in January, agreement was reached on the topical agenda for the Conference and the rules of procedure to govern its proceedings. It was considered desirable that at a first international conference of this kind the programme should range rather broadly over the field of peaceful uses of atomic energy. Within this wide scope it was necessary to seek a reasonable balance between the rival claims of topics and between subjects of a more general nature, such as the economics of nuclear energy on the one hand, and those of a highly technical and specialized nature, such as reactor theory or biological effects of radiation, on the other. The agenda provided that plenary sessions would be devoted to the more general matters, such as world energy needs, the building of a nuclear energy enterprise, factors in the use of nuclear energy and the future role of nuclear power. Other matters would be discussed in section meetings. The programme was very full and had to be tightly organized. A rigid time-schedule was a necessity. In turn, the rules of procedure sought to meet the needs of a scientific conference of unusual dimension and to ensure that its broad programme could be completed in the time available.

The rules, therefore, were designed to facilitate and expedite the organization and conduct of the Conference by avoiding procedural and other forms of non-scientific debate and by defining procedures which would be as precise and simple as possible in dealing with the great volume of information to be presented to the Conference by a large number of participants.

7. The topical agenda and the rules of procedure thus formulated were circulated together with the letter of invitation of 1 February. The letter also announced that the Secretary-General, with the advice of the Advisory Committee, had appointed Dr. Homi J. Bhabha, Chairman of the Atomic Energy Commission of India, as President of the Conference, and Professor Walter G. Whitman, of the Massachusetts Institute of Technology, United States, as Conference Secretary-General. Dr. Viktor S. Vavilov, of the Institute of Physics of the Academy of Sciences of the Union of Soviet Socialist Republics, was appointed as Deputy Conference Secretary-General.

8. In order to facilitate conference planning and preparatory work and to assist in conducting the Conference itself, a staff of nineteen scientists was recruited from thirteen countries for temporary service as Scientific Secretaries of the Conference.

9. The organization of the Conference was on the basis of an initial series of plenary sessions, a concluding plenary session and three parallel series of section meetings dealing with the technical and specialized matters which accounted for most of the papers and most of the time of the Conference. A series of public evening lectures was presented by a selected group of eminent scientists.

10. The formal sessions of the Conference were supplemented and elaborated by numerous informal discussions among groups sharing common interests which took place outside the scheduled meetings. These significant spontaneous activities, which could find nourishment only in a friendly and trustful atmosphere, merit special mention.

11. The following countries provided official scientific exhibits: Belgium, Canada, Denmark, France, Norway, Sweden, the Union of Soviet Socialist Republics, the United Kingdom and the United States of America. A commercial exhibition devoted to educational and industrial displays provided by Governments and private companies was held under Swiss auspices in the Palais des Expositions in Geneva simultaneously with the Conference.

12. All meetings of the Conference and the official exhibits were housed in the European Office of the United Nations at the Palais des Nations.

13. Active participation in the Conference became very great, far exceeding initial expectations. Altogether, 1,132 abstracts of scientific papers were received from thirty-eight Governments, and 1,067 full papers were finally submitted for Conference consideration. Of this total, owing to necessary limitations of time, only 450 could be selected for oral presentation and these formed the basis of the Conference programme.

14. In all, seventy-three States and eight specialized agencies were represented at the Conference by official delegations. The total number of delegates was 1,428. In addition, there were 1,334 observers in attendance, principally from non-governmental organizations, academic institutions and industrial concerns.

15. For the United Nations this unique undertaking affords lessons and implications which have important significance for its operations and for such future responsibilities in this general field as the Organization may be called upon to assume. The General Assembly resolution called for a conference which would be technical and on an exclusively international basis. The United Nations, in assuming full responsibility for the planning, preparation and conduct of the Conference, sought two basic objectives: (1) to achieve the freest possible discussion, exchange and sharing of general knowledge with a view to harnessing atomic energy to the needs of peace and human well-being; and (2) to ensure, notwithstanding the quite obvious and important political, economic and social implications of a conference of this nature, that it would be scientific in the most objective sense and free from all political bias. It may be said without reservation that these objectives were attained. In the light of all circumstances, it is safe to say that the results of this Conference would have been difficult to achieve in a context other than the international framework of the United Nations. This conclusion becomes the more apparent in the light of those practical aspects of the Conference with which the United Nations, uniquely, is equipped to deal.

16. A major factor in the success of the Conference and the achievement of the goals set for it by the United Nations was the co-operation received from Governments and particularly from the seven experts made available by their Governments for service on the Advisory Committee.

17. The international sharing of scientific knowledge which took place at Geneva in the interests of peace and human progress, under conditions of friendly and balanced co-operation among a large number of States, was an expression in effective action of the purposes and principles of the United Nations. With this Conference the United Nations entered a new field of activity which may properly inspire great hopes and expectations. This encouraging beginning invites projection into the future.

18. Some implications of the Conference for the future were summed up by Sir John Cockroft, Director of the Atomic Energy Research Establishment at Harwell, England, and a Vice-President of the Conference, in an evening lecture delivered on the day preceding the close of the Conference. It seems appropriate to give from this lecture the following excerpts which refer especially to the energy problems:

"To many of us this Conference has been a celebration of a very great achievement of the scientific world - the harnessing of the energy of atomic nuclei to serve the future needs of man. This is the culmination of scientific work of men of genius in many nations. It is fitting therefore that representatives of the great majority of countries should have come together to present their contributions to this work and to discuss how this new source of power can help the future development of their countries and the whole human race.

We have had described to us the first experimental atomic power stations and have heard that they are working well. We have also heard of the rapid progress of construction of the first full-scale nuclear power stations. Within two years they will be delivering very substantial amounts of electricity to industry and we will begin to gain experience in their operation and economics. These early stations will be closely followed by successors of different and generally improved designs, so that within five years we are likely to have at least ten nuclear power stations generating up to 200 megawatts in a single unit operating in different parts of the world.

These will all be pioneering or demonstration stations built to test the technology on which all depends and to compare the relative advantages of the ten most promising types both from the point of view of economics and also of reliability and safety in operation. So most of the next decade will be occupied in laying a sound basis from which nuclear power can expand rapidly to become in the end the major power source of the world. Until we have achieved satisfactory operating experience we will not be justified in embarking on a more rapid expansion.

This new industrial development has the advantage of a very great and unparalleled concentration of scientific and engineering ability driving it forward with imagination and enthusiasm - as you can judge from the papers which

have been presented to this Conference. So the speed of development will be rapid and the nuclear power stations of 1970 will look as different from those of 1957 as the modern motor car differs from the Model T Ford.

The papers presented to the Conference have shown that we must not expect the cost of nuclear power to be cheaper in the next decade than power from coal. The consensus of opinion is that capital costs will be appreciably higher - 50 to 100 per cent higher - than the capital costs of coal stations, but that fuel costs will be less than half that for coal. So on balance there should be little difference in the cost of power, with nuclear power slightly more expensive than conventional power.

But to many countries this is not the important point. The important point is to obtain an additional source of energy to our conventional energy resources where they are becoming overstrained.

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"We have also heard of the more ambitious final goal of achieving the nuclear physicist's dream of making use of the breeding principle, and so extracting a great part of the fission energy of the whole uranium. In this way we expect to make one ton of uranium do the work of at least a million tons of coal. The engineer has still to convert the physicist's dream into large-scale practical power stations but we have heard during the Conference of the building of large-scale experimental breeder reactors both of the homogeneous and fast reactor types. Both have their difficult engineering problems but sometime during the second decade breeding is likely to be an important characteristic of nuclear power stations.

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"We have heard the forecast of uranium supplies - how it occurs throughout the world, not only in concentrated deposits but in abundant gold ores, shales, phosphate rocks. In seven countries alone there is reported to be available at least one million tons of uranium, whilst costs of uranium toward the end of the next decade have been predicted to be as low as 10 dollars a pound. The evidence presented to this Conference suggests that in the 1960's there will be more than enough uranium for the nuclear power development of that decade. If we look further ahead and combine the forecast of nuclear energy produced in the year 2000 with the forecast of the achievement of breeding, we can see at once that only a few thousand tons of uranium or thorium a year would be required for this task. So there would appear to be ample uranium and thorium available to accept the economists' predicted task and if necessary to do even more than this, carrying a still greater share of the world's energy needs until we achieve our final goal and produce by fusion reactions in the light elements an inexhaustible power source for the world.

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"We must all hope that the statesmen who control our destinies and whose vision has made this Conference possible will continue to liberate the creative ability of the scientific world and so enable it to produce these benefits which I have so imperfectly attempted to predict."

19. The President of the Conference indicated in his closing address that there was universal sentiment at Geneva for another scientific conference in two or three years to carry forward the work begun so well. Apart from the possibility that a second conference may be decided upon, it is likely that in the future various responsibilities in the general field of the atom will fall to the Secretariat. In meeting the challenge of new responsibilities in this unfamiliar and highly technical field, the Secretariat will have great need to count upon the continuing assistance of a competent body of experts. In the immediate future, at least, such assistance would probably best be given by the Advisory Committee, first established in order to assist in preparations for the Conference. It would thus be desirable that this Committee, in its present composition and under its existing rules and procedures, be continued with the understanding that it would be available as a consultative body for assistance on those atomic matters in which responsibilities may be entrusted to the United Nations Secretariat. I hope that the General Assembly, as part of its decisions in this field, will give its approval to such an arrangement.

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