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President: Mr. ASAKAI (Japan)

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* GC(IX)/311.

The composition of delegations attending the session is given in document GC(IX)INF/82/Rev.2.

ADOPTION OF THE AGENDA AND ALLOCATION OF ITEMS FOR INITIAL DISCUSSION
(GC(IX)/295,311)

1. The PRESIDENT suggested that the Conference accept the recommendations made by the General Committee in regard to the agenda and the allocation of items for initial discussion (GC(IX)/311).
2. The recommendations of the General Committee were accepted, and the agenda was thereby approved.

GENERAL DEBATE AND REPORT OF THE BOARD OF GOVERNORS FOR 1964-65 (GC(IX)/299,307)

3. Mr. SEABORG (United States of America) congratulated the President on his election and thanked the Director General for his outstanding leadership of the Agency. His delegation was extremely gratified that Dr. Eklund had agreed to serve a further term as Director General.
4. It was a great pleasure and honour for him to be in Japan at the present time, and he wished to express his particular appreciation of the Japanese Government's hospitality as host to the Conference.
5. He now wished to read a message to the Conference from the President of the United States of America.

"I welcome this opportunity to speak, through Chairman Seaborg, to the delegates to the ninth General Conference of the IAEA. I believe it is significant that you are meeting this year in Tokyo, the capital of a nation whose people have made such remarkable progress through the peaceful development of science and technology.

"Today we realize, more than ever before, the power of science. We also realize that the mighty force of science is not the domain of any one nation. Its great knowledge springs from sources in many lands. Its fullest development demands international responsibility and the co-operation of all men. This is the reason for the existence of the International Atomic Energy Agency. You are directing the atom, the greatest source of power which man has ever wrested from nature, towards peace, towards the fulfillment of human need.

"Since its inception in 1957, the IAEA has made noteworthy progress. In organizing and implementing international programmes of scientific and technological co-operation, it has shown the world that men gain far more by sharing their knowledge and tools than by using them alone in secrecy and isolation. The IAEA has offered the advanced countries and their less developed neighbours and friends opportunities to work together and to share the scientific developments of many nations.

"But the IAEA also has the solemn duty - and the unique opportunity - to assure the world that materials and equipment employed for peaceful uses of atomic energy are not used for any military purpose. Prevention of the spread of atomic weapons is one of the most important tasks of our times. It is my deep conviction that the IAEA, through its safeguards system, can make a crucial contribution to achievement of this goal. The United States Government is pledged to do all in its power to assure the success of the Agency's system. I urge every Member State to give its support to the Agency system in principle and in practice.

"There must be no resting. The work which you have been doing must be carried on with increasing effort and support. There is no standing still in your two-fold task of keeping the peaceful atom peaceful and directing its enormous energy toward productive uses.

"I take this opportunity to renew my country's pledge to assist the International Atomic Energy Agency in the full pursuit of these benefits which the peaceful atom can bestow.

"With gratitude for your past accomplishments I send you the best wishes of the people of the United States for your future endeavours."

6. He had come to Tokyo in the spirit of President Johnson's message, in order to advance on behalf of his Government the high principles of the Agency, which in the words of the Statute were "to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world". He would recall that the United States Government's basic policy of international co-operation in the peaceful uses of atomic energy had been operating since 1954, and extensive programmes, set on foot with the assistance of many different agencies in the United States and abroad, had become a symbol of effective international co-operation aimed at the betterment of mankind. Those programmes concerned the uses of radioisotopes and radiation sources, the promotion of peaceful nuclear research, the provision of opportunities for nuclear education and training and, more recently, the uses of nuclear power for generation of electricity and for the combined production of electricity and fresh water.

7. The United Nations International Co-operation Year coincided with the end of the first decade of the United States Atoms for Peace programme and provided a special opportunity for taking stock of the situation. The Third International Conference on the Peaceful Uses of Atomic Energy held the previous year had likewise provided such an opportunity, and the most salient feature emerging from the review which had then been undertaken had been that

the extent of international co-operation in the development of nuclear energy resources during the last decade had no parallel in all the history of international science and technology.

8. In his view, the establishment of the International Atomic Energy Agency in 1957 had been the most important expression of international co-operation during that decade. Delegates would all be familiar with the Agency's far-reaching programme, which the United States, together with other Member States, had consistently sought to strengthen.

9. The advent of economically competitive nuclear power and the world-wide expansion of nuclear power potential lent special importance to the Agency's safeguards system, which was designed to ensure that power reactors and the nuclear materials which they employed and produced were not diverted from peaceful purposes. A general review of the safeguards system was before the Conference, and he urged all delegations to vote for the resolution approving the revised system. One of the most important factors contributing to the growth and viability of the Agency was its concentration on the technical aspects of its responsibilities. In the opinion of the United States delegation, the practical progress made by the Agency in carrying out some of its most difficult tasks was due to its ability to deal with those tasks on a technical basis without the introduction of political issues.

10. The United States Government was proud of its programme for transferring responsibility for administering safeguards to the Agency. The first such transfer had been accomplished by means of a trilateral agreement signed by the United States, Japan and the Agency on 23 September 1963 and to date arrangements of that kind had been made for the Agency to administer the safeguards in respect of nuclear materials and equipment supplied by the United States to 13 countries. The United Kingdom and Canada had concluded similar agreements with the Agency and with countries, including Japan, with which they had safeguards agreements. The United States was seeking to conclude further agreements for the transfer of bilateral safeguards responsibilities to the Agency and it was hoped that other Members would follow the same policy. The Agency's safeguards were also to be applied to its projects in Finland, Norway, the Democratic Republic of the Congo, Mexico and Yugoslavia.

11. To demonstrate the effectiveness and acceptability of Agency safeguards, to provide Agency staff with experience and to test the system in operation, the United States in 1962 had voluntarily agreed to place four of its civilian prototype power and research reactors under the safeguards system. That agreement had been renewed the year before and extended to include a large, privately-owned power reactor in the United States, the 600 MW(th) Yankee reactor, which was capable of producing more than 100 kg of plutonium per year. Experience of several years had shown that the Agency's safeguards system in no way interfered with the efficient operation of nuclear installations.

12. The United States was greatly encouraged by the offer of the United Kingdom to place its Bradwell nuclear power station under Agency safeguards, a step which would mean the application of the Agency's system to another important type of power reactor and thereby contribute to the objective of having widely accepted international safeguards with uniform standards and methods of inspection.

13. The prospects for nuclear energy were very bright and the future of international co-operation in that field, focused through the Agency, was most promising.

14. Recent events in the United States and elsewhere had indicated that nuclear power was now a significant competitive source of energy and there was every indication that its use was going to increase rapidly. Projecting current trends, one could estimate that by 1970 the nuclear electrical capacity of the United States would be of the order of 6000-7000 MW and that of the entire world approximately 25 000 MW. A further projection indicated that there would be 60 000 to 90 000 MW of installed nuclear power in the United States by 1980 and that by the year 2000 about 50% of total electric power generated in that country would be from nuclear energy. The uses of nuclear products and energy sources in space, medical diagnosis and treatment, food sterilization and preservation, industrial processes and ship propulsion were also showing substantial growth. The use of nuclear energy in water desalting, large-scale excavation and rocket engines for extended space missions was also promising.

15. Important strides had been made by the Agency in connection with the use of nuclear energy in desalination. His delegation considered the Agency to be a focal point for international co-operation in that field. Because of the growing international interest in the subject, the United States was sponsoring and would be the host to the First International Symposium on Water Desalting, to be held in Washington on 3-9 October. Over 62 nations had accepted invitations to attend. The Agency would chair a session and present a paper on the technical and economic aspects of nuclear applications in desalting. Co-operative studies between the United States and countries (including Israel and the Soviet Union) interested in the potential of nuclear desalting were under serious consideration and his delegation looked forward to increased participation by the Agency in that important field.

16. The Agency's activities had kept commendable pace with recent technological developments: it had assisted a number of Member States in making preliminary assessments of nuclear power and desalting prospects, in evaluating reactor systems and in the siting, construction and safe operation of nuclear power plants. It had also fostered the development of nuclear technology, of research and services in the life sciences and the physical sciences, and of health, safety and waste management standards, codes and manuals. The United States delegation urged the Agency to continue and intensify those activities.

17. It also commended the growth of technical assistance activities, through which the agency took a direct part in promoting the application of nuclear science and technology to the economic progress of the developing countries. The increase in regional and inter-regional projects was also noteworthy. The Agency's services were particularly necessary in that type of international co-operation where a number of Member States was involved.

18. The activities conducted in 1964 included 11 training courses on a variety of subjects, the appointment of a regional officer for Asia and the Far East, assignments of several regional experts, follow-up survey missions to Asia, the Far East, Latin America and Africa, and courses and research projects at the Middle Eastern Regional Radiosotope Centre for the Arab Countries. Other regional programmes included research and training at the International Centre for Theoretical Physics at Trieste, reactor fuel-element research under a co-operative project in Norway, Poland and Yugoslavia; sea disposal research

under the Monaco Project and spectrometer research at the Philippine Atomic Energy Research Centre, while the utilization of research reactors continued to be one of the Agency's most beneficial fields of regional activity.

19. Another important aspect of the Agency's programme was the growth of co-operation with the United Nations and its specialized agencies. The Third International Conference on the Peaceful Uses of Atomic Energy, held in September 1964, had been successfully conducted through close co-operation between the Agency and the United Nations, and the two organizations had continued to collaborate on the International Co-operation Year and on general questions of power. Other examples of effective and valuable co-operation were the Joint FAO/IAEA Division of Atomic Energy in Agriculture, which had been in existence for almost a year, the exchange of technical liaison officers between the Agency and WHO, UNESCO's aid to the International Centre for Theoretical Physics in Trieste and the collaboration between the Agency and UNESCO on studies involved in the International Hydrological Decade. The Agency and ILO had together reviewed a draft manual on safe practices in mining and milling radioactive ores, while the Agency was also executing projects for the United Nations Special Fund in Yugoslavia on agricultural research and training and in Central America on the elimination of the Mediterranean fruit fly and had almost completed a Special Fund pre-investment power study in the Philippines.

20. The Agency was also working closely with several regional organizations: with the European Nuclear Energy Agency (ENEA) and the Österreichische Studiengesellschaft für Atomenergie (Austrian Atomic Energy Research Organization) on the use of radiation for food preservation, with ENEA on providing various standards and codes relating to health, safety and waste management, and with the Inter-American Nuclear Energy Commission (IANEC) in its survey of the possibilities of using nuclear power in America, while IANEC was helping the Agency with a study of training problems in Latin America.

21. He had emphasized such regional and inter-agency projects in order to call attention to a relatively new trend in international co-operation, but the fact that in 1964 about 86% of the Agency's technical assistance had gone to individual Member States should not be overlooked.

22. He wished to pay tribute to Japan and to the many other countries which had taken special initiative on various occasions to co-operate through the Agency. In 1959, Japan had been the first country to obtain nuclear material through the Agency, and in 1963 had signed, with the Agency and the United States, the first trilateral agreement for the administration by the Agency of the safeguards provisions under a previous bilateral agreement. Japan had donated equipment to the Agency's Laboratory, Agency-sponsored training courses had been held in Japan, and only a week previously the Agency's working group on nuclear data had met in Tokyo.

23. The United States Government would continue making every effort to advance the Agency's objectives. It supported the budget recommended by the Board of Governors, and would renew for 1966, for the seventh consecutive year, its offer to donate up to \$50 000 worth of special nuclear material for use in Agency projects in research and medical therapy. It would continue whenever possible to make available on a cost-free basis the services of experts, training opportunities and certain items of equipment, and to contribute to the Agency's library copies of all scientific and technical reports published by the United States Atomic Energy Commission on the peaceful uses of atomic energy, and prints of United States films on the subject.

24. The United States Government pledged its continued support to the Director General and the staff of the Secretariat, and would continue to provide the most competent Americans to fill posts in the Agency.

25. The demands upon the Agency were growing and becoming increasingly challenging. The international scientific community and the Governments of Member States should meet that challenge by increasing their efforts towards international co-operation on the peaceful uses of atomic energy for the world-wide benefit of mankind, an aim which would provide not only the greatest challenge, but, if successful, the greatest reward.

26. Mr. HIRSCH (France) congratulated the President on his election and thanked the Japanese Government for its hospitality.

27. Great changes had taken place in the last 20 years. In the absence of any real measure of general and universal disarmament, there was an inevitable increase in the number of countries liable to have access to nuclear weapons.

On the other hand the relative importance of the peaceful uses of atomic energy was also increasing. The production of nuclear power now exceeded the amount consumed in plants producing nuclear weapons and in a few years' time the uranium market would be governed by civilian requirements.

28. The role of the Agency would expand in proportion to the extent of the problems and studies which had to be tackled on a genuinely international scale. While the considerable development to be expected would benefit the industrialized nations in the first instance, it was essential to ascertain how the new techniques could best be utilized in various fields by the less advanced countries. France had concentrated on the different ways of producing power from natural uranium, a solution which would ensure independence from outside nuclear fuel supplies for a growing number of countries possessing uranium resources. France had already supplied experts in uranium-ore prospecting to a number of such countries and was prepared to provide technical assistance to countries interested in the generation of electricity from natural uranium. At the present time France, in conjunction with some of its neighbours, was working on the problem of producing electricity on a joint basis in international power plants.

29. On the national level, in December 1964, the French Government had approved the conclusions of a report drawn up by a consultative commission for the production of nuclear electricity, which recommended that work be started between 1966 and 1970 on the construction of nuclear power plants with a total capacity of 2500-4000 MW(e). France's fifth National Economic Plan provided for a nuclear capacity that was at least twice as great as the capacity installed under the preceding plan.

30. That programme would mainly involve the construction of natural uranium reactors with unit powers of 500 MW(e), which would probably be raised subsequently to 750 and perhaps 1000 MW(e). Experience gained during the last ten years and the improvements made would make it possible to produce electricity at costs competitive with those obtaining in conventional plants. It was also planned to make such reactors more economic by increasing their specific power and reducing the number of channels for a reactor of any given power.

31. The commissioning in 1966 of an 80-MW(e) experimental power reactor moderated with heavy-water and cooled with pressurized CO₂ would provide the experience needed if it were decided to embark on a programme based on heavy-water plants. Such a programme would make for a more effective utilization of natural uranium and would at the same time continue to provide the plutonium needed for fast-neutron breeder reactors. Such heavy-water reactors would also make it possible to build economically acceptable medium-size power plants with capacities of 200-300 MW(e).

32. Large-scale development of nuclear electricity production would require the use of fast-neutron breeder reactors, which would enable uranium-238 to be fully utilized; with such reactors the cost of the ore would have little effect on the total cost involved. In that connection, France was working in collaboration with EURATOM. At the Cadarache Centre the first experimental fast-neutron reactor was scheduled to become critical in 1966 and the construction of a critical experimental facility would provide a means of testing the components of that reactor type. The construction of a first experimental fast-neutron power plant was scheduled to begin before 1970.

33. The trends noted at the Third International Conference on the Peaceful Uses of Atomic Energy had grown clearer, and present assessments of installed capacities in 1980 were higher than the estimates made a year ago. At the same time, however, most nuclear power plants had been, or were due to be, constructed in the industrialized countries, and international transactions in the nuclear field, still few in number, were being concluded without reference to the Agency, which had been set up, among other things, to play a part in such transactions.

34. It had to be realized that countries that made progress in the civilian sphere were at the same time increasing their capacity for producing weapons.

35. The Agency's safeguards system provided a means of keeping a check on the way in which assistance was used, but it did not prevent recipient countries from engaging in uncontrolled activities at the same time. The position was particularly clear in the case of safeguards applied to facilities placed voluntarily under the Agency's system by countries which also operated military

programmes. It was like a traveller picking out only one case from among his many pieces of luggage for inspection by the customs. The control exercised by the Agency did, nevertheless, provide a basis for the development of a system which would only be properly applied as part of a general scheme for nuclear disarmament. It was for that reason that France was anxious to ensure the effectiveness of the system and had approved the new safeguards document.

36. As for the financial aspects of the system, France had agreed that it should be paid for out of the Agency's Regular Budget insofar as research reactors and certain power reactors of various types were concerned. In such cases the main objective would be to work out suitable safeguards procedures and acquire the experience needed for future operations. If, however, a large number of power reactors were placed under Agency safeguards within the framework of bilateral agreements, the costs would exceed the level of the Agency's total budget at the present time. Such expenditure could no longer be charged to the Agency's budget but would have to be borne by the parties to the agreement and would thus have to be included in the cost per kWh.

37. In connection with the Agency's budget for 1966, his delegation had expressed reservations at the meetings of the Board. It supported the efforts made by the Director General to keep Secretariat staff at a practically constant level, but it considered that the slow development of the Agency's activities justified only slight increases in the budget; certain inevitable items of expenditure would have to be met by savings on other items.

38. Similarly, the financial assistance provided by the Agency to regional training centres should be submitted to close scrutiny. Such assistance was primarily designed to ensure that a centre was set up and could start work. Subsequently the level of financial assistance should be scaled down and costs should be borne by the countries directly concerned. A detailed study should be made of the financial implications of setting up an international centre for research and training in the medical applications of radioisotopes.

39. Technical assistance was one of the most positive aspects of the Agency's work, and France, which had provided the Agency with 15 experts over the past year, would continue to support the technical assistance programme. France was

also offering the Agency a loop for low-temperature irradiations, valued at \$20 000. The equipment supplied would enable numerous experiments to be carried out involving basic research in solid-state physics. France was also prepared to ensure that the centre which received the equipment would work in close collaboration with the Grenoble Nuclear Research Centre in order to make sure that the equipment was utilized to maximum advantage.

40. His country also supported the work being done by the Agency in drawing up regulations, in particular those relating to safety standards and transport. It would continue to assist the Secretariat in drafting the important documents in question. France had approved the international convention on civil liability for nuclear damage and hoped to be able to ratify it in the near future.

41. In connection with the proposal to amend Article VI of the Statute on the composition of the Board, he recalled that the Statute represented a delicate compromise which it had taken a long time and much mutual goodwill to work out.

42. In approving Mr. Eklund's appointment as Director General for a further four years, his delegation was glad to note that continuity would be assured and it expressed the hope that the development of the international situation would enable the Agency to play the part expected of it. For its part France would do everything in its power to ensure that it did.

43. Mr. FERRERA (Belgium) congratulated the President on his election and thanked the Japanese Government for its magnificent hospitality.

44. It was with the greatest sympathy that Belgium was following the Agency's valiant efforts to fulfil its responsibilities under the Statute, particularly in the field of regulatory activities and safeguards. The safeguards document was indeed the first practical step on the slow road to disarmament. The application of the safeguards system would thus prepare the Agency for carrying out a role in the future which its founders had not foreseen; there was no doubt that, if the nuclear Powers could agree on general disarmament, the Agency would, thanks to the experience which it would have gained, be able to assume international supervisory functions in nuclear matters.

45. Belgium had also followed with great interest the work of the various symposia and conferences organized by the Agency or with its assistance.

46. However, the basic task of the Agency remained the provision of technical assistance to the countries which were still in the early stages of nuclear development. Yet the Agency was perhaps still not making as big an effort in that direction as it might. The funds at its disposal were certainly limited, but it could extend its influence by acting more as a catalyzing agent for technical assistance provided by the advanced countries, instead of attempting to carry out with its own technical resources work which could be performed at its request by laboratories and institutions in various Member States. It should likewise not devote too much attention to basic research, to the detriment of the practical applications of atomic energy.

47. It was above all by the provision of training fellowships, expert services, judicious advice and equipment that the Agency could fulfil its task of bringing about technical progress. To that end, Belgium each year placed at the Agency's disposal six Type II fellowships of a total annual value of \$20 000, in addition to the country's annual voluntary contribution to the General Fund.

48. In that connection he wished to mention that the sum of \$10 000 would be paid as Belgium's voluntary contribution for 1965.

49. It had been said that a country could undertake large-scale action in the nuclear field only if it possessed a sound academic infrastructure. Belgium had therefore been particularly gratified at the conclusions and proposals put forward by the group which had met at Vienna in April 1965, in compliance with Resolution GC(VIII)/RES/182, to study the scientific training of nationals of the developing countries. Indeed, ever since 1962 Belgium had proposed that the Agency should expand nuclear training with the assistance of other international organizations.

50. It was also important to make better use of the facilities offered by modern publicity media. The organization of filmed study courses under the auspices of the Agency and UNESCO would be particularly valuable to the developing countries. The latter would then no longer be forced to send students abroad if, by means of sight and sound, it were possible to provide them with scientific training of the same quality as that of the Western nations.

51. Another matter which the Agency should consider forthwith, in collaboration with the Expanded Programme of Technical Assistance and the International Bank

for Reconstruction and Development for example, was the arrangement of special financing procedures to help countries with weak currencies to purchase large-scale nuclear installations, which were particularly expensive items. Adequate safeguards and long-term credits would be necessary for the purpose. Now that the use of nuclear power had become a reality, the solution of that problem would assume vital importance for the economic development of many countries.

52. Among the six priority fields of study which the Agency had assigned itself there was one which deserved particular attention, namely the use of nuclear power for the desalination of water. The problem of water was a universal one, and even the most favoured countries were beginning to fear a fresh-water shortage in the more or less distant future. The good prospects offered by nuclear power for water desalination placed the Agency under an obligation closely to follow all the research and experimentation carried out throughout the world for the purpose of developing the most economic types of desalination plants. Belgium was studying that problem with the greatest attention and would like to be associated as closely as possible with the work of future symposia and panels on the subject.

53. Belgium had decided to build a network of nuclear power stations. The first station, with a capacity of 560-600 MW(e), would be begun early in 1966, and would be followed by a second station of similar capacity, work on which would start at the end of 1966 or the beginning of 1967. In the meanwhile the BR-3 Vulcain experiment was proceeding satisfactorily. Under a bilateral co-operation agreement signed during the present year, India had agreed to lease to Belgium 13 tons of heavy water required for experimental purposes.

54. In conclusion, he wished to thank the Director General for the work he had accomplished during the four years of his term of office. It was thus with the greatest pleasure that Belgium would cast its vote in favour of his appointment for a further similar term.

55. Mr. BAFFOUR (Ghana) expressed the great pleasure of his delegation at Mr. Asakai's election to the office of President of the General Conference at its ninth session. The splendid hospitality extended by the Government and the people of Japan was keenly appreciated.

56. Ten years previously few people would have imagined that the Agency's evolution could proceed so far by 1965. Only a few of the nations represented at the present session of the Conference had then possessed the secret of the atom. Today things were very different: many nations, among them Ghana, had advanced considerably in nuclear science and were eager to be closely associated with the work of the Agency because of the numerous possibilities it offered for their future progress.

57. He could not pretend to speak for the whole of Africa, a vast continent comprising many nations. Many of those nations were still in the very earliest stages of development, and a large part of the continent's resources remained untapped. Indeed, at first sight the problems faced by Africa seemed almost insuperable, but precisely because they were beset by so many difficulties the nations of Africa were endeavouring to take a highly realistic and practical approach to the planning of their future.

58. One example of the problems which weighed on Africa and transcended the boundaries of its individual countries was the tsetse fly, a source of disease which, to a considerable extent, was responsible for the serious lack of protein in African countries. The task of eradicating it was faced by most of the continent. Before the use of isotopes had come into its own, a great deal of money and effort had been expended on efforts to eradicate the tsetse fly, efforts based largely on a careful assessment of the pest's ecology. All had failed. That was but one reason why Ghana was eager to pursue the limited programme of atomic research on which it had embarked. There was now hope that some progress could be made towards the eradication of the tsetse fly, and Ghana, along with the other countries of Africa, would look to the more developed nations of the world for encouragement and assistance in their endeavour.

59. Many other problems interested the African countries. Just as in other parts of the world, water, either through scarcity or excess, often presented serious problems. The African nations still possessed little knowledge of their subterranean water courses, and it was a well-known fact that in that connection isotopes could be of great assistance. In short, it was problems of that kind which had prompted Ghana to undertake nuclear research, and he was confident that in the end the considerable expenditure required would be well justified.

60. He believed that the Agency and its Member States should make a thorough re-appraisal of the problems they were called upon to face. They should take a fresh look at their objectives, and should never lose sight of the fact that the bridging of the gap between the developing countries and the more advanced countries was really their most important task. In the future, then, it would be possible to look back on the Agency's achievement as one that had truly fostered international co-operation and understanding. That, after all, was what the Agency was for.

61. The Agency's financial resources should be carefully husbanded so that the greatest possible benefit could be derived from them. In mentioning that point he had the safeguards programme particularly in mind. It was unquestionably an important programme, but serious thought should be given to the value which could be derived from the Agency's work by all Member States, particularly the less-developed countries. It was urgently important to concentrate not on refinements but on the fundamental problems that had to be tackled. If the developing countries could be encouraged to make full use of the resources which the Agency was able to place at their disposal, it would be possible to affirm that the Agency had done its job well.

62. He warmly thanked the Agency, and Dr. Eklund in particular, for all that had been done to enable Ghana to pursue its limited programme; and thanks were also due to all others who had offered stimulation and encouragement.

63. Mr. FAROLAN (Philippines) congratulated the President on his election and expressed his delegation's appreciation for the generous hospitality extended to the Conference by the Government of Japan. Because of past history, it was auspicious that Japan should be the host country for the first session to be held outside Vienna, and the peoples of Asia would be watching the proceedings with tremendous interest.

64. He welcomed the newly admitted countries; the continuous growth in the Agency's membership testified to the vital role it was playing in contributing to world peace and progress. The fact that the Director General had agreed to serve for a further four-year term was gratifying and would ensure continuance of the work so well begun.

65. It was gratifying that the great progress made in recent years towards the ultimate development of atomic energy as an instrument for peace, progress and greater understanding among friendly nations had far surpassed and outweighed the distressing trend towards nuclear proliferation. The role played by the Agency in that development had been of singular importance and it was to be hoped that, with the greater support of Member States, it would continue to exert the utmost influence in directing the work along peaceful lines.

66. A recent development for which the Agency was to be commended was the establishment of the Joint PAO/IAEA Division of Atomic Energy in Agriculture. Hunger was the most frightening spectre haunting millions of the world's population, and it was essential that food production should be increased to the point at least of matching the explosive growth in world population. The joint programme, bearing on such matters as soil fertility, irrigation and crop production, insect eradication and pest control, together with training work and exchange of scientific information, would constitute the best investment of the resources available to the two organizations for tackling that problem of fundamental urgency.

67. His delegation was grateful for the help being extended by the Agency in the promotion of closer co-operation in specific nuclear energy activities among the Member States of the Asian region, as typified by the study group meeting on reactor utilization held in Bombay in late 1964 and the regional training course on the application of radioisotopes in medicine conducted in 1964 in Manila with the support of his Government. Study group meetings of the kind were assuming greater importance with the increase in the number of research reactors now in operation or under construction, and were an important instrument for fostering fruitful working relations among scientists and regional centres. It was therefore unfortunate that, because of unforeseen difficulties, the first Agency-sponsored study group meeting on nuclear power for developing countries, which had been scheduled to meet in Manila in mid-September 1965, had had to be postponed. His delegation hoped that the delegations of the Member States concerned would be able during the Conference to discuss plans for its convening at the earliest possible time.

68. Medicine and public health constituted one of the most important areas where atomic energy could benefit the greatest number of people. His Government had therefore considered it a privilege to act as host for the 1964

regional training course on the application of radioisotopes in medicine, and looked forward to the holding of the inter-regional advanced training school on the same subject, to be held in Bangkok in January 1966.

69. The training and research programme being undertaken jointly by the Philippines, India and the Agency, which he had mentioned at the eighth session, had been formally inaugurated in January 1965 at the Philippines Atomic Research Centre, with participants from China, Korea, India, Thailand and the Philippines. The first six months' work had proved most fruitful; several diffraction studies had been completed and at least one paper published. The programme was thus already demonstrating its value as a scientific endeavour and example of regional co-operation, and his Government hoped that the venture would pave the way for similar joint efforts in the Asian region.

70. He was glad, too, to be able to report that the first phase of the pre-investment study of the power supply situation in Luzon, which was being undertaken with the assistance of the Special Fund and the Agency, had been completed. The results indicated that only a small proportion of the future power requirements could be met by local energy resources, and the place of nuclear power was now being studied as a second phase. His delegation hoped that the results to be obtained would prove of use also to other countries similarly placed.

71. It was encouraging that, within the space of barely one year, 21 Member States should have concluded agreements with the Agency for the transfer of safeguards functions. That development indicated growing recognition of the Agency's vital role in reducing the possibility of the diversion of nuclear materials to military purposes. The Agency's safeguards system would be improved by the proposed revisions before the Conference, whereby the intent and purpose of certain of its provisions were more clearly specified and technological advances were taken into account. The revisions would not, of course, remove the greatest defect of the system, i.e. the non-coverage of the nuclear Powers except on a voluntary basis. That shortcoming was not inherent in the system itself but derived from the fact that it was unlikely that any of those Powers would call upon the Agency for assistance, despite its being

in the best position to apply safeguards to prevent the misuse of nuclear facilities and materials. His delegation would support the proposed revisions in the firm hope that in time the system would come to have a more universal application.

72. In conclusion, he was glad to say that his Government, despite the financial difficulties it had to face, would continue its support for the Agency's work. With the growth in membership and activities, increased financial support for the Agency was essential if it were not to fall short of its objectives. He hoped that all Member States would bear that important consideration in mind.

73. Mr. BERGLANN (Israel) said that he was pleased to be among the first to congratulate Mr. Asakai on his election to the office of President. He also wished to thank the Government of Japan for the unstinting hospitality it had shown the Conference.

74. His delegation had always endeavoured, in its statement during the general debate, to report on the scientific and technical work carried out in Israel during the previous twelve months, to review its co-operation with the Agency, and to suggest courses of action which, in the light of Israel's own experience, seemed to be of general interest. Such a report was in keeping with the technical character of the Agency, and avoided political issues with which the Agency should not concern itself.

75. During the year under review Israel had placed its swimming-pool research reactor under Agency safeguards. It had done so with some hesitation, but was convinced of the rightness of its course. To quote from a statement of the Resident Representative of Israel to the Agency, "The Government of Israel has been co-operating faithfully with the Agency in all matters of planning, research and development of atomic energy. The transfer of safeguards is a further step along this road, the more so as Israel is the only State in the Middle East to accept the Agency's safeguards on an atomic reactor". The Resident Representative had also expressed the hope that that step would enhance the standing of Israel within the Agency.

76. Israel had been fortunate in obtaining Agency assistance for some of its research projects. In addition to four continuing projects (in nuclear desalting, biology, haematology and insect control) the Agency had now approved

Israeli participation in a new project concerned with the efficient use of water in agriculture. His delegation accordingly wished to express its gratitude to the Director General and the technical staff of the Agency for the interest they were taking in Israel's work and for the assistance they had given.

77. He used the word "assistance" deliberately because in all those projects the Agency was contributing only part of the budget; his delegation believed, moreover, that that was only right and proper. The Agency should serve as a catalyst in areas of work which were regarded as worthwhile. It should encourage Member States to make an independent effort, by taking an interest in their work and contributing to it when possible. The Israel Atomic Energy Establishment had therefore contributed a number of cost-free research contracts on subjects which it believed to be of interest to the Agency, for example liver scanning and insect eradication by irradiation.

78. To anyone concerned with the administration of scientific work it was obvious that the Agency's Secretariat faced a difficult task in distributing its available resources among the many worthwhile projects submitted to it. The Agency might well consider restricting its research efforts to a number of important subjects, so that it would be in a position to give appropriate grants to those Member States which appeared to be most competent in the fields in question and to ensure the international character of the projects by encouraging scientists from other countries to participate in them. In a sense that had already been done at the International Centre for Theoretical Physics, which promised to be one of the Agency's most successful ventures. Some Israeli scientists had already had the good fortune to participate in the Centre's work, as teachers and as students.

79. To assist the Agency in encouraging international co-operation between scientists, his Government had decided to continue its policy of awarding scholarships to the extent of 90 man-months for foreign scientists who wished to participate in Israel's research and development projects. It hoped that the Agency would continue to help by allocating those scholarships as suitably as possible. Under that scheme Israel had already had the pleasure of welcoming a number of scientists from other developing countries.

80. Israel had continued its efforts to establish and strengthen relations with the atomic energy commissions of other countries, especially the developing countries, and that too was in keeping with the spirit of the Agency. Joint planning among those countries, and joint projects undertaken by them, surely constituted one of the best ways of promoting and accelerating the application of atomic energy.

81. One of the most difficult problems for countries in the early stages of nuclear development was to ensure a proper division of manpower and facilities between fundamental and applied research. Research reactors were a great asset but could easily become a liability if not used fully and rationally. Israel had tried to strike a balance between the two extremes and to apportion reactor time sensibly between pure science and practical applications.

82. The verification of the prediction of "omega-minus" had greatly encouraged work on elementary particle theory. Israel had continued its theoretical studies on the physics of fast reactors and had broadened its programme on the Mössbauer effect and the resonance scattering of gamma rays from highly-excited nuclear levels. A facility had been constructed which produced polarized neutrons by reflecting thermal neutrons from a cobalt-iron mirror. In general, a great deal of attention had been paid to the use of neutrons in Israel; and in that connection neutron diffraction was regarded as one of the most promising techniques. It was a method of particular importance to chemists in the determination of molecular structures because it permitted the localization of hydrogen atoms in organic and inorganic molecules and thus supplemented X-ray and electron diffraction techniques which were not capable of that refinement. Indeed, the number of problems which could be solved by neutron diffraction was so vast that his delegation urged the Director General to plan and co-ordinate an international effort on the subject. Even countries with relatively limited nuclear programmes could usefully participate in such a scheme and it would enable them to put their research reactors to good use.

83. Solid-state physics offered many possibilities for a reactor establishment, for example studies on inelastic scattering of neutrons by ferroelectrics of the potassium-dihydrogen-phosphate type. By studying the location of the hydrogen atoms it should be possible to explain the properties of such compounds

and possibly even to evolve a theory which would describe them in terms of their characteristic strong hydrogen bonds. The results so far obtained had led Israeli scientists to a new theory of the structure of liquid water, a problem which had occupied physicists and chemists for a long time.

84. Other chemical problems which had continued to attract attention included the nuclear properties of short-lived nuclides, the mechanism of high-energy chemical interactions, the radiolysis of aqueous solutions and - most important of all - the physics and chemistry of molten salts and of highly-concentrated aqueous solutions.

85. Thus Israel had tried to give fundamental research its due, but at the same time it had not neglected the practical applications of atomic energy. Emphasis had been laid on developing methods of activation analysis, including the utilization of photoneutrons and delayed neutron emission. There were, in addition to the fissionable nuclides, a few radioactive nuclides which emitted neutrons during decay; such secondary neutrons could quite clearly be used for the determination of delayed neutron precursors. Thus, in addition to ^{235}U , ^{233}U , ^{238}U ; and ^{232}Th , ^{16}O and ^{17}O could be converted into the delayed neutron emitter ^{17}N , and ^{16}O into ^{17}F by way of a (d,n) reaction. There was thus an elegant method for determining isotopes of oxygen and, indirectly, the concentration of deuterium oxide. Similarly ^6Li could be determined in the presence of ^{18}O . Some elements, such as ^{37}S , ^{49}Ca and ^{28}Al , produced by neutron capture from the "normal" isotopes, emitted such highly energetic gamma rays during decay that they could produce neutrons from heavy water or beryllium. By counting neutrons one could determine the concentration of the nuclides and of the elements from which they were formed by neutron capture.

86. He hardly needed to emphasize the practical importance of activation analysis. Even so it seemed worthwhile to mention its use in criminology -- for detecting forgeries and falsifications, determining the origin of drugs such as opium, and performing non-destructive analyses of court evidence. In fact, the Israeli delegation believed that the Agency would do well to encourage further research in activation analysis, a fairly simple technique which nevertheless provided good training for young nuclear chemists. The Government of Israel would be pleased to see the Agency organize, possibly in 1967, an international seminar on the subject, to be held in Israel; informal contacts had already given considerable encouragement to the idea.

87. At the eighth session of the General Conference he had stressed the importance which Israel attached to the use of atomic energy in agriculture, especially in connection with food preservation and insect eradication. Israel had made good progress in such work, and his delegation wished to acknowledge the important role which the Agency had played and was continuing to play. The Agency would be well advised to expand its activities in agriculture, and in particular to encourage the developing countries to embark on such activities. Food preservation and insect eradication were both problems of vital importance to the success of agriculture and to public health; both, moreover, could be undertaken with relatively simple techniques and without elaborate equipment. The Agency might profitably collect data on the most damaging insects, especially those prevalent in the newly independent countries, and initiate a world-wide project for the eradication of such pests. He was pleased to associated himself with what the distinguished delegate of Ghana had said on the subject.

88. He had dwelt at some length on the work of the Israel Atomic Energy Establishment in order to show how many problems in the field of atomic energy could be usefully tackled before one bothered about nuclear power. They constituted, in fact, an immediate answer to the question of how atomic energy might serve peaceful purposes.

89. At the same time his Government was well aware of the long-term problems: nuclear power and, more important still, the combination of power generation and water desalting. In the latter field Israel had benefited by collaboration with the United States Government. A clearer picture of the economics of such dual-purpose ventures had already emerged, and it was now possible to conjecture when they might come to fruition.

90. His delegation, like others, had noted the fluctuating attitude towards power reactors over the past ten years; periods of undue optimism had generally been followed by unwarranted pessimism. In connection with the desalting of sea water, Israel hoped that a balanced view would be attained more quickly than had been the case with nuclear power. It believed that the use of large dual-purpose reactors was likely to become, during the next two decades, the most important and almost certainly the most spectacular application of atomic energy. The programme would require time, but it should be studied and planned immediately. There was no room for pessimism.

91. Israel was convinced that atomic energy, in all its aspects, would play a major role in the further development of society. Many problems remained to be solved but their solution held great promise. The Agency should continue to assist Member States in making the fullest possible use of their manpower and facilities for the many constructive applications of atomic energy. Only in that way could it fulfil its legitimate function and bring nearer the time when swords would be converted into ploughshares.

92. Mr. FRANGELLA (Uruguay) congratulated the President on his election and reviewed the work carried out in Uruguay during the past year in connection with the peaceful uses of atomic energy.

93. Uruguay was continuing to make routine use of twelve 250-kV radiotherapy units, four of which were of the moving-field variety. Five grams of radium, broken down into convenient quantities, were being used to meet requirements. Five radioisotope laboratories were in operation; they were receiving every help from the Government in obtaining the radioelements they required. One caesium-137 and four cobalt-60 bombs were available for teletherapy and an 18-MeV rotating betatron had come into operation a few months ago; it was the first such unit to be used in the Southern Hemisphere.

94. He listed the advantages of the betatron, particularly when use was made of accelerated electrons, and discussed the results obtained in the treatment of specific malignant tumours. The higher costs of the installations and equipment was justified by the improved teletherapeutical results obtained.

95. Although Uruguay was well equipped in the field of teletherapy, the position was not so satisfactory in other sectors of atomic energy which required greater investments - particularly at a time when the economies of most Latin American countries had suffered a decline as a result of currency devaluations. Nevertheless, some progress was being made, albeit slowly.

96. The Faculty of Engineering (Physics Institute) was doing research and carrying out measurements of fluxes with a view to providing a substitute for arteriography in cases where the latter technique was liable to be dangerous; various radioisotopes were being used. The Technology and Chemistry Institutes, which were part of the same Faculty, organized regular advanced courses on nuclear physics and also offered courses in reactor engineering. The Veterinary

Faculty was carrying out fish conservation studies using carbon-14 at the Fisheries Research Institute and was also performing autoradiography work which was extremely important in view of the fishery resources of the Rio de la Plata. The Biology Institute at the same faculty was making a study of the effects of radiation on foodstuffs, particularly beef, with a view to neutralizing the virus of foot-and-mouth disease.

97. The Agronomy Faculty was doing work on fertilizers and the Chemistry Faculty was engaged on a broad radioactive-ore prospecting programme with assistance provided by an Agency expert. Prospecting work had already been carried out in nine of the 19 departments which made up the country. Interesting work on the determination of lavas by means of the potassium-argon method had also been carried out in co-operation with the Atomic Energy Institute of São Paulo (Brazil).

98. A State organization had discovered monazite, associated with a titanium ore, in the black sands along the Atlantic coast. Millions of tons of the ore had been found and the discovery would help to make up for the scarcity of thorium deposits in Uruguay.

99. During the past year the Agency had provided Uruguay with a prospecting expert, a one-year contract providing for further gammagraphy work on the hydatid cyst of the liver, three fellowships for technical training and assistance in obtaining fuel for a reactor of up to 100 kW.

100. In the name of his Government and the Atomic Energy Commission of Uruguay he wished to express his appreciation to the Director General for the support and collaboration that had been provided by the Agency. His delegation would have pleasure in supporting the Director General's reappointment for a further four-year term.

101. Finally he wished to propose that the General Conference should send telegrams in the name of the Agency's 95 Members calling on the Governments of Pakistan and India to abandon the use of force in settling their differences. Resort to force had never provided an equitable solution to any problem. Although the conflict was of direct concern to the United Nations rather than the Agency the latter organization, as a body set up to promote peaceful activities, would demonstrate its moral stature by taking such action.

102. Mr. LAURILA (Finland) congratulated the President on his election and expressed his delegation's gratitude to the Director General and the Secretariat for their praiseworthy work during the past year, which had been hampered by the fact that the Agency's material and financial resources had not kept pace with the general development of nuclear technology.

103. Nuclear power plants had proved competitive even where the cost of conventional electric power was not high and a rapid growth in its use was to be expected, which meant a great increase in the amount of fissionable material produced in various countries. Hence much attention was being given to the means of ensuring safety in the use of nuclear energy and to eliminating the possibility of fissionable material being used for non-peaceful purposes.

104. The revised safeguards system now being proposed could be regarded as the best that could be devised for the time being, but the rapidly expanding use of nuclear energy could create technical and economic problems in its application so that the system would need to be revised in the near future. The system finally adapted should be flexible, inexpensive and universally acceptable, so that every user of nuclear facilities would be prompted to place them under Agency safeguards. The aim should also be to enable the Agency to be fully informed of the amount and nature of fissionable material in various parts of the world and its movement from country to country.

105. The installation of nuclear power plants for generating electricity posed complex industrial problems for a small country like Finland. The introduction of nuclear power in a small country's generating system must be preceded by a thorough study of the energy economy and its relation to the national economy, and such a pilot study had been initiated in Finland in 1958. It had been completed by a joint team of experts from the Agency and Finland. The forecast based on the results of the study, published under the title "Prospects of Nuclear power in Finland"^{1/}, had proved sound.

106. Safety and safeguards in particular would create problems when the first full-scale nuclear power plant was completed in Finland in the near future. So far, safeguards arrangements in respect of the majority of large-scale reactors had resulted from the transfer of responsibility for administering

^{1/} STI/DOC/10/2.

safeguards under bilateral arrangements to the Agency. In Finland, however, it would be possible, at least in principle, to test the applicability of the safeguards system in a practical case, in which no factors of secondary importance or of an artificial character were involved.

The meeting rose at 1 p.m.

