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EFFECTS OF ATOMIC RADIATION

Report of the United Nations Scientific Committee  
on the Effects of Atomic Radiation

1. The United Nations Scientific Committee on the Effects of Atomic Radiation was established by General Assembly resolution 913 (X) of 3 December 1955. It consists of the following members: Argentina, Australia, Belgium, Brazil, Canada, Czechoslovakia, France, India, Japan, Mexico, Sweden, Union of Soviet Socialist Republics, United Arab Republic, United Kingdom of Great Britain and Northern Ireland and United States of America.
2. The Committee held its eighteenth session at Headquarters from 8 to 17 April 1968. Dr. Gordon C. Butler of Canada and Professor Bo Lindell of Sweden served as Chairman and Vice-Chairman, respectively, and Dr. V. Zelený of Czechoslovakia was elected Rapporteur.
3. During that session the Committee continued its discussion of assumptions and parameters used in estimating dose commitments, recent information on radioactive contamination of the environment by nuclear tests, effects of ionizing radiation on the nervous system and radiation-induced chromosome anomalies in man, which it had initiated at its seventeenth session. The Committee expressed its intention of preparing for submission to the General Assembly at its twenty-fourth session a report dealing with such evaluations of risk as might result from its consideration of the aforementioned subjects.
4. The Committee also reviewed the data that it needed to assess levels of radiation from nuclear tests and decided to outline the information that it required in a letter to States Members of the United Nations or members of the specialized agencies or of the International Atomic Energy Agency. The text of the letter is annexed to the present report.

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5. The assistance provided to the Committee by the Joint FAO/IAEA Division of Atomic Energy in Agriculture, which collected and assembled data on radio-active contamination of the human diet, was noted with appreciation.

6. It was recognized that it would be necessary to hold one session in 1969 and requested that arrangements be made for the nineteenth session of the Committee to be held from 5 to 16 May 1969 at Headquarters.

ANNEX

Letter sent to States Members of the United Nations or members  
of the specialized agencies or of the International Atomic  
Energy Agency

30 April 1968

Sir,

I have the honour to inform you that the Scientific Committee on the Effects of Atomic Radiation, which was established by the General Assembly at its tenth session, has completed its eighteenth session during which it has reviewed, among other things, the information that it currently requires to assess levels of radiation resulting from nuclear tests.

The Committee noted that in the past it had received from a number of countries a large amount of information on radio-active contamination of the environment from nuclear tests. It expressed its appreciation of those comprehensive survey data that have greatly assisted it in its evaluations. Although there are large areas of Africa, South America and Asia, encompassing nearly two thirds of the world population, from which information has been fragmentary, nevertheless the Committee has been able to make reasonable estimates of the average exposure of the world population.

However, to guard against the possibility that population exposures in certain areas, and therefore their contribution to world-wide population averages, may have been underestimated owing to lack of information, the Committee felt that it would be valuable to have some measurements of bone contamination in a few selected locations. Extensive surveys in these areas are not needed for the assessment of the average world population exposure, but more information on environmental transfer mechanisms would be useful for estimating local exposures in possible future situations of environmental contamination.

For those areas from which most of the information has come, the general principles governing the transfer of radio-active material to man through food chains are now better understood than when the last request for measurements was made by the Committee in 1960. In the past, radio-active contamination has been largely by direct deposition on the above-ground parts of plants, but rates of

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deposition of the radio-active material are now relatively small and, unless large-scale atmospheric testing is resumed, the future mode of entry of long-lived nuclides into food chains will mainly be by root absorption of the deposit accumulated in the soil. Opportunities for quantitative study of this mechanism, as well as of the behaviour of long-lived radio-nuclides in the soil, have been limited in the past, and the Committee expressed the hope that surveys would continue in the future to provide information on this problem.

The Committee considered that this information can be obtained from surveys conducted in only a limited number of countries where agricultural practices and dietary composition are representative of those of a wider area, and recommended that those countries which have reported survey data on contamination of both diet and human tissue since 1961 or earlier continue to do so in the future. The measurements needed by the Committee are, as before, the total amounts of individual long-lived nuclides in food and human tissue, levels of external radiation from deposited radio-nuclides and levels of contamination by short-lived nuclides in food.

The Committee's specific requirements on continuing survey measurements are the following:

(a) The Committee's estimates of the total amount of individual nuclides in the atmosphere and in soil have so far been based on the results of two continuing world-wide surveys. The Committee expressed the hope that the results of these surveys would still be available to it in the future.

(b) With regard to levels in food, the Committee requires the results of measurements of  $\text{Sr}^{90}$  (in pCi/g Ca and pCi/kg) and  $\text{Cs}^{137}$  (in pCi/g K and pCi/kg) contamination in dairy produce, cereals and vegetables. The Committee also expressed interest in obtaining a few representative measurements of the levels of stable strontium in the same food-stuffs.

(c) Tissue levels include (i) body contents of  $\text{Cs}^{137}$  and (ii)  $\text{Sr}^{90}/\text{Ca}$  ratios in the skeleton. As it is anticipated that the distribution of  $\text{Sr}^{90}$  in adult bones will become more uniform in the next few years, the Committee recommended that intercomparisons of contamination levels in various types of bone and in whole skeleton be made more regularly than hitherto. The Committee also noted that an increasing number of persons were now entering adult life who had been exposed to  $\text{Sr}^{90}$  contamination during their growing years and in whom the distribution of  $\text{Sr}^{90}$  within the skeleton will be different from those who have only been exposed as adults. The Committee therefore recommended that the results obtained from adults

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should be reported separately for those between twenty and thirty years of age and for those older than thirty in 1967, and that for the next few years results for children should be presented by years of age up to four years and as a group from five to nineteen years. Because of its importance in assessing the long-term behaviour of  $\text{Sr}^{90}$  in the human body, the Committee would also be interested in obtaining measurements of stable strontium in bones of both juveniles and adults from those populations where comparable data for diet are also available.

(d) Levels of external radiation from deposited radio-nuclides have been recorded continuously at a few sites, and the Committee recommended that these recordings be continued and that other measurements making it possible to improve the accuracy of estimates of external gamma doses from  $\text{Cs}^{137}$  and short-lived nuclides should also be made.

(e) The Committee has a continued interest in levels of  $\text{I}^{131}$  in milk and vegetables because of the high concentration of iodine in the thyroid gland, relative to other tissues, and of the resultant local radiation doses, which can be of particular importance in infants and children.

(f) The Committee is also interested in data on other internal emitters in local areas, when these emitters make a substantial contribution to radiation exposure from environmental contamination.

The Committee's requirements on information from areas not covered by continuing surveys are as follows:

Limited investigations only, rather than continuing surveys, would be adequate for the purpose of obtaining information from those areas of the world from which data are yet scant. Measurements of  $\text{Sr}^{90}$  in bones from selected areas need to be carried out only once in the near future. The areas of greatest interest to the Committee are those where the mean calcium contribution to the diet is from cereals such as rice and maize, or from pulses and nuts. The Committee believes that one effective way of carrying out such a limited collection of samples is by agencies within the United Nations system and by existing national laboratories.

The Committee emphasized that it had outlined the information at present required for its own purposes only and noted that its requirements might need a further revision if massive injections of radio-active material into the atmosphere through nuclear tests were to be resumed, and that the requirements would in any case be revised as soon as sufficient additional knowledge accumulated.

Accept, Sir, the assurances of my highest consideration.

(Signed) Francesco SELLA  
Secretary  
United Nations Scientific Committee on the  
Effects of Atomic Radiation

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