DEPARTMENT OF FOREIGN AFFAIRS

Nº DATE

D/31 18 May 1973

REPORT OF AUSTRALIAN SCIENTISTS

Attached is a copy of the Report of the Australian scientists who attended the meeting with French scientists in Canberra from 7 - 9 May 1973. Agreement between the two delegations was reached on a number of points, and these are set out in Section A of the attached Report. This section also appears in the Report of the French delegation.

Both Reports were tabled in the House of Representatives by the Prime Minister, Mr Whitlam, on 17 May 1973.

MEETING BETWEEN AUSTRALIAN AND FRENCH SCIENTISTS

MAY 7-9, 1973

AT THE AUSTRALIAN ACADEMY OF SCIENCE, CANBERRA

REPORT OF THE AUSTRALIAN SCIENTISTS

Present:

Australian Side

Sir Rutherford Robertson
Professor S. T. Butler
Dr D. Metcalf
Professor M. J. D. White
Dr C. H. B. Priestley (present for two sessions to discuss meteorological questions)

French Side

M. le Professeur A. Gauvenet
Dr D. Mechali
M. J. M. Lavie
M. A. P. Chaussard

SECTION A

This section is identical in the two reports.

1. Dose Commitments

There was general agreement that the technical methods used by the Australian authorities for measuring quantities of radiation fall-out are satisfactory and are in accordance with international practice. A large degree of agreement was reached regarding the levels of dose commitment in Australia due to past French tests. The estimates of those dose commitments in millirads are as follows (for strontium-90 and caesium-137, the low figures are preferred by the French scientists according to their method of estimation; the Australian scientists' estimates are the higher figures):

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| Element | Thyroid (young children) | Thyroid (older children & adults) | Blood forming cells | Bone cells | Whole body |
|---|---|---|---|---|---|
| iodine-131 | 97 | 9 | 0 | 0 | 0 |
| short-lived | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| strontium-90 | 0 | 0 | 4.0-6.2 | 5.6-8.5 | 0 |
| caesium-137 (external) | 2.0-3.0 | 2.0-3.0 | 2.0-3.0 | 2.0-3.0 | 2.0-3.0 |
| caesium-137 (internal) | 0.9-1.3 | 0.9-1.3 | 0.9-1.3 | 0.9-1.3 | 0.9-1.3 |
| carbon-14 | 0.2 | 0.2 | 0.2 | 0.3 | 0.2 |
| TOTAL (in round figures) | 102-103 | 14-15 | 9-12 | 10-15 | 5-6 |

The estimates of the dose commitments due to all tests are as follows (the figures were provided for the meeting by an Australian government scientist; the values for the French tests are the higher values from the preceding table):

| Element | Thyroid (young children) | Thyroid (older children & adults) | Blood forming cells | Bone cells | Whole body |
|---|---|---|---|---|---|
| French tests | 103 | 15 | 12 | 15 | 6 |
| Tests by other nations | 74 | 54 | 83 | 96 | 52 |
| TOTAL for all tests | 177 | 69 | 95 | 111 | 58 |

Both delegations agree with the method which has been used to obtain these figures.

2. Biological Effects

There was general agreement between both groups that for certain dose levels, radiation is known to cause damage in humans.

However, there may be a threshold below which lower levels of radiation have no effect, the action on human beings of low doses and very low doses such as result from the tests never having been observed. Current work, for example on the phenomenon of repair by living cells of damage they have suffered at high doses of radiation, suggests that low doses may not cause cancer or genetic defects at a rate proportional to dose. Novertheless the international authorities have prudently accepted the hypothesis of direct proportionality in order to establish accepted dose limits. Certain additional factors may operate to reduce significantly the risks below those predicted from a simple estimation based on proportionality. These include the lesser effects of certain types of radiation, radiation received at low dose rates, or over extended rather than brief time periods.

SECTION B

The following part of this report is the sole responsibility of the Australian scientists.

The Australian scientists stressed that, despite the uncertainties outlined in the above discussion of biological effects, the only prudent course in attempting to assess the overall risk to the Australian population was to assume direct proportionality of all biological effects to radiation dosage. This is the public health position taken by the United Nations Scientific Committee on the Effects of Atomic Radiation and by other recognised authorities. The Australian population is large enough that even very small linear estimates of risk, in the region of the radiation doses due to the French tests, yield finite estimates of deaths due to cancer and genetic abnormalities. The Australian scientists believe that it is necessary to accept such estimates as realistic and not to take into account notions of a hypothetical threshold dose below which damage would not accur. Assuming a linear relationship between dose received and using maximum published figures for radiation risks, it has been calculated that, as a result of past French atomic tests, a final total of 26 cases of thyroid cancer and 14 cases of leukaemia and other cancers could result in the Australian population. The Australian scientists present believe that, as a result of the French tests that have already occurred, there could be approximately one death or serious disability in Australia from genetic causes during the first generation and 18 deaths in all subsequent generations; these are minimum estimates,

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and maximum estimates based on present information (see the Report of the Advisory Committee on the biological effects of ionizing radiation, U.S. National Academy of Sciences, November 1972) would be approximately 15 times these figures.

The above figures are based on the dose commitment estimates from the French tests given in the tables in Section A. It should be noted that the report of the Academy of Science Committee estimated the steady radiation effects to Australia from French tests in the Pacific, assuming continued testing at the French site on a pattern similar to that of the past seven years, and the harm commitments given in the report must be interpreted in this light. The dose commitments for the seven years of French testing in the Pacific are included in the report. Together with the risk factors used in the report, these commitments permit a direct computation of the harm commitments to the Australian population from the past tests.

The Australian scientists drew attention to the additional harmful effects which would accrue to the Australian population as a result of the improbable event in which the explosion of a high-powered bomb was combined with quite exceptional meteorological conditions giving a high fallout over Australia (Appendix - Academy Report).

Although the levels of radiation due to the French tests are unlikely to cause a statistically detectable increase in the frequency of cancer or genetic abnormalities in Australia, it is emphasised that there should be no unwarranted exposure to radiation. Further, with the long-lived isotopes produced as the result of nuclear explosions, the genetic effects on the Australian population, though small, are cumulative.