APPENDIX L

Comments on the Recommendations of the International Commission on Radiological Protection

By the M.R.C. Committee on Protection against Ionizing Radiations*

The Medical Research Council's Committee on Protection against Ionizing Radiations has considered the recommendations of the International Commission on Radiological Protection adopted September 9th, 1958 (Pergamon Press, 1959), and the explanatory statement and amendments to the 1958 recommendations made at the 1959 meeting of the Commission (Brit. J. Radiol., 1960, 33, 189). Subject to the following comments, the Committee advocates the acceptance of the Commission's recommendations. The text of these recommendations is not reproduced here and requires to be read in conjunction with these comments. References below to numbered paragraphs refer to the text of the Commission's recommendations.

Occupational exposure

1. The formula given in para. 47 relates the maximum permissible total occupational dose accumulated in the gonads or certain other organs to the age of a subject above the age of 18 by the relationship \[ D = 5 \times (N - 18) \] where D is the tissue dose in rems and N is the age in years. The Committee notes that this formula would permit a maximum dose to the gonads of 60 rems by age 30 and is of the opinion that this dose is acceptable provided that the contribution from this source to the genetic dose for the whole population does not exceed 1 rem per head of population.

2. The Commission recommends (para. 51c) that, when a person begins to be occupationally exposed at an age of less than 18 years, the dose to various specified tissues shall not exceed 5 rems in any one year under age 18, and the dose accumulated to age 30 shall not exceed 60 rems.

The Committee recommends that those persons between the ages of 16 and 18 years who are in 'occupational' contact with radiation should not be allowed to receive, as a result of their occupation, an annual dose in excess of 1.5 rems. This should be sufficient to allow the training of such persons in the use of ionizing radiations in hospitals, industrial establishments, technical colleges and schools. However, for such persons, subsequent exposure shall be controlled so that the dose accumulated to age 30 years shall not exceed the overall limit of 60 rems recommended by the Commission.

3. The Committee notes and approves the interpretation of para. 49 that a calendar 13-week period may be used instead of a period of 13 consecutive weeks if there is no reason to suppose that doses are being accumulated at grossly irregular rates.

* See page 154.
4. The Committee accepts the maximum dose-rates recommended as permissible for the various 'critical organs', although it considers that the basis for these recommendations should be kept under review. It is of the opinion that radiation to bone marrow should not exceed that applicable to the 'blood forming organs' whether other blood forming tissues are equally irradiated or not. It accepts the maximum rates regarded as permissible for bone (8 rems per 13 weeks or 30 rems per year) having regard to the relative damage factor applicable to most bone-seeking isotopes (bringing the average rates to 1-6 rems per 13 weeks or to 6 rems per year in such cases).

5. The Committee agrees the Commission's recommendation (para. 86) in regard to estimations of tissue dosage from total body burdens but considers that these should be noted, if significant, on personal record cards, and the permitted doses of external radiation adjusted correspondingly to allow for the 'internal' doses.

6. The Committee is of the opinion that, in the event of an accidental high exposure (para. 51d), any exposure in excess of that permissible in the light of the subject's age should be included in future calculations of the subject's accumulated dose and should, if possible, be 'worked off' during the following 5 years by work under conditions of reduced exposure. This parallels the recommendation of the Commission for emergency exposure (para. 51e). The Committee agrees with the Commission's recommendation in regard to exposures in excess of 25 rems (para. 51d) to those occupationally exposed.

**Exposure of members of special groups**

7. The Committee interprets the Commission's recommendation (para. 56) on maximum permissible concentrations in air and water as applying to average concentrations over periods of a year. The recommendation in para. 57 is similarly taken to refer to average concentrations over periods of a year. These interpretations are consistent with the averaging period adopted by the Commission for populations at large (para. 68).

**Exposure of the population at large**

8. The Commission suggests (para. 64) that the genetic dose (as defined in para. 63) to the whole population from all sources additional to the natural background shall not exceed 5 rems plus the lowest practicable contribution from medical exposure of patients.

In the light of the limitations dealt with in paras. 59 and 60, the Committee is prepared to accept the suggested figure as the upper limit. It considers, however, that the operative figure should in fact be determined by considering the levels which should be allowed for different sources of radiation (of the types given in the addendum to para. 65). Subject to a maximum value of 5 rems, this operative figure would thus be ascertained by adding the figures regarded as permissible for individual sources, the contribution from each being held to the lowest practicable value.
When the reports given here as Appendices J, K and L were prepared the Committee had the following members:

E. E. Pochin (*Chairman*)  
Sir Ernest Rock Carling* (*Vice-Chairman*)  
W. M. Court Brown  
Professor D. G. Catcheside  
Sir John Cockcroft  
W. R. S. Doll†  
L. H. Gray  
Sybil G. Horner  
L. F. Lamerton  
J. F. Loutit  
J. W. McLaren  
A. S. McLean  
W. G. Marley  
Professor W. V. Mayneord  
Professor J. S. Mitchell  
G. J. Neary  
G. J. Popjak  
F. G. Spear  
Professor F. W. Spiers  
Katharine Williams  
Professor B. W. Windeyer  
W. Binks (*Secretary*)

† Joined the Committee after Appendix J had been prepared.