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RECOMMENDATIONS OF THE INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION

PREFACE

THE International Commission on Radiological Protection (ICRP) has been functioning since 1928 when it was established, under the name of International X-ray and Radium Protection Commission, by the Second International Congress of Radiology held in Stockholm, Sweden. It assumed the present name and organizational form in 1950 in order to cover more effectively the rapidly expanding field of radiation protection.

The recommendations published in the present volume represent concepts and practices evolved from discussions at formal and informal meetings of the Commission and its Committees, held in recent years. Prior to World War II the Commission published recommendations at intervals of about three years. The first meeting in the post-war period was held in London in 1950. An informal meeting was held in Stockholm in 1952 in connection with the conference organized by the International Joint Committee on Radiobiology primarily to discuss the genetic effects of radiation. The next meeting was held in Copenhagen in 1953, at which time four of the Committees held formal meetings for the first time. The results of the deliberations were published in 1955 as Supplement No. 6 of the *British Journal of Radiology*. The Commission and its Committees met again in the spring of 1956 in Geneva, at which time most of the recommendations in the present volume were adopted in principle. At this meeting the Commission became formally affiliated with the World Health Organization (WHO) as a "non-governmental participating organization".

The Commission (ICRP) and the International Commission on Radiological Units (ICRU) held a special joint meeting in New York in the fall of 1956 to consider an invitation from the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) for cooperation in the phase of its work involving exposure from medical procedures. The two

Commissions accepted the assigned task and submitted a report to UNSCEAR, published in the October 1957 issue of *Physics in Medicine and Biology*. Funds for expenses incurred in the preparation of the report were provided by the UNSCEAR. At the time of this joint meeting the Commission held an informal meeting to discuss further the recommendations to be made following the deliberations in Geneva earlier in the year. Additional discussions were carried out at another special meeting of the Commission held in New York in the spring of 1958. At this time an ad hoc Publication Committee was appointed to expedite the preparation of the manuscripts. This Committee held a two-week meeting in New York in May and prepared a first draft of the recommendations, which was sent out to all members of the Commission. The Committee met again during the second half of July and revised the first draft in accordance with suggestions made by members of the Commission. At this time, the Committee reviewed also the available drafts of the reports of the Commission's Committees.

In the preparation of the Commission's recommendations, the Publication Committee found it necessary to fill certain gaps involving items that had not been formally discussed and approved by the Commission. For this reason advantage was taken of the presence of seven members of the Commission in Geneva in September 1958 to review the second draft and make appropriate changes. The amendments were sent to the members who could not attend this meeting. The final draft embodies further comments made by members of the Commission.

Many individuals, who are not members of the Commission, were consulted in the preparation of the recommendations and their co-operation is gratefully acknowledged. In particular the recommendations on genetic dose were discussed by the Chairman of the Publication Committee with several prominent geneticists

at the Xth International Congress of Genetics in Montreal, August 1958. It should be noted, also, that Committee I at its 1956 meeting in Geneva, prepared the first draft of the new recommendations adopted by the Commission at that time, which provided the basis for the recommendations published in the present volume.

In recent years the Commission has received financial assistance from the International Society of Radiology, the National Association of Swedish Insurance Companies and private Swedish sources for incidental secretarial expenses. Practically all the work of the Commission has been done on a voluntary basis by its members and members of its Committees. The Commission is heavily indebted to them for their efforts and to their parent organizations for technical and secretarial help. The World Health Organization contributed funds for travel expenses of some members of the Publication Committee, for secretarial help and for incidental expenses in the preparation and circulation of the manuscripts. The Commission takes this opportunity to express its deep appreciation of these

contributions, without which the preparation of the present recommendations would have been greatly hampered.

The chairman of the Publication Committee and the Temporary Secretary wish to thank the members of the Commission for their cooperative and prompt replies to the numerous questionnaires and ballots that had to be circulated in the course of preparing the final manuscript. Thanks are due also to the members of the Publication Committee who prepared the first two drafts.

The Commission is happy to announce that the Pergamon Press has generously assumed financial responsibility for the publication and distribution (at modest prices and without copyright restrictions) of the present volume and others in preparation embodying the reports of the Commission's Committees.

ROLF M. SIEVERT

Chairman of ICRP

GIOACCHINO FAILLA

Vice-Chairman ICRP

Chairman of Publication

Committee

ORGANIZATION

Rules Governing the Selection and Work of the International Commission on Radiological Protection

(1) The International Commission on Radiological Protection (ICRP) functions under the auspices of the International Congress of Radiology. The following rules, amended in 1953 by the International Executive Committee (IEC) of the Congress, govern the selection and work of the ICRP.

I. (a) The International Commission on Radiological Protection (ICRP) shall be composed of a Chairman and not more than 12 members. The selection of members shall be made by the International Executive Committee (IEC) from a list of nominations submitted by the national delegations and by the International Commission on Radiological Protection itself. Members of the ICRP shall be chosen on the basis of their recognized activity in the fields of radiology, radiation protection, physics, biology, genetics, biochemistry, and biophysics, without regard to nationality.

(b) The members of the ICRP shall be selected during one International Congress to serve through the succeeding Congress. Not less than two, but not more than four, members of the ICRP shall be changed at each Congress. In the intervening period a vacancy caused by conditions beyond the control of the IEC shall be filled on the recommendation of the ICRP.

(c) In the event of a member of the ICRP being unable to attend the ICRP meetings, a substitute may be selected by the ICRP as a temporary replacement. Such a substitute member shall not have voting privileges at the meetings unless specifically authorized by the IEC.

(d) The ICRP shall be permitted to invite individuals to attend its meetings to give special technical advice. Such persons shall not have voting privileges, but may ask permission to have their opinion recorded in the minutes.

II. The continuance of the records of the ICRP shall be in the hands of a Secretary of the ICRP elected by the ICRP from among its regular members and subject to the approval of the IEC.

III. The ICRP shall familiarize itself with progress in the whole field of radiation protection. The Secretary shall be responsible for the preparation of a programme to be submitted to the Commission for discussion at its meetings. Preliminary reports shall be prepared and circularized to all members of the ICRP and other specially qualified individuals at least six months before the meeting of the Congress.

IV. The Chairman shall be elected by the ICRP during one Congress to serve through the succeeding Congress. The choice shall not be limited to the country in which it is proposed to hold the succeeding Congress.

V. Decisions of the ICRP shall be decided by a majority vote, with the Chairman casting the deciding vote in case of a tie. A minority opinion may be appended to the minutes of a meeting if so desired by any member and upon his submission of same in writing to the Secretary.

Policy of the Commission

(2) The policy adopted by the ICRP in preparing its recommendations is to deal with the basic principles of radiation protection, and to leave to the various national protection committees the right and the responsibility of introducing the detailed technical regulations, recommendations, or codes of practice best suited to the needs of their individual countries.

(3) The Commission's recommendations have been kept continually under review in order to cover the increasing number and scope of potential radiation hazards, and to amend safety factors in the light of new knowledge concerning the effects of ionizing radiations.

Official Relations with the World Health Organization

(4) In accordance with rules laid down by the World Health Assembly for the admission of non-governmental organizations into official relations with the World Health Organization, such relations were established between the ICRP and WHO in 1956 and were reaffirmed in 1958. This arrangement has been eminently satisfactory to the Commission and it is hoped that it will continue.

Composition of the ICRP and Its Committees

(5) During the preparation of these recommendations the ICRP has had the following composition:

Main Commission

1953–1956

Sir ERNEST ROCK CARLING, Chairman (Great Britain)
 W. BINKS, Secretary (Great Britain)
 A. J. CIPRIANI (Canada)
 G. FAILLA (U.S.A.)
 H. HOLTHUSEN (Germany)
 J. C. JACOBSEN (Denmark)
 R. G. JAEGER (Germany)
 W. V. MAYNEORD (Great Britain)
 K. Z. MORGAN (U.S.A.)
 R. M. SIEVERT (Sweden)
 R. S. STONE (U.S.A.)
 L. S. TAYLOR (U.S.A.)
 M. TUBIANA (France)

1956–

R. M. SIEVERT, Chairman (Sweden)
 G. FAILLA, Vice-Chairman (U.S.A.)
 W. BINKS, Secretary* (Great Britain)
 L. BUGNARD (France)
 H. HOLTHUSEN (Germany)
 J. C. JACOBSEN (Denmark)
 R. G. JAEGER (Germany)
 W. V. MAYNEORD (Great Britain)
 K. Z. MORGAN (U.S.A.)
 R. S. STONE (U.S.A.)
 L. S. TAYLOR (U.S.A.)
 E. A. WATKINSON (Canada)
 Sir ERNEST ROCK CARLING, Chairman emeritus (Great Britain)

* Mr. BINKS resigned as Secretary in 1957, for health reasons. After his resignation E. E. SMITH (Great Britain) served as Acting Secretary, and since August 1, 1957, B. LINDELL (Sweden) has served as Temporary Secretary.

Committee I (Permissible dose for external radiation)

1953–1956

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 L. BUGNARD (France)
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Committee II (Permissible dose for internal radiation)

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F. WACHSMANN (Germany)

*Committee V (Handling of radioactive isotopes and disposal
of radioactive waste)*

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RECOMMENDATIONS OF THE COMMISSION

A. PREFATORY REVIEW

(1) Prior to the Geneva meeting of the Commission in April 1956, permissible levels of exposure to ionizing radiation had been expressed in terms of a dose in a rather short

interval of time (1 day or 1 week), that is, essentially, in terms of an average dose rate—the average referring to the temporal distribution of the dose in the specified interval of time. Implicitly, if not explicitly, it was assumed that

* From March, 1958