

CONTENTS

SUMMARY AND CONCLUSIONS.	1
Risk of Somatic Effects from Radiation, 3	
Risk of Genetic Effects from Radiation, 6	
I INTRODUCTION.	9
II SCIENTIFIC PRINCIPLES IN ANALYSIS OF RADIATION EFFECTS.	15
Physical Aspects of the Biologic Effects of Ionizing Radiation, 18	
Application of Dose-Response Functions to Observed Data, 27	
Biologic Factors in Radiation Effects, 29	
Epidemiologic Studies as the Basis of Risk Estimates for Effects of Ionizing Radiation, 33	
III SOURCES AND RATES OF RADIATION EXPOSURE IN THE UNITED STATES.	43
Natural Background Radiation, 45	
Radiation in the Healing Arts, 51	
Production and Use of Nuclear Energy, 65	
Research Activities, 71	
Consumer and Industrial Products, 79	
Miscellaneous Sources, 79	
Summary, 81	
IV GENETIC EFFECTS	91
Introduction and Brief History, 93	
Advances in Knowledge since 1972, 96	
What Kind of Genetic Damage Does Radiation Cause?, 96	
Could an Increased Mutation Rate Be Beneficial?, 101	
Radiation Exposures of Genetic Importance, 102	
Methods of Estimating the Genetic Risks from Radiation, 104	
Discussion, 116	
Summary, 118	
Notes, 121	
V. SOMATIC EFFECTS: CANCER.	181
Summary and Conclusions, 184	
General Considerations, 197	
Estimating the Total Cancer Risk of Low-Dose, Low-LET Whole-Body Radiation, 226	
Statement Concerning the Current Version of Cancer Risk Assessment in the Report of the Advisory Committee on the Biological Effects of Ionizing Radiations (BEIR III Committee), by Edward P. Radford, 287	
Separate Statement--Critique of BEIR III, by Harald H. Rossi, 315	
Comments on Certain Divisive Issues Noted in BEIR III, by Edward W. Webster, 321	
Appendix A--Site-Specific Data Concerning Radiation-Induced Cancers, 325	
Appendix B--Review and Analysis of Selected Studies on Record, 553	
VI SOMATIC EFFECTS: EFFECTS OTHER THAN CANCER	577
Summary, 579	
Early Development, 580	
Fertility, 594	
Cataracts, 600	
Aging, 602	
GLOSSARY	625

