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MEETINGS

Radiation Biology of the Fetal and Juvenile Mammal

In his introductory talk at a symposium on the radiation biology of the fetal and juvenile mammal, T. R. Noonan (University of Tennessee-AEC Agricultural Research Laboratory at Oak Ridge) traced the general development of this subject since 1953, when a major symposium was held in Oak Ridge on the effects of radiation on embryonic development. Research areas that were only beginning to be of interest at that time have since assumed major importance. Changes in approach by investigators became increasingly apparent as the symposium progressed.

The opening session was concerned with cross-placental transfer of radionuclides. There were several reports on quantitative measurements of this transfer, including papers on the dynamics of transfer and the relative ease of passage of related materials. Studies in which the radiation dose to the fetal animals was calculated after administration of radionuclides to the dams were reported. Sufficient information has become available for some nuclides to permit estimates of the radiation dose to the human fetus after exposure of pregnant women. In other studies, it was possible to separate the role of the fetus from that of the placenta.

The metabolism of inorganic elements by the neonatal organism and the changes that occur during maturation were considered. The accumulation of environmental ^{90}Sr in the teeth of children was reported. Some of the factors affecting strontium retention in newborn swine were considered. Several workers reported on the comparative utilization of various alkaline earths and on age-related differences in the metabolism of a number of minerals, including cesium, cerium, and zinc.

Interest in the effects of continuous or fractionated radiation on the perinatal animal was evident in the session on radiation effects in the fetus. Related to this were papers on the effects of the continuous infusion of tritiated thymidine and on the role of dose rate. Studies on the neurological and behavioral effects of prenatal irradiation were reported, as well as effects on the heart, vascular system, gonads, and thyroid.

Papers on the long-term effects of radiation of the intrauterine or neonatal animal were presented at a session on perinatal radiation effects. A number of

the factors that influence the response of the perinatal animal to radiation were discussed. Several reports, based on autoradiography studies, were presented on the effects of radiation on cell proliferation. The relation between age and radiosensitivity was studied by measuring the size and intrinsic sensitivity of the population of stem cells in the bone marrow of animals of various ages. Several groups reported differences in the radiosensitivity of various systems and organs in animals of different ages.

General aspects of the studies on the Marshall Islanders exposed to fallout were described by R. Conard (Brookhaven National Laboratory). More detailed results on the status of the children exposed in this incident were presented in a session in which the results observed in several irradiated human populations were considered. An analysis of the age factors in thyroid carcinogenesis in the Japanese populations exposed to the atomic blasts was presented. Other reports included a review of the progress in follow-up studies of children who received diagnostic x-rays during intrauterine life and a consideration of the importance of the latent period in the interpretation of the epidemiology of radiogenic cancer following exposure of the pre-natal human. Recent changes in the rate of decline in the incidence of neonatal mortality and childhood leukemia were correlated with fallout from atomic weapons testing. A number of investigators took strong exception to the suggested correlation and thereby initiated a vigorous discussion as to the validity of the epidemiological approaches employed and of the interpretations.

In a session devoted to the effect of radiation on the immature central nervous system, the reports included determinations of the differential radiosensitivity of various anatomic and functional loci in the brain and studies of the fine structural changes observable by electron microscopy. Other investigators described the reproductive integrity of cells, as measured by thymidine incorporation, and cellular recovery, as measured by split-dose radiation techniques. A comparison was made of the effects of localized radiation and surgical ablation of localized areas of the cerebellum on the development of motor function. Several groups reported effects of radiation on the biochemistry of the brain, including changes in nucleic acids, enzymes, and lipids.

The final session, on mechanisms, commenced with a review of the molecular events which might be altered by radiation. This was followed by a consideration of the role of the hormonal environment on the radiosensitivity of oocytes and by several papers suggesting alterations of enzymes and of proteins as possible mechanisms for the differential radiosensitivity of the immature organism. The symposium ended with a discussion of the relative importance of radiation damage to inductor and competent tissues in the response of the embryo.

An increasing tendency toward quantitative experimentation and the impact of modern concepts in biology on the study of radiobiologic phenomena was particularly notable. It was evident that there is continuing effort to understand the mechanisms and processes of normal development underlying the many experiments with radiation and radioactive material.

The symposium was held in Richland, Washington, 5 to 8 May, under the sponsorship of the Battelle Memorial Institute Pacific Northwest Laboratories and the U.S. Atomic Energy Commission. Approximately 150 scientists, representing 11 countries, participated in the meeting. Approximately 65 papers were selected from those submitted, to provide a coherent development of the field. The texts and related discussion are available as the *Symposium Proceedings*, from the Clearing House for Federal Science and Technological Information (National Bureau of Standards, Springfield, Va. 22151).

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Forthcoming Events

April

16-18. Carnahan Conf. on **Electronic Crime Countermeasures**, 4th annual, Lexington, Ky. (J. S. Jackson, Electrical Engineering Dept., Univ. of Kentucky, Lexington 40506)

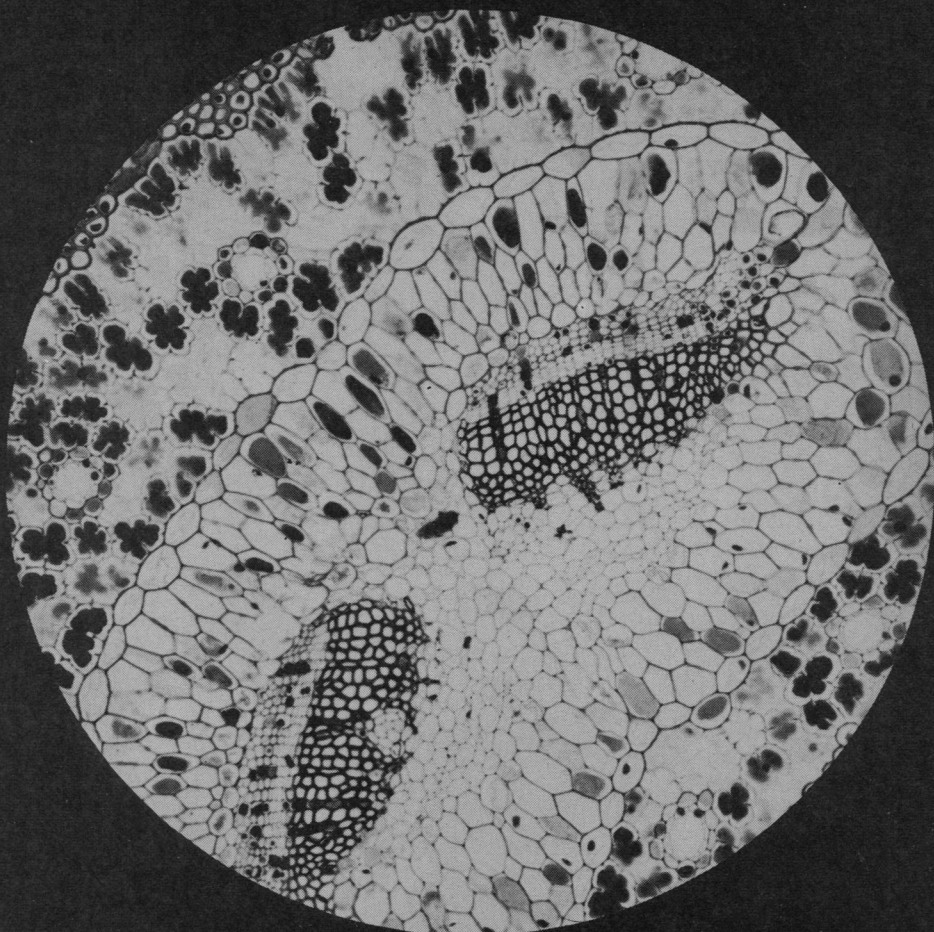
20-23. Southwestern **Surgical Congr.**, Dallas, Tex. (J. A. Barney, 301 Pasteur Medical Bldg., Oklahoma City, Okla. 73103)

20-24. American **Geophysical Union**, Washington, D.C. (W. E. Smith, AGU, 2100 Pennsylvania Ave., NW, Washington, D.C. 20037)

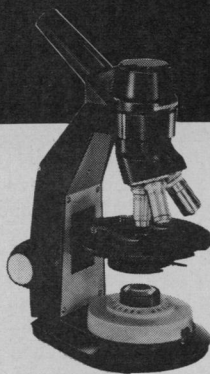
21-23. **Aerospace Nuclear Applications**, Huntsville, Ala. (A. D. Smith, American

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