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QUARTERLY REPORT

FEBRUARY, MARCH, AND APRIL 1951

DIVISION OF BIOLOGICAL AND MEDICAL RESEARCH

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Health and Biology

ARGONNE NATIONAL LABORATORY
P. O. Box 5207
Chicago 80, Illinois

DIVISION OF BIOLOGICAL AND MEDICAL RESEARCH

QUARTERLY REPORT, FEBRUARY, MARCH, APRIL, 1951

Editor,
Austin M. Brues, Director, Division of Biological and Medical Research

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ERRATA

p. 5.	Under Microbiology
	Paramecium aurelia - A in aurelia should be lower case
p. 32.	Paragraph 1, line 1, 39 experiments
p. 47.	Last figure under survival % - 40
p. 53.	Literature Cited. Schreh should be Schrek
p. 140.	#4 under Literature Cited. L. O. Jacobson.
	Delete p. 47 should be 47 pp.
p. 163.	#13, line 2, Proc. Soc. not J. Soc.
p. 172.	Paragraph 2. Journal should read Ber.

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Administration

Austin M. Brues, Director
Hermann Lisco, Associate Director
Leonidas D. Marinelli, Associate Director
E. Lawrence Powers, Associate Director
Rosson L. Cardwell, Assistant to the Director

BUILDING PROGRESS

Work is proceeding rapidly on Building 202. Structural steel work is completed for some parts of the building, first floor slabs have been poured in three of the wings, and second floor forms are almost complete for two of them.

STAFF ACTIVITIES

Dr. Austin M. Brues has been appointed special consultant to the United States Public Health Service, acting as a member of its Committee on Radiation Studies.

Dr. Theodore N. Tahmisian has been elected chairman of the zoology section of the Illinois Academy of Sciences for the year 1951-1952.

PERSONNEL CHANGES

Mr. Vladimir Clemens, associate scientist and former group leader of the Radiation Physics Group, resigned in March. His principal field of interest was dosimetry and instrument development for the physical measurement of radiation effects on biological material.

Mrs. Leola Rietz, who had assisted Dr. Brues in research in experimental cytology, resigned at the end of April.

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Radium Toxicity Program

Robert J. Hasterlik
Leonidas D. Marinelli
Austin M. Brues
William B. Looney
William P. Norris
Andrew H. Stehney
Charles E. Miller

RADIUM TOXICITY: CLINICAL STUDIES ON 24 PATIENTS

W. B. Looney

ABSTRACT

Our clinical studies include a history, physical examination, complete skeletal X ray, complete dental X ray and dental consultation, complete blood count, differential and sedimentation rate, urinalysis, serum calcium, phosphorus, and alkaline phosphatase, and Kahn for each of 24 patients.(1)

Preliminary determinations have been made on patients at Elgin State Hospital. Of the ten patients on whom we have made X-ray studies, three show changes that are compatible with the diagnosis of "radium necrosis."

Nine of ten patients studied in the Chicago area have had complete skeletal X rays. Seven of these patients have an estimated total-body radium content of 1 μg or more, and all seven have changes compatible with the diagnosis of "radium necrosis."

Bone specimens have been obtained in three of these patients, and the radium and calcium contents and their correlation with the physical estimates will be presented. Histological sections were obtained in two cases.

One case had a fibrosarcoma of the left foot with an estimated total-body radium content of 1.9 μg.

LITERATURE CITED

1. Looney, W. B. 1951. Radium toxicity program: Clinical studies on 24 patients. ANL-4666.

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PROGRESS REPORT: STUDIES OF THE EFFECTS OF IRRADIATION ON CONNECTIVE TISSUE

F. Wassermann

ABSTRACT

The effects of irradiation on the submicroscopic structures demonstrated during electronmicroscopic investigations of connective tissue are being studied. This program will be extended to include observations of the formation of connective tissue fibrils, growth, and differentiation of connective tissue under the influence of irradiation. Experiments on regeneration of rat tendons are currently under way. The sequence of changes in the regenerating tissue has been established as a basis for evaluation of irradiation effects.

In addition to the work on intercellular structures, the cell population of the connective tissue is being studied in mice following exposure to total-body X radiation. A decrease in the eosinophilic granulocytes, which are numerous in the tissues of rats and mice, was found to follow irradiation. The decrease in the number of histiocytes appears to be related causally to the disappearance of the granulocytes. A combination of total-body irradiation and vital staining was used to elucidate these changes. It appears that the fibrocytes in irradiated animals accumulate a greater amount of trypan blue than those observed in the tissue of control animals. The reticulo-endothelial system, in general, was not found to be impaired following irradiation as far as the reaction of histiocytes, expecially of the Kupffer cells in the liver, was concerned.

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