STANDARD FORM NO. 64

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TO : John Z. Bowers JZB Circulate + to S Warner

DATE: April 7, 1949

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FROM : L. W. Tuttle LWT

SUBJECT: REPORT ON ACTIVITIES AT BERKELEY, CALIFORNIA, ON MARCH 28, 1949

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Conferences with Drs. John Lawrence, Harden Jones, C. Tobias and G. G. Hamilton disclosed that the following programs are now being carried out at Donner and Crocker Laboratories. Laboratory investigations are being made in a number of fields. As representative of the scope of work presently carried on, there are listed below some of the various problem groups:

Biological Effect of Cyclotron Radiations Using 190 Mev Deuterons and 380 Mev Alpha Particles

1. Study of the specific ionization, straggling and scattering of the particles.

2. Dosimetry for protons, deuterons, and alpha particles.

3. Biological effects studies as a function of the specific ionization.

   a. Chromosomal effects studied as a function of the specific ionization.

   b. Lethal effects on B and $\frac{B}{r}$ strains of Escherichia coli.

4. Effect of deuterons and alpha particles on water.

5. Lethal effects on mice.

6. Therapeutic irradiation of mouse tumors.

Study of Hematopoiesis

1. The mechanism of hemoglobin synthesis using radioactive iron.

2. The effects of X-radiation on hemoglobin synthesis.

3. The role of calcium in blood clotting using radioactive calcium.

4. The role of cobalt in the etiology of polycythemia.

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Basic Studies on the Metabolism of C^{14} Labelled Compounds (H.Jones)

1. Methyl labelled acetate.
2. Carboxyl labelled acetate.
3. Pyruvate methyl and carboxyl labelled.
4. Formate methyl and carboxyl labelled.
5. Propionic acid methyl and caroxyl labelled.
6. Glycine methyl and carboxyl labelled.
7. Phenylalanine 3rd and carboxyl labelled each separately.
8. Tyrosine.
9. Glucose.
10. Carboxyl labelled lactate.

Distribution of various Radioactive Colloids and the Physiology of Deposition (H. Jones)

1. Colloids concentrating in liver and spleen
2. Colloids concentrating in bone marrow.
3. Methods of infusing colloids into the lymphatic tissues.

Neutron Activation Analysis of Tissues (C. Tobias)

1. Methods of techniques.
2. Trace elements in human blood
3. Trace elements in nuclear matter vs. cytoplasm in normal and neoplastic tissues.

Radiation Effects on Bacteria.

Correlation of radiation sensitivity with morphology, age, strain, and conditions of irradiation using ultraviolet lights, x-rays, and deuterons (also see above).

Health Radiation Protection

1. Systematic study on project personnel and hematological data
2. Clinical study of patient suspected of Be poisoning.
3. Planning of the study of radiation effects on the eye.

Study of Long Range Effects of Radiation on human Beings Treated with Radioactive Isotopes

Studies on the effect of Hormones on Radiation Sensitivity in Animals

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Rather intriguing experiments were carried out on parabiotic rats. It was found that parabiosis offered protection again 900 r of x-radiation administered to one rat, with the other shielded.

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However, both rats epilated suggesting a chemical mechanism by which radiation damage may be transmitted. Dr. Jones, in addition, has found that after lethal amounts of radiation had been administered to rabbits a turbidity appears in the blood serum. This turbidity is caused by lipodial material and is apparently related to the lethality of the dose administered. This offers promise as a diagnostic aid in determining which subjects have received lethal amounts of radiation and which have not.

Dr. D. M. Greenberg of the Biochemistry Department is carrying on investigations of the cancer problem from the point of view of administering amino acid antagonists. It has been found that the administration of ethionine inhibits uptake of labelled methionine by tumors. Dr. Greenberg expressed some interest in the possibility of obtaining A.E.C. support for this work.

Dr. I. L. Chaikoff who is a physiologist with considerable experience in endocrinology and lipoid metabolism has been using P-32 and i-131 in endocrine studies. He expressed slight interest in possible A.E.C. support

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