

US DOE ARCHIVES
326 US ATOMIC ENERGY COMMISSION
RG _____
Collection *Division of Biological Medicine*
Activities of Biological and Medical Research Group of Health Division
Box _____ Los Alamos Scientific Laboratory
Folder *8*

711910

Wright H. Langham

The research activities of the Biological and Medical Research Group (H-4) are directed along three general lines which are listed below in the order of importance:

1. Problems concerning the acute effects of radiation and the radioactive materials which are of special interest to the Los Alamos Scientific Laboratory and of general interest to the AEC.
2. Problems which may be done at Los Alamos in preference to other places because of the availability of many special pieces of equipment which are unique to the Los Alamos Scientific Laboratory, such as critical assemblies and various types of particle accelerators.
3. Problems of the more basic nature which utilize radiation, radioisotopes and radiochemical techniques.

The group consists of approximately 40 people of which 18 are staff members and the rest technicians and clerical personnel. For purposes of organization, personnel are divided into five separate sections. These sections and their general functions are as follows:

1. Radiobiology -- During the past few years the efforts of the Radiobiology Section have been directed toward:

a. Studies of the relative biological effects of radiations of different types and different energies using mammalian systems. The criteria of biological effectiveness which have been employed include lethality studies, survival studies, incidence of cataract formation, rate of uptake of Fe⁵⁹ by red blood cells, effect of radiation on organ weight and the effects of radiation on mitotic activity.

b. Effects of massive doses of radiation on physiology and performance of rats, mice and monkeys. In this study dose rates up to 10,000 r/min have been employed and total radiation doses of the order of 200,000 r have been delivered.

c. Studies of inhalation hazard of flying through an atomic cloud within a few minutes after bomb detonation.

2. Radiopathology -- Much of the effort of the Radiopathology Section has gone into detailed studies of the pathology, biochemistry, enzymology, physiology and treatment of acute beta radiation injury. Other studies have included the pathology of massive rapid doses of gamma radiation on mammalian systems and the characteristics of acute beta radiation burns in domestic animals.

FOR OFFICIAL USE ONLY

3. Organic Chemistry --The Organic Chemistry Section has been concerned with the synthesis of biologically and medically important compounds labeled with radioactive isotopes. A specific example is the recent synthesis of isonyazid (the anti-tuberculosis drug) labeled with C^{14} . The group has also synthesized numerous special compounds of specific interest to other groups and divisions of the Los Alamos Scientific Laboratory.

4. Biochemistry -- The principal programs of the Biochemistry Section of Group H-4 have been essentially as follows:

- a. Studies of cholesterol metabolism using C^{14} and tritium labeled materials.
- b. Metabolism of drugs, vitamins and other biologically important materials using isotopically labeled compounds and radiochemical techniques.
- c. Toxicology and physiology of materials of special interest to the Los Alamos Scientific Laboratory.
- d. The role of ethylenediaminetetra acetic acid (EDTA) and other chelating compounds in the therapy of heavy metal poisoning.
- e. The mode of action of isonicotinic acid hydrazid on bacteria.
- f. The effect of radiation on red cell cholinesterase.
- g. The effect of radiation on the physical properties of heavy molecules such as nucleic acids and plasma proteins.

5. Biophysics Section -- During the past several months the Biophysics Section has been engaged in the synthesis of organic scintillators and studies of liquid and solid scintillating materials, the development of scintillation counting of C^{14} and tritium, radiation dose measurements at very high dose rates and the application of solution scintillators to large scale radiation detecting devices.

Oct. 15, 1953

NOV 1953