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statements confirm findings Academy of Sciences. Japanese Grant Taylor, and genetics. axposed. Atta the Co to atomic Dr. Director Taylor A Title Limorate (LECC) clinical investigations eatlefactorily, and Hational of loukenia,

# Test Activities (Jangle)

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DEPARTMENT OF ENERGY DECLASSIFICATION REVIEW

SINGLE REVIEW AUTHORIZED BY:

DETERMINATION [CIRCLE NUMBER(S)]

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Delta (Utah), and Idaho Falls (Idaho). The highest values of activity in the air were found at Elko, where 0.18 microsurie per cubic meter of air was observed about 8 hours after the surface shot. The twenty-four hour average was about 0.003 microsurie per cubic meter. The safe level agreed upon by the Feasibility Committee (July report) was 1.0 microsurie per cubic meter. Hence observed levels failed to approach permissible levels.

In addition to the above close-in monitoring of fall-out primarily for safety reasons, a country-wide monitoring program was also in effect through the coordinating activities of the Health and Safety Division, NYOO, and the cooperation of AEC laboratories and contractors and the Weather Bureau. Results of this study will be reported later, but none of the observations indicated hazardous levels of radioactivity anywhere in the country.

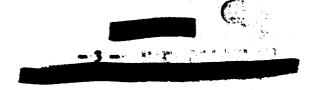
Analysis of Soils Samples. Analysis of sail samples collected from the fall-out from the surface and underground burnes at the Negada Test Site has provided useful data for the evaluation of the over-all health hazards of atomic explosions. Deposition of radioactive particles on the land and absorption by plants is the beginning of a major pathway for uptake by man of fission products and induced radioactive elements.

Additional samples of the dirt and fused glass of sodium, potassium and calcium silicates around the surface site crater have also been collected. This material has been sent to the AEC project at the U. 3. Department of Agriculture at Beltsville, Maryland for chemical and particle size analysis and for studying its rate of uptake by plants growing in various soils. Minute particles of the fused soil constitute an appreciable portion of the radioactive dust sloud and it is desirable to know its solubility and rate of solubilisation on various soils, especially eastern seid ones. Previous test of the fall-out on the soil from around the old Alamogordo test crater in New Maxico had indicated that the radioactivity was taken up by the plants very slowly over a period of several years. However, the western desert soil has an alkaline character while eastern soils are predominantly acid. It is known that glass silicates are many times more soluble in slightly acid solutions. Therefore, it is desirable to obtain more information on the rate at which radioactive fall-out will be absorbed by plants from dust from an underground explosion.

Study of long-range effects. The study of long-range effects which may result from the detonation of a large number of atomic bombs was begun several years ago. During the past few months, the question was again subjected to careful scrutiny in the light of new information gleaned from recent bomb tests, and a revised report was prepared. In Movember, this report and the various questions of climatology, fall-out and biological effects of bomb debris were carefully considered by an ad hop committee of

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appropriate specialists assembled by the Division of Biology and Medicine. This committee agreed in essence with the conclusions of the reports, and went on to consider short-range effects as well. Results of the study to date are being summarised, and further studies are planned should they be required.

(End of Secret)

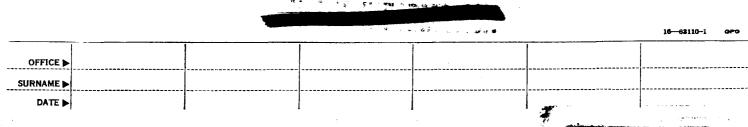
### Shelter Design Criteria (Companyatiat)

A prototype shelter was designed by the Civil Befense Linison Branch and was tested during Operation Buster in the fall of 1951. In the design of the shelter primary consideration was given to simplicity and economy and to optimum salvage value.

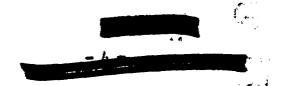
In order to obtain maximum test data to support theoretical design the shelter was built in two sections, each of different material and construction, to compare the relative effectiveness of each. Specifically, the structure consisted of:

- (a) 24 feet (3 8-ft lengths) of 90-inch (I.D.) enlyert pipe of standard centrifugally spun reinforced concrete, with a poured-in-place reinforced concrete ramp entrance; and
- (b) 24 feet (4 6-ft lengths) of 90-inch (I.D.) sulvert pipe of standard 10 gauge ingot iron corrugated smitiplate, with a 10 gauge corrugated smitiplate and structural steel ramp entrance.

These materials were joined at the center to form a 48-foot long shelter covered with 3 feet and 3 feet 8 inches of earth over the concrete and metal pipe respectively, with a capacity of 48 persons. The structure was located 800 feet from ground zero of shots Baker, Charlie, and Deg, and a greater distance from Shot Easy, of Operation Buster. Shots Charlie and Dog exposed it to estimated blast, radiation, and thermal effects of greater



<sup>\*</sup> L. S. Taylor, Chairman (USHBS physicist), H. M. Smith, Jr., (ORHL, author of reports), Edward Teller (LASL theoretical physicist), Joseph Kaplan (UCLA geophysicist), Leo Marinelli (AHL rediologist and health physicist), Col. Benjamin Holsman (USAF meteorologist), Sterling Hendricks (USDA soil expert), William Urry and Donald Rock (AFOAT-1), Shields Warren (Dir. BEM). This group was assisted by Dr. Sverre Petterssen of Air Weather Service and staff members of Division of Biology and Medicine, Military Application, and Reactor Development.



severity from each Shot than that at ground zero from a 20 KT atomic bomb detonated at a 2000-ft. height. The shelter successfully withstood the individual and cumulative blast overloadings with light to moderate observable damage. Final evaluation of radiation, pressure and displacement measurements will furnish valuable data for future consideration with respect to gamma radiation, reflected static pressures from shock fronts, and dynamic overpressures, or wind drag, inside the shelter and their effects on occupants.

The data obtained from this test will be made available to the FCDA for review and study, and its applicability to divil defense practices for protective measures. (End of Confidential)

### Instrument Loan Program (Unclassified)

Instruments were provided for FCDA for use in the three touring exhibits, the "Alert America Convoys." These convoys have been prepared and are operated by the Valley Porge Foundation for FCDA.

### Effect of X-radiation on Chromosome Breakage.

Recent studies at Brockhaven include the effects of X-radiation on various plants. In experimenting with a lily, as a typical plant, an interesting reaction was noticed. Chromosome fragmentation occurs most frequently if the radiation is given when the dividing cells are at the diplotene stage, immediately preceding the actual division of the cell nucleus. It has been found that nucleic acid (DMA) is actively synthesized up to that time, and then remains constant. Thus it is believed that chromosome breakage, or mutation, is associated with DMA synthesis, even though this is not the only factor in radiosensitivity.

### Protective chemicals to living cells.

The protective action of certain chemicals against irradiation damage to living cells continues to be a subject of major interest at ORNL. High exygen concentration is directly related to death by X-irradiation, and most shemicals which give increased protection against radiation damage are exidisable compounds. Recent work has shown how this protective action results. It is shown that these protective chemicals remove exygen from within and around bacterial cells, and this decreases the concentration of toxic substances formed by the action of X-rays.

### Radiation Instruments Catalog.

Preparation of the 1952 edition of the Radiation Instruments Catalog has been initiated. The new issue will be about one third the present size and will represent a considerable savings in publication costs and an improvement in format.

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### Ra-Det.

The Movember issue of Ra-Det will include as its feature articles, a report on a tritium air monitor developed at Los Alamos Mcientific Laboratory, and a progress report on the development of the special photomultiplier tubes at RCA Laboratories under AEC contract.

Both of these items have been of interest to ANC personnel as well as to other governmental agencies, and the articles provide considerable factual data.

### Visitors to Sadiation Instruments Branch.

In November, the RIB received fifteen visitors from the following organizations: Ericson Research Laboratory, Radio Corporation of America Research Laboratory, Westinghouse Atomic Energy Laboratory, El-Tronics; Inc., Beckman Instruments, Inc., Muclear Instruments and Chemical Corporation, Landsverk Electrometer Company, Office of Maval Research, Navy Department Bureau of Aeronautics, Princeton University, and the Mational Bureau of Standards. (End of Unclassified).

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