MEETING OF JOINT PANEL ON MEDICAL ASPECTS OF ATOMIC WARFARE

September [illegible] 1952

Los Alamos, New Mexico

Tuesday, Sept. 2 Morning

9:00 to 9:30: Welcome to the Laboratory and Description of Los Alamos Facilities and the Los Alamos Program - Dr. Norris E. Bradbury, Director, Los Alamos Scientific Laboratory

9:30 to 10:00: Comments on Test Programs, Past and Future - Dr. Alvin C. Graves, Test Director and Leader, J-Division

10:05 to 10:45: The Absorption, Distribution, and Excretion of Tritium in Laboratory Animals and Man - Lt. Col. Ernest A. Pierson (USAF)

10:50 to 1:[illegible]: The Pathology, Physiology, Biochemistry and Treatment of Late Ray Burns - Dr. Clarence C. Lushbaugh

Afternoon

1:30 to 2:[illegible]: Relative Biological Effectiveness of Thermal Neutrons - Capt. Wayne C. [illegible] (USAF MC)

2:20 to 2:50: The Cataractogenic Effects of X Rays and Thermal Neutrons - Dr. [illegible]

Intermission

3:00 to Adjournment: Studies on the Effects of Massive, Rapid Doses of Gamma Rays on Animals - Dr. [illegible] H. Langham

Wednesday, Sept. 1[illegible] [illegible]

9:00 to 9:30 [illegible] Division Activities – [illegible] Health Division

9:30 to 10:[illegible] [illegible] Thomas [illegible] White

10:00 to 10:[illegible] [illegible] Cloud – Mr. [illegible]

[illegible]

10:[illegible] to [illegible] Tests – [illegible]

11:[illegible] to [illegible] (U[illegible])

[illegible] to [illegible] (U[illegible])

[illegible]

[illegible]

[illegible] Bend.

[illegible] [illegible]

[illegible] Bend.

Afternoon

[illegible] buildings (CM[illegible]), [illegible] Building, [illegible]

(Certain [illegible] Alamos [illegible] afternoon, [illegible] until Saturday [illegible] or even [illegible].)

ABSTRACT

RAD SAFE PROBLEMS AT TESTS

Thomas N. White, Ph. D.
Leader, H-5, Radiological Physics Group

A discussion of some of the continuing problems of radiological safety at nuclear field tests:

1. How to ascertain the requirements of the experimenters early enough to build the right rad safe unit.
2. What are sensible levels for maximum permissible contamination?
3. What proportion of inexperienced personnel can a rad safe unit risk carrying, and how much preoperational training is needed?
4. What are the minimum requirements for continuity from test to test in personnel for the more responsible positions in the unit?

Criticism of the following proposal is invited: that future rad safe units be set up in such a way that they can concentrate wholly on the task of providing radiological safety; that the training mission be officially recognized as a separate program operating under its own director.

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STUDIES OF FALLOUT FROM A JET CLOUD

Harry P. Schulte, M. S.
Leader, H-5, Industrial Hygiene Group

(Presented by William S. Johnson, Industrial Hygiene Engineer, H-5)

Studies of fall-out outside the boundaries of the Nevada Proving Ground are conducted for a variety of reasons including:

1. Public relations.
2. The unknown potential health hazards to both humans and animals.
3. As a check on meteorological predictions.
4. To gain information on the physical nature of fall-out.

The actual fall-out material consists of various combinations of fission products, tower materials, and soil, some of the latter two containing induced radioactivity. The fission products may be loosely adherent to the other materials or may be completely fused into them.

Air concentrations, particle size distribution, and surface contamination levels of radioactive materials have been measured at distances from 10 to 200 miles from ground shots of Operation Upshot-Knothole, Buster Jangle, and Tumbler-Snapper. The location of areas of high air concentration agrees fairly well with predictions with enough exceptions, however, to warrant use of a considerable safety factor. Generalizations to permit predictions of concentration and radiation levels from meteorological forecasts are extremely dubious, but certain undesirable weather patterns are beginning to be recognized.

In general, locations where high air concentrations are obtained are also usually areas of high surface contamination. However, no quantitative relationship exists between these two conditions. With light winds, small particle size material may remain suspended in air for many hours in a given

location without producing appreciable ground contamination. The percentage of airborne activity carried on particles smaller than 10 microns, and hence respirable, may be as low as 20% but is usually greater than 90%. Surface contamination levels for tower shots are greater than on air drops, but air concentrations are of the same order of magnitude for all types of shots.

Decay curves on material collected from the air or on the ground many miles from ground zero parallel those for material collected in the zero area.

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ABSTRACT

BIOLOGICAL EFFECTIVENESS OF NEUTRONS FROM AN ATOMIC BOMB

LTJG Robert E. Carter, USN

In this presentation the acute effects of neutron radiation from nuclear weapons were discussed. The combined data from two nuclear weapon tests were given. While the high classification placed on weapon characteristics essential to the interpretation of biological results precludes their detailed summary in this abstract, the following general statements may be made. A high degree of correlation between biological measurements and physically measured neutron flux existed in both experiments. Biological and physical data indicate that with the exposure apparatus used, the animals showed 90% of the total effect they would have demonstrated had they been exposed to only the total neutron spectrum from nuclear weapons in free air. Contaminant gamma radiation in the exposure area was considered to have caused no more than 5% of the total biological effect seen. The combined data appeared adequate for predicting the total REM of neutron radiation received by a small animal exposed to the total neutron spectrum when the flux of high energy neutrons was known. Measurements made with several biological test systems were presented and the effects of neutron radiation on acute lethality and several organ systems were discussed. Data on the combined effects of bomb neutron and gamma radiation were given and the contribution which neutron radiation can make to the total ionizing radiation biological effect under a variety of circumstances discussed.

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ABSTRACT

THE PENETRATION OF ATOMIC BOMB CLOUDS BY AIRCRAFT

Major Payne S. Harris, USA, MC
Radiobiology Section, H-4, Biomedical Research Group

The general problem of cloud penetration by manned aircraft is a primary concern of the Air Force. Several reports on this subject have appeared. Unfortunately, these reports have been theoretical and did not utilize all available data.

From an evaluation of scattered bits of data collected during various test detonations, reasonable results have been ascertained. The data are useful in estimating radiation dose. Such estimates are necessary in attempts to answer questions on 1) immediate effects of penetration on the lowering of operational efficiency of both air and ground crews; 2) late effects of penetration on involved air crews; and 3) the effect of penetration on attack formations and associated problems.

The Sandstone and Greenhouse drone plane data, associated weather data, and kilotonnage data have been collected and analyzed to produce curves indicating possible dosage levels under operational conditions. The curves show integrated dose as functions of size and burst, time of penetration post detonation, and altitude of penetration.

Apparently the total external dose received during penetration depends upon the cloud portion penetrated as the majority of the activity is in the mushroom head or fission cloud. The results also indicate that the dose varies inversely with the cloud volume and is therefore an inverse function of cloud temperature or kilotonnage and time of penetration.

Other data from Greenhouse and Buster-Jangle have been used to evaluate internal radiation hazards which are the primary causes of late effects.

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From the data it is apparent that inhalation and ingestion of radioactive materials only become a hazard when the hazard from external dose becomes so large as to be the limiting factor in itself.

JOINT PANEL ON MEDICAL ASPECTS OF ATOMIC WARFARE

PANEL MEETING - SEPT. 8-13, 1952
LOS ALAMOS, NEW MEXICO

1. AUB, Dr. Joseph C. (Chairman)	Massachusetts General Hospital Boston 14, Massachusetts
2. BACH, Lt. Col. Sven A.	Development Branch Off. Asst. Chief of Staff, G-4 Rm 3C481 Pentagon Washington 25, D. C.
3. BEHRENS, Rear Admiral Charles F.	Staff Eastern Sea Frontier Federal Office Building 90 Church Street New York, N. Y.
4. BLOUNT, Col. Robert H	Box No. 6955 Wright-Patterson AFB Dayton, Ohio
5. BURRY, Lt. Col. William C.	Research & Development Board 3D1075 Pentagon Washington 25, D. C.
6. CARTER, Lt. (JG) Robert E.	Code 3-922 Naval Radiological Defense Laboratory San Francisco 24, California
7. COOK, Col. William F., (MC) USAF	Office of the Surgeon General, USAF Washington 25, D. C.
8. CRONKITE, CDR. Eugene	Naval Medical Center Bethesda, Maryland
9. DAWLEY, Lt. Col. John R.	Research & Development Board Committee on Atomic Energy Washington 25, D. C.
10. DeCOURSEY, Brig. Gen. Elbert	AF Institute of Pathology Washington, D. C.
11. DUNHAM, Dr. Charles L.	Division of Biology and Medicine U. S. Atomic Energy Commission Washington 25, D. C.
12. ETTER, CDR. Harry S.	Bureau of Medicine & Surgery Potomac Annex Bldg. 3 Washington 25, D. C.
13. EVANS, Dr. Robley D.	Massachusetts Institute of Technology Cambridge, Massachusetts

14.	FISHER, Dr. M. C.	Naval Radiological Defense Laboratory San Francisco 24, California
15.	FRIEDELL, Dr. Hymer L.	Western Reserve University Cleveland 6, Ohio
16.	GAGGE, Col. A. P., USAF	Chief, Aeromedical & Human Resources Div. Directorate of Research & Development Pentagon Building Washington 25, D. C.
17.	GALLER, Dr. Sidney R.	Office of Naval Research Washington 25, D. C.
18.	HAIGHT, Capt. Harry F.	Division of Military Application Washington 25, D. C.
19.	HARTGERING, Lt. Col. Jacob B.	Special Projects Division, AFSWP Washington 25, D. C.
20.	HEARNS, Maj. Gerrit L.	Office of the Surgeon General Washington 25, D. C.
21.	HEMPELMANN, Dr. Louis H.	Strong Memorial Hospital Rochester 20, New York
22.	LeROY, Dr. George V.	School of Medicine University of Chicago Chicago, Illinois
23.	McDONNEL, Lt. Col. Gerald M.	Special Projects Division, AFSWP Washington 25, D. C.
24.	MAXWELL, Col. Roy D.	Army Graduate Medical School Walter Reed Army Medical Center Washington 25, D. C.
25.	MELCHER, Col. Charles S.	Research & Development Board 3D1075 Pentagon Washington 25, D. C.
26.	MUSSELLS, Dr. Lloyd F.	Executive Director, Committee on Medical Sciences Research & Development Board 3D1075 Pentagon Washington 25, D. C.
27.	NEWELL, Dr. Robert R.	Professor of Medicine Stanford University School of Medicine Clay & Webster Streets San Francisco 15, California
28.	PEARSE, Dr. Herman E.	University of Rochester Rochester 7, New York

29.	PICKERING, Lt. Col. John E.	Department of Radiobiology School of Aviation Medicine Randolph Field, Texas
30.	PINSON, Lt. Col. Ernest A.	Air Force Cambridge Research Laboratory 230 Albany Street Cambridge 39, Massachusetts
31.	POLLARD, CDR Joseph P.	Research & Development Board 3D1075 Pentagon Washington 25, D. C.
32.	STOECKLE, 1st Lt. John D. (MC)	Committee on Medical Sciences Research & Development Board 3D1075 Pentagon Washington 25, D. C.
33.	TALBOT, Col. John M.	Box 1395 Baltimore, Maryland
34.	TERRILL, James G., Jr.	U. S. Public Health Service Washington, D. C.
35.	WOOD, Col. John R.	Office of the Surgeon General Main Navy Bldg., Room 2749 Washington, D. C.