

VERIFIED UNCLASSIFIED

H-DIVISION PROGRESS REPORT

September 20 - October 20, 1953

PUBLICLY RELEASEABLE

CS 6
PAGE(S) 22
SERIES A

REF: H-95

I. ADMINISTRATION (Thomas L. Shipman, M. D., Leader):

A. General Remarks:

H-Division had the privilege of acting as hosts to the AEC Advisory Committee on Biology and Medicine on Oct. 9 and 10. Various fields of work of the Division were described for the Committee with discussions of problems of current importance in our program. Members of the Committee were shown through the Los Alamos Medical Center, the Health Research Laboratory, the new Physics Building, and a portion of the CMR Building. On Sunday, Oct. 11, the Laboratory held Open House in the three last named buildings. These two events were taken as marking the official opening of the Health Research Laboratory. This building is now in full operation except for four biochemistry laboratories and installation of the 250 KV X ray.

The interpretation of the data from the massive exposures of monkeys to radiation is still incomplete. It seems fairly certain, however, that a dose of 5000 r can be regarded as disabling, certainly to a monkey and presumably to a human, within a period of 5 to 7 minutes after the start of exposure. Rather profound physiological changes were observed which unquestionably merit further study. Preliminary experiments are already under way to determine the effects of even higher doses of radiation on small animals. Considerable thought is being given to the possibility ultimately of utilizing the Godiva assembly for biological experiments.

Construction of the human-sized scintillation counter has started and there is intensive study on all phases of this work. Another small pilot model has been built and new scintillation systems are under study.

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In order to assist in the clarification of the cause of death of numerous sheep in areas in the general region of NPG, a study is now well under way to determine the nature of beta ray burns on sheep. So far only two animals have been studied, but the sheep is large enough so that he can be given quite a wide variety of exposures. Each animal has been irradiated with three series of burns ranging in dose from 2000 rep to 25,000 rep. In addition, there have been comparable exposures on the ears and around the mouths of the animals in an attempt to simulate some of the lesions seen on the animals in Utah.

Members of Groups H-5 and H-6 continue to devote considerable time to problems connected with test operations. The Test Operations Section of H-5 is still largely looking backward and concerning themselves with problems arising from Operation Upshot-Knothole, while the Field Test Section of H-6, working closely with Major Servis, is primarily concerned with Operation Castle. Preparations for the monitors' indoctrination course to be held at NPG are complete. The Meteorology Section of H-6, aided by the more complete and accurate data available from Upshot-Knothole, has now revised the equations for predicting cloud height so that it should be possible in the future to make this prediction within plus or minus 1000 feet.

B. Personnel: (Oct. 1 - Nov. 1)

1. New Hires:

10/19	SPALDING, John F.	H-4	Radiobiology
10/20	ALTAVILLA, Thomas G.	H-1	TA Monitoring
10/26	LARKINS, John H.	H-4	Biochemistry
10/27	SCHAEFFER, James R. (Returned from Military Leave)	H-1	Group Office
10/28	MIKLOSOVICH, Margaret	H-2	Medical Records

2. Terminations:

10/5	GEOFFRION, Robert D.	H-1	TA Monitoring
10/26	SCHUCH, Robert L.	H-4	Biochemistry
10/30	VIER, Marion C.	H-4	Biochemistry

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 (Date on authority changing classification) (Date)
 By *Green Johnson 6/21/78*
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3. Total Personnel:

SM	40
Military	3
RA	15
SCP	78
Military	1
ASC	<u>25</u>

TOTAL 162

II. GROUP H-1. MONITORING (Dean Meyer, Leo Chelius):

A. General Remarks:

1. The wrist to finger ratio for TU Shop was established with the use of finger and wrist badge correlations over an 18-week period. The average was found to be 2.23 with a standard deviation of 0.74. A wrist to finger ratio of 2 will be applied hereafter.

2. Two separate surveys were made of the Picker X-ray unit in Y-Building in preparation for establishing a routine operating procedure. By appropriate shielding it was found that exposure to the operator could be negligible.

3. Contaminated equipment within MRA was torn out and removed on Oct. 8. At present the floor needs cleaning and then removing.

4. The size of the Abner missiles has outgrown the drybox accommodations and therefore requires that a cut-off operation be conducted in the open at TA-33. The actual assembly was easily split open within the burial pit. The tuballoy section was then cut off exposing the Abner. The operators were unable to remove the Abner from its position even with force. About 9 sq. ft. of ground adjacent to the burial pit and the cut-off saw are highly contaminated. The missile was placed in a plastic bag and put back in the pit.

5. The contaminated earth over chamber No. 2 at TA-33 was successfully bulldozed into the existing crater and the area is now cleared for the planned construction.

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6. During the early days of September it was found that considerable difficulty was encountered in the north thermal column of the Omega Water Boiler. The bismuth blocks were binding, making it hard for removal, and due to activation of the bismuth, polonium contamination was detected on the floor. By Sept. 24, conditions were such that it was felt necessary to remove the offending blocks and either dispose of them or file them into shape. The floor was covered with paper, the area cleared of equipment, and protective clothing issued, so that the mechanical work could be conducted in the confined area. Unfortunately, some of the lost dust was either tracked or blown to other portions of the building, necessitating extensive janitorial scrubbing. After several days the floor was reduced to 200 c/m. No other unusual incidents occurred other than a few personal shoes that were contaminated but were cleaned successfully by the monitor. Urine results are not yet available.

7. The Ten Site cell was entered on Oct. 19 and decontaminated to a background of 50 mr/hr. Dosage was held to the average of approximately 2/3 of the tolerance in effect at Ten Site. The cell equipment is now being repaired.

8. Demolition of the D-Building area was started with the removal of Buildings D-2, D-7, and D-9. D-2 was found to be contaminated but the work was completed without overexposure to the personnel involved.

9. A series of training lectures for Group H-1 monitors was started Oct. 14. The initial series will consist of eight lectures. Additional lectures will be planned to follow if sufficient interest is shown.

10. The new densitometer designed and constructed by H-6 was received and is in operation.

11. The nuclear track film with the 100 micron emulsion has been received and turned over to H-6 for calibration. They have designed new holders and a drying rack for processing the film.

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12. Felix Vigil left for monitoring duty at Dahlgren, Va., on Sept. 28.

III. GROUP W-3, SAFETY (Roy Reider):

A. <u>Accident Record:</u>	<u>Jan. 1 to Oct. 1, 1953</u>	<u>1952</u>
Man-hours Worked	3,910,184	5,985,003
Number of Disabling Injuries	10	18
Number of Days Lost	138	199
Frequency (Accidents per 1,000,000 Man-hours)	2.6	3.0
Severity (Days Lost per 1,000 Man-hours)	0.04	0.03

B. Industrial Accident Experience:

1. On Oct. 12, [redacted], SP-3, received a disabling injury when he injured his back while lifting cylinders. [redacted] lost 3 days from work.

C. Fires:

There were no fires other than brush fires reported during this period.

D. Motor Vehicle Accidents:

	<u>Jan. 1 to Oct. 1, 1953</u>	<u>1952</u>
Miles Driven	1,315,013	1,820,000
Number of Accidents	27	49
Rate (Accidents per 100,000 Miles)	2.1	2.7
Total Cost	\$ 978.00	\$1,900.00
Accident Cost per 100,000 Miles	\$ 75.00	105.00

Two accidents occurred during September. One was a backing accident and the other occurred when a government vehicle was passing a private vehicle and the private vehicle made a left turn.

E. General Remarks:

1. The Group Leader visited the Boulder Cryogenic Engineering Plant (National Bureau of Standards) to consult with the Cambridge Corporation on their problems of design of new facilities.
2. Additional sites were reviewed in connection with the program of indoctrinating security and fire protection personnel on emergency procedures.
3. Currently under review is the procedure whereby all Carco flights are routed around TA-33. Since it appears that there will be a firing schedule at this site for a long period, an attempt is being made to permit Carco over the site other than firing days.

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4. The Safety Group reviewed the plans contemplated for the Laboratory Open House held on Oct. 11.

5. At the meeting, Oct. 9, of the Advisory Committee for Biology and Medicine of the Atomic Energy Commission, held at the Laboratory, the Group Leader discussed the operations of the Safety Group, H-3.

6. Roy Reider and James G. Stearns attended the National Safety Congress in Chicago from October 19-23.

7. At the request of the AEC Safety Office, H-3 assisted in checking the conductivity of the floors in the operating rooms of the hospital.

IV. GROUP H-4. BIOMEDICAL RESEARCH (W. H. Langham):

A. General Remarks:

C. C. Lushbaugh participated in a seminar at the Armed Forces Institute of Pathology on radiopathology.

B. Biochemistry Section:

1. Koenig:

Most of the time has been spent in assembling the data and material

on the desoxyribonucleic acid and polysaccharides of the pneumococcus type III for publication.

The paper on the polysaccharides has been written.

A series of ultracentrifuge runs have been made on a sample of desoxyribonucleic acid from E. coli furnished by the AEC Project laboratory at Los Angeles.

2. Anderson:

Preliminary studies on the measurement of the light emitted by firefly extract when excited with ATP were carried out. A Shattli Li-Sb photomultiplier was used to measure the light output because of its low background. Encouraging results were obtained with one sample which could not be duplicated. Progress waits on more and better firefly ~~extract~~.

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Several samples of conducting, tissue-equivalent plastic have been obtained from the Plastics Shop. Some of these show conductivity of the necessary magnitude. Development work is continuing.

3. Anderson, Lotz:

Some modifications have been necessary in the tritium scintillation counter to improve the stability. The apparatus necessary for the distillation of 0.1 ml water from rat blood samples has been constructed.

4. Sabine, Miller:

A series of mice has been radiated, and the cholinesterase and hematological investigation is being carried out. The same sharp rise with a fourth day peak of cholinesterase activity in the erythrocytes, which was found with plutonium, has been found in the radiated mice.

5. Foreman, Trujillo:

A study determining the excretion and body distribution of barium and lanthanum after injection of an equilibrium dose into rats was carried out preliminary to a study in humans in which a correlation between urinary excretion and body burden of these two elements is to be studied. Attention was devoted to working out problems of procedure and instrumentation.

6. Vier, Magee:

The 24-hour metabolic study made on three rats using 1-C¹⁴ labeled caffeine has been completed. An average of over 90% of the intravenously injected dose was eliminated by the three rats within this time interval. Sixty-eight per cent was excreted by the kidneys, 9% in the feces, and approximately 14% as respiratory CO₂. As with the 6-hour study made previously, the liver contained the largest per cent of dose found in any organ or tissue at 24 hours (1.3%).

At the present time a full metabolic study identical to the above is being made using caffeine labeled in a different position (1,3,7* trimethyl-xanthine).

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11. Keenan, Gould:

A confirmatory study of the effect of hypophysectomy on the rate of cholesterol and fatty acid synthesis has been completed.

12. Kohr, Gould, Haugner:

Metabolic studies on a series of humans with tritium labeled cholesterol are being completed. The results indicate differences between individuals in the form in which dietary cholesterol first appears in blood but are rather irregular, and additional patients will need to be studied.

13. Kohr:

Considerable time was spent doctoring the liquid scintillation counter.

C. Radiobiology Section:

1. Worman, Larkins:

Work during the past month has consisted to a large extent of furthering completion of the animals X-ray and source exposure facilities. The dark room is now ready for use as is the 100 KV Picker portable unit for diagnostic radiography.

Other work has consisted of acting in an auxiliary capacity for various investigators as listed.

1. For Jean Sabine: Sixty mice exposed to 300 r X ray on the 250 KV machine at T Site.
2. For R. E. Carter: One hundred eighty mice exposed to X rays on the 250 KV machine at T Site.
3. For Robert Schuch: Calibration of scintillation cell counter at Beta and Ten Sites with Cobalt-60, using FeSO₄ and Victoreen rate meter.
4. For Sam Rothermel: Calibrations for determination of depth dose to rat brain on 50 KV-50 Ma and 250 KV equipment at T Site. For this study FeSO₄, Victoreen standard and nylon ~~_____~~ film have been used.

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2. Boone, Woodward, Turney:

Studies on the cell surface adsorption of radioactive compounds. -- Using H. influenzae and the microbiological assay technique, a preliminary specific activity has been determined of the C^{14} labeled Coenzyme I. The paper entitled "Isolation of C^{14} Labeled Coenzyme I and II by Paper Chromatography" is being revised for publication in the J. Biol. Chem.

Extraction of the spent medium to determine whether the remaining 50% of non-adsorbed C^{14} nicotinic acid or its amide have been converted to other metabolic products other than Coenzyme I and II is continuing.

3. Boone, Turney:

Particle size and local radiation studies of the respiratory studies in the rat. -- A new problem to determine the radiation effects locally on the respiratory tract in the rat is being undertaken. Radiation in the trachea, and possibly the bronchi, will be delivered by implanting small cylindrical screens that have been electroplated with various radioactive elements and then observed for local carcinomas, etc. Spherical pellets, also electroplated, will be implanted surgically into the lungs and then followed for extensive periods for carcinomas. At present the surgical techniques and physical problems are being worked out.

4. Woodward, Rothermel, Worman:

Effect of massive, rapid doses of X rays on the rat brain. -- An investigation is being undertaken into the effects on the psychomotor mechanism of the rat of selective irradiation of the brain and parts of the brain with massive, rapid doses of X rays. The physical signs (including survival time) produced by such irradiation will be compared with those found in the studies on massive, rapid, whole-body gamma irradiation. Calibrations are being run on a 50 KVP X-ray machine. An apparatus to test the memory-motor functions of rats is under construction.

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5. Boone, Woodward, Rothermel:

Relative effectiveness of thermal neutrons and X rays in depressing antibody production. -- Preliminary work is being done on setting up a project to quantitate the effect of neutrons on antibody production. Techniques are under consideration. Antibody response is of importance in physical injuries such as wounds and burns, and may be a critical function in combined radiation burn or radiation wound-damage.

6. Boone, Woodward, Rothermel:

Relative effectiveness of thermal neutrons and X rays in overcoming resistance to leukemia transplants in mice. -- Leukemia has been transplanted to mice of a strain foreign to that of origin of the leukemia by irradiating the recipient mice before transplantation and also by prior administration of cortisone. Both procedures appear to break down natural barriers to the growth of foreign cells. Reports in the literature describe irradiation with X rays. It is planned to test the effect of neutrons on this biological system and to obtain their relative biological effect compared with X rays. It would be of interest to compare this RBE with that on the closely related system of antibody production as well as on other body systems already studied.

7. Rothermel, Schweitzer:

Observations on the incidence of lens opacities in mice exposed X rays and neutrons are continuing.

D. Radiopathology Section:

1. Lushbaugh, Hale, Hughes:

a. Research in Progress:

1) Beta ray injury to the skin of sheep. -- The amount of beta radiation necessary to cause epilation, scabbing and ulceration was determined. Histological material was obtained for comparison with sections of lesions occurring in sheep grazing near the Nevada Test Site.

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2) The effect of rapidly delivered large doses of radiation upon the mitotic index of regenerating livers continued under study.

3) Histological specimens of the pituitary, pancreas, kidney, spleen and small intestine continued to be processed. These organs obtained from animals exposed to large doses of radiation will be studied for pathological changes.

4) Quantitative methods of determining the content of adenosine triphosphate in tissues and serum are being developed, using gravimetric and bioluminescent methods, in order to follow any post-irradiation changes in this important substrate.

b. Services:

1) The Pathology Section continued to provide service to other sections in the Group, to other Groups in the Division, and to the medical staff of the Los Alamos Medical Center. These services consisted of radioautography, chromatography, photomicrography, photography, clinical chemistry, surgical and anatomical pathology and control histopathology.

2) The Safety Group (H-3) was aided in an investigation of any possible human hazard in an accidental spill of liquid hydrogen. The rate of evaporation was not found to be fast enough to prevent frostbite, although the damage seemed to be quantitatively less than that after a similar spill of liquid nitrogen.

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E. Organic Chemistry Section

Chapman Anderson
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1. Work in Progress:

By Alan Kohn 6/21/58

(Signature of person making the change) (Date)

a. The work of labeling pyridoxine is still in progress, and date)

b. The work on the book "Organic Syntheses with Isotopes" is still in progress.

c. The preparation of fluoro-cyclohexanone is in progress.

d. No work was done on mesantoin because of press of other work.

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2. Work Completed:

- a. Precision analyses on the tissue equivalent plastic have been completed.
- b. The methylation of diphenyl oxazole with methyl chloride at high pressure in a sealed bomb was tried at two different pressures. Methylation was incomplete at the pressures and temperatures tried.

3. Consultations:

- a. We were consulted by James Phillips, P-7, on the subject of the suitability of lithium and barium metals for targets.
- b. We were consulted by Richard F. Taschek, P-3, regarding the possibility of using silane as a counter filling. A brief review of the properties of this gas was compiled and given to Mr. Taschek.
- c. We were consulted by James Phillips, P-7, on the suitability of tritium labeled organic compounds for targets.
- d. We were consulted by J. W. Mather, P-7, on possible methods for utilizing lithium for targets.
- e. Five grams of deuterio-polythene was dispensed to John E. rolley, P-12.

4. Reports:

- a. Report No. 97: Analysis of Tissue Equivalent Plastics.
R. Ronzio.
- Report No. 98:
b. Attempt at Methylating Diphenyloxazole with Methyl Chloride.
R. Ronzio.

GROUP H-5, INDUSTRIAL HYGIENE (H. F. Schulte, E. C. Hyatt):

A. General Remarks:

A considerable portion of this month was devoted to meetings and preparations for meetings and talks. In a sense, the Health Research Laboratory

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was officially opened and a large number of persons were shown through the building, and other persons visiting the Laboratory discussed mutual problems in the field on industrial hygiene. However, a very varied program of routine and nonroutine work was carried on in addition.

B. Test Operations:

One member of this Section participated in a meeting on off-site communications problems associated with continental test operations. Two water samples received from the Las Vegas Field Office were analyzed by the Laboratory Section. The results of these analyses created so much interest that it seems probable that routine collection will be instituted and many more such samples may be expected. Considerable progress was made on a procedure for the determination of beta ray energies from fallout particles and a number of samples have been analyzed. An investigation is being started by the Test Section to obtain further information on the physical properties of collected particles. It is hoped that a catalogue of photomicrographs of such particles can be compiled. The report on the contamination of milk has been reviewed and returned to D-Division for publication.

C. Lithium:

During this period the lithium work by the Shop Department in Bldg. 96 was accelerated considerably and the last piece of normal lithium material was finished by the end of the period. Sixty air samples collected during this period were below 25 micrograms per cubic meter. The dust collection unit in Bldg. 96 has now been switched to feed into the new cyclone collectors fabricated by CMR Division. To date, these appear to be giving excellent performance.

A total of thirty air samples were collected in the basement of CMR Building during milling and weighing. These samples were all below 10 micrograms per cubic meter which is a sharp contrast with the concentrations found when this operation was first begun. The only operation which remains difficult

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to control is that of filling the dies prior to hot-pressing lithium hydride. Air samples as high as 175 micrograms per cubic meter have been found and the operator is required to wear a respirator.

Several experiments have been made on the reaction of water and water vapor with pressed mixtures of lithium hydride and germanium. Thus far, these experiments have failed to reveal the presence of gaseous germanium compounds. Infact, it appears that the metallic germanium has not reacted with the lithium and remains undissolved after the addition of water. Further experiments will be made on material fabricated at higher temperatures.

D. Beryllium:

The beryllium survey of CMR-2 operations in Wing 5 of CMR Building has been completed and a final report is being written. Air sampling has been conducted for a year and more than 300 air samples were collected, only one of which exceeded the maximum permissible level of 2 micrograms per cubic meter.

A similar study of CMR-1 analytical work on beryllium has been terminated after 12 weeks of air sampling with negative results. Unless changes are made in the analytical procedure, this area will be considered free of atmospheric Beryllium. However, should CMR-2 succeed in its effort to synthesize certain beryllium compounds, it is possible that large quantities of new and unusual beryllium compounds may be handled. Toxicological information will then be needed. Air samples collected for Group P-12 during handling of beryllium powder showed no air contamination from beryllium.

Considerable time has been devoted to the completion of studies on the new beryllium shop prior to the shop's going into production. Complete protective clothing, including changes of underwear and socks, has been recommended and daily air samples will be collected.

E. Uranium:

The survey in T Shop is continuing with Group H-1 collecting daily air

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samples and Group H-5 doing weekly urine analyses. The new system for pneumatic conveying of uranium oxide in TU Building has been completed and air sampling tests are being run. These tests will be completed during the next reporting period but initial results indicate that the cloth bag filter is nearly as efficient as the temporary unit tested previously.

F. Plutonium:

Group H-5 is co-operating with Group H-1 in the collection of cascade impactor samples for particle size analysis during demolition of the old D-Building. The sampler counter-alarm system originally built for use at DP West is being used in this work also.

G. Incinerator:

One member of the Group has been working with Group ENG-4 on modifications of the incinerator. All instruments used for testing the air cleaning train have been recalibrated in preparation for the next series of tests expected to begin shortly.

H. Tritium:

Considerable progress has been made on the construction of a unit for the calibration of tritium air samplers. It is expected that preliminary results on this will be available during the next test period. A new apparatus for the determination of tritium in urine and water at remote sites is being designed.

I. Boron:

With the approval of GMX-3, a continuous air sampling program for boric acid and boracatol is being conducted at S Site. Samples will be collected with the Filter Queen and Whatman #41 filter paper using the air ejector.

J. Trifluoroacetic Anhydride:

Group GMX-2 has indicated that they are working with this compound and anticipate considerably more work in the future. It is known that the

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compound is irritating and its similarity to the extremely toxic rodenticide sodium fluoroacetate makes it a material to be handled with great caution. Further investigations will be made in co-operation with Group H-2.

K. Ventilation:

Considerable time was devoted to ventilation studies during this period. Recommendations have been made that local exhaust systems with cyclone collectors be installed in the Foundry Pattern Shop and the HRL Woodworking Shop. Additional studies have also been made on the main exhaust systems at HRL. Several members of the Group conducted a ventilation study at Delta Building during a staff member meeting and a report on this study has been completed. Recommendations were made for an exhaust ventilation system for chrome plating, acid cleaning and degreasing in Gamma Building for GMK-9. The hoods in the new Physics Building were surveyed and a report submitted. Detailed ventilation studies were made in the new Beryllium Shop and after numerous adjustments and the installation of a larger fan motor the unit was approved for operation.

L. Miscellaneous Investigations:

Preliminary tests on the over-all efficiency of respirators on various systems have been made using the assault mask as a standard reference. Recommendations for humidity control in the P-12 dark room were made and a calibrated recording humidigraph was loaned to Group P-12. Other investigations were made involving exposures to hydrogen cyanide, toluene, barium and anthracene.

M. Miscellaneous Activities:

In addition to the visitors attending the Air Cleaning Seminar, the Group was visited by H. MacAlduff of Oak Ridge, J. Novak of Argonne and Sidney Williams of the National Safety Council.

The Advisory Committee of the Division of Biology and Medicine met at the Health Research Laboratory. Talks were given by members of the Group on "Industrial Hygiene," "Discussion of Fallout at NPG," and "Industrial Hygiene

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Urinalysis:

Mercury	1
Plutonium	112
Polonium	24
Radium	3
Tritium	183
Uranium (fluorometric)	143
Uranium (radiometric)	21

Miscellaneous:

Aromatics in kerosene	5
Tritium in water	2

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 By *William Stender*
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VI. GROUP H-6. RADIOLOGIC PHYSICS (T. N. White):

A. General Remarks:

The second meeting of the Committee to consider the use of the Nevada Proving Ground held at SFOC on September 24, and the "Radiation Protection Panel" meeting held at Berkeley on October 5 were attended by T. N. White. On the afternoon of October 8 an informal meeting with Dr. G. Fialla was held at LASL to discuss problems of neutron dosimetry. On October 9, a short description of typical work was given at the meeting of the Advisory Committee of the Division of Biology and Medicine.

B. Special Problems Section (S. Shlaer, H. Israel):

1. General:

- a. William de Alva was on vacation from October 12-19.
- b. Edwin Bemis was on vacation October 1-5.

2. Work in Progress:

- a. Plans are being made for calibrating the fast neutron films recently received by H-1.
- b. The A. D. Little filter paper 2390, which showed about a 30% higher alpha count than the H&V 70 in our experiment with thoron daughters, is being subjected to further comparison in actual working areas.



c. The study of the effect of thermal neutrons on cadmium shielded film is continuing. The purpose of this study is to see if thermal neutron dose can be evaluated by our standard film badge in the presence of gamma rays of different energies.

d. Activated copper is being used as a tracer in the study of fallout of soil particles made airborne by a short duration, high intensity arc.

e. Edwin Bemis and Robert Barker are preparing course work for the monitors' school to be held at NPC Nov. 4-6.

f. Drawings for the free air ionization chamber are being completed.

3. Work Completed:

a. The new densitometer was demonstrated at the meeting of the Advisory Committee of the Division of Biology and Medicine. It has been in service with the film dosimetry section of H-1 since Oct. 19.

b. A drying rack for the nuclear track films of H-1 has been designed and drawings have been completed.

c. The following equipment has been serviced:

- 1) X-ray unit of H-1.
- 2) Pumps in the thermostat of H-1 film dosimetry.
- 3) Sorensen regulator of H-1.
- 4) Water still for H-1 installed under our supervision.
- 5) Weather instruments and installations for H-6 Weather Section.

C. Meteorology Section (Maj. George J. Newgarden, 3rd, CIC):

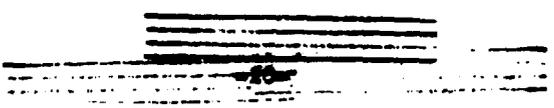
1. Personnel:

a. The Air Force Group (4th Weather Group, Baltimore, Maryland) to which the H-6 Weather Section is assigned received a new commanding officer in September. Col. John J. Jones succeeded Col. George F. Taylor, who left the Air Force at the close of his active duty tour.

2. Operations:

a. Revised the bomb-cloud height prediction equations which were

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used during Upshot-Knothole. This was possible because of the more complete and accurate data available from the Upshot-Knothole series. It is anticipated the new equations will predict cloud heights within plus or minus 1000 feet which is less than half the mean error of the previous equations.

b. Mr. Lester Machta, U. S. Weather Bureau, visited the Section the first week of October to discuss ways and means of improving the weather service for Nevada tests. Statistical data to be used in a study of capabilities of the weather services was prepared for Mr. Machta.

c. Furnished Lt. Col. Lulejian, Hq. ARDC, Baltimore, Maryland, meteorological and fallout data to aid him in revising his "Hot Spot" formula.

d. Furnished Lt. Col. Wyatt, Weather Project Officer, Kirtland AFB, with meteorological data to aid him in his study of past weather service capabilities of NPG.

e. Furnished weather support to H-1 for Bayo experiment, Oct. 10.

f. Sgt. Garlock presented a talk on Meteorology to the sixth grade of the Los Alamos Central Public School.

D. Nuclear Field Test Section (W. R. Kennedy, P. R. Schiavone):

1. Ranger:

The list of personnel radiation doses for Ranger was amended where possible with the addition of home stations and organizations of personnel involved. An amended copy was forwarded to the AEC, Division of Biology and Medicine, Washington, D. C.

2. Castle:

Considerable time was spent on lining up material and firming the program for the monitors' school to be held at NPG for Castle project personnel.

3. General:

a. Attempts to correlate surface dose measurement with in-pile history of plutonium metal have been unsuccessful to date. The chief difficulty

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is that the surface dose rate is extremely sensitive to the protective coating thickness over the metal in the range of thickness of zero to five mils. For adequate comparison of pieces, not only should the thickness be known, but it would also be desirable to have the same thickness on each piece. Coatings on pieces used as measured by us and by others varied from 2.5 to 11.5 mils.

b. An inquiry from Edgerton, Germeshausen and Grier, Inc., concerning test exposures of an individual employed by them was referred to AEC, Division of Biology and Medicine. Our information was fragmentary over the period of tests concerned. This event clearly demonstrates the wisdom of having a central repository for these test records.

4. Laboratory Activities (A. O. Dodd, B. F. Schnap):

a. Routine analysis of the waste retention tanks in the CMR Building was made. The maximum value found was 4000 d/m/l plutonium, slightly above the chronic mpc of 3300 d/m/l. Considering dilution from other tanks, average values were well below the mpc.

b. Drinking water and cooling water from CMR Building, D-Building and DP West were assayed for plutonium. All results were negative with the exception of:

- DP West Equipment Room #3 circulating water - 5500 d/m/l.
- DP West Equipment Room #4 circulating water - 1100 d/m/l.

Maintenance and operating personnel were notified of the sudden appearance of activity in Equipment Room #3 circulating water.

c. Polonium and uranium analyses were completed for the soil samples tabulated in last month's report. Polonium results were negative in all cases, a considerable improvement over the 1947 results. Uranium analyses were not done in 1947. Uranium results for the current series were well below published average values for natural occurrence of uranium (3 to 6 ugm/gm of soil)

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F. P. Cowan, "Quantitative Summary of Natural Radiation and Naturally Occurring Isotopes" Univ. of Mich. School of Public Health, Lectures Presented at the Interservice Training Course in Radiological Health, Feb. 5-8, 1951. However, our analysis techniques are of the surface stripping type. The soil particles are not entirely put into solution before extraction of the uranium.

Nov. 10, 1953

T. L. SHIPMAN, M. D.,
Health Division Leader

clA - H-Div. Files (following circulation to H-Div. Group Leaders)

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