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HEALTH DIVISION

Md for N.T. Bray
5/29/53 SUPERVISOR CENTRAL FILE

ORNL

REPORT FOR MONTH ENDING SEPTEMBER 30, 1946

J. S. Felton, M. D., K. Z. Morgan and P. S. Henshaw

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CLINTON LABORATORIESMEDICAL SECTION OF HEALTH DIVISION

by

J. S. Felton, M. D. - - Section Chief

- 1) Dispensary: The present system of rendering out-patient care to Clinton Laboratories' personnel has continued and in addition to the usual pre-placement and termination physical examinations, long standing annual examinations have been re-started. Emergency medical and surgical care for occupational and non-occupational injuries and illnesses has continued and in addition a small group of employees of the J. A. Jones' company is now receiving emergency medical care for occupational illnesses and injuries only.
- 2) Physical Facilities: Final painting of the Dispensary has been started and it is anticipated that this will be completed within the forthcoming month. The chair portion of the Ritter Ear, Nose and Throat unit has arrived, has been installed, and is now in use. Individual treatment units, self-sufficient as to diagnostic instruments, medications, and dressings have been installed for use in the Treatment Room.
- 3) Illnesses and Injuries: Specific health problems have been detected among the personnel of Clinton Laboratories, and further clinical studies will be made in order to clarify some of the issues involved. The first of these is the problem of anemia which is now being studied. Briefly, it has been found that employees coming to Clinton Laboratories either demonstrate anemia on arrival or develop a lowering in their blood counts shortly thereafter. The exact cause for this lowering in blood level is not known, but it is hoped that following statistical studies of past case histories, and utilization studies of iron that remedial measures can be taken other than the medical administration of iron as a corrective agent.

The second clinical subject of interest is that of allergy. We are faced here with a great number of people suffering from hayfever, asthma, angioneurotic edema, and urticaria. Many of these conditions existed prior to the arrival of these personnel in Oak Ridge, but a good number have developed acute flareups of these conditions, or developed them as sensitivity reactions to the pollens of this area. Detailed histories are being started which will be followed by other clinical procedures, for this actually is an important health problem. Why have a great number of scientific personnel come to Oak Ridge only to have them work accompanied by blocked noses, wheezing, or running eyes? This discomfort does not make for efficiency, and tends in many instances to encourage leaving the area. It is hoped that definitive information will be secured in the near future.

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During the month 388 vaccinations have been given employing Types A and B Influenza Virus Vaccine. The total number receiving this is not complete, but the percentage (20%) taking advantage of the immunization is of interest as it denotes somewhat the percentage of persons employed interested in improving their well-being. A comparable program is being undertaken for tetanus toxoid.

The athletic program of Clinton Laboratories has been productive of a great number of injuries, and the Medical Section has cared for fractures, strains, sprains, contusions, and abrasions resulting from the inability on the part of amateur baseball players to withstand the rigors of the game. To date one fractured finger has been received from bowling and it is anticipated that further injuries will be encountered. The Safety Department has been appraised of these non-occupational injuries and some athletic leadership is being contacted in an effort to provide an answer. It seems somewhat ridiculous to continue a safety program against industrial injuries and then have so many disabling, time losing, non-occupational conditions arising from our amateur athletics.

- 4) Occupational Hazards: Two memoranda have been issued in connection with personnel protection against the hazards of beryllium and its salts. The present recommendation for the medical regimen include:
 - a. Chest film every 3 months, b. Physical examination every 3 months,
 - c. Weight determination, every 6 weeks, and d. Vital capacity determination every 6 weeks.
- 5) Steering Committee: In accordance with a recent memorandum from the office of the Executive Director, the Medical Section in company with the Biology and Health Physics Sections will function under a Steering Committee of the three Section Chiefs concerned.
- 6) Personnel: Doctor John E. Wirth has terminated from Clinton Laboratories to return to his former position with the Tumor Clinic, of the National Cancer Institute, U. S. Marine Hospital, Baltimore, Maryland.

Harry Boatwright, M. D. has been added to the medical staff.

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CLINTON LABORATORIES

MEDICAL SECTION - HEALTH DIVISION

J. S. Felton, M. D. - Section Chief

DISTRIBUTION OF EFFORT FOR THE MONTH OF SEPTEMBER, 1946

<u>Persomnel:</u>	<u>Monthly</u>	<u>Weekly</u>
Physicians	5	0
Medical Technicians	1	3
Nurses	1	6
Office Personnel	0	7
Janitorial personnel	0	4
	<u>7</u>	<u>20</u>

Number of technical persomnel added:	3
Number of technical persomnel terminated:	<u>1</u>

Allocation of Time

Physicians

Physical examinations	2	0
Dispensary service	1	0
Haematology studies	1	0
Administration & PFR Writing - Leave of Absence	1	0
	<u>5</u>	<u>0</u>

Medical Technicians

Supervision	1/2	0
General Laboratory	1/2	0
Blood studies	0	1-1/2
Urine Analyses	0	1/2
Leave of absence	0	1/2
Vacation	0	1/2
	<u>1</u>	<u>3</u>

Nurses

Supervision	1	0
Dispensary shift nursing	0	4
Visiting nurse	0	1
Leave of absence	0	1
	<u>1</u>	<u>6</u>

Office Personnel

Clerical	0	7
Janitorial	0	4
	<u>0</u>	<u>11</u>

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CLINTON LABORATORIES

HEALTH PHYSICS SECTION

by

K. Z. Morgan

A survey of opinion of the directors and other members of Clinton Laboratories has indicated a general desire to continue Health Physics activities and to accelerate Health Physics research. General interest is expressed in the possibility of parallel expansion of Health Physics, Biological and Medical research. The first requirement for such expansion is more laboratory space. The initial step toward securing this space for an expanded research in Health activities has been to investigate the possibility of using some of the abandoned laboratories south of the Engineering Building in Oak Ridge. Although it would be desirable to keep these three research divisions at the present site, it is considered expedient to move most of their research to the new location as a temporary measure until the permanent buildings are constructed at Clinton Laboratories.

Considerable interest has been manifest from numerous sources in an effort to have established at Clinton Laboratories a School of Health Physics, Biology, and Medicine. From the very beginning of operations at Clinton Laboratories, the Health Physics Division has trained Health Physicists for other projects. At present, men are being trained as Health Physicists for other projects, for universities, for commercial concerns and for the Armed Forces. Consultation service is being given to numerous organizations in an effort to prevent radiation damage to persons outside Oak Ridge who wish to profit by our experiences. In connection with this radiation educational program, Health Physics classes are being arranged for newcomers to Clinton Laboratories; reports and radiation safety rules are being declassified; and instrument information is being supplied to prospective commercial producers of Clinton Health Physics instruments.

During the past month concrete was poured over the alpha contaminated floor of room D in the old Chemical Separation Building (205) so that the building could be put to new use. A stainless steel plaque was imbedded conspicuously in this new floor warning against drilling and chipping through this floor. Similar warnings should be placed on machinery, hoods, burial grounds and all objects or locations that might preserve this plutonium hazard for future generations of less suspecting victims.

On September 27, 1946, Health Physics precipitron reports began to arrive from various parts of Clinton Laboratories to the effect that there was an unusually high alpha activity in the air. Hurriedly made decay curves indicated a half-life of about $\frac{1}{2}$ hour which fortunately removed any possibility of a plutonium hazard. Mr. Howard Parsons of the Chemistry Division checked several precipitron collected samples with the pulse analyzer and rather definitely established the alpha emitter as Ra B from radon gas. On a few occasions in the past the radon



activity at Clinton Laboratories has increased by a factor of 8 or 10 above normal, but on this occasion it rose by a factor of 40. This high level of radioactivity continued over a wide area around Clinton Laboratories for three days before it returned to normal. It would require thousands of curies of radium to release this much radon and extended measurements are planned in an attempt to account for such an occurrence.

A Health Physics check was made during a preliminary run in the hot laboratory of the pile building of the xenon cross section experiment of L. B. Borst and B. Hasbrouck. Measurements indicated that iodine concentration in the air of the cell on the final run would probably exceed 10^4 times the operating tolerance level so special precautionary procedures were established.

A contaminated area in the lunch room of the cafeteria was found on a routine survey which read 35 mr/hr at the surface. This should reflect the need for more careful observance of the radiation hazard safety rules.

The Victoreen Company has furnished us with 500 new pocket meters using insulators molded of polystyrene and a case molded of tenite II. Extended tests of these meters are in progress.



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CLINTON LABORATORIES

HEALTH PHYSICS SECTION

K. Z. Morgan

DISTRIBUTION OF EFFORT FOR THE MONTH OF SEPTEMBER, 1946

<u>Personnel</u>	<u>Monthly</u>	<u>Weekly</u>
Physicists (Assoc., Sr. & Prin.)	7	0
Chemists, Elec. Engr., H.P. Supv., Adm. Asst.	4	0
Jr. Physicists & Research Assistants	23	0
Jr. Chemists	2	0
Laboratorians, Technicians & Clerical	0	33
	<u>36</u>	<u>33</u>

Number of Technical personnel added during month: 2
 Number of Technical personnel terminated during month: 3

Allocation of time during September in Man-months:

Services

Pocket meters	1 1/2	8 1/2
Badge & Ring meters	2	8
Neutron Films	0	1
Hand, glove & shoe counts	0	1
Laundry counting	0	3
Calibration	1 1/2	2
Surveys - 100 Area	1	0
Surveys - 200 Area	1	0
Surveys - 706-A	1	2
Surveys - 706-B, C & D.	7	0
Surveys - Construction Area	2	0
Mud, water & air surveys	2	1
Radiation consultant to Army	1 1/2	0
Trainees	3	0

Research & Development

Improvement & development of instruments	4	0
Instrument tests	1 1/2	1
Physio-chemical effects of radiation	1	0
Neutron studies	1 1/2	0
Methods of detecting product in urine	2	1
Preparation of PPR	1	0
Special problems	1	0
Development of laboratory facilities	1	0

Administrative

Office Personnel	2 1/2	0
Vacations & leave of absence	0	3
	<u>1 1/2</u>	<u>1 1/2</u>
	<u>36</u>	<u>33</u>

REPORT FOR SEPTEMBERRADIOBIOLOGY SECTION

by

P. S. Henshaw - - ChiefMechanism of Irradiation Injury:

New work has been started utilizing recovery following irradiation as a means of getting at the mechanism of irradiation injury. The following were known at the time this work was laid out:

1. Animals die with the same general symptoms when uniformly penetrating radiations are used, irrespective of whether the radiations are fast or slow neutrons or gamma rays.
2. Despite this fact, the amount of dosage required to kill, varies directly with the distribution of ions in space (specific ionization) and with time (dosage rate), suggesting that, although death may result in the same way following exposure to the different radiations, different biochemical mechanisms may nevertheless be involved but leading to the same end point.

It is of basic importance to determine whether different biochemical mechanisms are affected by the various radiations. If it can be shown in addition to the fact that the lethal dose varies with distribution of ions, that the rate of recovery also varies, strong evidence will be available favoring this view. Such evidence would then justify further attempts to utilize the different radiations to modify specific biochemical reactions.

The Wave-Reaction:

Histological examination of representative tissues at different times after single doses of uniformly penetrating radiations disclosed that a "wave-reaction" takes place - that is, a cycle of degeneration and repair which is complete in three to six weeks. In the bone marrow after 400 r of X- or gamma rays, for example, there is a loss of cells to the extent that the marrow cavity contains almost no cells at one week after exposure. In three to six weeks then the bone marrow is indistinguishable from normal again.

It has been surprising to learn that such a cycle of break-down and repair can take place during a course of daily treatments. Such changes have been observed in the testis of mice following 8.6 r of gamma rays. It is amazing that whereas this daily exposure is sufficient

to cause extensive breakdown in testicular tissues, in a few weeks repair can nevertheless take place in the face of such treatment.

Microbiology:

New work has been started which is to deal with an extended series of studies on single cell forms. In many ways microorganisms permit a study of fundamental processes in cells that would be impossible in multicellular forms. Such problems as the induction of mutations, the mechanism of killing with radiation, the biochemistry of metabolism, the process of photosynthesis, cytoplasmic mutation, and the production of a new chlorophyll are contemplated.

RADIOBIOLOGY SECTION

P. S. Henshaw

Research:

Experimental Radiology - P. S. Henshaw, J.J. Lane, E. Loftus
E. Riley, H.B. Cupp, E. Ledford
G. Stapleton, G. Johnston

Microbiology ----- W.A. Arnold, E.H. Anderson

Radiogenetics ----- G. Lefevre

Biochemistry -----

Developmental Anatomy --

Experimental Cytology --

Isotope Therapy ----- (D. Clark)

Geriactrics -----

Service:

Pile Irradiation Management - G. Stapleton
J. J. Lane

Farm Management ----- H. Weaver

Histologic Preparations ----- G. Johnston, E. Loftus

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CLINTON LABORATORIES

RADIOBIOLOGY SECTION

P. S. Henshaw - - Chief

DISTRIBUTION OF EFFORT FOR MONTH ENDING SEPTEMBER 30, 1946

<u>Problem Assignment</u>	<u>Subject</u>	<u>Status</u>	<u>Man-Months</u>	
			<u>Sept.</u>	<u>Oct.</u>
BK12-11	Periodic Slow Neutrons	Active	1	1
BK12-12	Single slow Neutrons	Active	1	1
BK12-13	Periodic Gamma	Active	1	1
BK12-14	Single Gamma	Active	1	1
BK12-15	Single Fast Neutrons	Inactive	0	0
BK12-16	Periodic Fast Neutrons	Inactive	0	0
BK12-18	Single Beta Rays Delayed	Active	1	1
BK12-20	Vitality In Mice		1	1
	Parabiosis	Active	1	1
	Microbiology	Active	2	2
	Radiogenetics	Active	1	1
	Animal Care	Active	8	8