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ORNL-2418
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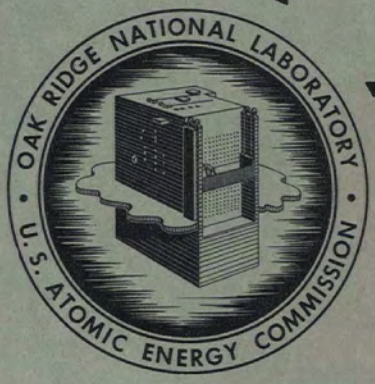
HEALTH DIVISION

ANNUAL REPORT COVERING PERIOD

JULY 1956 THROUGH JUNE 1957



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HEALTH DIVISION

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A Division of Union Carbide and Carbon Corporation

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Annual Report

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53 Medical Director, Union Carbide Nuclear Co., Paducah, Ky.
54 Technical Information Service, Oak Ridge Operations Office, AEC, Oak Ridge, Tenn.

HEALTH DIVISION ANNUAL REPORT

July 1, 1956 -- June 30, 1957

Thomas A. Lincoln, M. D., Medical Director

INTRODUCTION

This is a report of the changes in the basic health program at the Oak Ridge National Laboratory, accomplishments, new programs, a statistical summary of visits and procedures, and personnel changes which occurred between July 1, 1956 and June 30, 1957. Much of this report is of historical interest primarily to the Health Division staff.

SCOPE OF PROGRAM

An active program in industrial health has been maintained at the Oak Ridge National Laboratory during the past year, with the objective of maintaining the best possible health status of the employed personnel. The specific component parts of this program are as follows: (Changes are indicated with an asterisk and are explained at the end of this section.)

I. INDUSTRIAL HEALTH PROGRAM AS IT RELATES TO THE INDIVIDUAL EMPLOYEE

The employee ordinarily is considered from three points of view: A. As a candidate for employment; B. As an employee requiring health maintenance, and C. As a sick or injured employee.

A. As A Candidate for Employment

1. Examination at time of Interview.

   a. Completion of Cornell Medical Index Health Questionnaire
   b. Completion of medical and employment history.
   c. Laboratory examinations
      1). Complete blood count (hemoglobin, white blood cell count, differential cell count, hematocrit and sedimentation rate).
      2). Urinalysis
      3). Chest film (14" by 17" at 6')
      4). Serodiagnostic test for syphilis (VDRL).
   d. Brief personality evaluation by clinical psychologist, routinely when possible and mandatory when examining physician so indicates.

e. Complete physical examination by a staff physician.
f. Review of all laboratory and clinical findings by examining physician and consulting psychologist.
   1).* Weekly consultation with Personnel Director
   2). Health classification determined and forwarded to the Employment Section of the Personnel Department.
   3). Reservations stated when indicated.

2. Examinations and Procedures When Employee Reports for Work

a. Complete blood count, urinalysis, chest x-ray, if interval between preliminary examination and employment date exceeds three weeks.
b. Determination of blood type and Rh factor.
c. Vision evaluation (Bausch and Lomb Ortho-Rater).
d. Hearing evaluation (Maico audiometer).
e. Brief interview with examining physician for interval history.
f. Immunizations
   1). Smallpox
   2). Tetanus
   3). Typhoid and paratyphoid fever.
g. Fitting and issuing of occupational eyewear, if indicated.
h. Electrocardiogram.

B. As An Employee Requiring Health Maintenance

1. Annual multiphasic screening on all employees each year.

a. Complete blood count, urinalysis and serodiagnostic test.
b. Ortho-Rater examination.
c. Audiogram.
d. Electrocardiogram, including weight determination and blood pressure recording, at age 35 and then once a year after age 40, or yearly when abnormal, or when so requested by examining physician.
e. Stimulating immunization injections as needed.
f. Chest x-ray (offered every six months to men age 40 or older).

2. Complete periodic physical examination by physician.

a. All employees 45 years of age and over.
b. Given every third year until age 45, with the exceptions listed below:
   1). Yearly on all diabetics.

2). Yearly on all employees with restrictions.
3). Yearly on certain key personnel.
4). Yearly when so requested by a physician.

3. Review of classification and restrictions by examining physician.

a. Notification to supervisor of any changes in restrictions.

4. Notification of results of multiphasic screening examinations.

a. No significant abnormality.
b. Request for repeat examination.

5. Special examinations, when indicated, because of special health hazards.

a. Metallurgy
1). Vital capacity.
2). Blood and urine beryllium determination.
b. Cafeteria employees.
1). Blood, urine and x-ray examinations every six months.

c. Chemical Technology (mercury workers).
1). Blood and urine mercury level determinations when employed, then every three months.
2). Oral pharyngeal and neurological examination by a physician.
3). Quarterly routine urinalysis and hemoglobin determinations.
d. Lead Burners
1). The concentration of lead in the blood and urine, a qualitative urine coproporphyrin and blood hemoglobin determinations are done at the time of employment and every three months thereafter. Urine lead determinations are done every month.
e. Cyclotron and Pile Operators.
1). Slit lamp examination by consultant ophthalmologist semi-annually.
f. Other diagnostic procedures, as indicated.
g. Clinical photographs, in color and/or black and white, of unusual findings.

6. Health Education

a. Creation (or procurement) and distribution of posters and pamphlets.
b. Procurement of waiting room issues of the American Medical Assocation health magazine, "Today's Health," for all dispensaries.

c.* Preparation of a weekly health column for the Oak Ridge National Laboratory News by Dr. Lincoln.
d. Meeting with supervision or management to clarify job adjustment of the worker.
e. Health Division contribution to orientation for new employees and other groups.
f. Talks to employee groups relative to occupational and non-occupational health problems.
g. Health education seminars.
h. Nutrition counseling.

7. Surveys for occupational hazards by Y-12 Industrial Hygienist at our request; co-operation with Safety Department in industrial hygiene maintenance control.

C. As a Sick or Injured Employee

1. Medical and/or surgical care of occupational illness or injury, including over-exposure to radiation, under workmen's compensation laws.
2. Emergency care for non-occupational illness or injury including diagnosis, emergency therapy, and referral to family physician when indicated.
3. Assistance and direction in medical rehabilitation of the ill or injured employee.
4. Liaison between ill employee and private physician, hospital, Veterans' services, Welfare Services Department, American Red Cross, Office of Vocational Rehabilitation, etc.
5. Counseling services for workers presenting job maladjustments involving emotional disturbances (mental hygiene procedures).
6. Conference with management or supervision in order to effect a better work adjustment for the emotionally disturbed employee.
7.* Completion of necessary injury and illness forms.
8.* Reporting of pregnancy.

II. CONSULTATION SERVICES

A. Consultant services in cardiology.
B. Consultant services in radiology.
C. Consultant services in clinical psychology.
D. Consultant services in industrial hygiene.
E. Consultant services in proctology.
F. Others as selected.

III. MISCELLANEOUS

A. Termination Physical Examination for All Employees.

1. The same as preliminary examination, exclusive of serology and psychological consultation.

B. Special Examination for Visitors

1. Visitors of three days or less. These individuals do not report to the Health Division.
2. Visitors of three weeks to three months. Complete blood count, urinalysis and chest x-ray.
3. Visitors remaining over three months. The same procedures as for reporting to work examination without the electrocardiogram unless over age 40.

C. Examinations for Individuals at the Laboratory under Contract, or in Oak Ridge by Special Arrangement.

The same procedures as for the reporting for work examination without the electrocardiogram unless over age 40. Among these groups are:

1. Atomic Energy Commission.
2. H. K. Ferguson Company
3. Oak Ridge Institute of Nuclear Studies
4. Oak Ridge School of Reactor Technology
5. Pratt-Whitney Company

COMMENTS

These will be confined to changes made in the examination program during the past fiscal year.

A. 1. f. 1)* This is no longer done on a routine basis, but reserved for "problem" cases.

B. 1. e.* The nurse offers primary or booster-type immunizations for tetanus, typhoid and smallpox. A convenient wallet-sized identification card, see Fig. 1, with space for blood type, Rh factor, and immunization date, is completed and given to patient. He is asked to note on the reverse side of the card any x-ray examinations he may have from his private physician, dentist or hospital during the coming year. At the time of his next periodic examination

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Oak Ridge National Laboratory
Oak Ridge, Tennessee

Name of Employee: _____

Home Address: _____

Nearest relative: Name _____

Address _____

Immunization Dates:

Tetanus		Polio	Influenza	Typhoid	Smallpox

Blood type _____

Rh Factor Rho _____ Rho' _____ Rho'' _____

Personal Physician: Name _____

Address _____

PLEASE NOTE: _____

_____

_____

_____

_____
Date

T. A. Lincoln, M.D.
Medical Director

Oak Ridge National Laboratory, Oak Ridge, Tennessee
Radiation Exposure Record

Name _____ Badge No. _____

Date Begun _____ Age this date _____

Estimated total – Diagnostic, Therapeutic x-ray Exposure to this date. _____

Record below only the *number* of x-ray exposures made. Mark F if you were also fluoroscoped. Figure in ( ) indicates usual no. of exposures.

Body Part	1957	1958	1959	1960	1961	1962
Skull(4)						
Sinus(2)						
Teeth(1–6)						
Chest(1)						
Heart(1+F)						
Shoulder(2)						
Spine: Upper(2)						
Lower(4)						
Abdomen(1)						
Kidney-bladder (Pyelogram)(5)						
Stomach(3–5+F)						
Colon(3–5+F)						
Gall Bladder(3–6)						
Pelvis(1)						
Hips(2)						
Thigh(2)						
Knee(2)						
Other						
TOTAL						

Fig. 1. Wallet Size Identification Card.

he will be asked for this information and suitable estimates of the exposure will be added to his medical exposure record here in the Health Division. During the past three months the employee has been asked to recall how many and what type of diagnostic x-ray examinations he may have had away from the Health Division during the preceeding 12 months. He is also asked where he had the examination. We are not only attempting to estimate the number of examinations, but also, to find out how many people go away from their home city to get them. This latter information will be helpful in determining the possible value of studying the clinical x-ray records of the Oak Ridge Hospital for the purpose of estimating the average yearly gonad dose to the citizens of the city of Oak Ridge.

B. 6. c.* As of June 30th, an accumulated total of 137 news articles have been prepared. Spontaneous comments from employees and their wives indicate that these health articles have a fairly wide readership. They will be continued as long as interest is maintained.

C. 7.* The Discharge of Injury form has been discontinued. A list of injuries discharged during each month is now being sent to the Insurance and Safety Departments.

8.* At the present time a pregnant employee is required to leave the Laboratory six weeks before the expected date of confinement and may not return until six weeks after delivery. In those cases where there has been a miscalculation in the expected time of delivery, or a post-mature delivery has taken place, adjustments in the post-delivery waiting period are usually made to enable an employee to retain company service credit eligibility. In no case is the pre-delivery time knowingly shortened, although the termination which is required may be deferred by using vacation time for one to three weeks of the pre-delivery time. This, of course, enables the mother to be with her child for a longer period before she has to return to work and is, therefore, encouraged.

PERSONNEL SERVED

During this period the total number of employees at the Laboratory approximated an average of 3947 ± per month. Medical services were also provided for an average of 243 visitors per month from the H. K. Ferguson Company, Pratt-Whitney Company, Oak Ridge School of Reactor Technology, Oak Ridge Institute of Nuclear Studies and the Atomic Energy Commission. Various sub-contractor construction employees were given emergency care prior to referral to their company physician.

PERSONNEL OF THE HEALTH DIVISION

The maximum staff of the Health Division during the past year is as follows: Medical Director, two staff physicians and eight nurses. There is one x-ray technician, three clinical laboratory technicians, one optical technician, an administrative clerk, one record clerk, two secretaries, and two members rendering custodial services. A consultant clinical psychologist, at the present time, spends approximately three days weekly at the Health Division.

FACILITIES

A. Building 2013

The decontamination unit, started during the previous year, has been completed, see Figs. 2, 3 and 4. Although there have been no serious radiation accidents which involved injury and contamination to employees, this facility has been used occasionally during the past year. Employees who report to the Reception Desk in protective clothing designated for use in radiation areas only are requested, unless injured, to leave the Dispensary and re-enter through the decontamination facility where they are "frisked" by one of the Health Division staff to be sure they are not contaminated. This facility is also used for medical decontamination procedures on individuals who cannot be successfully decontaminated in the "field."

To prepare for the addition of one physician to the staff, which has been approved, and to provide office space for the consulting clinical psychologist nearer to the physicians and to the Reception Desk, several office changes have been made. The previous Conference and Lunch Room was converted to an examination room and office for Dr. Lockett. The examination room previously used by Dr. Lincoln was converted to an office for Dr. Hurt. Dr. Lincoln's office was converted for use both as an office and examination room. A Change Room and Dr. Hurt's old office were combined to form a new Conference - Lunch Room.

B. Building 4500

There have been no significant changes in this dispensary in the past year.

C. Building 7009

A window air conditioner was installed in this dispensary.

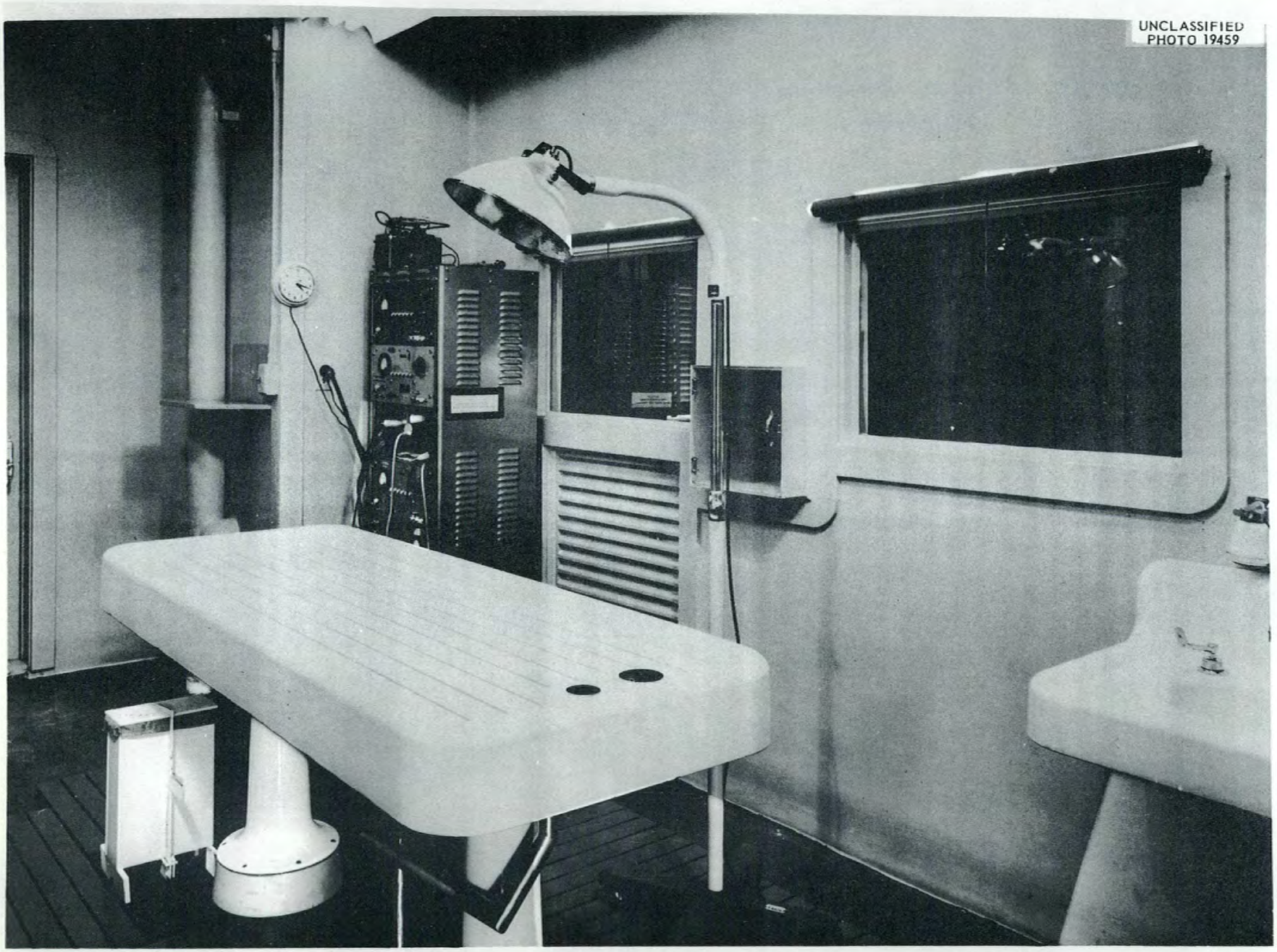

Fig. 2. Decontamination Facility, Bldg. 2013. View from hallway showing table, scrub sink, instrument console and pass box and window into Surgery.

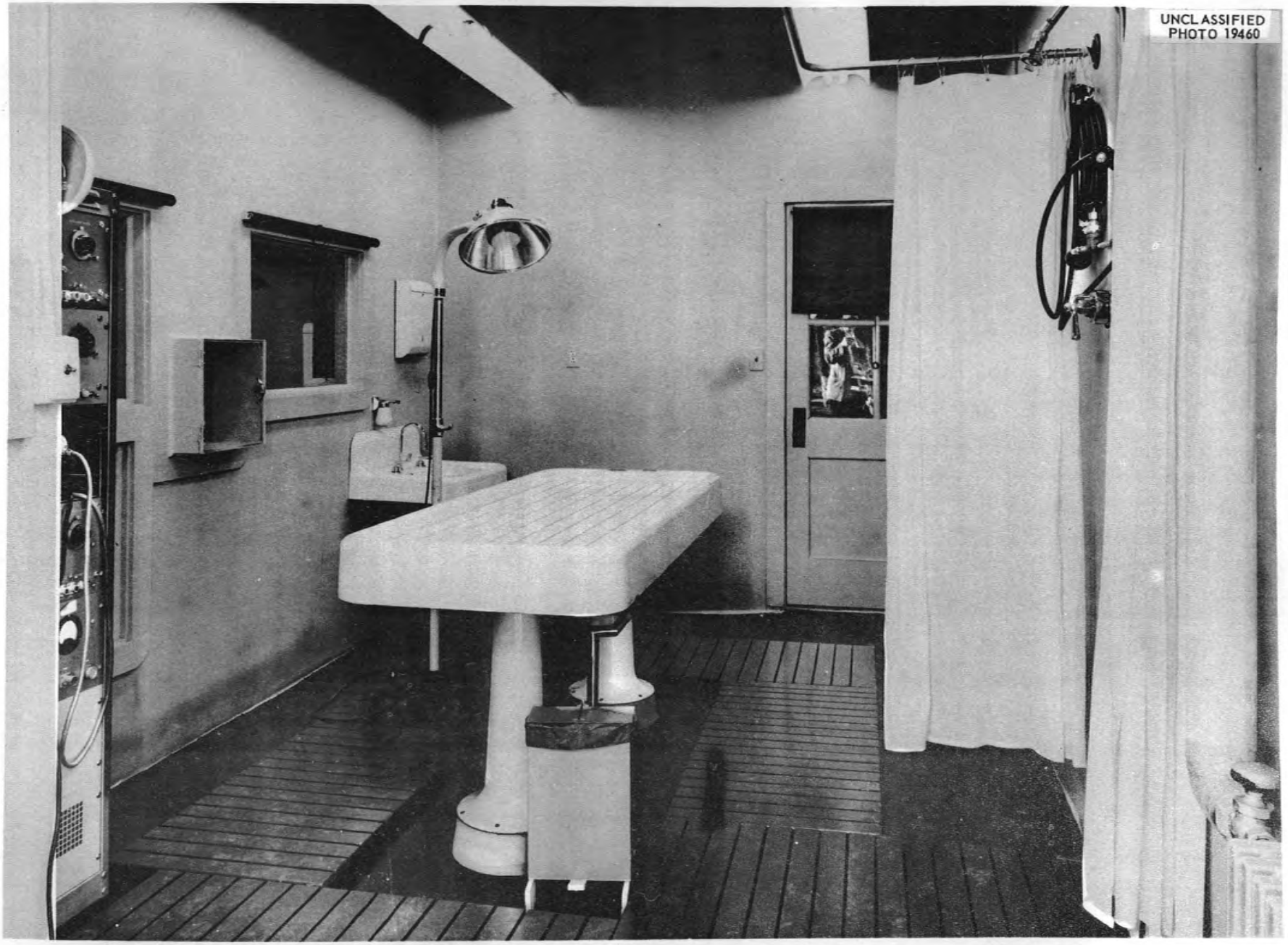

Fig. 3. Decontamination Facility, Bldg. 2013. View from hallway to outside entrance.

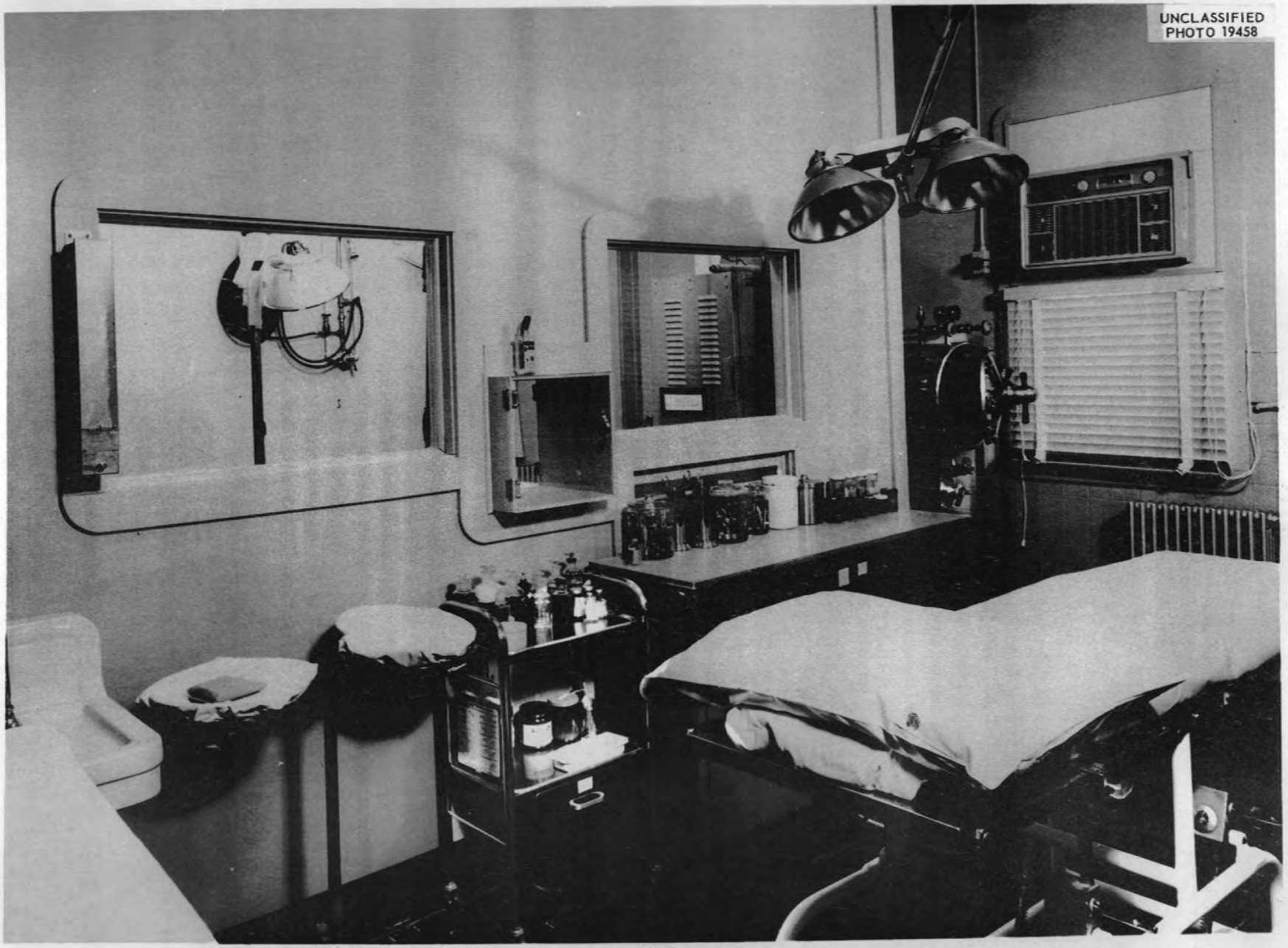

Fig. 4. Decontamination Facility, Bldg. 2013. View from present Surgery showing pass box and window.

GENERAL

Physical Examinations

During the past fiscal year 2,785 complete physical examinations were performed by the physicians of the Health Division staff. Of these, 551 were preliminary examinations and 1,342 were periodic physical examinations, including 173 complete examinations for the AEC and 86 for the Oak Ridge Institute of Nuclear Studies.

Rheumatoid Arthritis Study

In January 1957 preliminary discussions were held with Dr. Sidney Cobb of the Graduate School of Public Health, University of Pittsburgh, relative to a proposed epidemiological study of rheumatoid arthritis to be done here in the Health Division. Because of the health services available here at the Laboratory and the stability of the employment group, it was decided that this was an ideal location for such a study. Following additional discussions between the Health Division staff, Dr. Cobb and Dr. A. G. Kammer, Union Carbide Nuclear Company and the University of Pittsburgh, a specific proposal for the research program was prepared and an application for a research grant from the U. S. Public Health Service, National Institute of Health, was made by Dr. Cobb. This was later approved and Laboratory management and the local AEC office approval and support for this program were obtained.

This research project seeks at least preliminary answers to the following questions:

1. Can the population be divided into those with morning stiffness and those without, or does everybody have morning stiffness some time during life?

2. Are the definite and probable rheumatoid (American Rheumatism Association definitions) drawn from among those who have a long history of morning stiffness or are there cases which have a sudden and, from this standpoint, unpredictable onset?

3. What are the concommitents of onset and exacerbation of rheumatoid arthritis which may contribute to the understanding of its etiology?

4. What are the relative merits of a routine screening examination, latex fixation, and a case register made up from visits for rheumatic complaints, as methods of finding rheumatoid arthritis?

5. How many cases of rheumatoid arthritis are there at the present time at the Oak Ridge National Laboratory?

Methods

A nurse will be employed by the University of Pittsburgh and stationed at the 7009 Dispensary of the Health Division. She will interview approximately 325 men permanently stationed in the 7000 Area. These men will be asked each month, for 15 months, about the occurrence of arthritis or rheumatism, morning stiffness, pain on motion or swelling in any joint during the preceeding month. A brief inspection of the hands for evidence of swelling will be followed by several tests for joint pain. These will include compression of the knuckles, forcible flexion of the wrists and forcible flexion of the forearms, while being moved away from the body. The metatarsal arches will be squeezed through the shoes. Those who screen positive at appropriate levels will be referred for complete examination.

This study will run 15 months and its objectives are as follows:

1. The maximum number of persons having morning stiffness or other manifestations in question during a given year will be estimated.

2. Seasonal fluctuations will be observed.

3. Experience will be gained before beginning a more extensive five year study.

A laboratory technician will also be employed who will, after suitable training at Mount Sinai Hospital in New York City, perform the latex fixation test of Singer on samples of blood withdrawn routinely during the yearly periodic physical examination. Individuals who screen positive during the monthly examination will also have the latex fixation test done.

All screening information will be coded on IBM mark sense cards. Tabulations will be made by the Y-12 Tabulating Service and analyses done

at the University of Pittsburgh.

This project will begin on approximately September 1, 1957, if a well trained nurse and technician can be hired.

Gonad Dose From Diagnostic X-ray

Mr. E. D. Gupton, of the Health Physics Division, and Dr. Lincoln co-operated on a study to determine the gonad dose from diagnostic x-rays. Direct measurements of the gonad dose during several representative types of examinations, using Victoreen Condenser Chambers placed in the location of the testes and ovaries in a paraffin filled manikin, were made in the Medical Departments of Y-12 and K-25 and the Health Division of the Oak Ridge National Laboratory. Table top measurements were made at the Oak Ridge Hospital, two radiologists' clinics in Knoxville, and at the East Tennessee Tuberculosis Hospital, Knoxville.

The radiation dose to the gonads during the various other radiographic examinations at ORNL were either directly measured or estimated. On the basis of reports of roentgenograms in the permanent clinical records calculations were made of the accumulated gonad dose experienced by employees. From these values, the yearly average for each employee and the yearly average for the group were determined.

A report of this work will be made at the meeting of the Radiological Society of North America in Chicago, November 19, 1957. A more general report is being prepared for submission to one of the medical journals. This latter report should be consulted for details of this project.

Radiation Accident Emergency Program

Dr. Gould Andrews, of the Oak Ridge Institute of Nuclear Studies, and Dr. Lincoln worked together on developing an emergency procedure for handling victims of serious radiation over-exposure or of serious physical injury accompanied by radioactive contamination.

Since it may be possible to transfuse bone marrow cells into victims who have received large whole body doses of penetrating radiation, it was felt that a better understanding of the possible contribution of each medical group in Oak Ridge, in the event of such an emergency, was needed. A general discussion meeting with representatives of each of these groups

was held in Dr. S. Shoup's office in the AEC Administration Building, in April 1957. Unfortunately, there seemed to be a misunderstanding of the purpose of this meeting and the discussions were not productive of any plans. Dr. Lincoln was appointed by Dr. Shoup as chairman of a group to study the problem further. There have been no subsequent meetings of this committee, although a co-operative plan of action has been worked out with the Medical Division of the Oak Ridge Institute of Nuclear Studies and is reproduced below.

EMERGENCY PLAN FOR CARE OF RADIATION ACCIDENT CASUALTIES

Basic Plan

The Health Division will decontaminate and give minor surgical care to as many radiation accident casualties as is possible. Those cases requiring further surgery and/or hospitalization will be taken to the Medical Division of the Oak Ridge Institute of Nuclear Studies.

Details

Phase 1 - Report of Radiation Accident

1. Ambulance with nurse and doctor, if indicated, will be dispatched to the scene of the accident.

2. Health Physics will be notified to send a representative to the Health Division and ORINS Medical Division will be alerted to the existence of a radiation accident emergency.

3. Dispensary will be cleared as rapidly as possible and all entrances closed except for admission of other seriously ill or non-contaminated injured individuals.

4. Health Division staff will prepare for reception of contaminated casualties.

5. If Laboratory evacuation is necessary, see Phase 4 below.

Phase 2 - Segregation of Casualties

1. Critically injured (i.e., those whose life could possibly be saved by immediate surgical care not available at Health Division)

contaminated casualties will be given what first aid is possible at the Health Division and will then be taken immediately to the ORINS Medical Division.

2. Contaminated and injured, non-ambulatory and ambulatory casualties will be admitted to the Health Division in the following general order.

a. One non-ambulatory and one ambulatory case, or two ambulatory cases will be admitted to the Decontamination Facility.
b. Depending upon the number of individuals, extent of their injury and degree of contamination, additional casualties will be handled in the following manner.

1). Depending on nature of injury, first aid may be given in emergency vehicle and patient held there until space is available for decontamination in the Decontamination Facility. Ambulatory casualties with relatively minor injury will be given preliminary first aid at the Health Division and then sent back to the field for decontamination. They will then return for medical or surgical care.
2). If absolutely necessary the Health Division surgery will be used as an additional decontamination facility, (the maximum capacity -- one non-ambulatory and one ambulatory or two ambulatory cases).
3). If absolutely necessary surplus contaminated casualties will be transported either to the Y-12 Dispensary or the Medical Division, ORINS, after preliminary first aid is given at the Health Division.

Phase 3 - Disposition of Casualties

1. Casualties will be decontaminated by the best available method and either first aid or definitive surgical care completed at the Health Division whenever possible.

2. All casualties, whether physically injured or not, who have received an estimated whole body dose of 100 r or more, X- or Gamma, will be sent to ORINS Medical Division for observation and

treatment as soon as bed space can be made available.

3. Fifteen cc of whole blood will be carefully withdrawn as soon as possible after admission to Health Division from all individuals believed to have received 100 r or more whole body penetrating radiation. Two smears will be made and the remaining blood allowed to coagulate and material will be sent, with patient, to the ORINS Medical Division.

4. Individuals believed to have received 25 but less than 100 r X- or Gamma whole body dose, will have two blood smears made before release from Dispensary.

5. If dangerous internal contamination is believed to exist, chelating agents, such as calcium EDTA and/or Zirconium citrate will be started in the Health Division. Decision to admit these individuals to ORINS Medical Division will depend on --

a. Estimated dose.
b. Biologic nature of contaminant (alpha, beta, gamma emitters, half-life, bone seeker, solubility, etc.)
c. Desires of individual

Phase 4 - Evacuation

1. If Laboratory Emergency Director orders a Laboratory-wide evacuation, emergency vehicles accompanied by the Health Division staff will move immediately to the Y-12 Medical Department or the ORINS Medical Division Hospital for decontamination and further care. The Y-12 Medical Department will be used as the new headquarters for the ORNL medical staff.

Phase 5 - Follow-up care at ORNL

1. Blood smears will be made daily for one week (if possible) then twice weekly for one month on all individuals receiving an estimated whole body X- or gamma dose of 25 to 100 r.

2. Further dosage information will be forwarded to ORINS Medical Division by the Health Division.

The Y-12 Medical Department has received approval for construction of a decontamination facility similar to the one here at the Health Division. This will more than double the present capacity for handling of contaminated and physically injured radiation accident victims.

It is planned to later review radiation accidents which have occurred in the AEC at a seminar to be held at ORINS. The purpose is to review our present plans in the light of experiences of others and to make indicated changes in our procedures.

SECTION REPORTS

X-ray Section

During the year, 5,447 separate x-ray examinations were made. This represents a decrease of 325 from the previous year and reflects the more conservative attitude of the physician staff in the use of diagnostic x-ray. It also reflects an increase in concern by Laboratory members about the radiation they receive during our diagnostic x-ray examinations. Because of our study on dosage, we have usually been able to reassure them. In some cases if an individual because of a short stay at the Laboratory, or because he expects to get a chest x-ray at his next location, prefers to decline the termination chest x-ray, he may do so if he has had a chest film taken at the Health Division some time during the previous year. We do, however, ask him to sign a release. The statement they sign is indicated below.

DATE _____

To Whom It May Concern:

I certify that I was offered a chest x-ray on this date, _____,
as part of a _____ examination.

I have declined to have said chest x-ray.

_____
Signature

Witness:

_____

Dr. Arthur J. Muller, radiologist in Knoxville, is continuing to interpret all roentgenograms taken by the Health Division. In general service has been poor. Unless the service improves a great deal, we will have to seek additional consultant help in this field.

Thomas L.Tuck, Jr., x-ray technician, worked closely with Mr. Gupton and Dr. Lincoln in the previously mentioned study of the gonad dose during diagnostic x-ray procedures. He accompanied them to all other locations and rendered valuable assistance in the measurements.

Nursing Section

The largest immunization program undertaken during the year was a special poliomyelitis vaccination campaign. Since the vaccine was not provided gratis by the Health Division, individuals were advised to get together in groups of nine and purchase the vaccine from their local pharmacist. We assisted by giving them the necessary prescriptions.

The response of the Laboratory to this program was truly remarkable. The total number of poliomyelitis immunizations to date (primarily first and second injections) is 4470. There was a large amount of bookkeeping necessary to keep the various vials separate and to see to it the individual received the vaccine from the proper vial. It was not unusual for one or two individuals to bring in a vial with a list of people who were to be included in that vial. It was then necessary for the nurses to store the vaccine and then when the others came in, to check their names off the list.

The nursing staff has obtained information on x-ray examinations done to employees during the previous year. They have also assisted in the completion of the new wallet-sized identification card previously mentioned. In addition, the nurses did much of the tallying and totaling of the x-ray reports in the clinical records, necessary for the special Study previously discussed.

Clinical Laboratory

During this year the laboratory has changed slightly its procedure for taking as well as mounting electrocardiograms. We are now taking all 12 leads routinely. In addition, the routine sedimentation rate was discontinued.

Occupational Vision

During the past year, the occupational vision program continued and expanded. Due to increased emphasis by supervisory personnel, in addition to the larger numbers of Laboratory personnel, many more employees are now utilizing the services of this section. The manufacturers of the products used in the vision program have completely redesigned several of their optical devices to increase comfort, as well as to improve cosmetic appearance. This has resulted in a new high in employee acceptance.

It is interesting to note that the ratio of plano to prescription lenses now being used has about reversed from that of several years ago. The ratio of prescription to non-prescription lenses is now about 2 to 1, whereas seven or eight years ago it was about 1 to 1.5. This is probably largely due to the increasing average age of users of safety glasses.

Plastic type safety glasses for people with large corrections have been obtained during the previous year from the Armorlite Lens Company of Pasadena, California. The regular safety glasses for an individual with a large optical correction are so heavy that users frequently declined using them and preferred to continue to use their regular glasses. The plastic lenses are light weight, have a high impact resistance, and improved physical appearance. The manufacturer of the plastic lenses is able to provide more accurate filling of the prescription than the manufacturers of the glass type lenses. One obvious disadvantage is the ease with which these lenses can be scratched or pitted. Since the plastic safety glasses are being issued only to those who have large corrections and who must therefore wear glasses constantly to see, scratching of the lens surface should not be a great problem. From past experience this usually occurs when a person lays his glasses on a table or bench, etc. The cost of the plastic type lens is only slightly higher than the hardened glass.

Psychological Service

Dr. Hurt has continued essentially the same program as in the previous year.

Health Education

During the year Dr. Lincoln gave a talk on the fluorides to some of the craft groups. Dr. Hurt spoke on mental hygiene to a group from Analytical Chemistry and to the wives of the ORSORT students one evening.

Industrial Hygiene

There were no unusual activities in this field during the past year. The Lead Shop has been the principal site of interest.

Administrative Section

Mrs. Margery Sealand was hired as a temporary replacement nurse for Mrs. B. Martin, who terminated because of pregnancy but who expects to return.

Publications and Talks

Dr. Lincoln: Selling Health in an Industrial Setting. Current Comment, J. Am. Diet. Assoc. 32:1084 (Nov.) 1956.

Dr. Lincoln: Symposium member: Medical Importance of Radioactive Fall-out. Meeting of Roane County Medical Association

Attendance at Professional Meetings

Dr. Lincoln: Tennessee State Medical Association Meeting, Nashville, September 1956.
Carbide physicians meeting, in conjunction with the Ramazzini meeting, Topako Lodge, N. C., October 1956.
Carbide physicians meeting, January 1957, member of panel discussing employability of cardiac patients.
Industrial Health Conference, St. Louis, Mo., April 1957
Carbide physicians meeting, Paducah, Ky., March 1957

Dr. Lockett: Annual Meeting, American Medical Association, New York City, June 1957.

Mrs. Hipshire: American Association of Industrial Nurses meeting, St. Louis, Mo., April 1957

Postgraduate Courses

Dr. Lincoln: Practical Electrocardiography, Beth Israel Hospital, Boston, November 1956

Dr. Zanolli: Diseases of theChest. American College of Chest Physicians, Philadelphia, March 1957

Kate Hipshire, R. N.: Nursing Workshop, University of Tennessee, Knoxville

Rachel Carter, R.T.: Course in Medical Technology - New Procedures, Institute of Pathology, University of Tennessee, Memphis, January 1957

STATISTICS

Statistical Summary

Average monthly Severity Rate (Days lost per illness-absence)		10.1
Average monthly Disability Rate (Days lost per 1000 days scheduled)		13.2
Average monthly Frequency Rate (Absence per 1000 days scheduled)		1.3
Average number of visits per employee per year		12.8
Average number of ORNL employees on payroll per month		3766
Average number of patients visiting the Dispensary per month		2394
Average number of employee-patients per month		2211
Average percent of ORNL employees visiting the Dispensary per month		58.7%
Average number of illness-absences per employee per year		0.3
Total number of visits for fiscal year 1956-57		50982
Total number of visits by ORNL employees	48062	
Total number of visits by AEC employees	177	
Total number of visits by H. K. Ferguson employees	128	
Total number of visits by others	2615	
Total number of visits to X-10 Dispensary	33083	
Total number of visits to 4500 Dispensary	8840	
Total number of visits to 7009 Dispensary	3863	
Total number of visits to Y-12 Dispensary	5196	
Average number of preliminary examinations per month		46
Average monthly ratio of occupational to non-occupational services		1:2.31
Total number of procedures accomplished for fiscal year 1956-57		77096
Non-occupational illness, first visit	15045	
Non-occupational illness, revisit	6356	
Non-occupational injury, first visit	1492	
Non-occupational injury, repeat visit	623	
Occupational illness, not otherwise classified	84	
Occupational illness, not otherwise classified, revisit	124	

Occupational Injury, not otherwise classified, alleged or questionable, first visit	2
Occupational Injury, not otherwise classified, alleged or questionable, repeat visit	3
Occupational Injury or Exposure, chemical, first visit	104
Occupational Injury or Exposure, Chemical, repeat visit	130
Occupational injury or exposure, not otherwise classified, first visit	1929
Occupational injury or exposure, not otherwise classified, repeat visit	2877
Occupational injury or exposure, radiation, first visit	6
Occupational injury or exposure, radiation, repeat visit	3
Occupational contamination inspection, first visit	6
Health education counseling	19

COMPLETE EXAMINATION

Absence due to non-occupational illness		17
Absence due to non-occupational injury		22
Absence due to occupational injury		1
Industrial hygiene examination		33
Job transfer examination		15
Periodic health examination, non-ORNL personnel		158
Periodic health examination, ORNL personnel		1342
	1st Visit	Repeat Visit
Hourly employees	521	0
Weekly employees	305	2
Monthly employees	512	2
Total	1338	4
Non-occupational examination		73
Preplacement		384
Rehire		66
Termination		442
Preliminary		551

PARTIAL EXAMINATIONS

Absence due to non-occupational illness			1101
Absence due to non-occupational injury			52
Absence due to occupational illness			3
Absence due to occupational injury			24
Industrial hygiene examination			37
Job transfer examination			7
Periodic health examination, non-ORNL employees			5
Periodic health examination, ORNL employees			2416
	1st Visit	Repeat Visit	
Hourly	1015	1	
Weekly	526	10	
Monthly	851	13	
Total	2392	24	
Partial periodic examination, chest x-ray			22
Non-occupational examination			492
Preplacement			499
Rehire examination			163
Termination examination			336
Blood donor examination			31
Special study interview			5
Psychologic consultation			270
Consultation, occupational condition			11
Consultation, non-occupational condition			1774
Consultation without patient, occupational			1310
Consultation without patient, non-occupational			2936
Premarital serodiagnostic test			76
Medical termination			24
Procedure for outside physician			280
Emergency first aid for visitors			18
Auxiliary procedures:			
Audiogram			3866
Electrocardiogram			1763
Field Clinical Laboratory procedure			1
Clinical Laboratory procedure			6228*

* This figure represents the number of clinical laboratory visits. More than one laboratory procedure may be performed in one visit, hence the breakdown for the procedures is shown on the following page.

Anemia type	1
Bacterial culture	2
Bacterial smear	10
Bence-Jones protein	1
Blood type	763
Basal metabolic rate	11
Blood pressure	2967
Blood sugar	221
Blood non-protein nitrogen	5
Blood PSP	7
Blood prothrombin time	28
Blood alcohol	1
Blood cholesterol	2
Blood serum bilirubin	1
Blood uric acid	9
Feces for ova and parasites	5
Fishberg urine concentration	4
Hematocrit	5105
Hemoglobin	5123
Hetrophile anti-body titre	7
Red blood cell count	1
Rh factor	763
Sedimentation rate	2372
Sperm count	4
Sputum analysis	2
Urinalysis	5493
Urine concentration	4
Urinary coproporphyrin	30
VDRL	3877
White blood cell count and differential	5098
Total	31917

Occupational Vision Section procedures

Spectacles issued, plano	310
Spectacles ordered, prescription	756
Spectacles issued, prescription	660
Ortho-Rater examination	3947
Emergency service for non-occupational eyewear	72

Partial replacement	168
Adjustment and repair	94
Advisory service regarding vision	45
X-ray, occupational, auxiliary service	4331
X-ray, non-occupational	1116
Psychological testing preplacement	291
Immunizations	
First immunization	3040
Second immunization	2880
Third immunization	724
Booster and smallpox	2087
Other immunization	449
Special ophthalmoligical examination	164
Urinalysis, special, done at Y-12	325

DISPOSITION

Return to regular work	47057
Return to modified or part time work	1091
Sent home	201
Remain off work	918
Rejected	4
Accepted with restrictions	14
Accepted without restrictions	1628
Sent to hospital or physician's office	69

ATTENDANT

Doctor	11045
Doctor and nurse	4402
Doctor, nurse and technician	73
Nurse	32961
Nurse referral	285
Neuro-psychiatrist	2
Psychologist	671
Technician	23672
No attendant *	3985

* This code is necessary to avoid a false duplication of items in the Attendant code.