

CERCURAL SECTION OF THE STATE O

M. W. Boyer, General Manager

March 13, 1953

John C. Bugher, M.D., Director, Division of Biology and Medicine

MONTHLY STATUS AND PROGRESS REPORT, FEBRUARY, 1953 - DIVISION OF BIOLOGY AND MEDICINE



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Transmitted herewith is the Monthly Status and Progress Report for this Division covering the month of February, 1953.

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SURNAME O'Neill Brown Dr. Bugher ORGANIZATION & MANAGEMENT

DATE 3/13/53

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MONTHLY STATUS AND PROGRESS REPORT

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Division of Biology and Madicipa

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Weapons Test Activities

Civil Effects Group pers

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1953 to hendle the

weds Frowing Ground, mal preparations. Openation UPSHOT/

participating in Op

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KHOTHOLE totaled like as of February 2, 1953. Maximum attendance of like at the Newada Site is scheduled for the week of March 16. A "Security Oxide for the Civil Effects Orong and the Test Operations Orong" has been propared for personnal use during the operation. The guide specifies security responsibility and pro-

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operational plans and arrangements for the Civil Effects Program,

The fruit fly, Drosophile, exployed sponteneously and fallowing xand gamma irradiation, has been the most used object for studies of
gene mutation frequency. Flant mutatial, especially the bude of the
spiderwort, fradescentia, has been very useful in determining the
special kinds of mutations due to chromosome breaks. Such species
are fairly hardy, and they will be compared with other material such out) in containers suck in the ground at heredity pecimens will be exposed to neutron bes t lower desages a small number of size will be exposed in order to seterials least preliminary data ero and covered with heavy lead shields. It least preliminary data on the genetic effects The objects to be exposed are the classic genetic test which have been used for establishing the mechanism of and from which data may be extrapolated to human subjects. genetic effects and (with gas It is hoped to sets of fast neutrons intervals from All of these I rays screened

soribes procedures for such matters as personnel element toal security, and the like for participating personnel.

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and pus Appropria

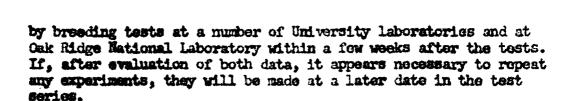
the Test Opera-

the kinds of mutations and the dosage-frequency ourse from the fast mention irradiation of the atomic book.

SALAND.

resulting

DOT ARCHIVES

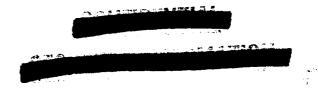


Laboratory tests have been completed of the telemetering system which will be in operation during test activities at the Nevada Proving Ground. A radio-frequency link is used in the system to transmit information on radiological conditions, as well as meteorological information, from areas within and surrounding atomic test sites. The equipment has been shipped to the test site for field evaluation and use in the coming test operations. The telemetering system, if successful, should replace many of the monitoring teams and their equipment which are now required to effectively monitor areas surrounding the test site.

Residual Environmental Contamination-TUMBLER/SNAPPER Data. Observations on the intensity of radioactive fall-out in areas mear the Nevada Proving Ground have been continued since the test series in 1952 (TUMBLER/SNAPPER). Calculations from the data observed at Groom and Lincoln mines, and the town of Pioche, show that in Jamesry 1953 residual levels of activity should amount to about 0.5, 0.1, and 0.5 milliroentgens per hour, respectively. Actual observations, however, show that the radiation levels are approximately normal background, i.e., 0.02 - 0.03 milliroentgen per hour. It thus appears that in addition to radioactive decay, other factors such as weathering (scattering by winds, penetration into soil as a result of snow and rain) are effective in reducing residual environmental dosage effects far below the levels which have been considered. It may be that further studies on this question will indicate that environmental hazards due to radioactive fall-out in populated areas near the site have been overestimated.

Research Activities

Fast Neutron Exposure at CRML. (UNCLASSIFIED) Exposure of biological material (Tradescantia and mice) to fast neutrons will be made in order to compare results with those obtained from experiments at the Nevada Proving Ground. For this purpose, a lead enclosure has been installed at the Y-12 Cyclotron at Cak Ridge. Praliminary investigation of the neutron dose indicates that fluxes up to 10 neutrons/cm²/sec are available with a small gamma-ray component. Measurements of the dose rate in roentgen equivalent physical units were obtained by the use of a tissue-equivalent ionization chamber. This instrument will also be used in the test series.



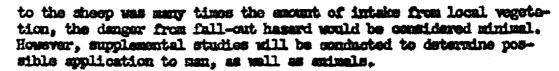
Hadistion Decomposition of Labeled Compounds. (UNIZASSIFIED) At the University of California, Heriniay, it has been found that certain organic compounds labaled with 0¹⁴⁴ have undargone decomposition as a result of the radiation from the C¹⁴⁴ in the malecule. Changes have been observed in the following: white, morteurine, chalins chloride, calcium glycalate, and chalesterol. The percentage decomposition varied in the different compounds. These findings demonstrate the necessity of checking the parity of stored labeled compounds.

A games ray scenner has been developed at the University of California, Berkeley, for the localization of redirective isotopes in the human body. A seventle portion of the apparetus, bearing a series of small radiation detectors which record as dots on a photographic film, is passed over the reclining patient. By this seaming procedure a ploture or image of the patient is furned as a patient of dots, each one of which represents a given degree of redioactivity. The number of cots in an area show the radiation in a particular portion of the body. This technique when used with radiatotive parette the detection of thyroid cancercus growths in various parts of the body.

Effects of Erradiction on Amino Acids. (UNILASSIFIED) Studies are being conducted at Heed College (Fortland, Gregom) to determine ionising effects on biochemical compounds, such as the enime acids. One of these acids, question has been found to give some protective action against radiation when fed to animals price to irradiation. No evidence as to the nature of this protective acids is apparent. It has been found, however, that several unknean products are formed when cysteins is subjected to x-radiation from a cobalt-60 source. In recent experiments, one of the products formed was identified as ALANINE (also an amino acid). This has not been demonstrated previously, and studies will be continued to determine if the products formed by the decomposition mechanism bear any relation to the protective action of gretcine.

a principal constituent of concern in the disposal of gaseous wastes emitted by the separations plant stacks at the Hanfurd Works. In order to obtain date on iodine toxicity to establish firm permissible exposure limits, a continuing experiment utilizing sheep, the comen grasing suimal of the region, was initiated at Hanford in 1950. Specifically, the immediate objective was to determine the permissible concentration of I on vegetation conteminated by stack effluents. Doses of I in up to 5 millicaries per day were feet to sheep for 20 mentis. Results indicate that no pathology was evident in the thyroid or in any other tissue. Since the smount of radioactive icdine fed





Development of Organ Perfusion Apparatus. (UNCLASSIFIED)
A medical research group at the University of Himmesota has developed, in the source of their studies on posphyrin metabolism, an inexpensive organ perfusion apparatus. The device has been used by this group for various organ perfusion emperiments including liver, whole leg, heart, kidney, spleen, and thyroid. This apparatus will circulate several hundred milliliters of blood per minute and can be adjusted for either a controlled rate of blood flow or a controlled pressure (either constant or pulsating), with automatic compensation to correct for changes in resistance of the organ.

While its use to date has related primarily to isotopic studies of porphyrin synthesis by the liver, it is expected that the apparatus will eventually prove of value for a variety of other biochemical and histochemical studies.

General

Conference on Infection and Issurity as Pactors. (UNCLASSIFIED)
A conference on "Infection and Issurity as Pactors in the Response to Whole-Body Irradiation" sponsored by the Phylaion was held in Washington on February 20, 1953. In attendance were representatives from Commission Isboratories, off-cits research contractors, the National Institute of Health, and the Department of Defense. Brief informal summaries of recent developments at the respective leboratories were given which stimulated discussion and comparisons of related data. This was the first meeting of its kind and considered successful in the original purpose to provide a mutual exchange of information. This will aid in expediting progress in the most promising directions, prevent any undue deplication of affort, and encourage renewed interest in resolving problems in this area.

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