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**NORTHAT STATUS AND PROGRESS REPORT
DIVISION OF BIOLOGY AND MEDICINE**

Month of July 1952

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Research Projects Approved During the Month of July

The following number of research projects were approved for negotiation or renewal during the month:

	Number	Amount
Biology	1	\$ 14,936
Biophysics	1	74,362
Medicine	1	12,616
Total	3	\$101,914

A summary of all actions taken on direct research proposals received in the Division is distributed monthly to Operations Section, National Laboratories, interested contractors, etc. Additional copies may be obtained from the Division of Biology and Medicine.

Biomedical Research Activities

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University of California - Los Angeles - Investigations in the Physiology of California - Los Angeles project have recently made a fundamental discovery concerning the mechanism by which ionizing radiation damages biological systems. Dosages of radiation which cause profound effects upon living organisms have almost undetectable action on most pure chemical substances. For this reason, the finding that a substance which is widespread in most organisms and which multiplies the effects of radiation considerably a significant advance in the field. They found that the polyphosphated essential fatty acids, which are intimately concerned with growth and cell formation, when irradiated undergo a shift of the isolated double bonds into conjugated positions. This bond shift is a measure of free radical and consequent peroxide formation in the acids molecules. Appropriate calculations showed that this phenomenon takes place with an ionize field of 16 which is very high and shows that a chain reaction similar to auto-oxidation must be taking place.

Information of this nature is of vital importance in determining the possible hazards involved in proposals to sterilize food products by the use of irradiation from fission products.

University of California Radiation Laboratory - Berkeley - Work has started on the radiation chemistry of diene systems polymers. These experiments are of theoretical importance in the consideration of any possible

DEPARTMENT OF ENERGY DECLASSIFICATION REVIEW

SINGLE REVIEW AUTHORIZED BY: AA SamsGorell 11/2/94

REVIEWER (ADD): ML KOLBAM

NAME: ML KOLBAM

DATE: 11/4/94

DETERMINATION (CIRCLE NUMBER(S))

1. CLASSIFICATION RETAINED

2. CLASSIFICATION CHANGED TO:

3. CONTAINS N/D/DOE CLASSIFIED INFO

4. COORDINATE WITH:

5. CLASSIFICATION CANCELLED

6. CLASSIFIED INFO BRACKETED

7. OTHER (SPECIFY):

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way for the origin of organic materials on this earth utilizing cosmic rays as the high energy source and the atmosphere as the dilute aqueous solution. Bombardments were made using the 40 Mev helium ion beam of the 60-inch cyclotron. Carbon-14 labelled carbon dioxide was bombarded and the reduction products were separated by the utilization of paper chromatography. It appears that approximately one-quarter of the dissolved carbon dioxide was reduced to formic acid and formaldehyde.

Whether or not carbon-carbon bonds and carbon-nitrogen bonds that exist in biological material can also be formed and more highly organized structures created under the influence of high energy radiations is at present under investigation.

Massachusetts Institute of Technology - The Health and Safety Division, NIOSH, has reported that experiments were begun at MIT under Dr. Robley D. Evans on studies of bone grafts using dogs injected with Ca45. The Ca45 migrations will be studied in hot grafts to cold hosts and in cold grafts to hot hosts.

Radiation Instruments Program - Arrangements have been made for the National Bureau of Standards to furnish the Radiation Instruments Branch under the Lombardi File (high voltage) battery development contract: (1) A 3,000 volt pile for inclusion in a E-25 designed small portable alpha proportional counter, and (2) 60 volt piles which may be used in a hermetically sealed quartz fiber dose meter developed at the Argonne National Laboratory. The indefinite life of the Lombardi pile will permit the operation of the Argonne instrument to be continuous and indefinite and, since essentially no current is required, once it is calibrated and sealed the instrument should require no further maintenance.

Twenty radiation detection instruments valued at \$5,250 were received in stock and forty-one instruments valued at \$13,744 were shipped to laboratories for inspection and evaluation. New equipment valued at \$1,890 was ordered during the month.

Loan of Instruments - Preliminary arrangements have been made to loan the Food and Drug Administration 32 survey meters for a period of 2 to 3 months for their use in training inspectors and chemists.

Eight sealing units and one automatic sampling changer were loaned to the USAF for use in test activities.

Field Investigations

New York Operations Office - Following Commission approval of a \$1,300,000 level of support in Fiscal Year 1952 and a new plan of operation for the ABCC contract, a meeting was held in New York to implement the

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approved plans. The meeting was called by Merrill Blumberg, Director, Health and Safety Division, HSO, who administers the contract for the Division of Biology and Medicine. Dr. Brown and Dr. Bartle attended for the Division, Mr. Wadd, Business Manager, National Academy of Sciences (the contractor), and Mr. Milton Evans, Business Manager, ABOO in Japan, also attended.

Mutual responsibilities under the contract were clarified, channels of communication were established, and final steps toward commencing construction of the new, but previously approved, housing and warehouse facilities were taken.

Brookhaven National Laboratory - Dr. Brown, Executive Officer of the Division, met with Mr. Van Horn, Mr. Lewa Hanger, of Brookhaven to review the FY 1952 construction budget. It was agreed that further consideration should be given to a "four-year flag" at Brookhaven, spending reduced and inter-dependent construction items in our package and scheduling each facility over the next four years as it is needed. At present, "throughput" construction items are sometimes supported by different programs and some items are partially dependent for their justification on yet to be approved facilities.

Howard Laboratory - Dr. Bayberg, Dr. Glass, Dr. Debus and Mr. Brown of the Division of Biology and Medicine, and Dr. Langham of the Los Alamos Scientific Laboratory, reviewed the Howard Laboratory personnel protection problems and the role of the Biology Laboratory in the study of the effects of exposure in Howard Laboratory workers. Dr. Anthony, Director of the Biology Laboratory, described the biology program and stressed the need for improved facilities. The Los Alamos and Howard Laboratory biological program on suitable materials was carefully reviewed and arrangements made for the program to be concentrated in the future at Howard Laboratory and for Los Alamos to forward to Howard the data it has accumulated.

Health Physics

Examination of a Typical Uranium Mine - Dr. E. Miles, Consultant to the Division of Biology and Medicine, in cooperation with a representative of the United States Public Health Service visited a typical uranium mine in the Colorado Plateau area for the purpose of making measurements of the concentration of airborne degradation products of radon to which miners are exposed. The results show that radon concentrations are high and the Long-147e degradation products of radon are present in appreciable amounts leading to weekly exposure of the miners to radiation dosage in excess of the 0.3 rem

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per week which is normally considered an acceptable dose. While there are several factors which indicate that the risks are not in immediate peril, nevertheless, years of exposure to these dangers may well involve some risks. Further studies are planned with USPHS for the purpose of evaluating the hazard as realistically as possible and of recommending corrective measures.

Millinocket Chemical Company, St. Louis, Missouri - The Biophysics Branch has found that the present environmental control group, under the direction of Mr. E. S. Ogden, assumed charge March 1948, and has made most commendable progress in reducing personnel exposure. However, practically every worker had received radiation in excess of permissible dose, the latest quarterly averages show that no one has exceeded the permissible dose and only 7% of the workers received more than half the permissible dose.

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Weapons Tests

Coordination of Biomedical Programs - By consultation with, the Division of Biology and Medicine has been given responsibility for the coordination and sponsoring of biomedical experiments and Civil Defense programs as well as similar proposals from within the ABC organizations. The Manager, BPO, through the Division of Military Applications, will determine feasibility. The Division has coordinated and recommended a limited scope biomedical program proposed by the Army Research Special Weapons program for incorporation in Operation BOSTON.

Operation JAMES - A second meeting of the Feasibility Committee to study radiological safety aspects of Operation JAMES was held in Washington. The Committee's function has been to determine whether or not the test can be safely carried out within the continental limits of the United States and, if so, to recommend radiological, physical, and biological data to be obtained as a result of the burst. The original recommendations were reconsidered in the light of additional information and a modified set of criteria was recommended for the tests. There was no change in the original agreement that the tests are feasible.

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Civil Defense Activities

The PCDA has expressed some concern over possible difficulties in obtaining weapons development data relating to civil defense. It was suggested by the PCDA that a briefing session for principal staff and

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AEC Commissioners be arranged for the purpose of acquainting the AEC with FCDA problems.

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Operation "Hot Rod" - A classified version of "Operation Hot Rod", prepared by the Biophysics Branch, concerning information relating to the effectiveness of automobiles as shelters during an atomic attack, was forwarded to the FCDA for evaluation with respect to shelter planning work.

Chalk River Accident - A report prepared by the Medical Branch, concerning information relating to an accidental explosion at the Canadian Chalk River atomic energy installation, was forwarded to the FCDA as data of potential value in the Civil Defense medical planning program.

FCDA Participation in Fall Tests - A conference was held with representatives of the FCDA Test Branch, Division of Military Application, and the Civil Defense Liaison Branch, to firm up FCDA requirements and participation in connection with fall tests. The FCDA submitted a program for testing a total of 46 "back yard" type shelters. The Civil Defense Liaison Branch has endorsed the request to the Division of Military Application for consideration. It is understood that the FCDA will submit another program covering the training of FCDA personnel in radiological safety.

FCDA Shelter Panel - At the request of the FCDA, Robert L. Corbie, Chief of the Civil Defense Liaison Branch, represented the AEC at the "FCDA Shelter Panel" held the week of July 23, for the purpose of reviewing and reporting on the Lehigh University Institute of Research on criteria for designing:

- Home Shelters
- Shelters in Existing Buildings
- Communal Shelters

Professor Harry L. Bowman, Consultant to the Civil Defense Liaison Branch, attended the July 25 sessions.

AEC Personnel Shelters - A program for testing AEC personnel shelters of the communal type has been submitted for consideration for inclusion in Operation MUSTER, and approved. These shelters have been designed for use at AEC prime target areas, as part of the AEC Disaster Plan coordinated by Mr. Fleury, Division of Security.

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Glass and Glass Substitutions - Dr. Corbille met with Mr. Walton G. Clark of Public Buildings Service and Mr. Sherwood B. Smith, AFSP, Director of GERRHOUSE structural tests, and discussed the report entitled "The Effects of Atomic Weapons on Glass and Window Construction" summarizing this part of the GERRHOUSE test data. The report was in preliminary form but provided useful data on the probable residual effects of glass and the characteristics of glass substitutions.

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Interagency and Institutes for CIVIL Defense Eng. - Arrangements were made to loan radiation detection instruments for CIVIL defense training purposes to the PCM General Training Center at Oklahoma AFB, and to the New Jersey State CIVIL Defense Agency. The latter also requested the loan of radiation sources for training purposes.

A jointly sponsored AEC-PCM booklet covering the procedures to be followed in submitting requests for the loan of instruments and sources from AEC has been distributed to AEC and PCM Civil agencies.

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Combined Conferences on Emergency Feeding - London, England - Several meetings have been held to discuss the agenda for the combined conferences on emergency feeding to be held in London in late November or early December. The Division of Biology and Medicine has participated in the preparation of the agenda for the conferences, insuring that items of special interest to the IRLMC will be given appropriate consideration and that reports of the conferences will be available to the Division of Biology and Medicine. It is anticipated that there will be between 25 and 30 representatives from the United States attending the conferences.

Construction Programs

New Laboratory Construction Ordeals - The CIVIL Defense Liaison Branch reviewed plans and preliminary criteria for the proposed AEC installation at Boney Flakes and furnished comments to the Division of Construction and Supply.

University of California Atomic Energy Project - Berkeley - With the exception of some minor cleaning up, construction work on the two-story animal house has been completed. Installation of some equipment is still to be undertaken prior to the start of the research work to be conducted in this building extension.

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Brookhaven Biology Laboratory - Twelve bids were received, and opened for the new biology laboratory, with an exceedingly favorable low bid of \$383,700. This bid permits revision of the total budget cost estimate of \$1,200,000 to \$989,700.

Hanford Aquatic Laboratory - A low bid of \$372,000 has been received on the aquatic laboratory. The work is expected to be completed in June 1952.

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