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MONTHLY REPORT OF ACTIVITIES FOR THE PERIOD 21 AUGUST - 20 SEPTEMBER 1968

The efforts of the Environmental Studies Section during the reporting period were primarily directed toward (1) completion of the CERT 24 Sudan grass test and (2) preparations for and execution of the sulfur dioxide test performed in cooperation with Dr. A. Clyde Hill and associates of the University of Utah.

CERT-24:

(a) A complete study of the metabolism by dairy cattle of radioiodine deposited on Sudan grass was made. Preliminary calculations of the ratio of the radioiodine concentration found in milk to the daily radioiodine intake indicate that this ratio is smaller (a statistical analysis has not yet been made) than the same ratio calculated for ordinary pasture grass.

(b) (b) Extensive data on the distribution of deposited radioiodine on Sudan grass and on the natural removal of radioiodine from Sudan grass with time were taken. Analysis of these data has not yet begun.

Sulfur DIOXIDE TEST

(a) Preparations for the test included layout and electrification of the sampling grid, construction and testing of impinger type bubblers for air sampling and calibration of gas metering devices for releasing the stable SO_2 and the $^{35}SO_2$.

(b) Jess Bennett, Frank Anderson, and Eric Pelton of the University of Utah were here on the 17th and 18th for preliminary stomatal sampling and other test preparations and for alfalfa sampling after the release.

(c) The release was carried out the morning of 18 September 1968. Approximately 320 mCi $^{35}SO_2$ were released over the stand of alfalfa at the EDF. Sampling of the alfalfa began immediately after the release and preparation of the samples for analysis was completed that evening. The remaining alfalfawas chopped and removed from the pasture the following day to avoid unnecessary contamination of the pasture.

(d) Analysis of the bubbler solutions and alfalfa samples for ^{35}S by the Analytical Chemistry Branch indicate that ~~kkm~~ we will be able to calculate an actual deposition velocity at some points but, because of the low air concentrations, restricted to calculating a limiting value (minimum) at most points. Examination of the meteorological data revealed that the 30-minute mean wind direction was 5-10° off the axis of the pasture and that the deviations from the mean direction were moderately large. These two factors probably reduced the expected air concentration by about an order of magnitude. The sensitivity for detection of ^{35}S on alfalfa was kept about an order of magnitude greater than that for air sampling because of the uncertainty of the value of the deposition velocity of SO_2; preliminary test results indicate that the SO_2 deposition velocity may well be greater than the Utah estimate of 0.1 $V_d(I_2)$.

We have received approximately one-third of the accessory equipment ordered to improve our capability for photomicrography.

The dairy cattle were returned to Montana State University September 5.

The farm electrification project is nearing completion. We have requested that contractor be required to adequately fill the trenches dug to bury h the cables and this work will be done in the near future.

Samples of wheat were collected from various farming areas surrounding the NRTS. These are currently being ashed in as part of the analysis for ^{90}Sr.

CERTLE: The wind field in the chamber was mapped by Markee and Boyd Mortensen in preparation for a series of tests planned by Earl Markee to determine the deposition of radioiodine on carbon plates (composed of AC-1 filter material on both sides of a thin aluminum plate). Six of the anticipated fifteen test runs were completed.

The radiation monitor at the ERC in Idaho Falls was tested (in composition with Instrumentation) and found to be operating in an acceptable manner.

Two emergency kits were checked and restocked following a Radiological Assistance Team exercise. The two TLD badges worn by the participants in the exercise were read by Dosimetry and found to indicate an exposure of 90 mR. The badges contained in the other emergency kits will be checked.

One of the drills used for the TRA pond study was found to be contaminated when checked prior to releasing the drilling crew. Decontamination of the drill was successfully accomplished.

The plotting routine for the computer program used to evaluate the rate constants for the bovine radioiodine metabolism model has been completed and successfully tested. Evaluation of the rate constants for the remaining CERT-20 metabolic data will begin soon.

On September 9-11 Dick Bangart attended a course on Particle Characteristics (sponsored by Coulter Electronics and given by Houghborough University, England). His trip report has been prepared and contains details for those interested.

Most of the comments which I solicited from individuals attended the PPCo computer orientation sessions regarding thesis value were distinctly negative.

My report "Calculation of Organ and Tissue Burdens and Doses Resulting From an Acute Exposure to a Radiation Aerosol Using the ICRP Task Group Report on the Human Respiratory Tract", IDO-12067, was published during the reporting period. I have since found two more errors, both slight.

The Analytical Chemistry group of INC at CPP has been requested to evaluate, in light of their extensive knowledge of the behavior of radioiodine, our I_2 generation techniques and sampling procedures. Close cooperation between our group and their group is anticipated.

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Environmental Studies Section