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February 3, 1959

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TRIP REPORT - NEW YORK AND BOSTON, JANUARY 26-30, 1959

SYMBOL: BMES:JZH

In New York, Jan. 26-28

I attended a meeting of the American Meteorological Society, delivered a paper entitled, "AEC Atmospheric Radioactivity Studies", spent an evening with Vonnegut and Moore of Arthur D. Little Co., and an afternoon at HASL. January 29 at MIT I participated in an exploratory meeting with cloud physicists and geochemists to set up a cooperative study of radio rainout, and spent the afternoon with Starr's group. I spent Jan. 30 with Martell at Air Force Cambridge Research Center.

1. AMS Meeting & Hardtack tracer release

Clearance for my paper was received via Eisenbud a few minutes before the Tuesday afternoon session of the AMS at which it was to be read. The press, represented by Sullivan of the N.Y. Times, Blakeslee of AP and Gamarekian of the Washington Post, showed an interest in the Hardtack tracer information. Gamarekian asked whether the tracers had been introduced deliberately for this purpose. I answered: "The rhodium - yes. The tungsten - no." Sullivan asked whether the tracers had been detected. I answered: "There is a delay in analysis. As of last October, the rhodium has not been detected; the tungsten has been." I was asked whether both tracers were on all Hardtack shots, and I answered "no". Clippings are attached.

2. HASL

Analysis of certain groups of research samples was discussed with Harley and Whitney. It was agreed:

(a) Armour particle-size fractions will be analyzed for Sr-90 and total beta.

(b) General Mills Ash Can research samples will be counted as soon as received and the gross beta counted sent to Stern, then they will be analyzed for Sr^{89}, Sr^{90} and Ce^{144}.

(c) General Mills stratospheric particle size fractions, to be obtained this Spring, will also get a quick beta count for Stern, followed by analysis for Sr^{89}, Sr^{90}, Zr^{95}, Cs^{137}, Ce^{144} and W^{185}.

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3. MIT - Rain study

The Thursday morning meeting was attended by Dr. Pauline Austin and Messrs. Newell and Fleisher of the Radar-Meteorology group, Drs. Victor Starr, E. Lorenz and R. White of the General Circulation Project, Prof. Winchester of the Geology Department, Drs. E. Martell and C. Junge of the Air Force Cambridge Research Center, Dr. L. Machta of the Weather Bureau, and myself. In order to learn more about both the scavenging of particulates by rain and the physics of precipitation, it was agreed:

(a) The MIT studies of total beta activity in very short-period rain samples, collected by a 25 square foot collector, should be continued and modified to include counting both the filtrate and the residue.

(b) For selected cases, these 1/2 - liter samples should be recombined and sent to Dr. Martell for Sr^{90} and Pb^{210} analysis.

(c) Dr. Junge will analyze these same samples for natural salts, the vertical concentration profiles of which are sufficiently well known to give an indication of the volume of air scavenged. If the Pb^{210} can be related to volume scavenged, then the salt concentration may give information on the altitude of formation of the rain.

(d) A 250-cc aliquot will be set to USGS in Washington for D/H and O^{18}/O^{16} ratio measurements. It is hoped that these ratio can be correlated with condensation mixing ratio sufficiently closely to permit its use for indirect measurement. Together with the other two tracers this would give considerable information regarding the condensation and scavenging process.

(e) Martell and Winchester will explore the possibility of having Dr. J. Arnold at Scripps Institution of Oceanography analyze selected large-volume samples for Be^{7}, S^{35} and P^{32}, natural cosmic-ray induced activities which are useful for identifying the proportion of scavenged particles which are of recent stratospheric origin. Dr. Machta will coordinate the project from the standpoint of fallout, and is authorized to spend with MIT up to $5,000 of AEC transferred funds.

4. MIT - Stratospheric Circulation Project

The Thursday afternoon meeting was attended by Starr, Lorenz, White, Machta, Martell, Junge, Fleisher and myself. The meeting served mainly to bring Starr's group up to date on the radioactivity data and problems in interpretation, and to bring the "nuclear" group up-to-date on the general circulation studies at stratospheric altitudes. Starr's AEC contract has been active only a short time, and new work is not yet underway. White, a leading worker on the general circulation, is in process of transferring from APCRC to MIT to work full time on this project.

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5. AFCRC - Geophysics Research Directorate

Friday was spent at Bedford with Dr. Martell and his group (Junge, Kalkstein and Drevinsky). The laboratory is gradually taking shape. Results on Ba^{140}/Sr^{90} in rain parallel Euredas' and are very impressive. The use of salt concentrations for normalizing specific activity to air volume scavenged is being explored. Pb^{210} may possibly be used similarly. Tritium analysis is expected to get underway on stratospheric samples next summer. Martell hopes to contract with Suess or Von Buttlar for low-level tritium.

Rh^{102} has been detected in three stratospheric analysis samples covering a wide range of latitudes. Condensation nuclei counting and impactors are being used to study natural dust in the troposphere and stratosphere. This appears to be a wide open and important field for study. Martell and Junge are now badly in need of more contract and equipment funds in order to ~~take advantage of go ahead with suitable sampling~~ get the samples needed to follow up the indications from the very small number of measurements made so far. Some of the implications regarding the fate of bomb debris, troposphere-stratosphere exchange, chemical reactions in the stratosphere, meteoritic accretion, the origin of natural freezing nuclei and other important questions are surprising but, so far, highly speculative.

cc: Dr. Shilling
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