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August 15, 1966

FOREIGN TRAVEL

MADRID AND PALOMARES, SPAIN

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- I. Eric B. Fowler, Alternate Group Leader, Group H-7 of Health Division of the Los Alamos Scientific Laboratory, Los Alamos, New Mexico
- II. Madrid and Palomares, Spain - June 14 through July 2, 1966
- III. The objective of the tour was to establish a soil surveillance program and to obtain soil and vegetation samples for Project Broken Arrow.
- IV. A. (None)
- B. Two LASL representatives were present on the above dates; William Moss, Group H-5, Urine analysis program
Eric B. Fowler, Group H-7, Soils and vegetation program
- C-D. June 15 - June 18: These dates were spent at the "Health Division" of the J.E.N. to meet personnel, unpack, and cross check equipment lists. Equipment was assembled and checked out. The blower motor on the drying oven overheated and was removed for rewinding. Other motors and heating equipment operated satisfactorily with powerstats. It should be noted that the line voltage fluctuates which probably causes some overheating of equipment at the J.E.N. location. **BEST AVAILABLE COPY**

Check out and assembly of equipment was completed.

All materials necessary for sampling of soil and vegetation

MEDICINE, HEALTH & SAFETY - 3-9 Spanish Incident
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at the Palomares site were packed for transport. Arrangements were made for travel.

June 19-24: Sampling sites at Palomares were selected in relation to impact points, two 50 x 50 meter sites were selected in each of the areas; 2, 3, and 5. One site, 50 x 50 meters, was selected north of the village toward Vera, this later was to serve as the background or control site. The sites were staked and 9 sampling points designated on the two diagonals of the square. A total of 63 sampling points were designated. Each plot was selected so as to cover at least two cultivated areas and the associated vegetation. Four of the sites were under crops; two of the sites were cultivated but not planted, and one site was neither planted nor cultivated. Three of the planted sites were in corn, one was in alfalfa.

Core samples were taken to a depth of 18 inches from all plots. Each core was divided as 0-2, 2-6, 6-10, 10-14, and 14-18 inches. In general the soils are a clay-sand low in organic matter. Stones and rocks are frequent. Two cores were taken from each point. In several instances a number of cores were removed in order to obtain two which were satisfactory. Evidence of non-uniform plow depth was indicated by the manner in which the core tool penetrated

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the soil. It would appear that the very stony fields were not plowed as deeply as the more sandy fields. Several areas which had not been under irrigation were so dry that small stones and soil fell into the annular space around the core tool making it impossible to pull the tool. In these cases, water was employed around the core tool to prevent soil and stones from filling the annulus. It is suggested that a jack be designed to assist in pulling the core tool and that it be used for the next sampling.

Wild vegetation, corn, and alfalfa were collected where available.

Since there was some evidence of salt accumulation from repeated irrigation, two water samples were collected, evaporated to dryness in the laboratory at Madrid, and returned to Los Alamos for analyses. It is possible that poor stands of crop may be experienced in the future; if so, this may be the result of salt accumulation. There is now some evidence of this effect outside the "contaminated" area.

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June 25-29: Soil samples were ground, mixed and divided at the laboratory in Madrid. One portion was

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sterilized at 15 lbs for 25 minutes, packed, and prepared for shipment to Los Alamos. The second portion remains at Madrid for future analyses.

Vegetation was dried, sterilized and divided; one portion was packed for shipment; a second portion remains at Madrid.

A total of 330 samples were prepared. The soil, 295 samples, can be combined within plots or areas or each sample can be analyzed separately. In all probability separate analyses will be conducted at Los Alamos on the first sampling in order to obtain data relative to distribution and variation among the 9 points within an area. Results may indicate the desirability of combination for future sampling.

June 30: Sample cans were sealed and packaged for shipment. One box of samples was to be returned as excess baggage; however, there are certain complications in this procedure. Further, if air freight is to be used, a previous authorization for removal, addressed to Spanish (or other country's) customs, is desirable to facilitate the removal of the specimens from the country.

July 2: Dr. Alvarez (Miss) came to Los Alamos where she is studying methods used here in the analysis of plutonium in soil matrixies.

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V. A-E. Personnel at the Spanish J.E.N. were most cooperative.

There is an attitude of warm friendship which made the tour most profitable and pleasant. Their laboratory facilities are somewhat antiquated; e.g., the bench tops are glazed ceramic tile fitted in place by a porous grout, benches are of wood without a finish in many places. These conditions lead to questions relative to cross contamination. However, the personnel are anxious to learn and offer pertinent suggestions. Such assistance as we can give is greatly appreciated. Our cooperation should continue on the basis of "What can we do to help with your problems?"

It has been suggested that fruit be sent to this laboratory at the next harvest season - about November or December 1966 for analysis. Soil samples will again be taken in June of 1967 and a conference should be held shortly thereafter to review results and to outline any changes in procedure. This review will be important to the marketing of fruits and hence to the future economy of the area.

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