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LOS ANGELES: ATOMIC ENERGY PROJECT

December 18, 1956

MEMORANDUM TO: Stafford L. Warren, M.D., Director, AEP

FROM: Alfred W. Bellamy, Ph.D., Consultant

SUBJECT: PROJECT OBJECTIVES.

Reference is made to Memos of December 16, and 17, the latter dealing with Project orientation.

Argument. In terms of the recommended orientation, "The Civil Effects of Environmental Radiation Arising from Nuclear Reactions and their Byproducts whether in a War Situation or Peacetime Developments", general objectives seem relatively easy to identify. The difficult part is inter-relating and coordinating the several specific objectives in program form in such a way as to provide a smooth flow of work and documentation.

Among the more easily identified general objectives, stated in broad category form, we mention:

1. Biological availability of byproduct radioactive sources and the variables affecting it;
2. Biological responses to absorbed radiations, acute and chronic;
3. Threshold values for injury, acute and chronic and with the time parameter well considered;
4. Recovery or rehabilitation of contaminated areas;
5. Treatment and handling of radiation injuries;
6. Methodology, techniques and instrumentation appropriate to the several programmed objectives;
7. Emergency operations;
8. Training;
9. Public information material.

Broadly considered these objectives fall into several broad categories, viz., Understanding the origin, nature, and distribution of environmental radiation; preventing radiation injuries; treating or handling radiation injuries; documentation for technical and public information; training.

Programming all of these categories seems a large order for one organization. Doubtless policy decisions at AEP and DEM will indicate which of these and probably other related objectives are to be emphasized here or elsewhere and whether and to what extent there should be participation in the correlation of related efforts done elsewhere.

Some breakdown of objectives into more specific categories follows on succeeding pages.

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I

The identification, definition and analysis of variables affecting the availability of selected radioactive isotopes to man and his domestic plants and animals, including organisms in the food chains leading to them.

1. Physico-chemical changes with time -- environmental decay in specific environments, including redistribution of selected isotopes by various components of the environment, wind and water for example.
2. Soil properties and interactions with fallout as related to availability.
3. Particle size distribution in fallout patterns in space and time and correlations with availability.
4. The role of living and non-living organic soil inclusions and constituents in affecting availability.
5. Biological variables affecting availability - epithelial barriers of lung and gut. (See also II-5)

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II

Biological responses to absorbed radiation, internal emitters, and sources of radiation, immediate and late effects (Limited in this writing chiefly but not exclusively to work currently programed at AEP)

1. Blood forming organs -- man; selected domestic animals.
2. Gut responses - selected domestic animals
3. Responses at the intracellular and molecular levels
4. Acute and chronic or late responses to irradiation, external and internal, at various stages in the life cycle from embryonic to adult.
5. Irradiation responses under "multiple insult" conditions.
6. Responses of selected plants and animals as judged by growth rates and selected performance characteristics.

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### III

Threshold values for injury, acute and chronic.

(Threshold values for injury can have little meaning except as defined in terms of the time-rate of exposure including equilibrium levels of internal emitters.)

1. Selected plants
2. Selected animals
3. Species characteristics for uptake rates of selected radioactive isotopes and their equilibrium levels.

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IV

Recovery or rehabilitation of contaminated areas, urban, suburban, agricultural with special emphasis on food producing lands, -garden truck, orchards, crops, forage.

1. Cropping to reduce levels of soil contamination
2. Soil treatments to reduce availability and to increase fixation.

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V

Treatment and handling of radiation injuries

1. Man
2. Selected domestic animals

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VI

Methodology, techniques and instrumentation appropriate to the several programmed objectives.

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VII

Emergency Operations

1. The Pu problem
2. Other unforeseen crash programs

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VIII

Training - especially of operating personnel in the area of dealing with sources of man-made radioactivity in the environment with emphasis on special "events" and programs.

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IX

Public Information

The preparation of special materials relating to environmental radioactivity for the information of officials and the public.

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