

CROSS EXAMINATION BY MR. EARDLEY [AEC]

Q. Doctor Loucks, what courses did you take in college or since college which led you to an understanding of the major functions of these radioactive nuclides?

A. I am presently engaged in work that is primarily concerned with systems analysis of materials moving through the environment. Most of my preparation has led up to this activity. In developing this experience, we have relied very heavily on the systems studies carried out at Oak Ridge National Laboratory, which I have followed closely for the past fifteen years. It has been one of the leading centers in the development of systems analysis of biological systems. And it is from that association that I have some experience with the movement of radioactive materials in systems. As a systems analyst, I cannot appear as a specialist in research in radioactive materials themselves, per se, but on their movement in complex systems.

Q. Now, what practical personal experience have you had in tracing the elements of radioactive substances in the ecology?

A. My experience in that area has been in the utilization of the published literature from Oak Ridge National Laboratory on the movement of these materials in biological systems, and which we are presently adapting through the systems analysis group at the University of Wisconsin.

MR. YANNACONE: I'm going to object. This is properly cross-examination. I am nowhere even halfway through my direct examination. ...

MR. EARDLEY: Your Honor, we are talking about now the introduction of two documents here which, if he is an expert in this field, I would object to because there's no way I can cross-examine him about stuff that he has not, you know- that he is not knowledgeable about.

MR. YANNACONE: Let me withdraw the offer and continue the qualifications.

THE COURT: All right.

Q. In the course of your regular professional activities have you had occasion to investigate the analysis of systems and transport mechanisms in the atmosphere, in water and in biological systems, alone and in conjunction with others?

A. I have.

Q. Is it possible for any single individual at this time, with competence in any single academic discipline, to consider all of the elements of a water, atmospheric, or ecological transport system in the natural environment”?

A. This is not possible for any one individual.

Q. [Are these considered) as a general rule, by the Systems Method?

A. Yes.

Q. And is this a method pioneered by the United States government at the Cambridge Radiation Laboratory and the Manhattan Project during World War II?

A. Yes.

Q. Have you had occasion to participate on some of these teams that do this type of research over the past ten years”!

A. Yes.

Q. Now, in the course of preparation of the... paper "Systems Models for Describing Changes in Ecosystems" have you had occasion to discuss the entire paper with your co-author, Dr. Watts”?

A. I have.

Q. Is Dr. Watts a member of the faculty of the University of Wisconsin?

A. He is.

Q. What is Dr. Watts” peculiar, specialized discipline?

A. He is associate professor of statistics, but his training at the master’s and Ph.D. level was in electrical engineering.

Q. In other words then, Doctor, to prepare that paper, which includes elements of a number of disciplines including, as not the least of which, statistics and ecology, required the... services of at least two people, is that correct?

A. It did.

Q. Of differing disciplines?

A. Yes.

Q. Are each of you capable of reporting the results contained in that paper?

A. Yes.

Q. Are you capable of standing cross-examination on that paper?

A. Yes, I am.

MR. YANNACONE: I [now] offer that paper in evidence.

This attempt to introduce published papers into the record as evidence met with objections and led to extensive *voir dire* by attorneys for the Atomic Energy Commission and the Austral Oil Company. These objections were met by elaborating the extent of the independent research conducted by the witness and its relevance to the systems analysis of radionuclide distribution, further establishing that systems science is an integrative operation requiring direct participation by representatives of many intellectual disciplines.