

This request was honored by the submission of a design for epidemiologic studies, dated October 1975. This document was prepared by A.P. Polednak, who had joined the CHR in May 1975 as an epidemiologist. In it he described two specific cohort studies of dial painters, outlined a study of birth characteristics of offspring of female radium dial workers, and included a design for an epidemiologic study of former thorium workers. This document was subsequently approved in 1976.

### **The Study of Plutonium and Thorium Cases**

Durbin (1972), in a review of patients of presumed short life expectancy given plutonium in 1945-1946 (Langham et al. 1950), deduced that some of these patients might still be alive. They had been injected to determine a relationship between the quantity of plutonium in the body and its subsequent elimination. The relationship determined was to be used to estimate the body content of accidentally exposed plutonium workers. The patients received injections of  $^{238}\text{Pu}$  (2 cases) and  $^{239}\text{Pu}$  (16 cases) containing 0.1-5.9  $\mu\text{Ci}$ . With Durbin's help and encouragement, the CHR found 4 of the original 18 patients to be still living in 1975. Three of these patients were hospitalized in a metabolic ward, and all urine and feces were collected for at least eight days. Blood samples from two of the patients were analyzed for plutonium.

In these efforts the CHR was not at first encouraged by the staff of the DBER/AEC, who had no objections to the analysis of the data from the published report of Langham but did object to direct contact with the still-living subjects. Rowland argued that the value of human experience with plutonium more than justified the difficulties that might be experienced in obtaining the information. Ultimately he obtained approval to attempt to exhume deceased subjects and to locate living individuals, as long as the CHR did not indicate to the subjects or their families that the study dealt with individuals containing plutonium or identify the university hospitals in which the radioactive materials were administered. Rowland agreed to these restrictions but did not get them in writing.

These restrictions later embarrassed the CHR, because the Division of Inspection of the AEC located an internal CHR memo that cautioned the staff not to use the term plutonium in regard to these cases. Quite correctly, since the CHR was operating under the restrictions placed upon it by DBER/AEC, the inspectors pointed out that the CHR did not have valid informed consent from these patients for its actions. The DBER/AEC was then required to contact each of the patients and inform them that they had been injected with plutonium in the period 1945-1946. Subsequently, this failure of the CHR to