72 Toxicity Following Inhalation. H.P. Dygert and others. Natl. Nuclear Energy Ser., Manhattan Project Tech. Sec. Div. VI, 1, Pt. 1, pp 423-524; Pt. 2, 525-700 (1949)

The toxicologic effects of a number of uranium compounds, following exposure of animals by inhalation was studied. Maintenance of concentration within the exposure chamber was assured by sampling devices, which are diagrammed and explained. The size of the particle is a factor of great importance, toxic effect varying inversely with size. Species differences were evident, the rabbit and cat being most susceptible, dog and mouse next and guinea pig and rat least susceptible. The overall toxicity of these compounds was compared using as criteria mortality, weight, response, and biochemical and histologic changes. Numerical scores based on severity of the response were assigned. Dogs, rats, and rabbits were chosen for estimating the score. The relative order of toxicity of the compounds is given. The most soluble compounds were relatively the most toxic. -- Condensed from Chem. Absts.

73 Studies on Human Exposures to Uranium Compounds. J.W. Howland. Natl. Nuclear Energy Serv. Manhattan Project Tech. Sect. Div. VI, 1, Pt. II, 993-1017 (1949).

Studies were made on the possible toxic reactions of human subjects to uranium compounds either as the result of acute exposure or after long-continued chronic exposure. Except for acute exposures, in which the individual was heavily contaminated, there was no evidence of a chronic toxicity for any of the uranium compounds utilized. Experimental examination established a preliminary maximum allowable concentration of 150 gamma uranium dusts per cc. air, based on the known toxicity of lead. Results of the experimental program indicated that this was a wise choice. In general, injury produced by acute exposure was directly proportional to the intensity of the exposure. Duration of exposure was relatively short in all instances, averaging about 17 seconds. The typical picture of the acute poisoning of human subjects by the inhalation of a soluble uranium compound (uranium hexafluoride) is that of an initial chemical injury to the respiratory tract, followed almost immediately by evidences of kidney involvement. In all probability the injurious effects were all directly produced by the action of the fluoride ion on the exposed tissues, the uranium as such having its only effect in the production of the transient urinary-tract changes. Analysis of teeth and bone removed from exposed workers indicated that the amount of uranium absorbed and stored is quite small and that the hazard that might occurr from such storage is in all probability negligible. -- Chem. Absts.

74 The Mechanism of Action of Uranium Compounds in the Animal Body. A.L. Dounce and others. Natl. Nuclear Energy Ser. Manhattan Project Tech. Sect. Div. VI, 1, Pt. II,951-991 (1949).

The acid which is produced when uranium compounds are hydrolyzed is the direct cause of the local effects of these compounds. Properly neutralized uranium compounds show serious local effect only when massive doses are used. Details concerning deposition, retention and excretion of uranium are given. The best procedure available for the treatment of acute uranium poisoning is continued administration of tolerated amounts