Flinn and Keim in rabbits; and Ogata in rats and mice. Variations exist in the degree of susceptibility of the liver of different species to the toxic action of arsenicals (rabbits being more sensitive than ferrets and rats, according to Von Glahn, Flinn and Keim).

The arsenical cirrhosis of the liver seems to be very similar to portal cirrhosis, and represents a type which shows statistically and histologically a certain causal relation to primary carcinoma of the liver. The possibility of such an effect may be likely, in view of the proven carcinogenic properties exhibited by arsenic in the skin.

*c) Lead.* Chronic exposure to lead, especially in the form of lead arsenate, is likely to cause chronic fibrosing and degenerative processes in the liver; as arsenic and lead exert a hepatotoxic effect. Six cases of plumbic cirrhosis of the liver in man were reported by Lafitte, who reproduced the same condition in rabbits by the administration of lead compounds. Similar results were obtained by Albot in rats, guinea pigs, and rabbits by repeated subcutaneous injection of lead carbonate and lead acetate. The cirrhosis caused by chronic plumbism is of the perilobular type, and not identical with Laennec's cirrhosis. A causal relation to primary carcinoma of the liver is improbable for this reason.

*d) Manganese.* Manganese compounds have been extensively used for the experimental production of cirrhosis of the liver (Langecker). The subcutaneous or oral administration of manganese salts (manganese chloride and aromatic manganese compounds) to rats, guinea pigs, and rabbits caused liver cell degeneration. Perilobular fibrosis followed resulting in a cirrhosis of the liver of the monolobular, biliary type without appreciable distortions of the lobular pattern (Findlay; Handovsky, Schulz and Staemmler; Martin; Hurst and Hurst; Fiessinger; and Albot). A case of liver cirrhosis in a man with chronic manganese intoxication was reported by Casamajor. It is not likely that this chemical and the hepatic changes it may produce are involved in the causation of primary malignancy of the liver.

*e) Copper.* A great deal of experimentation has been done to demonstrate a connection between cirrhosis of the liver and chronic poisoning with compounds of copper. The results obtained were contradictory. Mallory, Parker, and Nye claimed that a prolonged feeding of copper acetate to rabbits and rats resulted in the development of a hemochromatotic type of cirrhosis, which was confirmed in regard to rats by Andrianoff and in regard to rabbits by Hall and MacKay. Flinn and Von Glahn; Oshima and Siebert; Herkel; and Schindel were unable to substantiate such findings. In view of the uncertainty of the hepatic action of copper compounds and considering the fact that the cirrhosis observed did not obliterate the lobular architecture, chronic copper poisoning does not seem to have any causal relations to primary hepatic malignancy.

The statement of Moon, that "It seems improbable that inorganic poisons,