

leaves on the gum, on the roof of the mouth and teeth minute particles that stimulate the normal bacteria of the mouth to increased activity.”

Flinn, Professor of Industrial Hygiene at Columbia University, had been engaged by the U.S. Radium Corporation to investigate the problems at its plant in Orange, New Jersey. In his comments after Martland's presentation, Flinn described a measurement he had made to find the quantity of paint ingested by the dial painters. He went to a factory where the painters did not point the brushes with their lips but instead drew the brush through a cloth to bring it to a point. He had painters save all the cloths they used in one week. From these cloths, Flinn determined that 500 mg of paint (of the 10 g used daily) could have been ingested per day if the painters had pointed their brushes with their lips. (No translation into the quantity of radium involved was provided. At Martland's estimate of 1 mg of radium to 30-40 g of zinc sulfide, 500 mg of paint would have contained 13-17 μCi of radium. Kjaer gave an average value of 25 μg of radium to 5 g of paint, or 2.5 μCi of radium per 500 mg of paint.)

Flinn (1926) subsequently published a paper on the Orange, New Jersey, plant, concluding that no industrial hazard existed in the dial painting industry. He did note that five painters from Orange had died of some cause that could not be determined.

A year later, Flinn (1927) described a dial painter from the Waterbury Clock Company in Connecticut who had tripped and broken her femur without falling. This woman suffered from bone necrosis, and measurements showed that her body contained about 100 μCi of radium. She died in 1927, leading Flinn to believe that “radium is partially if not the primary cause of the pathological condition. . . .” Finally, Flinn (1928) concluded that “radioactive material is at the bottom of the trouble even if the mechanism by which it is caused is not altogether clear and not previously suspected.”

The last statement did not sit well with Martland, who had continued to publish accounts of death and disease among the dial painters (Martland 1926; Reitter and Martland 1926). In his next publication, Martland (1929) clearly indicated that radium had previously been identified as the cause of the dial painters' problems.

The papers of this period by Martland and his coworkers are truly remarkable. The researchers thoroughly investigated the new phenomenon of radioactivity. They concerned themselves deeply with the symptoms in the individual cases and showed a good deal of compassion toward the victims of the industry. Martland and his colleagues bemoaned the fact that the laws of