

Ottawa, Illinois; Elgin Watch in Elgin, Illinois; Waterbury Clock in Waterbury, Connecticut; New Haven Clock in New Haven, Connecticut; Waltham Watch and Clock in Waltham, Massachusetts; and Ansonia Clock in New York City. The U.S. Radium Corporation plant in Orange, New Jersey, and the Radium Dial Company plant in Ottawa, Illinois, were by far the largest application plants. By the end of 1921 an estimated 28 Ci of radium had been used in luminous compounds for watch and clock dials, gun sights, and similar applications.

One aspect of the use of luminous paint containing radium that has seldom been mentioned was its availability to the public. The U.S. Radium Corporation sold a product called Undark, a dial paint for general use. One of the company's advertisements stated the following:

You Can Apply UNDARK Yourself

For those who desire to experiment with Undark or who wish to illuminate articles in the home, we manufacture the UNDARK Radium Illuminating Set. It contains a small quantity of UNDARK radium luminous material of medium luminosity, a grade adaptable for most application requirements, one vial of practice material (for experimental purposes before UNDARK is used), one vial of adhesive, one vial of thinner, a mixing cup, glass mixing rod and a camel's hair brush.

The price of Undark was \$3 per set.

In 1929, over the name of the Commissioner of Labor Statistics of the U.S. Department of Labor, a document titled *Radium Poisoning* was published (Stewart 1929). This document stated that investigators had visited 31 plants "... covering all establishments of any importance engaged in dial painting and other establishments engaged in the commercial manufacture of radioactive preparations." A total of 23 radiation-related fatalities were found and another 19 living individuals who were suffering from poisoning due to radioactive materials. Of the 42 cases, 33 were dial painters; of these, 15 were dead and 18 still living. All were stated to have tipped their brushes with their lips. Of the dial painters, 25 were from the U.S. Radium Corporation plant in Orange, New Jersey, as were five deceased individuals who were not dial painters.

Stewart's document (1929) strongly suggested that radium dials were not necessary for the public and that the importing and manufacture of radium dials should be prohibited, but it also outlined guidelines for protecting workers. Stewart did discuss "modern" methods of applying