

radioactive substances, more extensive and thorough studies of the radioactive conditions prevailing within the mines and in the surrounding regions were made.

The first measurements of the radioactivity of the air in the Schneeberg mines were made by Ludewig and Lorenser, who found a maximal content of 50 Mache units per liter (1924). Investigations made by Neitzel, during the years 1923-1934 in these mines, brought out the fact that there were marked variations in regard to the degree of radioactivity in different parts of the mines. The air at the site of the drill holes contained 36 to 46.5 Mache units per liter, while the air at the bottom of the mine shaft had only a content of 2.6 to 11.7 Mache units. The water dripping from the walls of the mine ducts had a radioactivity ranging from 5.5 to 221 Mache units per liter, depending upon the location and originating from dissolved radium element (3.44×10^{-4} MC per liter of water). Assuming that the air in mines contains an average of 40 Mache units per liter and that a Schneeberg miner works seven hours daily and 300 days per year, Lange calculated that such a person would receive a yearly dose of 12.4 mg. of the radium element.

In recent investigations of Rajewsky concerning the emanation content of the air in the mines, it was found that the concentration varied in different localities between 0.02 and 183 Mache units per liter. It was significant that the mine which had the highest emanation content was known among the miners as the "Todesschacht" (death mine). The emanation content in the mines was in general between 6 and 8 Mache units. Rajewsky added that the emanation content of the mine air was, especially in former years, above the non-toxic level, and thus may have caused injury, representing at least one of the factors operative in the causation of Schneeberg cancer. While studying the urine of two hewers, following several days of work in drilling operations in the mines, Neitzel found 21.2 to 29.4 Mache units of radium emanation per liter of urine. As these figures are rather high, he concluded that there exists a more marked exposure to radium emanation near the sites of drill holes than in other parts of the mines. This observation is of special significance, as pulmonary malignancy is particularly frequent among the miners employed as hewers, thereby supporting the conception of a radioactive origin of these tumors (Neitzel; Fischer-Wasels).

It may be mentioned in this connection that radioactive rock formations and waters in springs and brooks are found in a larger area of the Erzgebirge. The air in the mines of the Johann Georgenstadt district, which is situated in close proximity to the Schneeberg region contains, according to Rostoski and Saupe, 1.8 to 6.6 Mache units per liter, rarely up to 40 units, while a few Mache units are present in the water of these mines. In a more detailed survey of the radioactive water of the baths in Schlema it was shown that the water contains 300 to 5,500 Mache units. Lange pointed out that the attendants of these bathing establishments should be exposed to the inhalation of an appre-