and Jonas (1936); Teleky (1936); and Gross (1936), who reported the occurrence of an appreciable number of lung carcinomas among workers of several chromate plants. There were five additional cases observed by Pfeil among workers of the chromate plant (Ludwigshafen), in which the first two cases, recorded by Pfeil, were found. A total of 10 cases of bronchial cancer, occurring from 1926 to 1936, was traced by Alwens, Bauke and Jonas to a chromate factory in Griesheim. These investigators became suspicious for the first time in 1929 concerning a chromate etiology of some of their cases of pulmonary malignancy, which came under their care at Frankfurt. Jonas diagnosed 5 additional cases from roentgenologic evidence among the workers employed in the same plant. Gross mentioned the occurrence of several sporadic cases among the workers of some other chromate plants (Uerdingen, Bitterfeld, and Leverkusen). Up to 1936, 25 cases of pulmonary carcinoma among chromate workers were placed on record (Koelsch), and this number has increased since (Bauer). The majority of cases observed so far have occurred among workers of chromate plants, which had been closed for some time (Ludwigshafen in 1923 and Griesheim in 1931). No cases of pulmonary malignancy have been noted, as yet, among the workers of chromate factories erected more recently (Teleky). This investigator gained, moreover, the impression that the incidence of gastro-intestinal cancers was excessive among chromate workers. His data, in support of this assertion, are insufficient for any definite decision.

Causative Mechanism. The etiological agent and the causative mechanism involved in the production of the pulmonary carcinomas in chromate workers are still entirely unknown. Attempts which have been made by Teutschlaender and Gross to reproduce these tumors in animals by an exposure to the inhalation of chromate dust were unsuccessful. There was only a swelling of the hilum nodes attesting to the irritative effect of the chromates. Similar results were reported by Lukanin, who exposed rabbits and cats to the inhalation of dust from chromium ores and from chromates. With the exception of emphysema, interstitial pulmonary fibrosis, and the deposition of a brown pigment (iron chromium ore) nothing was observed even suggesting preneoplastic pulmonary lesions. One of the rabbits had a perforation of the nasal septum. These changes were identical with those observed by Lukanin in a chromium ore miner, who had been killed in an accident after an employment of 5 years.

Many of the workers affected were employed in a chromate operation in which they inhaled, in addition to large amounts of ferrous chromite dust, dust of chromates and chromate fumes. Other workers afflicted with pulmonary tumors had been engaged in the production of sulfuric acid (3), hydrochloric acid (1), and sulfates, and in the regeneration of chromic oxide to chromic acid from the oxidation bases used in the manufacture of quinones. Several other workers were listed as drivers (2), glaziers (1), welders (1),