

Similar experiments were carried out by Molfino³ (1938) on rabbits.

The description of the syndrome which develops in man with inhalation of vanadium pentoxide dust varies in the few and mostly scanty reports appearing in the literature. The authors agree with regard to the irritation of the respiratory tract accompanied with symptoms of bronchitis, whereas in the earliest description of the condition (Dutton,⁴ 1911), which still appears in several of the larger textbooks, divers phenomena noted in the gastrointestinal tract, the blood, the kidneys and the central nervous system are said to belong to the syndrome (anorexia, nausea, diarrhea or constipation, anemia, cachexia, albuminuria with cylindric casts and red cells in the sediment, tremor, headache, neuroretinitis, amaurosis, vertigo and mental disorders). Balestra and Molfino⁵ (1942) described cases of pneumoconiosis, which may reasonably be presumed to have been cases of silicosis. In the first reliable report on the subject, Symanski⁶ (1939) reached the conclusion that the picture is quite characteristic and that the symptoms are due entirely to the irritating effect of vanadium dust on the mucous membranes of the respiratory tract and on the conjunctivas. In all his 19 cases he observed conjunctivitis with smarting of the eyes, rhinitis with watery discharge, sore throat, persistent cough with pressure over the chest, possibly a stitch and many rhonchi. Roentgenograms showed chronic bronchitis. Symanski pointed out the possibility that severe chronic bronchitis may occur, possibly with bronchiectasis. He emphasized that he had observed no gastrointestinal symptoms, no organic injuries of the kidneys, no signs of lowered activity of the blood-forming organs, nor any nervous symptoms. He considers that there is no reason to suspect an absorptive poisonous effect. There were no deaths in his cases.

Wyers⁷ (1946) reached a somewhat different conception of the disease. In his communication describing 10 cases in which the patients were exposed to vanadium pentoxide for five months to 10 years, he reported the following main symptoms: (1) pallor of the skin (no examination of the blood was made); (2) greenish black discoloration of the tongue (it may be due to the reduction of the pentoxide to trioxide and to the formation of green salts through the action of ptyalin and acid-forming bacteria; it occurred mostly in workers with caries; it could not be washed off but disappeared after a few days' absence from work); (3) paroxysmal cough, rarely with hemoptysis; (4) dyspnea; (5) pains in the chest; (6) palpitation on exertion; (7) tremor of the fingers and arms; (8) emphysematous chest; (9) profuse bronchitis; (10) bronchial spasm; (11) raised blood pressure, accentuated pulmonary second sound, and (12) reticulation on roentgenologic examination. Wyers also observed in one case hyaline and granular casts in the urine and reported four cases of pneumonia. There were no cases in which diarrhea, loss of appetite, emaciation, visual disorder, paresis, vertigo, convulsions

3. Molfino, F.: Contributo sperimentale allo studio dell' intossicazione professionale da vanadio, *Rass. med. appl. lavoro indust.* **9**:62, 1938.

4. Dutton, W. F.: Vanadiumism, *J. A. M. A.* **56**:1648 (June 3) 1911.

5. Balestra, G., and Molfino, F.: Alterazioni polmonari da polveri negli operai addetti all'estrazione del vanadio dalle ceneri di nafta, *Rass. med. indust.* **13**:5, 1942.

6. Symanski: *Ber. VIII Internat. Kongress f. Berufskrankh.*, 1938, p. 1061; *Gewerbliche Vanadinschädigungen, ihre Entstehung und Symptomatologie*, *Arch. f. Gewerbepath.* **9**:295, 1939.

7. Wyers, H.: Some Toxic Effects of Vanadium Pentoxide, *Brit. J. Indust. Med.* **3**:177, 1946.