

involving the respiratory tract. Finally, allergy may naturally play a part in this respect.

In five cases acute changes occurred in the lungs (pneumonic in one case, bronchopneumonic in the others), which in at least three cases appeared in connection with heavy exposure to dust. Wyers⁷ reported four similar cases. Thus, it seems probable that vanadium pentoxide dust may cause pneumonitis. The growth of several kinds of pathogenic bacteria suggests that this vanadium pneumonitis may be of a mixed chemical and bacterial origin (like manganese pneumonitis). An allergic factor may also be present, as one of the patients belonged to those who not only had eczematous lesions but also reacted positively to a vanadium patch test.

In two other workers with bronchopneumonia among those who had left the factory the disease may have been connected with epithelial lesions caused earlier by the dust and leading to increased susceptibility to infection.

Wyers stated that an emphysematous chest and reticulation on the roentgenogram are signs of fibrosis of the lungs. No signs of any chronic specific changes, however, similar to those in the pulmonary granulomatosis caused by beryllium or

TABLE 1.—*The Spirometric Values Expressed in Liters at the Existing Air Pressure, 37 C. and Water Vapor Saturation, and as a Percentage (the Quotients), Respectively*

	Vanadium Workers	Controls	Difference
Complementary air	2.16 ± 0.09	2.28 ± 0.06	0.12 ± 0.11
Tidal air	0.78 ± 0.05	0.76 ± 0.02	0.02 ± 0.05
Reserve air	1.90 ± 0.08	1.45 ± 0.04	0.45 ± 0.09
Vital capacity	4.84 ± 0.13	4.49 ± 0.07	0.35 ± 0.15
Residual capacity	1.70 ± 0.08	1.56 ± 0.04	0.14 ± 0.09
Total capacity	6.54 ± 0.16	6.05 ± 0.09	0.49 ± 0.18
Residual quotient	26.0 ± 1.03	25.8 ± 0.56	0.2 ± 1.17
Equilibrium quotient	55.1 ± 1.24	49.6 ± 0.60	5.5 ± 1.38

cemented tungsten carbide (Sjöberg^{12c}) or silica have been observed on repeated roentgenologic examination of the present material. I have also failed to find reticulation in any cases. Nor has any sign of emphysema in the form of an increase of the so-called residual quotient been demonstrated at the spirometric examinations performed according to the principles laid down by Birath¹³ (1944). In view of the short observation period, however, the possibility of the appearance of such changes may not be ruled out.

Gastrointestinal Tract.—With regard to digestive symptoms, Wyers' remarkable report concerning greenish black discoloration of the tongue, observed in many of the factory workers examined by him, has been mentioned on a foregoing page. As nobody else has observed any such discoloration, and as I myself have

12. Sjöberg, S.-G.: (a) Förgiftning av vanadinsyra (V_2O_5), Nord. med. **41**:500, 1949; (b) Pneumonier av tungmetalldamm, ibid. **42**:1709, 1949; (c) Metalldamm-pneumoniter, ibid. **43**:117, 1950; (d) Vanadium Pentoxide Dust: A Clinical and Experimental Investigation on Its Effect After Inhalation, Acta med. scandinav. **138**: supp. 238, 1950; (e) The Discovery of Vanadium: Nils Gabriel Sefström, His Discovery and Its Consequences, J. Chem. Education, to be published.

13. Birath, G.: Lung Volume and Ventilation Efficiency, Acta med. scandinav., 1944, supp. 154.