

164 DUST DISEASES, EXCLUDING THE FIBROTIC PNEUMOCONIOSES

compounds, at least, must be added to the list of substances which may cause cancer of the respiratory tract.

Association of pulmonary cancer with silicosis and asbestosis

Between 1930 and 1940 there were several papers calling attention to a suspected association between lung cancer and silicosis, the inference being that silica might, directly or indirectly, play some aetiological part in producing the malignant disease. Such an association has not been borne out by further inquiry.

The relation between asbestosis and lung cancer is, however, quite different. This subject is dealt with in Chapter I of this volume

New and unknown industrial carcinogens

In the future there may be new and increased usage of certain materials now known to be carcinogenic. This is true at the present time for radioactive materials, especially isotopes, and for x-rays. Furthermore, as our knowledge of the aetiology of malignant disease of the respiratory tract increases, it is to be expected that other materials which are now encountered in the industrial environment, as well, perhaps, as some in the domestic environment, will prove to have carcinogenic properties. New uses for some of the rarer metals are continually being found and the toxicology of many of these is incompletely known.

Substances carcinogenic to animals.—Some substances, not yet known to produce cancer in human beings, have been shown to induce malignant changes in animals. Beryllium is one of these, intravenous injections having been reported, both in Great Britain (Barnes, 1949) and in America (Gardner and Heslington, 1946; Dutra and Largent, 1950), as causing sarcoma of bones. Animal experiments have also shown that selenium is carcinogenic for certain species, although no human case attributed to its industrial exposure is known.

Mineral oils.—Uncertainty exists about exposure to mists of mineral oils, encountered by garage workers and in other occupations. Kennaway and Kennaway (1936) note that spinners and piecers of cotton, who are exposed to fine droplets of mineral oil, have a very low ratio (31) for lung cancer, but a rather high ratio (148) for laryngeal cancer. Hueper (1951) mentions *iso*-propyl oil, as requiring further study in regard to cancer of the nasal sinuses and lungs, in the manufacture of *iso*-propyl alcohol. Santo (1949) summarizes available knowledge concerning the reaction of the lungs to the instillation of various types of oil. He says that mineral oils may produce not only acute lipoid pneumonia but chronic granulomatous infiltrations or paraffinomas. He presents 2 cases of bronchial carcinoma in patients who had been taking liquid paraffin daily by the mouth over a period of years. In 1 case organizing lipoid pneumonia was present throughout the affected area, and in the other the carcinoma appeared to have arisen in such an