

material (Legge; Oliver; Schärer; Habermann; Hoffmann; Barnewitz).

The use of tar, pitch, and asphalt in the electrotechnical industry and in the manufacture of electrical appliances has led to an appreciable number of dermatoses and a few epitheliomas among the workers employed in such operations [insulation tape, dry battery cases, electrical cables, insulation of electrical appliances (molders, mixers, seal makers), and electrode pressing] (Baader; Betke; Büngeler; Arnstein; Heller; Carozzi; Foerster and Schwartz; Barkmeyer; Raabs).

The occurrence of a pitch dermatosis in cobblers using pitch for the impregnation of sewing thread has been noted by Oppenheim and Lutz; while Stahr reported a cancer of the thumb of a cobbler's apprentice who had frequently punctured the skin with the point of his awl.

The use of pitch as one of the ingredients (colophonium) of a lubricant, employed by glass blowers for greasing the palms of their hands when they rotate the hot iron blow pipe, has been recorded by Oppenheim; Epstein; Glaser; and Stein. Epstein, also, reported the development of a cancer in the palm of the left hand of a glass blower thus exposed.

The recorded occurrence of skin cancer in brush makers using wood tar (Bridge and Henry) should be mentioned as well as that in a hemp rope maker who employed the same material as a lubricant and for impregnation (Weiss).

Lauchs and Neumann noted the occurrence of skin cancer in workers using wood tar in the manufacture of wire cables; and Veiel observed a case following a prolonged therapeutic application of pinene tar.

From an analysis of the great number of communications dealing with the effects of an occupational contact of tar, pitch, and asphalt upon the skin of male and female workers, the remarkable conclusion must be drawn, that the development of non-neoplastic, and often precancerous reactions, is a very frequent phenomenon; while cancerous responses are relatively rarely observed in the majority of industries in which such a hazard exists. However, a much greater amount of extensive and reliable evidence is needed before this conclusion can be accepted as definite.

The following types of tar, pitch, and asphalt have been incriminated in the production of industrial cancer of the skin: gas works tar, producer-gas tar, coke-oven tar (Kennaway; Baader; Leymann), shale oil tar, lignite tar, anthracite-retort tar (Leymann; Rámbousek; Zweig), blast-furnace tar [for mice (Berenblum, 1930; Bonser; 1932); not for man (Legge; Kennaway); and, not for mice (Leitch, 1923)], gas-tar pitch, coke-oven pitch, certain petroleum asphalts, and certain wood tars (pinene) (Weiss; Neumann; Bridge and Henry; Twort and Fulton; Veiel; Watson; Kotzareff and de Morsier). Water-gas tar is said to be noncarcinogenic (Wood). Kennaway demonstrated the carcinogenicity of certain synthetic tars prepared by passing isoprene and acetylene through tubes heated at 700°-900°C. These synthetic tars are of