

regionary lymph nodes may be the result either of infectious or inflammatory reactions or are the seat of secondary neoplastic deposits. Primary multiplicity of tumors is frequent and may be simultaneous or successive in character affecting sometimes widely separated areas. The malignant development in the chronically injured roentgen-skin is set off not infrequently by some kind of traumatization (Halberstaedter).

While the changes observed after prolonged occupational exposure to radioactive substances are fundamentally identical with those found in connection with chronic roentgen-injury, the type of exposure brings about certain peculiarities in the location and character of the preneoplastic and neoplastic responses which deserve special mention.

The fingertips of persons handling radioactive substances show the most marked effect of the radiating energy because they are the most exposed parts of the body. After a relatively short period of exposure they show a flattening of the ridges of the skin and become painful and numb. With progressive atrophy, the fingertips become pointed and the skin smooth and shiny (Teleky; Droschl; Becquérel). The gradually increasing indistinctness of the cutaneous ridges ultimately leads to complete obliteration of the original finger prints. The pads of the fingertips lose their elasticity so that pressure marks on their surfaces persist for a few seconds. The nails develop dystrophic changes, while the cuticle turns dry and white. With a subsequent thickening of the epidermis, wrinkles and cracks appear in the horny layer of the dry, scaly, parchment-like skin of the tips. Hyperkeratoses develop beneath the nails (Jakoby) as well as on the dorsal and volar sides of the fingertips. A certain awkwardness in picking up objects results from the numbness of the fingertips (Ordway) which later develop an increased sensitivity to thermic influences, especially heat, as well as a throbbing sensation. Warty hyperkeratoses, which sometimes fall off spontaneously or can be pried off and whose development may be accompanied by radiating pains, may involve the more proximal parts of the fingers, the interdigital folds, the back of the hands and the forearms, where they are usually associated with pigmentary disturbances (Giesel; Friedländer). The hyperkeratoses of the fingertips necrotize ultimately and form small, highly painful, indolent ulcers, which slowly extend and finally involve the entire area of the fingertip. The thumb and the second finger of the right hand are most often affected for obvious reasons. Cancers may arise on the basis of the warty growths and of the ulcers and assume a mushroom-like appearance.

XI. HISTOLOGY

Acute Roentgen- and Radium-Dermatitis. The character, degree, reversibility, persistence and progressiveness of the cutaneous changes found in an acute roentgen-dermatitis depend upon the intensity of the exposure to the radiating energy. They are of importance in connection with the anatomical changes leading to the development of roentgen-cancer, as they are not