

(sweat glands, sebaceous glands) and loss of hair (alopecia). Whereas these effects are transitory in first and second degree burns, they are permanent with third degree burns, in which the glandular elements are destroyed by the severe roentgen-ray effect. As the result of these functional disturbances, the skin becomes dry, scaly, rough, dull and covered with a white dust (Cole). There develops at the same time an atrophy of the epidermis. The thinning of the skin results in a more marked red color of the blood vessels. With a progressive flattening of the normal ridges and wrinkles, the skin becomes smooth, glassy, translucent, delicate and inelastic, covering a reduced connective tissue. Later on, the skin may assume a bacon-like, sclerodermic appearance of board-hard consistency, or it may become increasingly atrophic and exhibit a senescent, dried out, wrinkled, and parchment-like character. The tactile sensitivity becomes reduced with the development of these changes, while the sensitivity to thermic influences becomes greatly accentuated. Often there appears a sensation of tension and heat, together with itching in the affected parts.

Not infrequently the fingertips become pointed as the result of marked atrophic changes. The nails become deformed, dry and brittle and develop longitudinal and transverse ridges, or may fall off entirely, being replaced later by a highly distorted rudimentary nail formation. The ribbed nails break off easily, fissure readily and assume a dirty brown appearance. They tend to loosen from the nailbed, thicken subsequently and finally turn into shapeless masses. Subungual hemorrhages and telangiectases develop sometimes and paronychias are a frequent complication. Marked subungual hyperkeratoses, which often appear, particularly after the handling of radioactive substances entailing an exposure of the fingertips, lift the nails from their matrix.

In addition to these atrophic and degenerative lesions in the epidermis, there also occur various types of hyperplastic and hypertrophic changes of local and diffuse keratotic character, which give to the skin a harsh touch. Two different types of keratotic lesions are observed in the chronically injured skin (Unna): (1) *hard warts* which are sharply circumscribed verrucous keratotic excrescences, often displaying an inflamed and painful base; they are usually multiple, irregularly distributed in areas showing only moderately atrophic changes; they grow slowly, some are dry, others are crusted; spontaneous regressions occur rarely; (2) *calluses*, which are elevated, shiny, stripe-like keratotic indurations of grey to greyish-yellow color, alternating sometimes with brown, hyperpigmented spots and located usually in the margins of nails and in the interdigital folds; they are frequently painful, containing in their base small subepidermal abscesses; their lamellated horny layer may desquamate spontaneously but is readily reformed, or it may slough, leaving an ulcerative defect, which bleeds readily. Ulcers develop also in the verrucous hard hyperkeratoses, which show a tendency to fissure and then to break down. The ulcers have a coarsely granular surface covered by a dirty greyish red exudate. Their firm, yellow margins are formed in general by