fibrils in the cutis, while the connective tissue cells are swollen and have hyperchromatic nuclei.

During the transition of this second phase into the third and last phase of the acute reaction, when the erythema fades away and may disappear completely, there occurs a narrowing of the epidermis, which then is composed of hypertrophic cells and numerous multinucleated cells. There is marked cellular and nuclear polymorphism. The cells of the basal layer contain an increased amount of melanin, while the more superficial epidermal layers display hydropic degenerative changes, melanin pigmentation and evidence of keratinization. There are no inflammatory reactions in the cutis, which contains scanty multinucleated fibroblasts and endothelial cells as well as pigmented melanophores.

The third phase of the acute roentgen-dermatitis, which begins usually, according to Miescher, 6 to 7 weeks after the irradiation and which passes directly over into the chronic roentgen-dermatitis, is characterized by morphological manifestations similar to those found during the second phase, if the exposure was *mild*. If the irradiation was *severe*, the reactive processes maintain a progressive character. While the number of epidermal cellular layers is reduced still further, there is a marked increase in cellular and nuclear irregularity. Multinucleated cells may become so frequent that every second and third cell may contain several nuclei. Some nuclei possess little chromatic material, but large nucleoli. There are numerous normal and pathological mitoses, which are especially frequent in the neighborhood of intra-epidermal foci of liquefaction necrosis. During the latter part of this phase, a new basal layer is formed which consists of densely crowded and rather small, deeply staining cells containing numerous normal mitoses. This newly formed germinative layer lifts the polymorphous original stratum malpighii from its base. With the gradual disappearance of multinucleated giant cells in the stratum granulosum, there appears in some foci a hydropic swelling of the more superficial epithelial cells which are transformed into large vesicles. A hyaline necrobiosis of the epithelial cells is observed in other parts of the epidermis. These ribbon-like, hyaline foci are infiltrated by phagocytic cells and surrounded by mitotic figures containing epithelial cells. The newly formed epithelial cells composing the new thickened epidermis are not quite normal, as they are often hypertrophic and deficient in chromatin.

The cutis exhibits during this time a minor degree of edema and a few perivascular round cell infiltrations in addition to epithelioid cells. The endothelial cells of blood vessels are sometimes swollen, while homogeneous, anuclear areas or areas composed of muscle cells with several and distorted nuclei are found at times in the venous walls.

There may occur a gradual and slow return to normalcy, if the skin is not too severely damaged, especially in its vascular aspects. A more persistent and progressive course ensues after an intense and massive irradiation result-