

of cheek (Montgomery and Viecegli); hypertrichosis of cheek (Kaplan); and dural endothelioma (Deuticke)). Deuticke collected, in 1939, seven non-tuberculous, therapeutic roentgen-sarcomas, and found for these cases a latency period varying from 10 to 16 years. This compilation apparently did not include the case of Kaplan with a latency period of seven years, and that of Montgomery and Viecegli with a preparatory period of 30 years. The latency period for the tuberculous roentgen-sarcomas is from 5 to 20 years, according to Deuticke.

The incidence ratio of sarcomatous developments in a previously tuberculous tissue which was irradiated, as contrasted with sarcomas originating in a non-irradiated tuberculous tissue, is 45 to 10. The relationship of therapeutic roentgen-sarcoma on a tuberculous basis to the therapeutic roentgen-sarcoma of non-tuberculous genesis is 45 to 11, according to Deuticke. The combination of tuberculosis and roentgen-irradiation seems to favor the development of sarcomatous growths.

The causal connection between these conditions does not seem to be a direct one, as the sarcomatous development appears as a rule long after the tuberculous process has healed, and at a time when no tuberculous lesions can be found in the vicinity of the tumor. This suggests that the prolonged effect of the irradiation is the contributing factor rather than any specific effect exerted by the tuberculous tissue changes (Deuticke). This conception is supported by the fact, that roentgen-sarcomas have originated in nonspecific granulomatous tissues and chronic inflammatory lesions other than tuberculous ones.

In all these cases, the sarcoma developed as a late result of the irradiation treatment administered. The relative rarity of such neoplastic sequelae produced by roentgen-rays is attributed by Wyss to the natural inertness of the connective tissue. This investigator contended that roentgen-sarcomas develop on the basis of a radiation ischemia in the connective tissue. This assertion was disputed by Rosenbach, who observed in the bed of a roentgen-sarcoma a marked vascularization and no evidence of obliterative vascular changes. Roentgen-sarcomas are histologically fibrosarcomas, spindle-cell sarcomas, or polymorphous-cell sarcomas, the latter frequently showing a tendency to myxomatous transformations. The prognosis of roentgen-sarcomas is bad.

*Experimental Sarcomas Produced by Roentgen-Rays.* The causal rôle, which an excessive and prolonged exposure to roentgen-rays plays in the production of sarcomas of the connective tissue in man, has been confirmed by numerous experimental observations made in animals. Bauer; and Clunet, Marie and Raulot produced spindle-cell sarcomas in the cutis of rats, which had been exposed for up to 18 months to repeated treatments with roentgen-rays.

The presence of an accentuated reactivity of an inflammatory granulation