The dry mass of shank bones was either reduced slightly (up to 5% of the contralateral bone weight) or remained unchanged. The ratios of shank BMC and BMD scans of IFA-treated to the contralateral control MIZ mice were below 1.0 when measured two weeks post IFA administration (1.22 ± 0.33 and 0.97 ± 0.0, respectively), while for the three-week subgroup this ratio for BMC was 1.19 ± 0.43 and for BMD was still below 1.0 (0.96 ± 0.08).

Response to CFA

The administration of CFA into the right pad of CFW/Ll and MIZ mice produced swelling, induration and redness of the injected pads within a few minutes. This reaction was maintained up to the 6th week with very slow normalization. No reaction at all was noted in the contralateral, left pads. On average, the cross-sectional areas of the CFA-treated pads were at least 2–3 times higher than those of the contralateral pads.

The weights of the right popliteal lymph nodes increased several times and this enlargement was maintained up to the 5th week. In contrast to the animals exposed to the IFA, the animals stimulated with CFA demonstrated an increase in shank bone dry mass and this was observed consistently. The yield of bone dry mass correlated roughly with the degree of lymph node enlargement. The bone mass increase was noted as early as two weeks post CFA administration and was maintained throughout the entire 6-week observation period.

The scan analysis of shank bones revealed constantly higher values for BMC and BMD in the CFA-treated limbs compared to the control limbs. On average, the ratios of the right to the left BMC and BMD were 1.18 ± 0.23 and 1.07 ± 0.03, respectively, for the two-week subgroup and 1.63 ± 0.35 and 1.16 ± 0.08 for the three-week subgroup. The animals of both groups (IFA and CFA-treated) appeared to move to the same extent.

Histological examination

The inflammatory reaction produced by IFA and CFA administration was manifested by avid infiltration of connective tissue with mononuclear cells and fibrin deposition, qualified as granulomatous inflammation. Fibrin deposits were observed on the 7th day, while epithelioid cells, foreign cells and collagen accumulation was observed on days 14–27. This pathology lessened on the 20th day for IFA and on the 43rd day for CFA. No substantial changes in metacarpal bones were observed in the IFA-treated pads, although in some areas the inflammatory cells had slightly eroded surfaces. No osteoclastic activity was detected. In contrast, the CFA-treated pads displayed an inflammatory reaction, which was associated with avid periosteal osteogenesis. As early as on the 7th day post CFA injection, a widening of the periosteum and deposition of osteoid was observed (Fig. 1). The osteoblasts were enlarged and exhibited a strong basophilia, but were often bizzare in shape (Fig. 1, 3). In some instances within the activated periosteum, chondrocytes were also present

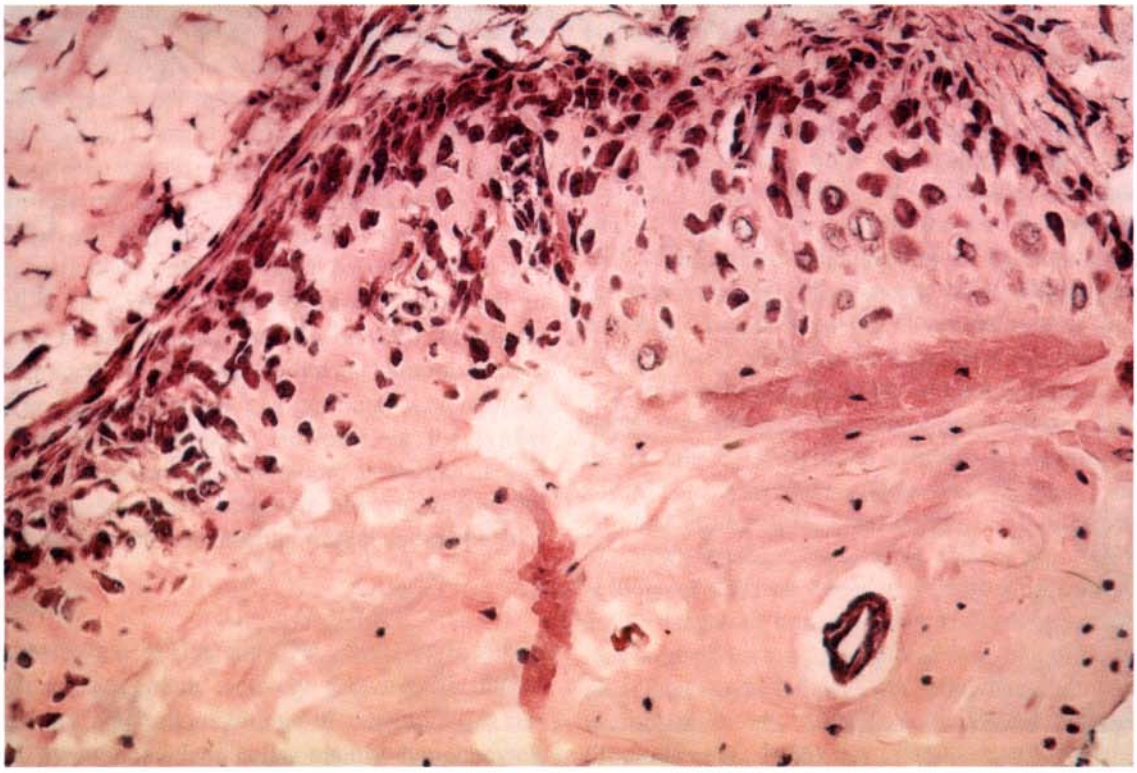

Fig. 1. Periosteal bone formation in the tarsal bone, seven days post CFA administration. Magnification 400x.

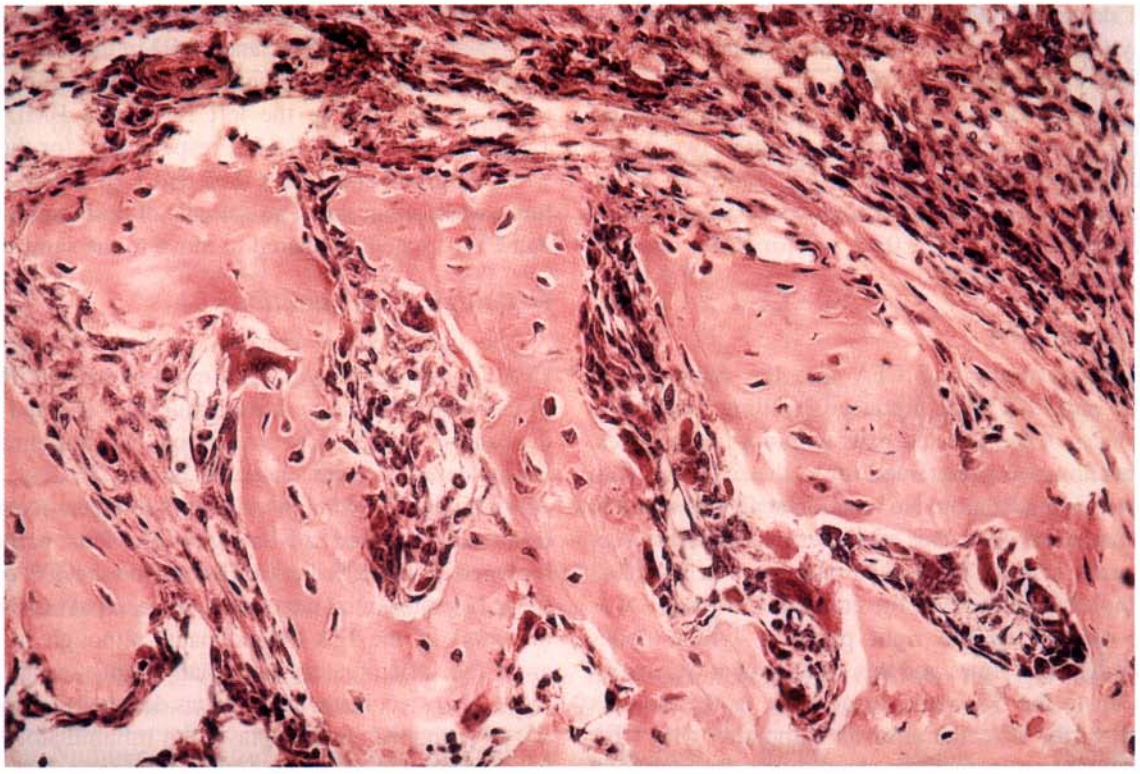

Fig. 2. Periosteal bone formation following the CFA-induced inflammation, two weeks post adjuvant administration. Bone spicules are covered with active osteoblasts; osteocytes are relatively large and entombed in spacious lacunae. Magnification 800x.

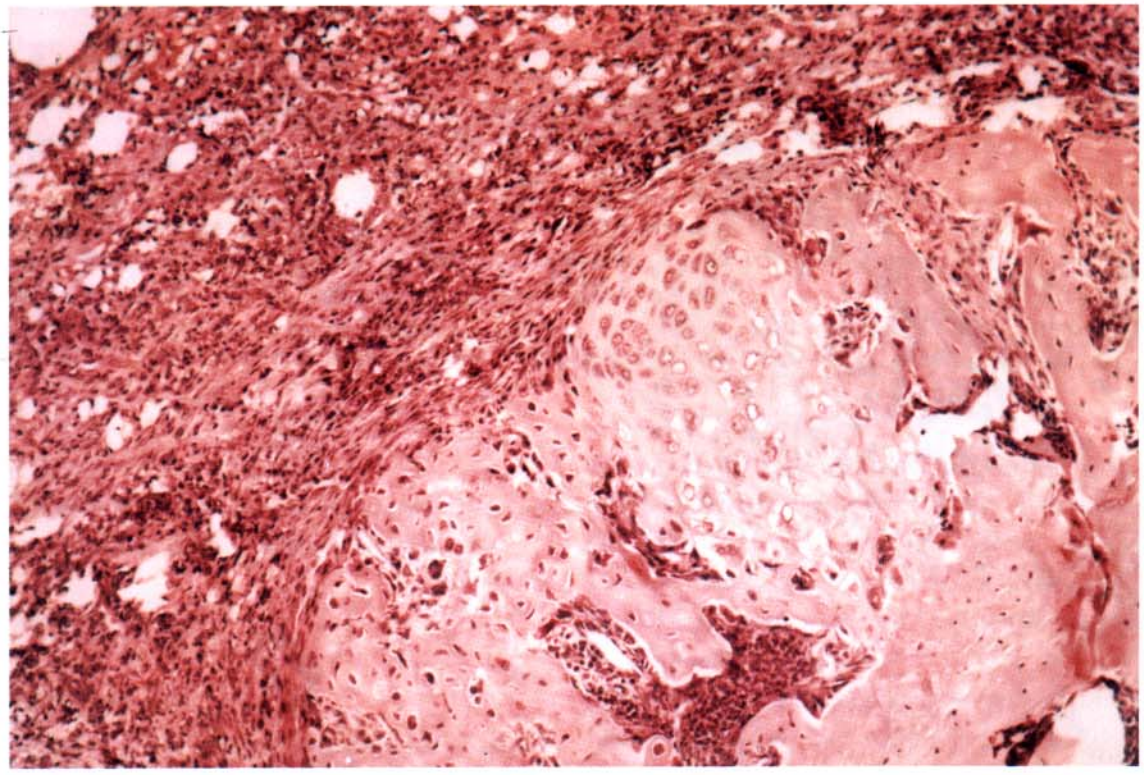

Fig. 3. Periosteal bone and cartilage formation in the tarsal bone. The inflammatory reaction evoked by CFA, two weeks post adjuvant administration. Magnification 400x.