other and therefore formed a connecting fibrous ring, the presumptive SVJ (Figs. 1 and 2).

V.p.18.d to v.p.20.d/b.0.d

Gradual expansive growth of the cartilaginous labyrinth and further intrusion of the stapes resulted in a shift of the fibrous SVJ towards the vestibular aspect of the oval window (Figs. 2, 3 and 4). The fibrous SVJ comprised rows of parallel and layered fibroblasts, and interposing ECM fibers (Figs. 3 and 4). The appearance of interzones in the cartilaginous ossicular chain indicated the initiation of articulations in the ossicular chain (Fig. 4). However, no ossification centers were observed in the cartilaginous labyrinth and ossicles in v.p.20.d specimens (Figs. 3 and 4).

V.p.20.d/b.0.d to b.2.d

Completion of simple synovial articulations between the malleus, incus and stapes was observed in v.p.20.d and b.0.d specimens (Figs. 4 and 5). Endochondral ossification centers commenced in the shafts of the rudimentary auditory ossicles between b.0.d and b.2.d (Figs. 6 and 7). However, chondrogenesis in the fibrous SVJ was evidenced in b.0-2.d mice by sprouting secondary cartilaginous extensions at the inner rim of the oval window and the periphery of the stapedial base (Figs. 5 and 6). Articulating cartilaginous extensions comprising layers of ovoid proliferating cells and hypertrophic cells were connected with the annular ligament, which contained a layer of palisade-like fibroblasts (Fig. 6). Epiphyseal cartilages of the ossicular joints and SVJ displayed haphazard arrangement of hypertrophic cells, gradual extension of endochondral ossification, and increased formation of primary spongiosa (Figs. 6 and 7).

B.5.d to b.6.d

The ossicles had ossified, leaving the articular surfaces with a thin layer of hyaline cartilage. The articular cartilages entered the non-hypertrophic phase, demonstrating alternation of cellular arrangement, abundant cartilage matrix, bony sealing of the cartilage and incremental increases in bone marrow cavity. Many densely-stained fibers were observed in the joint capsule of the morphologically mature IMJ and

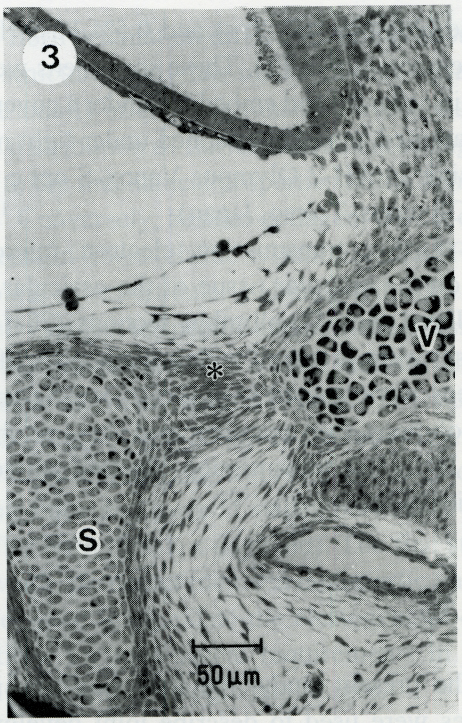

Fig. 3. Higher magnification of the fibrous Stapediovestibular joint (SVJ) (asterisk), comprising rows of parallel, layered fibroblasts at v.p.18.d.

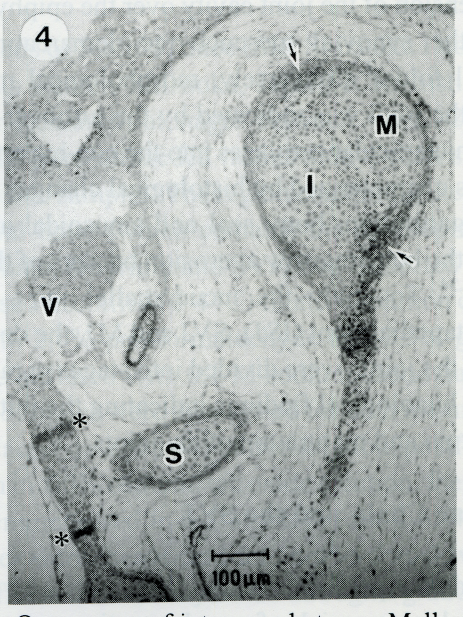

Fig. 4. Occurrence of interzone between Malleus (M) and Incus (I) of the cartilaginous ossicular chain is evident at v.p.20.d; M and I are connected by the fibrous capsule (arrows). Intrusion of the stapes and expansion of the middle ear cavity bring the fibrous Stapediovestibular joint (SVJ) (asterisks) towards the labyrinthine aspect of the oval window.