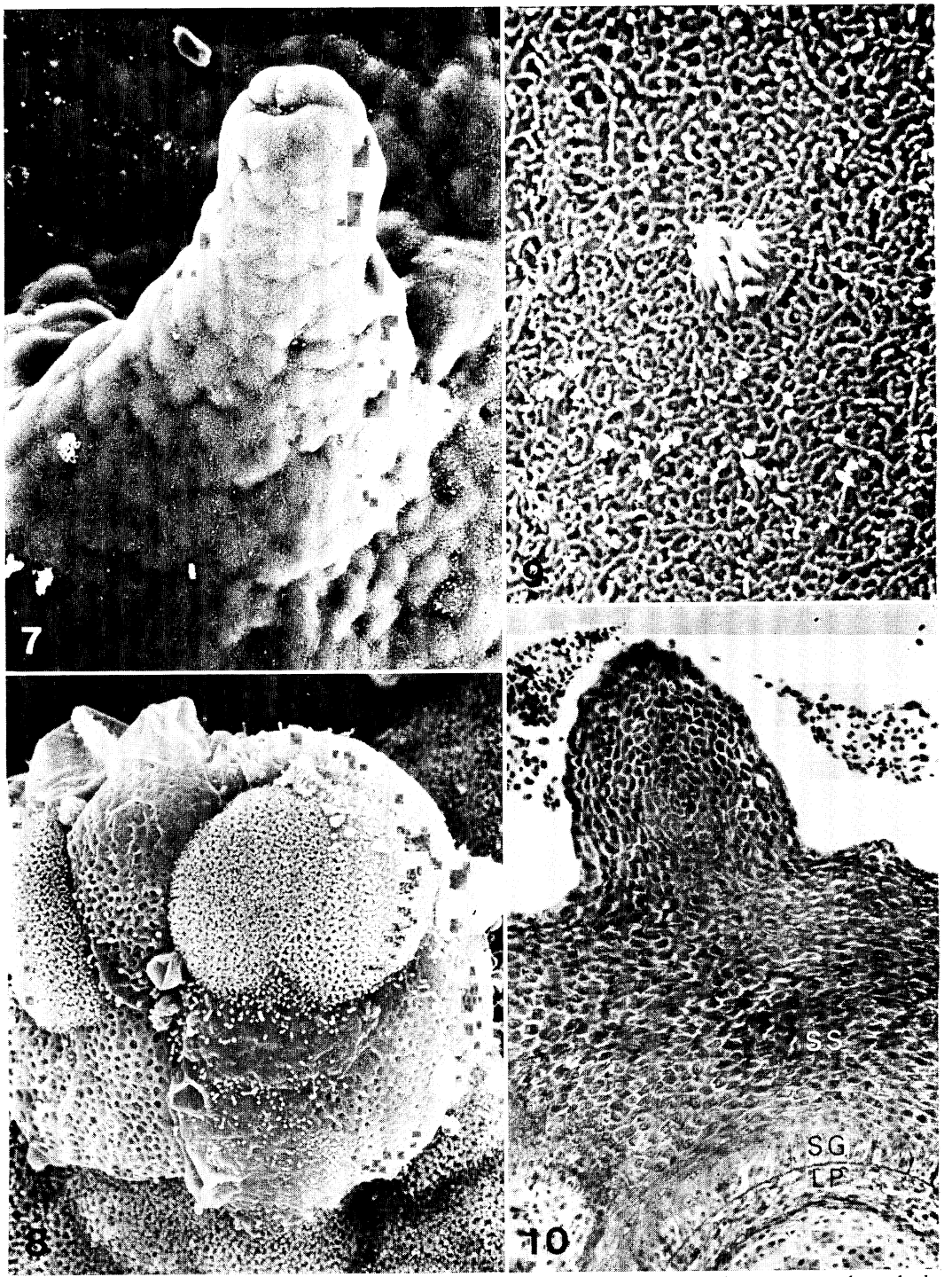
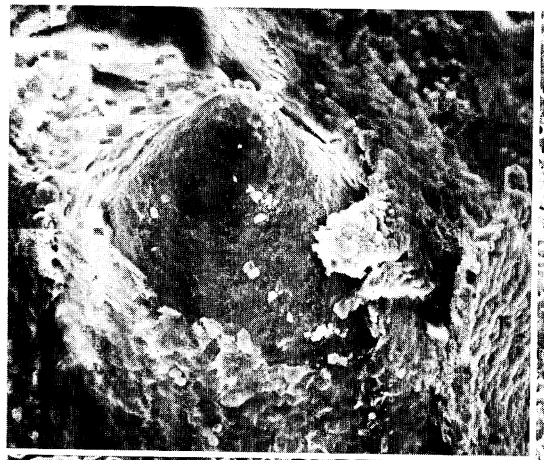
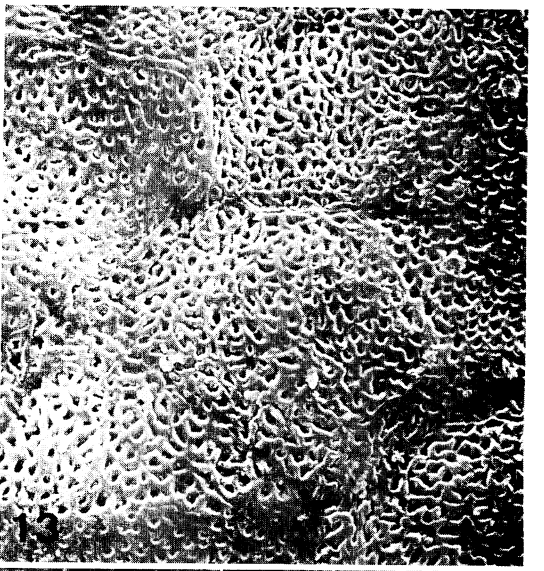
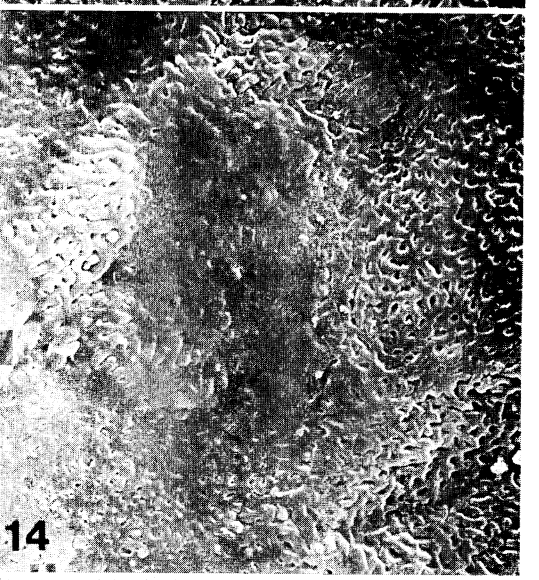
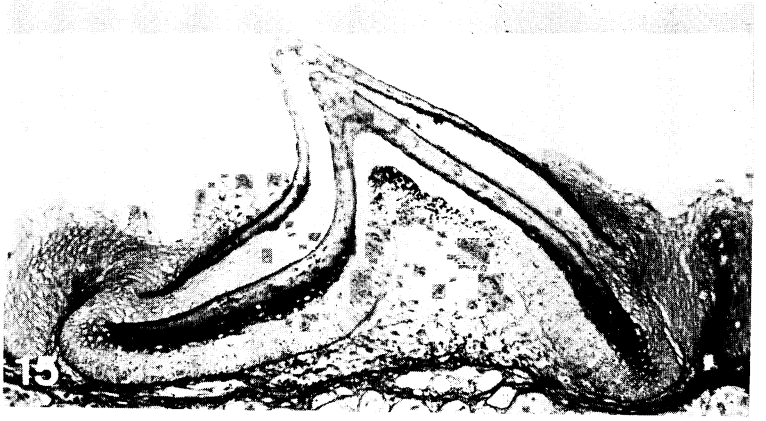


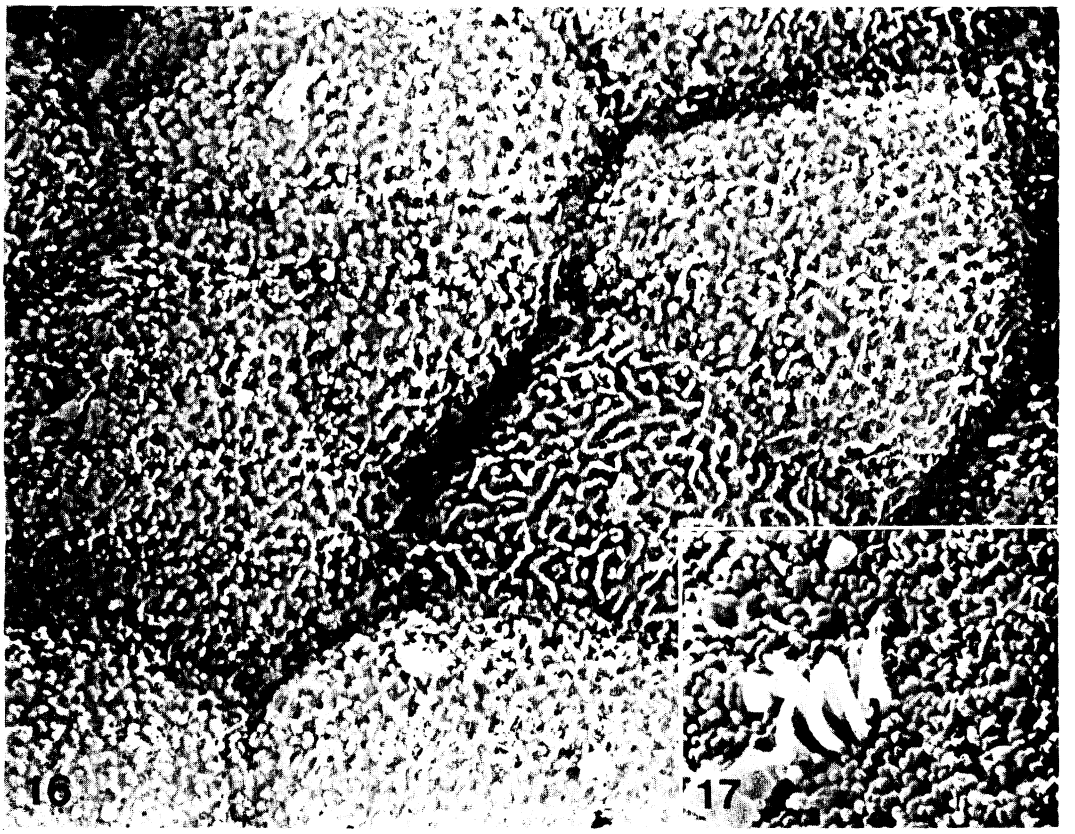
Figs. 7~10. Details of the papilla in the stage of early macrophthalmia. Fig. 7. An unbranched truncate papilla. ×700. Fig. 8. The apical portion of another papilla showing degenerated epithelial cells. ×2700. Fig. 9. Details of the surface of the papilla. Microridges in irregular pattern and a bundle of cilia are visible. ×6000. Fig. 10. A sagittal section through the papilla packed with the epithelial cells. The stratum spinosum (*SS*) is considerably thick. LP, lamina propria; SG, stratum germinativum. Azan stain. ×200.











Figs. 11～17. Details of the embryonic teeth and nearby structure in the stage of late macrophthalmia. Fig. 11. A low-power SEM photograph of the newly erupted cornified tooth covered with epithelial cells except for its apical portion. ×150. Fig. 12. Details of surface coat of a tooth at the basal portion showing the microridges in network and the marginal terraced ridge in each keratinized cell. Arrows show superficial groove along the margin of the cells. ×3200. Fig. 13. Details of surface coat of a tooth at the middle portion. The microridges decrease in height and change into small recesses. ×3200. Fig. 14. Details of surface coat of a tooth at the apical portion. Note the degenerated and flattened microridges. ×3200. Fig. 15. The sagittal section of a tooth. Two cornified layers, layers of unkeratinized stellate cell, and a prekeratinous zone are visible. Note that the primary cornified layer is thinner than the secondary. Azan stain. ×150. Fig. 16. Surface of the oral mucosa showing the short microridges in irregular pattern and a small number of microvilli. ×4600. Fig. 17. A bundle of cilia on oral mucosa. ×10,000.

network are replaced by small holes measuring 0.1～0.2 μm in diameter, drawing away from the basal region (Figs. 20～22). On the other hand, the pointed end of a tooth is smoother and flatter than that of the late macrophthalmia, although small holes are unevenly distributed over the surface (Fig. 23).

The oral mucosa of the adult lamprey is equipped entirely with a network of microridges (Fig. 24).

Discussion

The present examination reveals that the characteristically keratinized teeth in spinous condition appear at the stage of late macrophthalmia. The grade of dentition of the arctic lamprey, *Lampetra japonica*, coincides well with that of the landlocked sea lamprey, *Petromyzon marinus* (Manion and Stauffer, 1970; Manion and Piavis, 1977). The newly erupted teeth of the arctic lamprey have blunt