When the surface of the cornea is burned with alkali, the endothelial layer is also damaged and the denuded area is left.

The defect will be covered with migration and proliferation of surrounding endothelial cells. The healing process in the alkali-burned corneal endothelium was observed by scanning electron microscopy comparing with the findings of endothelial flat preparation and autoradiography.

EXPERIMENTAL METHOD

The burn was made by applying filter paper, 3 mm square, soaked in 4N NaOH, to the surface of the anesthetized rabbit corneas for 10 seconds.

The corneas were observed daily with a slit lamp staining with fluorescein-sodium.

The eyes were enucleated at intervals of 6, 3, 6, 12 and 24 hours and 3, 7 and 14 days after burn. The specimens were fixed with 4% buffered glutaraldehyde, after fixation, they were dehydrated in graded acetone and isoamyl acetate, then dried by the critical point method. After drying specimens were coated with gold-palladium in vacuum chamber and examined with scanning electron microscopy using magnification of X 200 to X 5,000 at 15kV.

An autoradiographic study was made on two groups (Fig. 1, below).
1. To check the incorporation of tritium thymidine into the endothelial cells at various intervals after burn.
2. To trace the movement of regenerating cells which had been labeled at the 24th hour after burn.

Both of flat preparation by van Sallmann's method and paraffin sections were dipped with SAKURA-NR-M2 emulsion and kept in dark for 10–14 days.

FINDINGS

Normal endothelial cells observed with scanning electron microscope showed regular distribution of hexagonal pattern with marginal folds resulting from overlapping of the margin of the adjacent cells.
Immediately after burn, the endothelium over the entire burned area were completely destroyed and lost normal structural appearance (Fig. 2, below).