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Regenerative changes were found in some birds which showed no apparent involution. The other birds often showed severe involution in both the medulla and the cortex of the thymuses.

In the contact exposure group, precipitating antibodies to MD antigens were positive from the 52nd day postexposure. There were no remarkable changes in the thymuses until the 48th day postexposure, thereafter marked pathologic involution was seen from the 116th day postexposure. The cortex of these thymuses diminished their width or almost completely disappeared. Depletion of lymphocytes was also found in the medulla so that irregular epithelial cell groups and myoid cell, etc. appeared to increase in number and density. Viral antigens were positive in some cases, but no inclusion bodies and virus particles could be seen.

Thymic lesions in the field group of MD consisted of mainly involuted changes and the neoplastic proliferation of lymphoid cells.

Under electron microscopy, in the pathologic involution, the active proliferation of lipid-laden foamy cells (macrophages) was prominent and an irregular pattern of the basement membrane connected with epithelial reticulum cells was observed as the sequel to regeneration.

MORPHOLOGICAL STUDIES ON THE RETE MIRABILE EPIDURALE OF THE CALF

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The rete mirabile epidurale of 24 calves, less than 9 months old, was observed by means of the injection of resin and histological preparation.

1) The rete mirabile epidurale consists of a compact network of interwind, freely anastomosing arteries and is distinguished into two parts, a chief part and an anterior V-shaped extension. The chief part, lying in the cavernous sinus around the hypophysis, is composed of two lobes, anterior and posterior communicating rami. The anterior V-shaped extension, consisted of a small network of intertwined arteries, lies in the optic foramina.

2) The rete receives its blood supply from the maxillary artery via the proximal rete branch and the distal rete branches, from the basi-occipital arterial plexus, and from the internal carotid artery, which was poorly developed in the calves used. The arteries arisen from the rete are the cerebral carotid artery

and the internal ophthalmic artery.

3) The cavernous sinus lying on the basi-sphenoidal bone receives its blood from the facial portion, the cornual processus, the orbital and nasal cavities. The main sources of blood supply to the cavernous sinus are the lateral and dorsal nasal veins via the naso-frontal vein and the orbital venous plexus. The blood in the cavernous sinus is drained into the basilar sinus and into four emissary veins through the foramen lacerum, the foramen orbitorotundum, the foramen ovale and the small foramen at the hypophysial fossa.

4) The arteries have been observed histologically in the chief part of the rete, and are classified into two groups, A with normal structure and B with sclerotic change. The former is subdivided into two types, A-I and A-II, and the latter into three types, B-I, B-II and B-III. Type A-I is a normal muscular artery and type A-II has an intima-cushion. In the arteries of B group, the sclerotic change becomes severe from type B-I, B-II to type B-III. All of the calves used in the present histological observation are less than 13 weeks old, but arteries of B group with sclerotic change are found in about 5% of the arteries in the rete and in about 65% of the cerebral carotid arteries.