juries, if administered only once. The larger single dose necessary to produce enamel injury, also causes general effects. The high selectivity (*i. e.,* the absence of other detectable symptoms) of the enamel mottling action in chronic fluorine administration is not encountered in acute experiments.

8213 P

Histological Changes Observed in the Intestinal Wall Following Simple Mechanical Obstruction in Rabbits.

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Due to the almost miraculous recovery of the intestinal wall in cases of ileus after surgical relief of mechanical obstruction as well as the recovery of the intestinal wall in certain forms of mesenteric thrombosis after simple enterostomy, this investigation was undertaken to demonstrate what changes, if any, may occur following simple mechanical obstruction in the various tissues of the intestinal wall.

Simple mechanical ileus of the terminal ileum was produced in 11 rabbits. At varying postoperative intervals (12, 24, 36, 48, and 72 hours), the rabbits were sacrificed, and sections from 3 different levels of the ileum were removed—1 cm., 10 cm., and 20 cm. proximal to the obstructing ligature. Sufficient intestine was removed from each level to obtain 10 specimens for immediate fixation, making a total of 30 gross sections from each animal. For controls, sections were removed also from a normal rabbit corresponding to the different levels mentioned above.

Gross lesions observed postoperatively were: After 12 hours, ileum proximal to the obstruction was reddish in color and on section some blood was seen in the lumen. 24 hours: Slight distention of the terminal ileum; lumen filled with liquid intestinal contents; very few gross changes were evident. 36 hours: Distention of the terminal ileum; few ecchymotic spots in the mucous membrane; intestines filled with liquid feces. 48 hours: Marked distention of ileum with considerable congestion; contents yellow watery fluid; ecchymotic areas in mucosa near the obstruction. 72 hours: Marked distention, especially just above the obstruction, and containing much yellowish-red fluid, with marked congestion of the

ileum and minute mucosal hemorrhages. Thrombosis of mesenteric vessels were never observed.

Staining methods used were: Hematoxylin and eosin, Gram's stain, Verhoeff's stain, Mallory's phosphotungstic acid hematoxylin, Laidlaw's lithium silver stain, Foot-Mènard's ammonium silver stain, Müller's osmic acid stain, Masson's trichrome, Ramon y Cajal's Formula 3a and Formula 6a. In comparison with control sections of the normal rabbit, the mucosa and muscularis after obstruction showed no essential changes. It is remarkable that even after 72 hours of obstruction, the mucosal lining cells showed no noticeable degenerative changes. The nuclear elements stained with great clearness.

Blood vessels showed no appreciable changes in the sections removed after 12 and 24 hours of obstruction. After 36 hours, in the soft tissues of the submucosa there was an increase in number and some distention of blood vessels. In one 36-hour specimen, a small submucosal hemorrhage was observed. By the 48th hour, all the vessels of the mucosa and submucosa were markedly engorged with surrounding minute hemorrhages. The lymphatic channels of the villi first became noticeable as oval and cylindrical dilated spaces. In proportion to the duration of obstruction, the dilatation of the lymph channels increased, reaching its maximum distention after 36 hours of obstruction. Following this maximum distention of central main lymph vessels, the adjacent tissue spaces became quite edematous, so that the stroma of the villi appeared as a lacy network. However, the edema of the submucosa was first noticed in the 12-hour obstruction, and progressively increased in intensity.

In the 12-hour sections, the intestinal wall near the site of the obstruction was diffusely but moderately infiltrated with polymorphonuclear leucocytes. At the 10 and 20 cm. levels, the leucocytic infiltration was still present but progressively less. After 24, 36, 48, and 72 hours, the leucocytic infiltrations were not as marked as after the 12-hour obstruction, being least evident in 72-hour specimens. This indicates that the leucocytic response was due to the operative trauma and not to the obstruction *per se*.

As regards the connective tissue derivatives (fibroglia, elastic fibers, and reticulum), no abnormalities could be seen. Few or no changes were observed in the nervous elements of the intestinal wall. Many of the ganglion cells of Auerbach and Meissner continued to exhibit well preserved Nissl bodies even after 72-hour obstructions. The neurofibrils of these nerve cells and their terminal finer arborizations were all well stained.

In the normal sections stained after Gram's method, only an occasional coccus or diplococcus could be found as gram-negative organisms in monocytes. After the production of obstruction, detailed examination of the endothelial lining cells of the distended lymph channels under oil immersion showed noticeable numbers of phagocyted gram-negative cocci, mostly diplococci. It was only after 48-hour obstructions that definitely gram-positive cocci were observed. The bacteria were first observed in the villi; after 24 hours of obstruction, bacteria began to be found in the submucosa, first as isolated diplococci and finally as definitely noticeable clumps and more numerous at about the 48-hour obstruction level. We were not able to find gram-positive or negative bacilli within the intestinal tissues. Most of the cocci were gram-negative and all phagocyted by the monocytic endothelial cells, indicative of the remarkable protective power of these cells in spite of the obstruction persisting for as long as 72 hours.

After 72 hours, the changes in the intestinal wall must have occurred with great rapidity involving all the tissues, as no animal survived up to 96 hours. Four rabbits were used; all died before 96 hours and marked postmortem changes were found, prohibiting any histological study.

8214 P

Effect of Multiple Pituitary Primordia in the Tadpole.*

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That the pituitary plays a prominent part in controlling metamorphosis and sexual maturity in vertebrate development is clearly established. But little is known of the factors that determine pituitary activity at these times. This study is directed at the analysis of these factors in the metamorphosis of the tadpole.

The experimental animals drawn from the same batch of *Rana sylvatica* eggs were prepared as follows: (1) 30 normal unoperated controls; (2) 116 in which the buccal primordium of the hypophysis was removed in the tail bud stage; (3) 48 hypophysectomized, but with the hypophyseal primordium reimplanted either into the eye cup or under the adhesive discs; (4) 50 as in No. 3, but with

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