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Effect upon the Biliary Tract of Sectioning the Splanchnic Nerves.

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Recently the first case of sectioning the nerves to the choledocho-duodenal junction in a patient was reported.[1] The reasons for believing that this procedure would not prove effective in relaxing the human sphincter of Oddi have already been set forth.[2] To test this more thoroughly, selection has been made of a laboratory animal in which inhibitory reflexes from the gut tract to the gall bladder have already been demonstrated[3] and in which the detailed distribution of nerves to the choledocho-duodenal junction has been worked out[4]—namely the cat.

At laparotomy, the following procedures were carried out upon approximately 30 cats: (1) various autonomic nerves in the abdomen were severed (or doubly ligated); (2) insulated electrodes were sewed to the caecum by a flap of the rubber tube through which the enamelled wires were brought to the laparotomy wound; (3) the gall bladder was filled with lipiodol (Whitaker method). Some 15 hours later, by which time the animals had fully recovered, the latter were fed a mixture of egg yolk and milk by tube and then x-rayed at appropriate intervals with the object of ascertaining the rate of emptying of the gall bladder and the presence of inhibitory reflexes emanating from faradically induced contraction of the caecum.

Severance of the gastroduodenal nerve and plexus—specific nerves in the lesser omentum leading to the choledocho-duodenal junction—resulted, in 8 animals, in retarding the evacuation of lipiodol. (The studies of DuBois and Hunt[5] were used as controls); and interruption of these nerves did not abolish the inhibitory reflex from the caecum to the gall bladder. These experiments, therefore, fail to support the view that such operations in man would relieve a spasm of the sphincter.

Severance of one or both splanchnic nerves, however, markedly accelerated the rate of emptying of the gall bladder (8 animals)

1 Reich, Henry, *Surg., Gynec. and Obst.*, 1940, **71**, 39.

2 Boyden, E. A., *Surgery*, 1941, **9**, 443.

3 Birch, C. L., and Boyden, E. A., *Am. J. Physiol.*, 1930, **92**, 301.

4 Schulze, J. W., and Boyden, E. A., *Anat. Rec.*, 1941 (suppl. 2), **79**, 77.

5 Du Bois, F. L., and Hunt, E. A., *Anat. Rec.*, 1932, **54**, 289.

and when both were severed the inhibitory reflex was abolished as well as the sensation of pain arising from a spastic caecum.

Various modifications of these experiments indicate that the 2nd lumbar roots of the coeliac ganglia as well as the lumbar sympathetic trunks are not pathways primarily involved in regulation of the biliary tract. Severance of the coeliac branch of the right vagus, in one instance, was followed by retardation of emptying.

The implications of these experiments are that evacuation of the extra hepatic biliary tract is inhibited by the sympathetic nervous system as mediated through the splanchnic nerves, and that the reason, perhaps, why severance of the specific nerves to the choledocho-duodenal junction does not relax this junction is that such nerves carry both vagus and sympathetic fibers and also innervate both the sphincter of Oddi and the contiguous portion of the duodenum.

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Bacteriostatic Effect of Paranitrobenzoic Acid on Pneumococci *in Vitro*.*

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Mayer and Oechslin[1] reported that paranitrobenzoic acid and certain derivatives were effective in pneumococcal infections in mice although they showed little activity *in vitro*.

Gruhzit[2] found that paranitrobenzoate protected mice infected with *Streptococcus viridans*. He found little activity against beta hemolytic streptococci and none against Type I pneumococci. Miller[3] recently reported that *Streptococcus viridans* is inhibited *in vitro* by sodium paranitrobenzoate.

Barlow[4] finds the acid and ester effective in pneumococcal infections in mice.

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1 Mayer, R. L., and Oechslin, C., *Compt. Rend. Soc. de Biol.*, 1939, **130**, 211.

2 Gruhzit, O. M., *Arch. Path.*, 1940, **29**, 732.

3 Miller, J. K., *J. Pharm. and Exp. Therap.*, 1941, **71**, 14.

4 Barlow, O. M., unpublished data.