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Reciprocal Action of Crop Muscles in Anaphylactic Shock.

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In a previous communication, the demonstration of hypertonicity of circular muscle in the intact crop of anaphylactic pigeons was reported,[1] this change being consistent with muscular hypertonicity in various organs of mammals. However, hypertonicity is not the only functional change in anaphylactic smooth muscle, contrary to usual suppositions. For we have now demonstrated repeatedly a marked hypotonicity of the longitudinal muscle, occurring simultaneously with the marked hypertonicity of the circular muscle in the same organ (crop) during anaphylactic shock in pigeons. There is, in other words, a reciprocal action of these muscles, which occurs also physiologically, but in anaphylactic shock, the action is increased and represents only a quantitative change from normal. The mechanism of the reciprocal action is in the crop itself, because it occurs after section of the autonomic nerves. Epinephrine and atropine act as imperfect antagonists. Our results on nerve degeneration and the myenteric plexuses are as yet indecisive.

The method used permits a simple and easy means of demonstrating and studying the reciprocal action of muscles in the alimentary tract, and also the importance of the functional state in drug and other responses, in the intact organism. The details of the method and of several studies will be published in the near future.

[1] Hanzlik, P. J., and Stockton, A. B., PROC. SOC. EXP. BIOL. AND MED., 1926, xxiii, 724.

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Atypical Action of Barium Chloride on Rabbit Colon.

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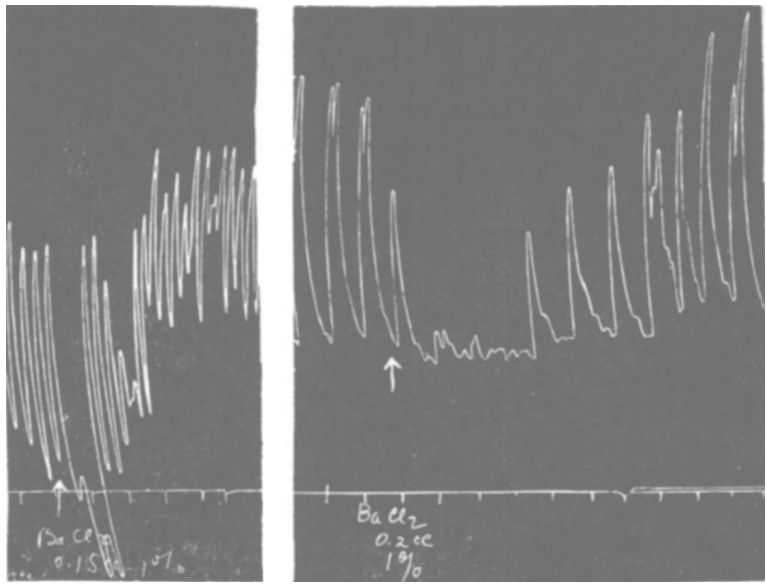
During experiments on excised smooth muscle organs, approximately one hundred segments of rabbit colon have been subjected to the action of barium chloride in concentrations of from 1:100,000 to 1:20,000. The segments were suspended in Tyrode

solution according to the method of Magnus. Colon segments as a rule were stimulated immediately by the introduction of barium chloride into the bath, resulting in an increase in tonus or in amplitude of rhythmic contractions and often in an increase in rate of contractions. In the case of seven segments, however, the stimulation due to barium chloride was slight, and was preceded by a period of depression, lasting from 15 to 250 seconds and manifested by a fall in tonus and decrease in amplitude. Rate was little affected. The accompanying figure shows two examples of this atypical response to barium.

FIG. 1.



Unusual action of Barium Chloride on Rabbit Colon: A—temporary fall in tonus due to 1:32,500 barium chloride; B—temporary inhibition due to 1:25,000 barium chloride. Time markings represent 30 seconds.

Roth[1] has described primary and persistent depression of rings of the lower intestine of the frog by barium; the writer[2] previously reported barium depression of rabbit uterus suspended in potassium-free Tyrode solution. These depressions agree with the atypical response of rabbit colon. The similarity suggests that barium affects smooth muscle according to the functional state determined by the physical and chemical conditions of its environment.

[1] Roth, G. B., *J. Lab. Clin. Med.*, 1926, xi, 1149.

[2] Thienes, C. H., *Arch. Internat. Pharmacod. et Therap.*, 1926, xxxi, 447.