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The inhibitory effect of adrenalin upon the sphincter of the pupil.

By DON R. JOSEPH.

[*From the Department of Physiology, Saint Louis University.*]

The sphincter muscle from the eyes of cattle, sheep and hogs was tested as quickly as possible after death. Two methods were used: (*a*) A strip, containing the sphincter, was cut from the pupillary border of the iris, connected with a lever and kept in a bath of either saline, Ringer's solution or aqueous humor, at 38 to 40 degrees Centigrade—in some cases with oxygen streaming through. (*b*) In other cases the sphincter was only partly excised, but connected with the registering apparatus in such a way that contraction or relaxation of the sphincter alone could affect the lever. In these experiments the iris was kept in an enclosed, warmed, air chamber and adrenalin dropped upon it from a pipette at the time of the test. The 1 : 1,000 Parke Davis solution was used.

Over 50 experiments are included in this report. Adrenalin produced, practically without exception, a relaxation of the sphincter. This was true for each of the three species of animals tested. The relaxation began promptly and at first was rapid so that the lever traced very nearly a vertical line on the drum. Later the rate of relaxation slowly decreased but in most cases continued until it seemed to be maximal. No recovery was seen even when the adrenalin bath was replaced with a fresh non-adrenalin-containing bath. That the sphincter was still irritable, however, was demonstrated by the addition of physostigmin, when a good contraction usually resulted.

This inhibitory effect of adrenalin indicates that the cervical sympathetic supplies inhibitory nerve fibers to the sphincter muscle of the iris.