

Coleman (W.)

Nerve Terminations
in the Heart of the Rabbit.

PRELIMINARY COMMUNICATION.

BY

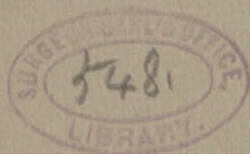
WARREN COLEMAN, M. D.

(From the Loomis Laboratory.)

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IN the course of other work on neural histology, a portion of the left ventricular wall of the rabbit's heart, extending from the base to the apex, was cut into thin slices and dropped into the picric-acid solution (Berkley's method having been employed). It was done more as a control experiment than for any other reason, and I was surprised to find, upon examining the sections, that the results differed materially from those of Dr. Berkley and the observers he quotes.* It is for this reason that they are made public.

The size of the heart in the rabbit has prevented any attempt to trace out the distribution of the nerves. This communication will have to do only with their finer branchings and terminations.

The most important fact which this study has revealed is the penetration of the muscular fibres by the terminal nerve filaments. This penetration is distinctly and con-

* *Anat. Anz.*, ix, 1893, Nos. 1 and 2.

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FIG. 1.

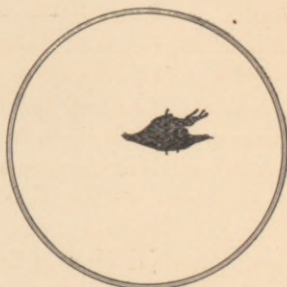


FIG. 2.

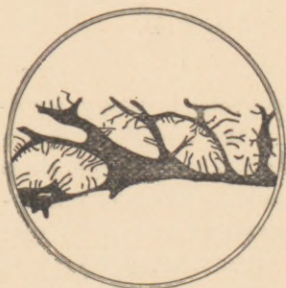


FIG. 3.



FIG. 4.



FIG. 5.

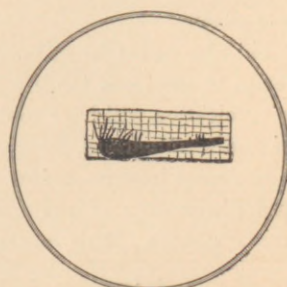


FIG. 6.

stantly shown in all the sections. The filaments are of variable lengths, and generally run toward the centre of the fibre. The differences in length may be partly due to an accident of cutting, for the filaments may be seen frequently to bend from their course. Some of them branch. They are of uniform size, and when examined closely are found to present a delicately beaded appearance.

In the majority of instances the filaments take origin from a plexus around the muscle fibres. These plexuses are peculiar both in their formation and distribution. They have undoubted ganglionic enlargements which occur chiefly among, but sometimes upon, the muscle cells. Figs. 1 and 2 have been selected from the more typical of these enlargements. If they are true nerve cells—and they present the appearance of being such—they exhibit an unusual feature in that the cell body gives off terminal filaments as well as its branches. These masses are stained so intensely black that it is impossible to distinguish any trace of nucleus. The openings which occur apparently in certain of these enlargements (Fig. 4) I take to be capillaries, about which the silver has been deposited.

As a rule, the plexuses are long and narrow, extending for a distance of ten or fifteen muscle fibres (in transverse section), but surrounding only one or two rows of them (Fig. 3). In a few of the sections a very large plexus is found, of which Fig. 4 represents but about one fourth. Unfortunately, it is impossible to tell in what part of the ventricular wall it occurs. A delicate plexus, surrounding



FIG. 7.

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only two or three fibres, and possessing few or no ganglionic enlargements, is constantly seen in the sections (Fig. 5).

The filaments arise also from bulbous endings which are applied to the surface of the muscle cells (Fig. 6). These pear-shaped terminations are of infrequent occurrence, at least in the heart of the rabbit.

Lastly, single fibres which run among the muscle bundles and apparently have no immediate connection with a plexus send off terminal filaments which then penetrate the muscle cells (Fig. 7).

It would appear that all of the heart fibres are not supplied with nerves, and in this particular resemble involuntary muscle. The tissue has been very thoroughly impregnated, and many of the fibres have no nervous connections.

The foregoing statements are based upon the study of one hundred and fifty sections, and the penetration of the muscular fibre by nerve filaments has been confirmed twice in other rabbits and once in the dog.

All the drawings have been made with a *camera lucida* (Leitz ocular 3, objective 7).

5 WEST THIRTIETH STREET.

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