

The ketones, and those aldehydes having an oxygen atom attached to the carbon atom next the aldehyde group were without obvious effect. This group included acetone and dihydroxyacetone and the following aldehydes: glycol aldehyde, glyceric aldehyde and methyl glyoxal.

Acetaldehyde, paraldehyde (which probably depolymerizes in Tyrode solution) and aldol, which has the oxygen atom attached to the carbon atom twice removed from the aldehyde group, reduced the contractions promptly. For reasons that are not quite apparent, acetophenone was also very effective in this regard.

These observations are in accord with the hypothesis that certain aldehydes in addition to formaldehyde unite chemically with aromatic amines. They also suggest a pharmacological relationship between the proximity of oxygen upon adjacent carbon atoms and the physiological reactivity of certain aldehydes.

This is a preliminary report.

¹ Kendall, A. I., *PROC. SOC. EXP. BIOL. AND MED.*, 1927, **xxiv**, 316.

3432

Pathological Changes in Arteries Following Partial Denervation.

A. H. KERPER AND W. D. COLLIER.

From the St. Louis University School of Medicine.

In a study of the innervation of the arteries of the extremities, segments of the vessels obtained from experimental animals killed at intervals varying from 5 weeks to 3 months following unilateral extirpation of the lumbar sympathetic trunk and the inferior cervical sympathetic ganglion, with or without ligation and section of the femoral and brachial arteries on the opposite side, were prepared by the pyridin silver method. Preparation of the vessels which had been ligated and sectioned still show an abundant nerve supply, though somewhat reduced as compared with that of the normal control vessels. Preparation of the vessels of the sympathectomized limbs show still further reduction in the nerve supply, but still exhibit relatively large bundles of nerve fibers both in the adventitia and the media. The reduction in the number of nerve fibers following sympathectomy is more marked in the arteries of the forelimb than in those of the hind limb. Obviously some of the nerve

fibers supplying the arteries of the extremities run along the vessel walls, while others join the vessels via the somatic nerves of the extremities.

Pathological changes in the wall of the arteries following such partial denervation were studied in preparation obtained from a goat about 8 months old, and a kitten. Both these animals had been subjected to extirpation of the left lumbar sympathetic trunk. In the case of the goat, the left inferior cervical sympathetic ganglion was also removed. The kitten was allowed to live 3 months, the goat 6 weeks following operation. Segments of the vessels were fixed in Zenker's fluid, sectioned and stained with Verhoeff's elastic tissue stain.

The more striking pathological changes are found in the partially denervated vessels in the goat, and the most striking changes in the most distal portions of the denervated vascular tree. Less extensive changes, but identical in kind, are found in the partially denervated vessels of the cat. These changes are briefly: atrophy of the muscle fibers with decrease in the thickness of the media and apparent dilatation of the lumen, foci of edematous swelling in the media, particularly just beneath the inner elastic membrane, and considerable fragmentation and disappearance of elastic tissue with a slight proliferation of collagen fibers.

The atrophy of the muscle fibers was not measured directly, but the nuclei show an actual decrease in volume with relative increase in length and decrease in breadth as well as hyperchromatism on the operated side. These changes have been found to be the characteristic changes of depression atrophy (Collier¹) induced either by depressant stimuli or reduced functional excitation. The latter is apparently the factor in this case following partial denervation, and the muscle change may be interpreted as a relative disuse atrophy. This interpretation is further borne out by the observation of a thinning of the wall and dilatation of the lumen. The dilatation is markedly aided by the fragmentation and partial loss of elastic tissue.

The presence of degenerating edematous areas in the media markedly disturbs the usual uniform, concentric arrangement of the long slender nuclei and the elastic fibers. There is a slight collagen fiber proliferation which suggests an adaptation partially compensating for muscle and elastic tissue degeneration and hints at an eventual definite arterio-sclerotic objective.

¹ Collier, W. D., *J. Med. Res.*, 1922, xliii, 207.