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**Effect of Sympathetic Ganglionectomy Upon Bone Growth.**

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The possibility of increasing the rate of bone growth in an extremity by the interruption of its sympathetic innervation has received clinical trial by Harris<sup>1, 2</sup> and others in recent years in cases with residual paralysis from anterior poliomyelitis in which there has been retardation of growth and a discrepancy in length in the 2 extremities. It has been assumed that the removal of vasomotor control would sufficiently increase the blood supply to the epiphyseal growth centers to bring about accelerated activity.

All experimental investigation conducted upon normal animals has produced negative results. Cannon<sup>3</sup> and his coworkers have removed the entire sympathetic chain on one side of the body of kittens and infant rats and have observed no increase in growth on the sympathectomized side of the component structures of the extremities, the bilateral symmetrical soft tissues and viscera with the exception of the reproductive organs. René Simon<sup>4</sup> has made the same observations on rabbits.

These investigators apparently read the results of their experiments only at the conclusion of a growth period, that is at post mortem examination. To preclude the possibility of a temporary acceleration of bone growth at some stage in development, the left lumbar sympathetic chains (ganglia 2, 3, 4, and 5 and intervening trunks) were removed from 4 kid goats weighing approximately 6 kg. each and frequent periodic roentgenograms were made of both lower extremities.

At present, these animals have been observed for 6 months and during this period their weight has quadrupled and the tibiae on both sides have increased in length from 6 to 6.5 cm. Bimonthly examinations, however, have demonstrated that the tibiae on the sympathectomized sides have at no time evidenced an increased rate of growth in comparison with the controls of the normally innervated extremities.

To these experiments the objection can be raised that they were

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<sup>1</sup> Harris, R. I., *J. Bone and Joint Surg.*, 1930, **12**, 859.

<sup>2</sup> Bacq, Z. M., *Am. J. Physiol.*, 1930, **95**, 601.

<sup>3</sup> Cannon, W. B., Newton, H. F., Bright, E. M., *Am. J. Physiol.*, 1929, **89**, 84.

<sup>4</sup> Simon, R., *Compt. Rend. Soc. Biol.*, 1930, **103**, 709.

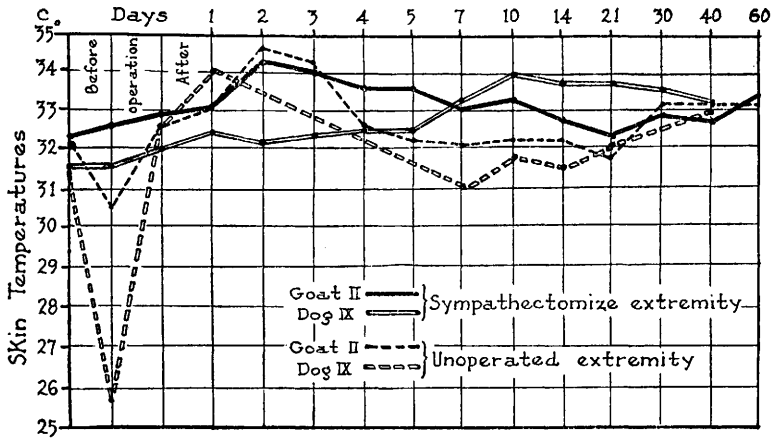


FIG. 1.

conducted upon normal animals and to overcome this objection a precisely parallel experiment to the human cases of residual paralysis in anterior poliomyelitis was sought, and from Doctor Hudson of the bacteriological department of the University of Chicago a half grown monkey with open epiphyses and complete symmetrical residual paralysis of both lower extremities from anterior poliomyelitis was obtained. The same procedures have been carried out upon this animal, but too short a time has elapsed to draw any definite conclusions. At present (2 months after the operation) the growth (0.2 cm. in both tibiae) has been too small to permit accurate comparative measurements.

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### Fiber Connections of Clarke's Column (Nucleus Dorsalis)

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The anatomical and functional relationships of Clarke's column (*Nucleus dorsalis*) have been long disputed. Several men, upon the basis of comparative studies, have argued that it is visceral sensory. In fishes, this cell column connects with a well demonstrated visceral sensory nucleus in the cerebellum. Furthermore, Clarke's column is found in the thoracic and upper lumbar levels, just where visceral afferent fibers are relayed into the cord via the white rami.