

4367

Variations in the Growth-Promoting Power, for Planarian Worms, of Digestive Mucosa of Rabbit.

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Through the use of the planarian worm as the test animal, according to the method developed by R. Wulzen,¹ I have found that different regions of the digestive mucosa of the rabbit cause marked variations in growth when fed to planarian worms.

According to this method, the worms were accurately measured at the beginning and at the end of the experiment, the result being the total gain in millimeters of the experimental group. Each experimental group consisted of 30 worms, 6, 7 and 8 mm. in length, and had an average total length of 200 mm. at the beginning of an experiment. Repeated measurements have shown that the total length of an experimental group can be duplicated with no greater error than 1%. The worms were fed twice a week upon portions of the digestive tract from freshly killed rabbits and each portion was placed in the respective bowl in such a manner that the worms could feed only upon the mucous membrane. Six parts of the digestive tract were used, as follows: the posterior half of the oesophagus, the fundus of the stomach, the duodenum at the entrance of the pancreatic duct, the anterior part of the caecum and the last part of the colon having 3 bands of taenia coli. Each part was carefully washed in running tap water before being fed to the worms.

Three separate experimental series, in which different groups of worms and different rabbits were used, exhibited the same variations in growth. Fig. 1 is a graphic representation of the first series and shows the total gains in the experimental groups fed upon these 6 regions of the digestive mucosa, for a period of 3 weeks. The percentage gains in this experiment are as follows: oesophagus 15%, stomach 37%, duodenum 75%, caecum 41%, vermiform process of the caecum 101%, colon 19%. In Fig. 2, second series, there are given the growth curves of 4 groups of worms fed respectively upon the oesophagus, stomach, duodenum and vermiform process of the caecum for a period of 4 weeks. In this series the percentage gains at the close of 4 weeks are as follows: oesophagus 40%, stomach 73%, duodenum 95%, vermiform process of the caecum 118%. The same order in growth-promoting power has been maintained in

¹ Wulzen, R., *Science*, 1927, lxx, 331.

both series. The third series yields the following percentage gains at the close of 3 weeks: oesophagus 12%, stomach 28%, duodenum 31%, caecum 26%, vermiform process of the caecum 53%, colon 4%. The percentage gains in this series are lower for all 6 regions of the digestive mucosa, but show the same order in growth-promoting power.

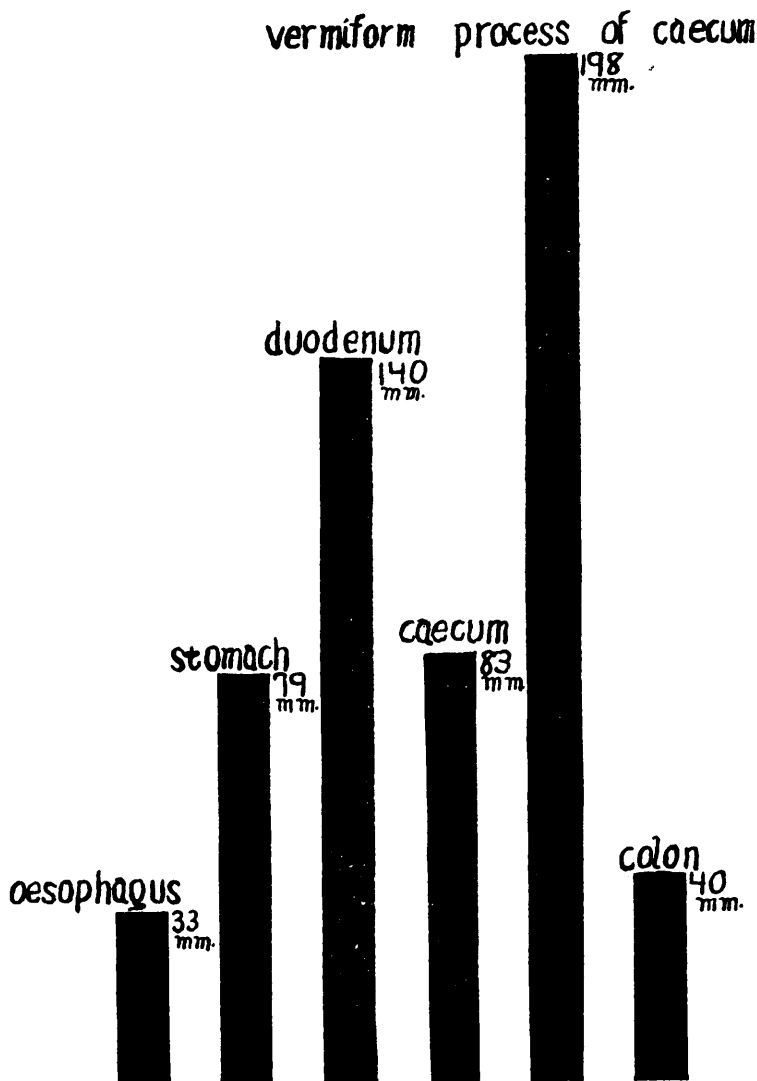


FIG. 1.

Total gains in mm. of experimental groups of planarian worms fed upon different portions of the digestive mucosa of the rabbit.

When fed to planarian worms, the mucosa from different regions of the digestive tract of the rabbit exhibits the following increasing order in growth-promoting power: oesophagus and colon < stomach and caecum < duodenum < the vermiform process of the caecum.

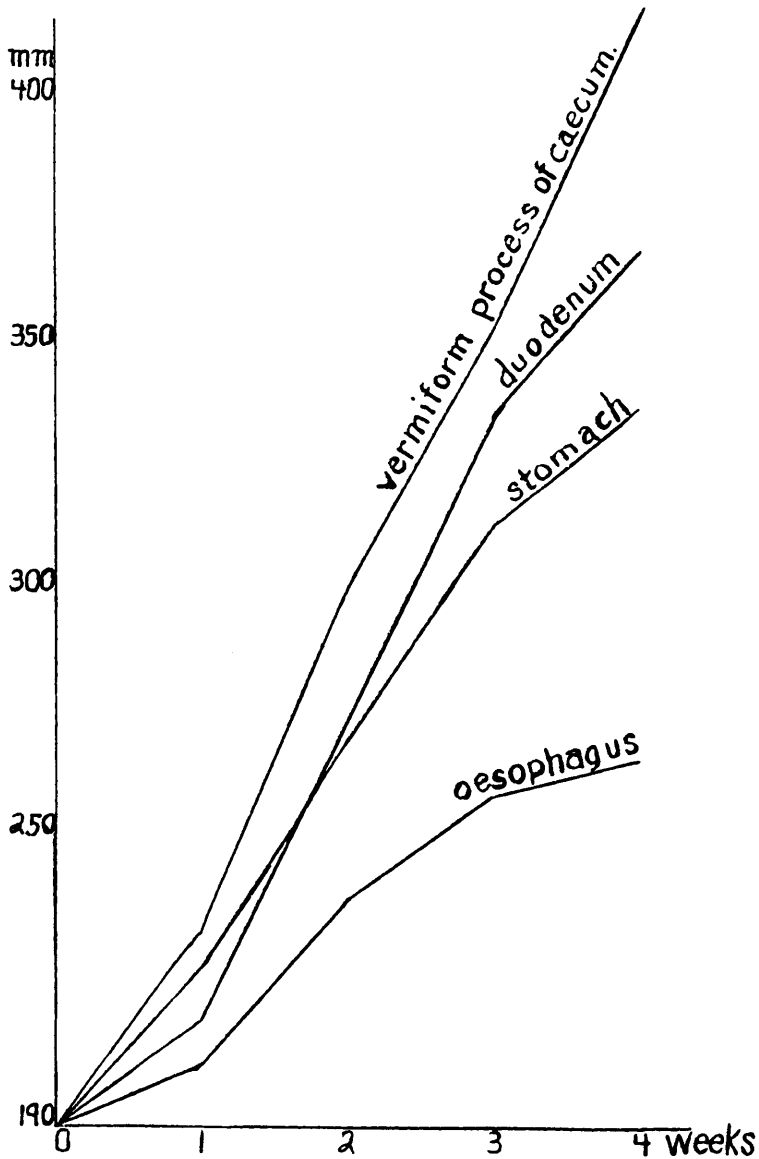


FIG. 2.

Growth curves of 4 experimental groups of planarian worms fed upon different portions of the digestive mucosa of the rabbit.