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Influence of Hypophysectomy on Epithelization of Wounds and on Fibroplasia.

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In the present studies, attempts are made to determine what effects the removal of the hormones of the pituitary and of those glands under its control has upon the ability of an animal to exert reparative epithelial growth or reparative fibroplasia.

Rats of the Wisconsin strain, obtained from the local Anheuser-Busch laboratories were used. At the age of approximately 14 weeks they were hypophysectomized, and then used 7-10 weeks later, at which time they showed a 10-20% loss of weight, loose thin skin, emaciation, appearance of fine silky hair, atrophy of testes, and atrophy of the adrenals, gonads and thyroid at postmortem.

In the first part of the experiment an area of 2 sq cm was resected from the right flank of 19 normal and 18 hypophysectomized animals under nembutal-ether anesthesia. This area was measured on the first and every other subsequent day by tracing on cellophane and measuring with a planimeter. The reduction in wound areas for the hypophysectomized animals is identical with that of the controls.

The wounds in the normals were slightly larger than those in the experimentals for the first 4 days. This is probably due to a greater amount of elastic tissue and less stretching of the normal skin before the area was demarcated, for in the normals the skin is more tightly bound down by the subcutaneous tissue that is strikingly lacking in the hypophysectomized animals.

In the second part, we attempted to test the rate of fibroplasia. Harvey had shown that fibroplasia is proportional to the return of strength in wounds of the stomach. Using his technic, incisions 1 cm long were made in the stomachs of 29 normals and 18 hypophysectomized rats. These were sutured with a running mattress suture of 000 catgut. At varying intervals postoperatively, the animals were sacrificed, a cannula inserted through the pylorus, the esophagus and duodenum tied off, and air introduced into the stomach. The system was connected to a mercury manometer and a pressure rise of 100 mm mercury per minute was maintained. The mercury level reached when the wound broke was regarded as indicating the relative amount of fibroplasia in the wound.

The return of strength occurred from the 4th to the 8th day. In this part of the curves the rise is most rapid, and the two curves are similar. On the 10th day, in many instances, the stomach broke before the wound did—a phenomenon observed by Harvey on the 10th and 12th days. In the initial 2 days, the wounds of the experimental animals were stronger than the normals. We are unable to explain this.

Hypophysectomy resulted in no change in the rate of epithelization of skin wounds or fibroplastic repair of stomach wounds in the rats.

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Effect of Saline Infusions Upon the Blood Volume and Serum Proteins of Hypoproteinemic Dogs

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Calvin¹ reported that the total circulating proteins of normal dogs could be increased by relatively large infusions of normal saline. During the course of other experimental work² it seemed pertinent to study the effect of massive infusions of saline upon the total amount of circulating protein in both normal and hypoproteinemic dogs.

Three dogs in varying states of nutritional hypoproteinemia and one normal dog were used in this work. After a preliminary determination of blood volume and serum proteins had been made, the experimental animals were given relatively large intravenous infusions of normal saline solution during short periods of 6 to 9 minutes. The blood volumes and proteins were studied in these animals at varying intervals. The methods used for determining blood volume, serum proteins and non-protein nitrogen have been described.²

The data for the plasma volumes and serum proteins are presented in Table I. The total circulating protein is calculated from plasma volume and serum protein concentration. After relatively large saline infusions the absolute amount of circulating protein in the hypoproteinemic animals shows practically no change during the

¹ Calvin, D. B., Proc. Am. Physiol. Soc., *Am. J. Physiol.*, 1939, **126**, 454.

² Shearburn, E. W., *Surg., Gynec., and Obst.*, 1942, **74**, 343.