

Influence of Mechanical Factors on "Basal" Gastric Secretion.

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In dogs with autotransplanted gastric pouches, it has been found (in confirmation of the observations of Pavlov, Kunde and others on Pavlov-pouch dogs) that the feeding of 100-300 gm. broken bones with a cereal gruel in the evening almost invariably causes a marked secretion of gastric juice the following morning (18-24 hours later). This "hypersecretion" does not occur immediately following the gruel, but the effect of the meal persists and is enhanced 12-18 hours afterwards. Roentgenological observations have not always revealed a shadow in the stomach, but dogs killed 18-20 hours after the bone feeding always show some pieces of bones with little or no food residue in the pyloric antrum.

Neither the gruel itself nor a 200 gm. meat meal gives rise to "hypersecretion". The bones (2 cm. long) have the same effect whether raw, or boiled for 72 hours. Bone chips (less than 1 cm. long) have a much smaller and more variable effect, while finely ground, incinerated or decalcified bones are without influence. 30 gm. calcium lactate, 50 gm. calcium carbonate powder and 40 gm. marble chips (1-2 cm.³) are all ineffective. Intravenous injection of calcium inhibits. The causal factor is thus due neither to organic secretagogues nor to calcium. 200 gm. of pumice stones (1-2 cm.³) plus 150 gm. of meat produce a slight increase of the morning "basal" secretion.

TABLE I.

Dog		Basal Secretion mg. HCl per hr.	Meal Secretion mg. HCl per hr. (4 hrs. after meat)
A-568	18 hours after feeding gruel or meat (mean of 122 observations)	0.5	3.9
	" 200-300 gm. broken bones	19.6; 19.9; 20.9; 22.6; 40.1; 53.2;	
	" 200 chipped bones	7.5	
A-726	18 hours after feeding gruel or meat (mean of 64 observations)	0.8	6.0
	" 200-300 gm. broken bones	7.0; 20.2; 22.7; 24.0; 36.0; 38.6.	
	" 200-300 gm. ground bones	0.5; 0.7.	
	" 200 gm. pumice stones	0.4	
	" 30 gm. Ca ₂ CO ₃ powder	0.6	
	" 40 gm. marble chips	0	

The examples in Table I indicate the increase in the basal secretion observed.

The evidence strongly suggests that "gastric hypersecretion" may arise as a result of a purely mechanical factor acting upon the pyloric humoral mechanism. Our results corroborate Savitsch's¹ work with glass beads in pyloric pouches and may lend support to his conclusion that the pyloric humoral mechanism is under nervous control.

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Behaviour of Denervated Spleen in Adrenalectomized Animal.

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It has already been shown that the denervated spleen contracts following exercise. Since adrenalin is one of the most powerful contractors of the spleen, it is desirable to study the behavior of the denervated spleen in animals which have been bilaterally adrenalectomized.

Dogs were used for this study. The adrenals were usually removed in 2 stages. Denervation of the spleen was performed by dividing visible nerves accompanying the splenic vessels and all intervening omental tissue between stomach and spleen. In some cases the spleen was divided into 2 and only one half denervated, the other remaining as an innervated control. In others, the upper half of the spleen was denervated without cutting the spleen into 2; the demarcation between the 2 portions was always clearcut. Immediately after operation, the denervated portion was purplish in hue and cool to the touch in contrast to the red and warm normal portion. Experiments were run before and after the 2nd adrenalectomy. The size of the spleen was traced on a soft celluloid sheet and the area calculated in cm.² by means of the Amsler planimeter. The mean error of the observation is $\pm 1.6\%$, so that allowance of $\pm 5\%$ may be made. The results summarized in the following table, are expressed in terms of the control splenic size taken as 100%.

Exercise, CO, bleeding and death bring about definite contraction of both the normal and the denervated spleen. Intravenous injection of lactic acid or sodium lactate (3-100 mg.) did not contract

¹ Savitsch, W. W., *Russki Physiol. J.*, 1922, iv, 282.