

In carrying out some experiments with thermal and silver nitrate cautery,^{2,3} it was found that cauterization of a bronchus was followed by complete stenosis in from one to 2 weeks. If this stenosis was located in the primary bronchus of the lung lobe, that lobe was found to be completely atelectatic with the secondary bronchi and bronchioles filled with a mucogelatinous material. However, if the stenosis was located in one of the several divisions of the primary bronchus to the lobe, no resultant atelectasis occurred; only a filling of the secondary and tertiary bronchi and bronchioles distal to the stenosis with the mucogelatinous material.

Group A. 4 dogs. Silver nitrate or thermal cauterization of a secondary bronchus of a lung lobe. Sacrificed at the end of 2 to 6 weeks. Results: Total stenosis of secondary bronchus with no atelectasis distal to the stenosis.

Group B. 7 dogs. Silver nitrate or thermal cauterization of the primary bronchus of a lung lobe. Sacrificed at the end of 2 to 6 weeks. Results: Total stenosis of the primary bronchus with complete atelectasis of the lung lobe.

In view of these experiments it appears very probable there are communications between the smaller air passages, or more likely of the air sacs and cells of the many lobules of a lung lobe. It also appears that obstruction of the primary bronchus or all of its divisions is necessary for the production of massive atelectasis of the lung lobe. Furthermore, although a straining type of respiration appeared essential in the production of this condition within 12 to 24 hours, it does not appear to be essential for its production over a longer period of time.

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Histologic Observations on Experimental Chronic Gastric Ulcers in Rabbits.

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The experimental chronic gastric ulcers in rabbits, to be described, were obtained by making acute lesions in the stomach, which subse-

² Adams, W. E., and Livingstone, H. M., *Ann. Surg.*, 1930, xci, 342.

³ Adams, W. E., and Livingstone, H. M., "Further Studies in Bronchial Injury and Repair," unpublished work.

quently became chronic. An operative procedure was used which consisted in the excision of a piece of the gastric mucosa by means of a certain technic which has been described.¹ A series of chronic ulcers was collected ranging in age from 3 months to a little over 2 years. Large Flemish Giant rabbits were used. These animals usually live to be about 5 years old and an ulcer of 2 years' duration, therefore, occupies a large part of the life cycle of the rabbit. All animals were kept under the same conditions, and fed identical diets composed of hay, oats, carrots and some lettuce. The ulcers were fixed in formol-Zenker solution, serial sections were made, and stained with ordinary and differential stains.

From a histologic standpoint there are 2 main structures in chronic ulcers to be considered, *i. e.*, the margin and the base. The margin is formed by mucosa which is composed of glands that decrease in length and are separated by relatively more connective tissue as the edge is approached. The last glands tend to overhang the ulcer and fall over into the crater. The cells composing these glands are all of one type, the foveolar cells. These are the cells that line the foveolae of normal gastric glands and have been shown to be the ones responsible for the regeneration of epithelium in acute gastric ulcers. (Ferguson.¹) In chronic ulcers a few of these cells invariably extend from the last marginal glands outward onto the floor of the ulcer. This indicates that the epithelium at the margin, in even the most chronic ulcers, is continually trying to grow out and cover the defect. In some of the ulcers collected considerable epithelium did extend out onto the floor, almost covering it in a few specimens and indicated that healing had occurred.

The base of these chronic ulcers is composed of 2 main layers covered externally by serosa. The first layer, which forms the floor of the crater, may be called the necrotic layer. It contains a great deal of cell debris and nuclei which stain darkly with hematoxylin. This layer changes rather abruptly into the underlying layer of connective tissue. This connective tissue is composed of young fibroblasts as evidenced by their rounded nuclei and rather large amount of cytoplasm which gives off irregular projections. A great many blood vessels are present and many leucocytes, especially eosinophils and plasma cells, are infiltrated into the tissue. The lower part of this connective tissue layer contains more mature cells and some collagen.

Chronic ulcers which show little or no healing have a rather marked crater and also undercutting into the base at the margins.

¹ Ferguson, A. N., *Am. J. Anat.*, 1928, xlii, 403.

The depth of this crater and the amount of undercutting are one index to the chronicity of an ulcer. These factors, together with the necrotic layer in the base, indicate that destruction is occurring on the floor of the base. The young connective tissue, beneath the necrotic layer indicates that reparative processes are being attempted but that destruction is proceeding at such a rate that the uppermost cells do not have time to reach maturity. If these destructive forces are in excess over the reparative processes in the base, destruction of tissue proceeds until finally there is a perforation.

The observations indicate that the essential factors which prevent healing of chronic ulcers are destructive forces which act on the base. These produce so much destruction and necrosis that the waiting epithelium at the margin is unable to gain a foothold on the base and is, therefore, unable to regenerate and cover it.

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Influence of Egg White Upon Gastric Secretion.

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The influence of various concentrations of bile upon the gastric secretion in dogs with non-leaking fistulous openings in the stomach has been reported.¹ Some phases of the problem of antigenic absorption through an intact body surface covering layer have been reported,² and further work is in progress. This report deals with use of egg white as a vehicle to introduce an antigenic substance into the lumen of the small intestine. Bile has been used by Besredka³ to sensitize or prepare the intestinal mucosa for antigenic absorption in his oral vaccination against the enteric group of infectious diseases. Arnold⁴ offered a different explanation for the action of bile than that suggested by Besredka. Bateman⁵ received the literature upon the digestibility and utilization of egg white in dogs and man. Raw egg white leaves the stomach more rapidly than other foods.

¹ Arnold, L., and Finder, J. G., *PROC. SOC. EXP. BIOL. AND MED.*, 1928, **xxv**, 615.

² Finder, Lash and Simon, *PROC. SOC. EXP. BIOL. AND MED.*, 1930, **xxvii**, 368.

³ Besredka, A., "Local Immunization," Williams & Wilkins, Baltimore, 1927.

⁴ Arnold, L., *J. Hygiene*, 1929, **xxix**, 82.

⁵ Bateman, G. W., *J. Biol. Chem.*, 1916, **xxvi**, 263.