

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.

Bateman showed that diarrhea followed the ingestion of certain amount of raw egg white. Arnold⁴ showed that raw egg white injected into the duodenum of dogs caused increased permeability of the wall for bacteria.

Four dogs with non-leaking gastric fistulae were used for these experiments. The material placed into the gastric lumen through the

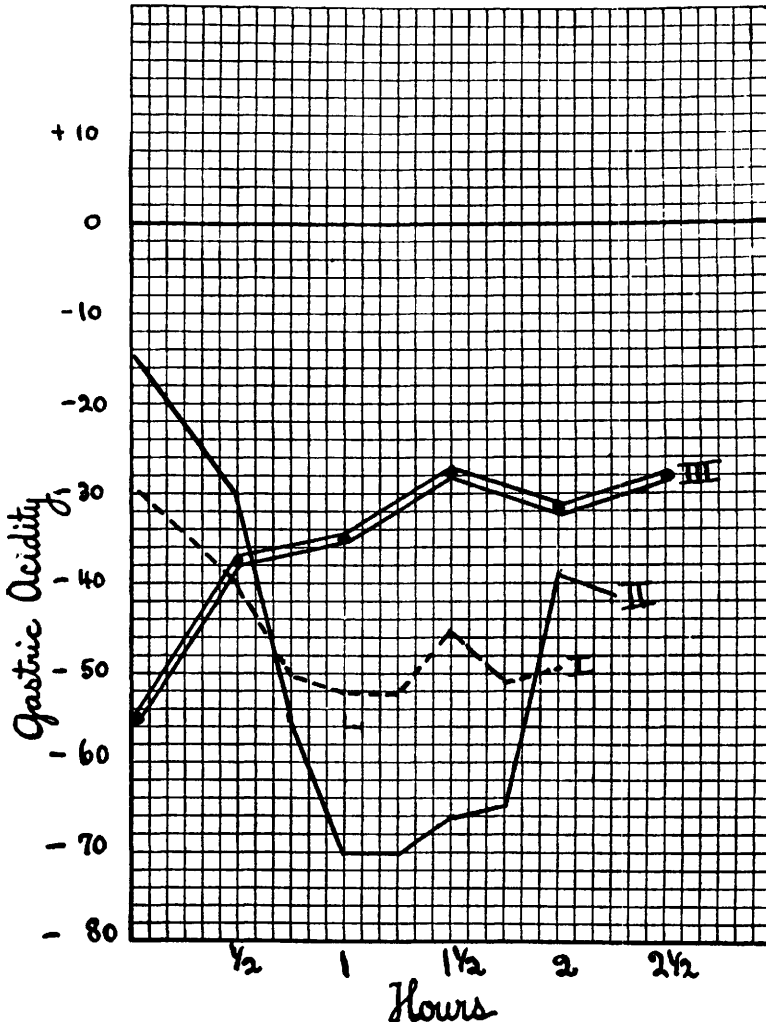


FIG. 1. Ordinate Gastric Acidity in Clinical Units.
Abscissa time in 30 minute periods.

I—Gastric Acidity after raw undiluted egg white.
II—Gastric Acidity after raw diluted egg white.
III—Gastric Acidity after egg white bile mixtures.
Each curve is an average of 15 experiments. (3 animals with 5 experiments on each.)

fistulous opening was raw egg white (25 cc.), raw egg white (25 cc.) suspended in 200 cc. of distilled water and a mixture of raw egg white (25 cc.) desiccated ox bile (Difco 1 gm.) suspended in 100 cc. of distilled water. The accompanying graph gives the average gastric acid secreting response to these substances. Stomach contents (1 or 2 cc.) were removed at half hour intervals and titrated in the usual manner.

These experiments combined with those reported by Bateman⁵ and by Arnold⁴ tend to place raw egg white in a unique position as a protein food. The lack of gastric response and the increased permeability of the small intestine has caused us to investigate the possibility of the utilization of egg white and bile mixtures as vehicles for vaccines for oral administration. Human experiments are now in progress.

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Liver Autolysis in Vivo.

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The experimental work of Mason¹ called our attention to the extremely toxic reaction produced by the implantation of liver into the abdominal cavity of animals. Ellis and Dragstedt² showed that death of these animals was not strictly due to toxemia but there was a constant finding of large numbers of organisms of the *B. welchii* group in the abdominal cavity and drew attention to the fact that this *B. welchii* organism was a normal inhabitant of the livers of dogs. They implanted fetal liver into the abdomens of dogs and also adult livers which had been previously autoclaved and found that no toxic reaction ensued. Our experiments were undertaken with a view to establishing the mechanism of death in peritonitis due to liver autolysis. It was found earlier in the course of these experiments that if the liver was ground and allowed to autolyse and then sterilized that its implantation into the abdomen caused the same picture of an overwhelming *B. welchii* peritonitis as when the infected liver had been used. The seeming contradiction in the work of Ellis and Dragstedt is probably due to the fact that in their experiments the hard

¹ Mason, E. C., *et al.*, *J. Lab. and Clin. Med.*, 1924, x, 622.

² Ellis, J. C., and Dragstedt, L. R., *Arch. Surg.*, 1930, xx, 8.