bile or was bile altering the permeability of the viscera containing bacteria to permit them to invade the peritoneal cavity?

Cultures of bile removed from the gall bladder at the time of the operation were all sterile except one in which grew a short Gram negative bacillus. A 10% solution of bile salts, filtered through a Berkefeld filter, and shown to be sterile when introduced into the peritoneal cavity produced a peritonitis identical with "bile peritonitis" except that fat necrosis was more extensive. Of the 20 dogs in this experiment smears and cultures of the peritoneal exudate showed the same Gram positive bacillus in 19. In one no growth occurred.

Twenty cubic centimeters of an 18 hour broth culture of this bacillus when introduced into the peritoneal cavity produced a peritonitis identical with "bile peritonitis" except that areas of fat necrosis were absent. From the peritoneal exudate the same gram positive bacillus was cultured.

The bacillus, a strictly anaerobic organism, grows readily in broth and produces stormy fermentation within 18 hours in milk. The colony is large on an anaerobic blood agar plate, varies its color from yellow to brown and is surrounded by a wide zone of beta hemolysis. It stains well with methylene blue and positively by Gram's method. It varies considerably in length, is broad, square ended and has an occasional subterminal spore. In smears it appears singly, in pairs or in short chains. This organism is either *B. welchii* or some other bacillus closely related to it.

These observations show that bile peritonitis is an infection which is produced by *B. welchii* or some other anaerobic bacillus closely related to it.

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The Variation of Anesthetic Efficiency of Procaine Hydrochloride and Procaine Borate With pH.

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Experimental evidence obtained both in the laboratory[1] and in the clinic[2] shows that the borate of diethylamino ethyl p-amino-benzoate,

[1] Benedict, Dailey and Arnim, *Dental Cosmos*, 1929, lxxi, 866.

[2] Freeman, *Dental Cosmos*, 1929, lxxi, 949.

procaine borate, has a higher anesthetic efficiency than the hydrochloride of the same base. The fact that the solutions of procaine borate used had a pH of about 8.4 while the procaine hydrochloride solutions had a pH of approximately 5.6 suggested that it might be worth while to determine the effect of variation of pH on the anesthetic efficiency of the two drugs.

O. Gros[3] found that addition of excess sodium bicarbonate or sec-

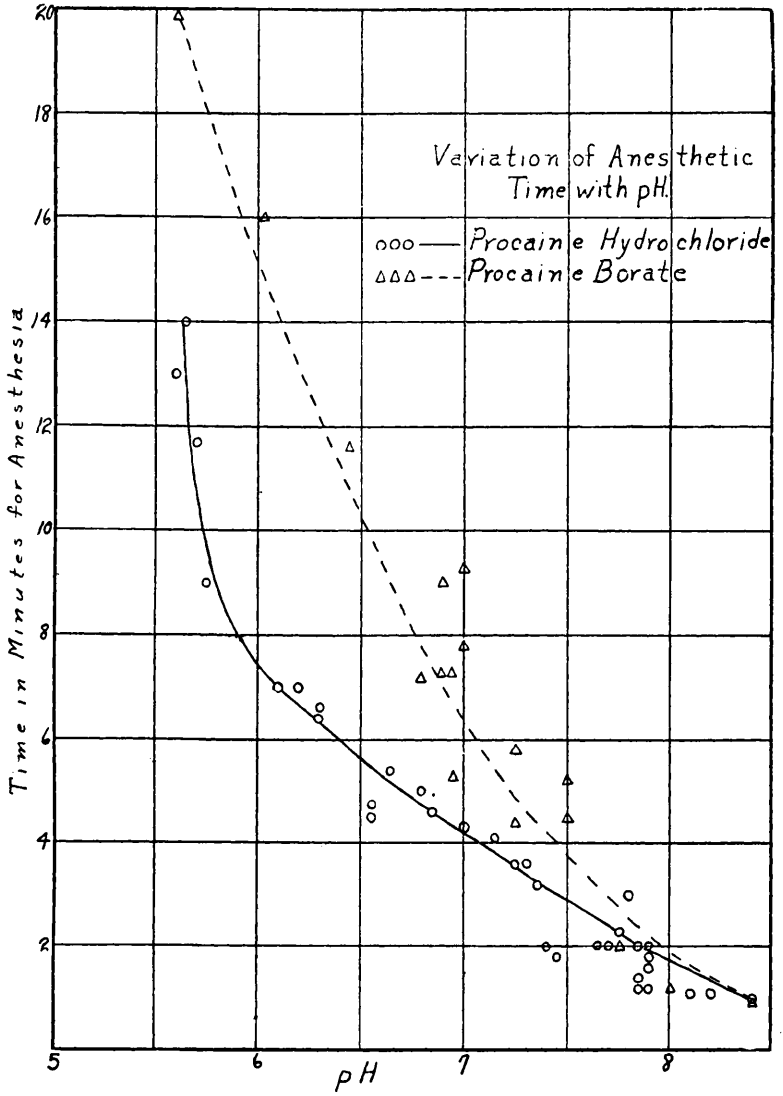

FIG. 1.

[3] Gros, *Arch. Exp. Path. Pharm.*, 1912, lxvii, 132.

ondary sodium phosphate markedly increases the anesthetic efficiency of procaine hydrochloride. Sollmann[4] corroborated and extended these findings. Regnier,[5] from his results on alkalinization of cocaine hydrochloride solutions, also concluded that increase in alkalinity augments anesthetic properties.

The present work consisted in a comparison of the anesthetic efficiency of procaine borate and procaine hydrochloride solution at varying hydrogen ion concentrations by the method of Adams[6] on goldfish with modifications suggested by Dailey[7] and Benedict. The solutions used were brought to the desired pH with N/10 sodium hydroxide and N/10 hydrochloric acid. The pH determinations were made with a Leeds-Northrup Quinhydrone potentiometer. All solutions used were of the same concentration with respect to the anesthetic base, the procaine hydrochloride solutions containing 1 gm. of the hydrochloride in 500 cc. of solution and the procaine borate solutions containing 1.638 gm. of the borate in 500 cc. of solution.

The results obtained are given in the graph. Each point represents the average time required to anesthetize 3 or more fish, anesthesia being determined by lack of response to stimulation of fins or tail. As can be seen by the curves the efficiency as determined by the time for anesthesia varies for both solutions and at a given pH is approximately the same for each drug. Apparently the increased efficiency of procaine borate is due to its alkalinity. Observations on the anesthetic effect of the 2 solutions on the rabbit's cornea confirm these findings on the goldfish.

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Effect of Diet on the Healing of Experimental Gastric Ulcer.

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Ferguson[1] was able to produce uniformly in rabbits gastric ulcers which persisted from 2 to 8 months or longer. He incised the an-

[4] Sollmann, *J. Pharm. Exp. Therap.*, 1917, x, 379; *J. Am. Med. Assn.*, 1928, lxx, 216.

[5] Regnier, *Compt. rend. de biol.*, 1925, xcii, 605.

[6] Adams, Rideal, Burnett, Jenkins, Dreger, *J. Am. Chem. Soc.*, 1926, xlviii, 1758.

[7] Dailey and Benedict, *Dental Cosmos*, 1929, lxxi, 704.

[1] Ferguson, *Am. J. Anat.*, 1928, xlii, 403.