The average loss of hemoglobin was 17.4% and of red cells, 17.8%. Four of the dogs died with hemoglobin and red count within the lower limits of normal and the lowest red count was 4,200,000. These findings are certainly not indicative of the fact that anemia is at all a primary factor in the condition. Furthermore, one dog died with a red count higher than before the operation, after having lost 41% of body weight in 5 months, his appearance being in every way typical of acholic cachexia.

Red cell fragility was tested every 4 days in all these animals and in no case was there any deviation from the normal.

From the accompanying chart it is quite clear that the weight loss ran a curve definitely ahead of the anemia, and that while the cachexia and weight loss were profound, the blood findings not only were of a far lesser degree but also did not in the least parallel the progress of the cachexia.

7211 P

Studies on Acholic Cachexia. III.* The Acid-base Equilibrium.

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For many years it has been assumed that since the bile was alkaline, loss of bile would consequently produce an acidosis. The importance of this factor in acholic cachexia has been a disputed point.

Okada[1] studied fistula bile from dogs and found a pH averaging slightly over 8.00, Düttmann's[2] investigations showed it a trifle lower. In the prolonged studies of Drury, McMaster and Rous[3] duct bile averaged pH 8.20. Neilson and Meyer[4] found figures in the same range, but called attention to the fact that on standing, or heating, duct bile would increase its alkalinity, the pH rising to 8.40-8.60. This was presumably due to driving off of CO_2. Drury[3] emphasized the point that the bile is a well-buffered solution, and that addition of considerable amounts of acid were necessary in

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1 Okada, S., *J. Physiol.*, 1915, 1, 114.

2 Düttmann, E., *Bruns. Beitr. z. klin. Chir.*, 1927, **139**, 720.

3 Drury, D. R., McMaster, P. D., and Rous, P., *J. Exp. Med.*, 1924, **39**, 403.

4 Neilson, N. M., and Meyer, K. F., *J. Inf. Dis.*, 1921, 28.

TABLE I.

Days Post-Operative	Cholecyst-ostomy 640		Cholecyst-ostomy 639		Cholecyst-nephrostomy 745		Cholecyst-nephrostomy 678		Dragstedt Cannula 824		Cholecyst-nephrostomy 680		Cholecyst-nephrostomy 699	
	CO_2	Cl	CO_2	Cl	CO_2	Cl	CO_2	Cl	CO_2	Cl	CO_2	Cl	CO_2	Cl
Pre-op.	%		%		%		%		%		%		%	
Normal	42	294	40	300	36	294	32	283	36		41	305	46	294
4	42	296	42	294	29	299	49	306	33		48	274	39	277
8	40	297	40	272	26	299	34	294	35		27	311	43	250
12	42	307	38	327	23	305	42	289	29		29			
16	37	299	37	283	29	299	32	310	25		28	283		
20	33	—	31	349	32	310	27	305	36		33	316		
24	35	305	35	305	25		32	316						
28	27	305	30	371	30		30	316						
32	33	316	40	327	29		39	332						
36	46	310	46	305	21		33	321						
40	31	348	35	283	25		35	305						
44	31	310	34	327	41									
48	31	327	33	337										
52	36	337	42	300										
56	39	305	24	294										
60	42	310	34	310										
64	40		32											
68	35		42											
72	32		36											
76	36													
80	30													

order to change the reaction. In this connection it is well to remember that considerable fixed acid is lost with the bile, as Wangensteen[5] found that a human with a biliary fistula secreted about 0.4 gm. NaCl daily.

In many previous studies too numerous to mention here, the presence of a mild degree of acidosis has been quite usual, while a few investigators have found it to be of such a high grade as to regard it as a primary factor in the accompanying cachexia. The material here reported consists of CO_2 and blood chloride estimations on 8 animals, part with biliary fistulas and part with cholecystnephrostomies. From the accompanying table it may be seen that there are no significant changes in the acid-base equilibrium. The average CO_2 before operation was 39.5, exactly that taken at the conclusion of the experiments (39.5). The average preoperative blood chloride was 290 mg. per 100 cc. and at the conclusion of the experiments was 293 mg. per 100 cc.

These animals were all on mixed diets and the onset of the cachexia was prompt and typical. It seems, therefore, that one is justified in concluding that if the typical picture may be reproduced without changes in the reaction of the animal that this factor is not fundamental and does not play an etiological rôle in cachexia cholepriva.

7212 P

A Study of the Dog's Stomach and Liver for Substances Effective in Pernicious Anemia.

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Since gastrectomized dogs do not develop pernicious anemia,[1] it is pertinent to determine whether substances effective in pernicious anemia are present in the liver and stomach of dogs.

We have prepared dog's "desiccated whole stomach" according to the standard method and have given the preparation orally to patients with pernicious anemia. We have made extracts of the dog's

[5] Wangensteen, O. H., Complete Biliary Fistula, *J. Am. Med. Assn.*, 1929, **93**, 1199.

[1] Ivy, Morgan and Farrell, *Surg. Gynec. and Obst.*, 1931, **53**, 611.