is not an important item).

These observations, therefore, indicate that the nature of the renal block is something of a functional disturbance due to an alteration of the tubule threshold for diacetic acid, as was suggested several years ago by Apple and Cooper.[7]

It is not at all clear why this phenomenon should occur in occasional cases. Often it is associated with oliguria, but oliguria is common in diabetic coma, and usually the concentration of diacetic acid in the urine is high. Dehydration and oliguria were more evident in Cases 1 and 2 than in these cases with negative ferric chloride.

[7] Apple, K. E., and Cooper, D. A., *Am. J. Med. Sc.*, 1927, **173**, 201.

Summary. A study has been made of the acetone bodies in blood and urine from a group of patients with diabetic ketosis, including 2 coma patients with urine giving a negative reaction with ferric chloride. The concentrations of free acetone in blood and urine were found to be similar in all cases; this observation supports the view that acetone is secreted into the urine by the physical processes of filtration and diffusion. The observed results were compatible with the suggestion that the cause of a negative urinary reaction with ferric chloride in certain cases of diabetic coma is due to a functional disturbance of the renal tubules, with elevation of the threshold for diacetic acid.

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Effect of Sulfathalidine and Sulfamethazine on Gaseous Distention in the Obstructed Small Intestine of Cats.

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It has been shown repeatedly that there are 3 sources of gas in intestinal distention (1) swallowed air, (2) decomposition of food, (3) diffusion, chiefly of nitrogen, from the blood into the intestines. According to Fine and his coworkers,[1] the nitrogen from the blood diffuses into the intestine in significant amounts only if other gases have collected in the gut in substantial volume. It has also been shown[1,2] that in the absence of food, swallowed air accounts for most of the gas present in the small intestine. The amount of swallowed air is variable within wide limits but can be controlled in great measure by withholding food and water and an inlying Levin tube. The fermentation or putrefaction of food is the second major source of gas in the obstructed small intestine. The coli-aerogenes-proteus group and certain clostridia, normally present in the small intestine, play a predominant role in this method of gas production. The inhibition of bacterial activity by antibacterial agents should contribute to a more complete control of meteorism. Hence a reduction in the number and metabolic activity of these groups of organisms might have a therapeutic effect.

Many of the sulfonamides now in use have a definite inhibiting action on enterobacteriaceae and clostridia, though each one to a different degree. Sulfathalidine (pthalylsulfathiazole) and sulfamethazine (dimethylsulfadiazine) clinically and experimentally have been shown to be effective against these

[1] Fine, J., and Levenson, W. S., *Am. J. Surg.*, New Series, 1933, **21**, 184.

[2] McIver, M. A., Benedict, E. B., and Cline, J. W., Jr., *Arch. Surg.*, 1926, **13**, 588.

bacteria.[3-6] The following experiments were performed to observe the effect of these drugs on the accumulation of gases in the obstructed small intestine of the cat.

Methods. Cats which had been deprived of food and water for 24 hours were subjected to laparotomy with the usual sterile precautions. Heavy cotton ligatures were used to completely occlude the oesophagus at the cardio-oesophageal junction to eliminate swallowed air and the ileum just proximal to the ileocaecal junction, thus producing a closed loop. Malted milk, which is a rich source of gas in the intestinal tract, was then injected into the stomach. Controls received 100 cc of malted milk without any drug; test animals received the same amount of malted milk containing sulfathalidine or sulfamethazine (1½ g per kg of body weight). At the end of 24 hours all animals were sacrificed and the amount of gas in the obstructed loop was measured by aspirating the entire contents into a syringe. The amount of gas in the stomach and in the small intestine was measured separately. Two animals were found dead at the end of 24 hours and were discarded. All the other animals were apparently in good condition at the time of execution.

A total of 46 animals were studied (Table I)—16 controls, 20 treated with sulfathalidine, and 10 with sulfamethazine.

Results. Gas production in the small intestine is apparently markedly depressed by the chemotherapeutic agents studied. Thus in the animals receiving sulfathalidine, the total gas production ranged from 0 to 60 cc, in those receiving sulfamethazine, from 0 to 30 cc, and in the control animals from 30 to 200 cc. Only 6 out of 16 controls showed less than 100 cc. These results seem quite significant, particularly considering individual variations in gas production.

TABLE I.
Total Gas in Closed Gastro-Intestinal Loops Containing Malted Milk.
A. Sulfathalidine; B. Sulfamethazine; C. No drug.

	A	B	C
	10	30	200
	0	15	75
	10	12	140
	0	0	110
	50	19	136
	0	0	100
	32	5	105
	16	7	200
	55	20	30
	8	12	55
	2		190
	60		130
	20		160
	0		57
	18		62
	3		39
	38		
	10		
	10		
	10		
Average	17.6	12.0	112.9

This observation is consistent with that of Sarnoff and Fine[7] who showed a protective effect by sulfasuxidine and sulfathalidine on isolated loops of ileum of dogs in which occlusion of the venous return produced gangrene except when these drugs were present in the injured loop.

Conclusions. Gas formation from malted milk in the occluded gastrointestinal tract is significantly depressed by sulfathalidine and sulfamethazine.

[3] Poth, Edgar J., and Ross, Charles A., *Texas Reports on Biol. and Med.*, 1943, **1**, 345.

[4] Poth, Edgar J., International Abst. Surg., 1944, **78**, 373.

[5] Schweinburg, F. B., and Yetwin, I. J., *New Eng. J. Med.*, 1944, **230**, 510.

[6] Schweinburg, F. B., and Yetwin, I. J., *J. Bact.*, 1945, **49**, 193.

[7] Sarnoff, Stanley J., and Fine, Jacob, *Annals Surg.*, 1945, **121**, 74.