phorus were found in saliva, blood determinations were likewise made, but in no case were abnormal findings noted.

SUMMARY OF SALIVARY ANALYSIS.

	Diabetic	Non-diabetic		Diabetic	Non-diabetic
	mg.%	mg.%		mg.%	mg.%
Calcium			Chlorine		
High	7.75	7.73	High	90.8	83.0
Low	3.7	2.8	Low	47.4	30.6
Mean	5.7	5.5	Mean	69.6	55.0
Phosphorus			pH		
High	17.8	16.6	High	7.0	7.3
Low	8.7	7.1	Low	6.3	6.3
Mean	12.1	11.5	Mean	6.8	6.9

The wide individual variations in mineral content of saliva noted in this study were also observed by Clark and Levine[1] in the saliva of adults, although the phosphorus values obtained by them appear to average slightly higher than those noted in this series.

Summary: The mineral content of saliva was studied in 2 groups of patients; one of diabetic children having resistant teeth and arrested caries, the other of unselected hospital patients showing as a group marked caries and soft teeth. The variations noted in the calcium, phosphorus, chlorides and pH of the saliva were similar in both groups, indicating that the formation of salivary calculus, and the arrest of dental caries noted in the diabetic children under dietary control, are probably not due primarily to any marked differences in the mineral content of the saliva.

[1] Clark and Levine, *Am. J. Physiol.*, 1927, lxxxi, 264.

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Relief of Parathyroid Tetany by Injections of Uranium Nitrate.

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Recent studies from this laboratory[1, 2] have shown that slight changes in the acid-base equilibrium, with a shift in the reaction of the blood toward the acid side, exert a profound effect upon the tetany of parathyroid insufficiency.

The writer and his collaborators have shown that asphyxiation by CO_2 of dogs presenting violent tetany promptly brings about

a return to normal in so far as tetany symptoms are concerned. The disappearance of symptoms was correlated with disturbance of the acid-base equilibrium, *i. e.,* lowered CO_2 capacity, CO_2 content and pH, due to rise in lactic acid. Tetany again supervened following a return to a normal acid-base balance and disappearance of the lactic acid. The total serum calcium remained unchanged by the CO_2 treatment, despite the fact the animals seemed normal and were free from tetany.

Since the effect of the CO_2 lasts but a brief period, and since it was considered desirable to study the experimental animals over longer periods, the present experiment with uranium nitrate was undertaken. This substance has been extensively employed in the study of renal function since it induces marked pathological changes in the kidneys when injected, and it is a well established fact that a profound acid intoxication develops in animals so treated. It is not definitely known to what acid or acids the acidosis of uranium nitrate poisoning is due. The intoxication develops slowly and reaches a maximum between the 4th and 8th day following injection.

In the present experiments both old and young dogs were used. They were thyroparathyroidectomized and allowed to develop marked tetany symptoms. They were then bled for CO_2 capacity, pH and serum calcium. It has been the experience of those working in this laboratory[3] that the CO_2 capacity, and pH of tetany dogs are normal. After bleeding, the tetany animals were injected with uranium nitrate subcutaneously. The dosage depended upon the age of the dog, for, as Mac Nider has emphasized, old dogs are much more susceptible to uranium nitrate than are younger animals. However, none of the dogs received more than 6 mg. per kilo.

The effect of uranium nitrate upon tetany is indeed striking, for within 12-24 hours after injection, all tetany symptoms have disappeared and the animals run about, eat and play in normal fashion. The normal condition may last a week or 10 days (dogs fed heavy meat diet) before tetany again develops. Examination of the blood of the injected dogs show a lowered CO_2 capacity, CO_2 content and a slightly lowered pH. The serum calcium may remain unchanged or increase somewhat. The increase is seldom more than 1 mg. per 100 cc. of blood. In general the serum calcium remains low. However, despite the low calcium content of the blood the dogs appear normal. Table I summarizes the data obtained from study of 2 typical cases.

The answer to the question why changing the reaction of the blood slightly toward the acid side brings about cessation of tetany

TABLE I. *Effect of uranium nitrate on parathyroid tetany.*

Dog	Operated	Tetany	Bled	CO_2 Capacity	pH	Ca	Remarks
4	Feb. 6, '28	Feb. 10	Feb. 10	38.9	7.34	7	Marked tetany. Injected (6 mg. per kilo) uranium nitrate 10 A. M. Feb. 10 complete recovery from tetany after 24 hrs. Dog placed on heavy meat diet.
			Feb. 12	37.3	7.36	8.2	Seems normal.
			Feb. 20	28.3	7.34	8	Animal normal.
7	Feb. 11, '28	Feb. 13	Feb. 13	47.1	7.39	8	Animal in tetany—given 5 mg. uranium nitrate per kilo. Normal after 36 hrs. Eats meat and runs about.
			Feb. 15	40.9	7.35	7.1	No tetany symptoms. Heavy meat diet.
			Feb. 18	32.4	7.35	5.8	No tetany. Heavy meat diet.
		Feb. 21	Feb. 20	36.8	7.39	5	Tetany present. Fine muscular tremors and jerking. Refuses food. Given 3 mg. uranium nitrate per kilo.
			Feb. 22	30.2	7.25	7	Tetany symptoms disappeared after 24 hrs. In coma when bled. Died. Uranium poisoning.

symptoms and small increases in the serum calcium is not forthcoming at the present state of our knowledge of the pathogenesis of tetany. It seems probable, however, that disturbance of the acid-base equilibrium with a shift in reaction toward the acid side, relieves tetany by rendering the serum calcium more diffusible, and also probably takes care of any excess of phosphorus which may be present by stimulating its excretion.

[1] Swingle, W. W., Wenner, W. F., and Stanley, P., PROC. SOC. EXP. BIOL. AND MED., 1927, xxv, 165.

[2] Wenner, W. F., *Am. J. Physiol.*, 1927, lxxxi, 612.

[3] Wenner, W. F., and Muntwyler, E., PROC. SOC. EXP. BIOL. AND MED., 1927, xxiv, 480.