We have observed several times that in taking hold of the tail of a pregnant albino rat or one with a litter that the animal executes a sudden gyration with its body such as described by Rabaud[2] in invertebrates, with the effect that one finds that the animal is free and several centimeters of tail remain in the hand. In the several animals in which this occurred, the tail fragment which was discarded amounted to about four and a half centimeters in each case. Whether this means that the conditions of holding the animal, etc., was so similar that the length of the discarded tail was the same or whether at that point the tail is weaker for such a special purpose, one can at present but conjecture.

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Experimental tetany and diet.

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In 1922 Dragstedt[1] and his co-workers were successful for the first time in preventing the onset of tetany in thyroparathyroidectomized dogs, their method being to add to the diet large amounts of lactose—from 50 to 100 grams—daily.

It has been our plan to repeat Dragstedt's work and do it more exactly and systematically, taking advantage of Cowgill's[2] method of feeding. In doing so we have been able to vary the foodstuff components in any way we like, keeping the total caloric value nearly the same.

After the animals were fed on a certain diet for 6 to 7 days, they were operated upon and the diet was continued. Severe tetany when it occurred usually developed on the second or the third day following the operation. When animals developed tetany, various attempts were made to cure them and special attention was paid to the efficacy of lactose in the treatment. If the animal did not show tetany under the experimental conditions, the

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[2] Rabaud, E., *Compt. rend. de biol.*, 1923, lxxxix, 229.

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[1] Dragstedt, L. R., and Peacock, S. C., *Am. J. Physiol.*, 1923, lxiv, 424.

[2] Cowgill, G. R., *J. Biol. Chem.*, 1923, lvi, 725.

diet was changed until symptoms of tetany appeared; this was done in order to exclude any possible action of accessory glands in the experiments.

In the table are given results obtained with various diets. In each case all constituents except casein and carbohydrate were kept constant.

As will be seen in this table, in a diet relatively low in casein, the amount of lactose which may prevent the onset of tetany is comparatively small, and when casein is increased, more lactose is needed.

The dextrin experiments are significant. It is much easier to prevent the appearance of tetany or depression in thyroparathyroidectomized animals than it is to cure it, once it has become established. Although lactose administration at the time severe symptoms of tetany develop appears to give much relief after a few hours, it has never been so successful as the administration of calcium salts which cure almost all symptoms in a short time. However, by stopping the symptoms of tetany by calcium administration and then changing the diet to a lactose food mixture, we have been able usually, without giving any more calcium, to save the animals from the recurrence of tetany. Furthermore, in mild cases, we were often convinced that lactose administration alone by stomach was effective enough to cure the symptoms. During these experiments blood sera were often analyzed for calcium and phosphorus, usually once or twice a week, and in some cases several days in succession. In every case, whenever the animal showed the symptoms of tetany after thyroparathyroidectomy, the calcium content of serum was low, and a parallelism existed between the degree of lowering of the calcium and the violence of the symptoms. When the animals were kept free from manifest tetany by a lactose diet, the calcium content of blood serum at first showed a value slightly lower than normal, never below 7 mg. In the course of time after the operation this value showed a tendency to rise gradually to normal. This indicates that some compensating factor is at work to restore the calcium level to normal and may have something to do with the fact that, when the thyroparathyroidectomized dogs are kept free from tetany by suitable treatment, they gradually become less susceptible to this condition. Nevertheless the idea of the dispensability of parathyroid glands has not been appreciated so far; even the animals which were kept free from tetany more

than 40 to 60 days and which appeared to be normal, developed tetany under certain conditions, known and unknown.

On the other hand phosphorus content of blood serum in thyroparathyroidectomized dogs was always increased regardless of whether or not the animals were kept free from tetany by lactose feeding or calcium administration. This increased phosphorus value returned gradually to normal in the course of time.

Either parenteral administration of galactose and lactose or the administration of a laxative agent (castor oil) failed to prevent the onset of tetany in thyroparathyroidectomized dogs. In experiments on normal dogs, a lactose diet raised slightly the level of calcium content in blood serum.

These experiments seem to suggest that the primary feature of tetany after thyroparathyroidectomy in dogs is a complicated disturbance of metabolism, in which protein metabolism plays some rôle. Although the lowering of blood calcium appears to be the direct cause of muscular symptoms of tetany, the calcium factor is, in our opinion, a secondary rather than a primary factor concerned in the development of the characteristic syndrome of experimental tetany. Just how lactose acts in preventing tetany still remains for further investigation. Possible changes in the permeability of the alimentary tract in this connection may require additional attention.

Diet and Parathyroid Tetany.

Tetany			Boundary			No Tetany		
No. Dogs	Diet.		No. Dogs	Diet		No. Dogs	Diet	
5	Standard	Per cent	3	Lactose *d*	Per cent	3	Lactose *a*	Per cent
	Casein	37.6		Casein	5.5		Casein	5.5
	Sucrose	34.9		Lactose	5.0		Lactose	68.1
4	High glucose			Sucrose	63.1	2	Lactose *b*	
	Casein	5.5	2	Casein-lactose *d*			Casein	5.5
	Glucose	68.1		Casein	20.0		Lactose	26.6
1	Sucro-glucose			Lactose	5.0		Sucrose	41.5
	Casein	5.5		Sucrose	53.1	4	Lactose *c*	
	Glucose	27.0	3	Casein-lactose *b*			Casein	5.5
	Sucrose	41.1		Casein	40.0		Lactose	15.0
3	High sucrose			Lactose	15.0		Sucrose	53.1
	Casein	5.5		Sucrose	23.1	3	Casein-lactose *a*	
	Sucrose	68.1					Casein	37.6
3	High dextrin						Lactose	34.9
	Casein	5.5						
	Dextrin	68.1						
3	Casein-lactose *c*							
	Casein	40.0						
	Lactose	5.0						
	Sucrose	33.1						