20 (2543)

Pseudo-autotomy in albino rat.

By THEODORE KOPPÁNYI (Introduced by A. J. Carlson).

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Bayliss[1] describes the process of autotomy as follows: "If a crab be picked up by one of its ambulatory appendages, it generally, by a powerful contraction, breaks this leg off at a particular place and so obtains freedom. This mechanism was first investigated by Fredericq, and more recently by Raskam (1913). The second segment of the leg in the crab consists of two parts which are distinct members in most crustacea and united by a movable joint. In this animal, however, in place of a joint, there is a double membrane whose two components are not very firmly united. In the middle of the membrane there is an aperture, through which nerve and blood vessels pass. Certain muscles are so arranged that by a powerful contraction, they separate apart the two layers of the membrane. Thus no soft parts are torn, except the nerve and blood vessels; there is practically no bleeding and the peripheral part of the appendage is rapidly regenerated."

A similar phenomena has long been known in some vertebrates. If a lizard is held by the tail it frees itself with a quick jerk at the expense of the piece of tail which remains in the hand. This phenomenon has also been termed autotomy, but it is different from true autotomy in that the tail itself is passive and is pulled apart, whereas muscles of the crayfish leg accomplish the separation which occurs there. At Dr. Carlson's suggestion, we wish to make manifest this difference by denoting as autotomy that mechanism by which an animal suddenly discards a portion of its body by a mechanism located in the member itself, and by denoting as pseudo autotomy that process by which an animal is enabled to lose a portion of its body, the part being lost playing a merely passive rôle. There is a possibility that such a portion of the body, the lizard tail, for instance, is especially adaptive (as to be unusually friable at a certain segment) for this purpose so as to facilitate the escape of the animal.

[1] Bayliss, W. M., Principles of General Physiology, 1915.

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.

21 (2544)

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.