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Elimination of Thyroglobulin from the Blood.

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Since thyroglobulin has been detected in thyroid venous blood and lymph[1, 2] but not in the general circulation, it would appear that the compound must be destroyed, or eliminated from the blood stream rather rapidly. At any rate the concentration of the protein does not become large enough to detect by the precipitin method. A study was undertaken to see how rapidly thyroglobulin could be eliminated when injected intravenously, and what the fate of the compound was.

Thyroglobulin was prepared from fresh hog thyroids by precipitating the protein in the isoelectric range. Antibodies were developed in rabbits by injecting this protein, and the antiserum was collected after 10 days. Suitable amounts of the hog thyroglobulin were injected intravenously into dogs. Samples of blood were withdrawn before and at various intervals after injection. Each sample of serum was diluted in a series of tubes and the antiserum added to each. The last tube showing a precipitin test was designated +, and those preceding were roughly gauged ++, +++, and ++++ by inspection.

Table I is a typical experiment.

TABLE I.

Time	Tube 1	2	3	4	5
0	—	—	—	—	—
10 min.	+++	++	++	+	—
60 "	++	++	+	—	—
90 "	++	+	+	—	—
120 "	+	+	—	—	—

It can be seen that thyroglobulin is steadily removed from the blood stream. Similar results have been obtained with 8 dogs. Smaller dogs remove the protein slower but the rate in terms of body weight has not yet been determined. The rate of elimination is apparently independent of the concentration in the blood. If the time

[1] Hektoen, Carlson and Schulhof, *J. Am. Med. Assn.*, 1923, **81**, 86.

[2] Hicks, *J. Physiol.*, 1926, **62**, 198.

necessary for 30 mg. of thyroglobulin to disappear is determined, it has been found that injection of 60 or 90 mg. requires about 2 or 3 times longer. One animal has been injected 13 times over a period of 18 days without any perceptible change in the rate of elimination.

It must be remembered that hog thyroglobulin injected into dogs is a foreign protein. This may account in part for the rapid rate of removal. The rate will be determined using dog thyroglobulin. In the above experiment about 60 mg. were removed in 2 hours. This is equivalent to more than 1 gm. of Armour's desiccated thyroid. There are several possibilities to account for the thyroglobulin: 1. The protein as such may be taken up by the tissues. 2. Excretion might occur through the urine, bile or intestine. 3. The protein might be broken up into smaller fragments and these remain circulating in the blood. 4. These fragments might be taken up by the tissues or excreted. The fate of thyroglobulin is being investigated.

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Relationship Between Lipase and Neurotoxic Action of Dog's Serum after Experimental Liver Damage

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On the basis of his finding of myelinolytic and lipolytic activity in the sera of patients with multiple sclerosis, Brickner[1] has suggested the therapeutic use of quinine in this condition, since it is known that quinine inhibits the action of some lipolytic enzymes *in vitro*. Weil[2] has confirmed the presence of a neurotoxic agent in the sera of these patients and has also demonstrated that the urine possesses a similar action. Crandall and Cherry[3] have shown that the majority of sera from cases of multiple sclerosis contain an abnormal lipase, similar to that of the pancreas; that diastase is also increased; and that similar findings are present in cases of liver disease and in animals with experimental hepatic damage. It seemed of value to determine whether a neurotoxic agent was present in experimental hepatic damage, and if so whether its appearance and concentration ran parallel to that of lipase.

[1] Brickner, R. M., *N. Y. State J. Med.*, 1931, 1.

[2] Weil, A., *J. Am. Med. Assn.*, 1931, **97**, 1587.

[3] Crandall, L. A., Jr., and Cherry, I. S., *Arch. Neur. and Psych.*, in press.