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.

Six dogs with complete obstruction of the common bile duct, 5 with ligation of both pancreatic ducts, and 3 with Eck fistulae were studied. Ligation of the pancreatic ducts has been shown by Berg and Zucker[4] to produce fatty degeneration of the liver. For determination of neurotoxic action the sera from these dogs were incubated with rat spinal cord (5 cc. serum with 0.05 gm. cord for 20 hrs. at 37°C.) After 3 days' formalin fixation the spinal cords were imbedded and sections stained for myelin (Weil's method), axis cylinders (Davenport's method) and with cresyl violet. Parallel determinations of lipase were made by the method previously reported.[5]

Normal serum produces only a mild swelling of the nerve fibers in the outer zone of the spinal cord. The serum from Eck fistula dogs was not active on rat cord *in vitro,* but beginning on the fourth or fifth postoperative day sera from animals with ligation of common bile duct or pancreatic ducts produced a severe destruction of both myelin sheaths and axis cylinders. The glia nuclei in the outer zones had lost their staining qualities and the ganglion cells showed marked vacuolation and shadow formation. The abnormal lipase usually appeared in the sera in large amounts within 24 hours after the operation, and had usually reached its peak before neurotoxic activity appeared. The lipase usually disappeared about a month after duct ligation but at this time the neurotoxic activity was still strongly present. Further, it was found that serum heated to 62°C. for 30 minutes lost all lipolytic action but the neurotoxic agent was unaffected.

We conclude that in experimental hepatic damage a neurotoxic agent is present in the blood serum, and that this activity cannot be accounted for by the lipase which is often simultaneously present.

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New Methods for Studying Motility During Sleep.

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The methods heretofore employed for investigating motility during sleep involved the continuous recording on a kymograph of the

[4] Berg, B. N., and Zucker, T. F., PROC. SOC. EXP. BIOL. AND MED., 1931, **29**, 68.

[5] Crandall, L. A., Jr., and Cherry, I. S., PROC. SOC. EXP. BIOL. AND MED., 1931, **28**, 570.