that the permeability of capillaries damaged by the local injection of irritants was altered, as indicated by the local diffusion of intravenously injected trypan blue, by the local injection of desoxycorticosterone acetate. We were unable to confirm these findings when this hormone was injected intravenously.

If the primary pathology in traumatic shock is an altered permeability of the capillaries, the foregoing observations are consistent with evidence recently presented by us that desoxycorticosterone acetate exerted no beneficial effect in shock following hemorrhage.[3]

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Fixation of Iodine by Thyroids of Rats Given Diets Deficient in Iodine.*

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Iodine fixation in the thyroids of rats given a goitrogenic diet was examined with the help of radio-iodine. One group of animals received Remington's diet No. 342,[1] modified after Steenbock and Black's diet No. 2965[2-5] by adding liver extract to improve growth, and by reducing the amount of calcium, so that the results could be ascribed to the low iodine content of the diet and not to the goitrogenic effect of calcium.[1] The amount of iodine estimated by the method of Matthews, *et al.*,[6] after destruction according to Kolnitz and Remington,[7] was found to be 19 μg per kilo. The animals ate

[3] Fine, J., Fischmann, J., and Frank, Howard A., *Surgery*, in press.

* This research was supported by a grant-in-aid from the Rockefeller Foundation administered by Dr. Stafford Warren. It was completed with the help of a Hoffman-LaRoche Fund, administered by Dr. Hans Selye. The radioactive iodine was kindly furnished by Dr. R. T. Evans, from the cyclotron of the Massachusetts Institute of Technology.

[1] Remington, R. E., *J. Nutr.*, 1937, **13**, 223; Remington, R. E., and Levine, H., *J. Nutr.*, 1936, **11**, 343.

[2] Steenbock, H., and Black, A., *J. Biol. Chem.*, 1925, **64**, 263.

[3] Krauss, W. E., and Monroe, C. F., *J. Biol. Chem.*, 1930, **89**, 581.

[4] Thompson, J., *J. Nutr.*, 1932, **5**, 359.

[5] Levine, H., Remington, R. E., and von Kolnitz, H., *J. Nutr.*, 1933, **6**, 325.

[6] Matthews, N. L., Curtis, G. M., and Brode, W. R., *Ind. Eng. Chem.*, 1938, **10**, 612.

[7] Kolnitz, H. v., and Remington, R. E., *Ind. Eng. Chem.*, 1933, **5**, 38.

an amount of food containing approximately 0.2 μg of iodine daily, which is well below the minimum daily iodine requirement of the rat.[1]

Another group of rats was given Sharpless' diet No. 153,[8] in which there was soybean, an active goitrogenic agent.[9, 10, 11] The amount of iodine in the diet was found to be 1 μg per kilo, so that in this case the animals, in addition to the action of a goitrogenic agent, had a diet very deficient in iodine.

Ten males and 12 females were put on each diet and divided into equal groups of control and experimental animals. The controls received distilled water containing 2 μg of iodine per cc, while the experimental animals received double-distilled water. The amount of iodine consumed by the controls varied, but was in the vicinity of 20 μg of iodine daily.

Both control and experimental animals gained weight on the Remington diet, but growth was poor and diarrhea frequent with the Sharpless regime. After 70 days (Remington's diet) or 54 days (Sharpless' diet), all the animals received an intraperitoneal injection of 15 μg of radio-iodine in the form of sodium iodide. One animal of each group was sacrificed one hour later. Since only about 2% of the injected radio-iodine was then fixed in the thyroids of the controls, and 4% in those of the experimental animals, it was decided to sacrifice the other animals at a later time. This was done either 8 or 24 hours after the injection of radio-iodine. The results, being similar at these two periods, were reported together (Table I).

At autopsy the hypophysis and a piece of the thyroid were removed for histological examination. Each thyroid was then destroyed in a mixture of chromic and sulphuric acids, and its radio activity estimated on a Geiger counter. Then the products of thyroid destruction from the animals of one group were pooled and the total iodine content estimated. In the table, the total iodine values are given after subtraction of the radio-iodine.

Results. (Table I.) In confirmation of previous work,[1, 3-5, 9] hyperplasia of the thyroid was shown by an increase in the weight of the gland, by thickening of the epithelium of the follicles with a decrease in the amount and density of the colloid, and by a decrease in the total iodine content of the organ. The amount of radio-iodine fixed by the thyroid gland was greater in the experimental than in the

8 Sharpless, G. R., PROC. SOC. EXP. BIOL. AND MED., 1938, **38**, 166.

9 Sharpless, G. R., Pearsons, J., and Prato, G. S., *J. Nutr.*, 1939, **17**, 545.

10 McCarrison, R., *Ind. J. Med. Res.*, 1933, **21**, 179.

11 Wilgus, H. S., Jr., Gassner, F. X., Patton, A. R., and Gustavson, R. G., *J. Nutr.*, 1941, **22**, 43.

TABLE I
Fixation of Radio-iodine by Thyroids of Rats on Iodine Deficient Diets.

	Avg body wt. g		Avg wt thyroid (mg)	Conc. of iodine in thyroid (mg per 100 g)	Avg conc. of radio-iodine in thyroid (mg per 100 g)	% of injected radio-iodine in thyroid (avg)
	Beginning	Autopsy				
I. Remington's Diet						
♂ Controls	119	234	12.8 (10.5-15.5)	100	7.0 (5.7-8.2)	4.8 (3.9-5.8)
Exp.	121	224	27.0 (23-32)	14	11.4 (6.1-19)	20.5 (7.2-37.2)
♀ Controls	91	177	14.5 (11.5-18.5)	—	6.2 (3.8-7.8)	5.9 (3.4-7.7)
Exp.	91	170	16.2 (13-19)	—	14.2 (8.5-18.8)	18.2 (11.3-25)
II. Sharpless' Diet						
♂ Controls	169	163	12.5 (10-15)	138	3.9 (3.7-4.3)	4.9 (4.6-5.2)
Exp.	199	202	18.0 (15-21.5)	75	32.6 (24.3-39.6)	43.7 (30-49.1)
♀ Controls	97	100	14.0 (10-19)	64	6.5 (4.4-9.6)	7.0 (5-8.1)
Exp.	141	142	20.3 (16.5-24.5)	34	11.5 (4.1-20.2)	20.1 (7.8-33.4)

The values in parentheses indicate the extreme variations.

control animals. Therefore, the transformations of the thyroid due to iodine deficiency result in a better use of the available iodine and thus are beneficial to the animals. The results were similar in the case of the straight iodine deficiency (Remington's diet) and in the case of the soybean diet, suggesting that the thyroid hyperplasia of iodine deficiency was not modified when a goitrogenic agent was present in the diet. It has also been shown that the action of goitrogenic factors in rabbits, such as obtained by feeding cabbage or injecting cyanides, also produces hyperplastic thyroids, fixing increased amounts of iodine.[12]

It must be noted that the thyroids made hyperplastic by dietary means behave as if they were stimulated by thyrotropic hormone, since the action of this hormone on the thyroid is to produce an increased ability to fix iodine,[13-15] and histological signs of hyperplasia.[16] Indeed, a hypersecretion of thyrotropic hormone by the

[12] Hertz, S., Roberts, A., Means, J. H., and Evans, R. D., *Am. J. Physiol.*, 1939, **128**, 565.

[13] Leblond, C. P., and Süe, P., *C. R. Soc. Biol.*, 1940, **133**, 543; Leblond, C. P., and Süe, P., *Am. J. Physiol.*, 1941, **134**, 549.

[14] Hamilton, J. G., and Soley, M. H., *Proc. Nat. Acad. Sc. U. S.*, 1940, **26**, 483; Hertz, S., and Roberts, A., *Endocrinol.*, 1941, **29**, 82.

[15] Morton, M. E., Perlman, I., and Chaikoff, I. L., *J. Biol. Chem.*, 1941, **140**, 603.

[16] Loeser, A., *Arch. Exp. Path. Pharm.*, 1936, **184**, 23.

hypophysis of iodine deficient animals was suggested by histological examination of their hypophysis. These glands showed a decreased percentage of acidophils with an increased number of basophils, as is the case with thyroidectomized animals.[17, 18] Since this hypophyseal picture in thyroidectomized animals is indicative of excessive release of thyrotropic hormone,[16, 19, 20] it is likely that it bears the same significance in animals lacking iodine. Goitrous thyroids would thus result from hypophyseal modifications. However, the possibility of a direct action of iodine on the thyroid is not excluded.[21]

Conclusion. The hyperplastic thyroids of rats given an iodine-deficient diet acquire an increased ability to fix iodine. The thyroid and hypophyseal changes in these goitrous animals indicate an excessive release of thyrotropic factor from their hypophysis.

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Use of Hamster (*Cricetus auratus*) for Detection of Influenza Virus in Throat Washings.*

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One of us has reported[1] that the hamster *(Cricetus auratus)* gave a specific immune response following intranasal inoculation of throat-washings taken from persons acutely ill with influenza A. These observations have now been extended, not only with regard to the immune response of the hamster but also as to its use in adapting influenza A virus to mice.

Experimental Material. The throat-washings used in these experiments were collected from persons presumably ill from influenza during the epidemic which occurred in the Argentine in July, 1940. The throat-washings were taken with 20 cc of an equal mixture of

17 Marine, D., Rosen, S. H., and Sparke, C., PROC. SOC. EXP. BIOL. AND MED., 1935, **32**, 803.

18 Sharpless, G. R., and Hopson, E. M., *Endocrinol.*, 1940, **27**, 129.

19 Loeser, A., *Arch. Exp. Path. u. Pharm.*, 1934, **176**, 697.

20 Starr, P., Rawson, R. W., Smalley, R. E., Doty, E., and Patton, H., *West. J. Surg.*, 1939, **47**, 65.

21 Chapman, A., *Endocrinol.*, 1941, **29**, 680.

* These studies were supported in part by a grant from the International Health Division of the Rockefeller Foundation.

1 Taylor, R. M., PROC. SOC. EXP. BIOL. AND MED., 1940, **43**, 541.