vitamin C content of the cerebrospinal fluid may become an aid in the diagnosis of avitaminotic states.

Conclusion. The ascorbic acid content of the cerebrospinal fluid in a series of 50 ambulatory patients has been determined. All individuals were on a diet adequate in vitamin C and showed no clinical evidence of avitaminosis C or of acute infection. The ascorbic acid content varied from 0.7 to 2.1 mg. % with a median of 1.2 mg. %.

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A New Goiter-Producing Diet for the Rat.

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Diets which consistently produce goiter in rats have been limited to those composed of natural food materials. Modifications of the Steenbock rachitogenic diet have been used successfully by Levine, Remington and von Kolnitz,[1] Thompson,[2] and others. Hellwig[3] has used a diet of 50% rolled oats and 50% corn meal boiled in distilled water. Other diets, composed mostly of the cereal grains or their milling products, have been used with little success.

Attempts to produce goiter in rats with the above diets or modifications of them resulted in failure. It was found that rats of the same colony and under the same environmental conditions that resulted in failure with other diets, readily developed goiter when fed the following diet: soy bean flour (unprocessed) 75.0 parts, dried yeast 3.0 parts, butter fat 5.0 parts, sodium chloride 1.0 part, calcium carbonate 0.5 part, sucrose 15.5 parts, and viosterol 15 drops per kilo of food.

Rats weighing 50-70 gm. were used in the study. More than 150 were fed the diet over a period of 2 years. Enlarged glands were obtained consistently. After 4 weeks on the diet, the glands of many animals were enlarged to 5 times normal size but there were wide individual variations. The weight of the gland in relation to body weight after 8 weeks was rarely greater than the largest glands of the younger group, but the individual variation was much less. The

1 Levine, Harold, Remington, R. E., and von Kolnitz, Harry, *J. Nutrition*, 1933, **6**, 325.

2 Thompson, Juanita, *J. Nutrition*, 1932, **5**, 359.

3 Hellwig, C. A., *Endocrinol.*, 1934, **18**, 197.

TABLE I.
Weight and Iodine Content of Thyroids of Normal Rats, and Those Fed the Goiterogenic Diet with and without Iodine.

Diet	Iodine content of diet, gamma per kilo	Age when killed, days	No. of animals	Aver. Thyroid Wt. Fresh Total mg.	Aver. Thyroid Wt. Fresh Per 100 gm. body wt. mg.	Aver. Thyroid Wt. Dry Total mg.	Dry matter in thyroid %	Iodine conc. dry basis %	Total iodine in each gland gamma
Stock	120	75	14	19.1	11.2	4.9	25.5	.0625	3.06
Goiterogenic (No. 153)	60-80	57	10	32.4	29.3	6.9	21.2	.0092	0.64
" (No. 153)	60-80	85	17	65.5	47.0	13.4	20.5	.0055	0.74
No. 153 with KI	430-450	85	14	16.8	11.2	5.0	29.6	.233	11.66

average enlargement obtained after 4 weeks and after 8 weeks in 2 representative groups where iodine determinations were made is shown in Table I.

That iodine added to the diet as potassium iodide completely prevented the enlargement is also shown in Table I. The glands were more firm and contained less moisture than those of normal control animals. Iodine was determined by the method of Trevorrow and Fashena.[4] Four or more goiterous glands were combined for a single determination. Other glands were analyzed individually. The iodine content of the goiterous glands is practically the same as that found by Levine, Remington and von Kolnitz[1] in glands of similar size.

Microscopically the enlarged glands are hyperplastic with little or no colloid. The lumen of the acini is small and almost indistinguishable in large areas. The lining cells are large. The glands of stock animals and of those fed the goiterogenic diet with potassium iodide are normal. The latter contain more colloid.

By adding soy beans to the diet of young rats McCarrison[5] produced an enlargement of the thyroid which was not prevented by potassium iodide. Under the conditions of the present study, McCarrison's observation was not confirmed. However, the iodine content of the goiterogenic diet was 4 times the 14 gamma per kilo found by Levine, Remington and von Kolnitz[1] in diets causing a similar degree of enlargement. Whether the diet contains a factor which affects the utilization of iodine may be indicated by experiments in progress. A similar degree of enlargement was not obtained when heated soy bean flour was substituted for the unprocessed flour.

Summary. In 4 to 8 weeks, a diet containing 75% raw soy flour induces in the thyroid of young rats an enlargement of 3 to 5 times normal. The enlargement is accompanied by hyperplasia and loss of colloid. Although the diet contains more iodine than would be expected, additional iodine will completely prevent the enlargement.

[4] Trevorrow, V., and Fashena, A. J., *J. Biol. Chem.*, 1935, **110**, 29.

[5] McCarrison, R., *Ind. J. Med. Res.*, 1933, **21**, 179.