obtained. However, we do not conclude that hydrogenation destroys the antiophthalmic vitamine, inasmuch as growth is a better index than ophthalmia, and our animals grew fairly well.

In this connection, it is of interest to note that Goldblatt and Zilva,[3] using the preventive type of experiment with animals fed on the McCollum diet No. 3143, found that 33.7 mg. daily of a hardened cod liver oil protected against rickets, and that 1.8 mg. promoted growth. The original oil, before hardening, also promoted growth in daily doses of 1.8 mg. The antirachitic value of the original oil was not determined.

From the above, it appears that the vitamine potency of cod liver oil is not appreciably destroyed by a suitable hydrogenation process.

It is thus possible to prepare a potent concentrate which may be used as a starting point for further chemical fractionation, and as a source of vitamine possessing obvious advantages over cod liver oil. Further work along this line is in progress and detailed data will appear in an early publication.

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The occurrence of gastric lesions in rats, and their possible relation to dietary deficiency.

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In examining the gastro-intestinal tract of rats which were being used for other experiments our attention was directed to the frequent occurrence of lesions in the rumen or esophageal portion of the stomach. These lesions, in brief, consisted of an inflammatory edema of the mucosa and submucosa, with marked cellular reaction, and in most cases, localized ulceration. Associated with these inflammatory changes there was always present more or less epithelial hyperplasia. These lesions were

[3] Goldblatt, H., and Zilva, S. S., *Lancet*, 1923, ii, 647.

situated by preference near the elevated ridge which divides the rumen from the glandular portion of the rat's stomach.

A relation of the lesions to dietary factors is strongly suggested in the following table:

Diet*	No. of rats examined	No. of rats showing lesions	Percentage showing lesions
Stock	19	0	0
84	14	12	86
Modified 84 and 85	8	3	37.5
84 + C.L.O. (12-22 dps.)	7	2	28.5
—A	14	7	50
—A + C.L.O.	6	0	0
Full-diet alkaline	7	0	0
Full-diet acid	7	0	0
Full-diet neutral	4	0	0

It is seen from the above figures that none of the 43 rats on complete diets showed gastric lesions; whereas of 36 rats on variously deficient regimens lesions were present in 20, or approximately 55 per cent. It seems justifiable to infer that the occurrence of the lesions is in some way determined by the diet. We are not as yet able to define this relationship in terms of known deficiencies. The relative acidity or alkalinity of the diet, when complete in regard to its basic food constituents, appears to be without influence. The addition of cod liver oil to a diet deficient only in fat soluble vitamine afforded complete protection in the small series studied. The indications are, therefore, that the deficiency in fat soluble vitamine is an important factor, but further experiments are in progress.

*Details as to the composition of the diets will be given in the final publication.