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The destruction of the antiscorbutic vitamin in milk by the catalytic action of minute amounts of copper.

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In a previous communication¹ it was shown that the antiscorbutic vitamin in milk, orange juice, or tomato juice, is, to a certain extent, destroyed by oxidation. In view of the well-known action of catalysts in increasing oxidative processes, and the frequent presence of traces of copper in milk, it seemed worth while to ascertain the effect of the addition of small amounts of copper to milk. To this end two groups of guinea pigs were fed equal amounts of milk, which, in the one instance, had been heated in a glass vessel to 60° C. for 40 minutes, and, in the other instance, had been heated in a copper vessel to the same degree. Each animal received daily dried milk to the equivalent of 100 c.c. of fluid milk, and oats in addition. Diluted dry milk was employed, so as to be able to concentrate the milk and thus insure its complete consumption.

None of the guinea pigs fed on the milk heated in the glass vessel developed scurvy during a period of four months; they did not, however, make normal gains as the quota of antiscorbutic vitamin was inadequate. On the other hand, the animals fed with the same quantity of milk, which had been heated in a copper vessel, all developed scurvy, and died after about four weeks. This milk contained 1.4 part of copper per million. That this nutritional failure was due to a lack of antiscorbutic vitamin was demonstrated by the excellent gains of a third group of guinea pigs which were given milk which had been heated in the copper vessel, but received in addition 2 c.c. daily of orange juice.

Milk frequently becomes contaminated with copper in the course of commercial pasteurization or condensation. It seems possible that these traces of copper may contribute to the destruc-

¹ Hess, A. F. and Unger, L. J., *PROC. SOC. EXPER. BIOL. AND MED.*, 1921, xviii, 143.

tion for the antiscorbutic, vitamin and account, in some degree, for the varying content of this factor in heated milk. It is also possible that the copper ingested with the food, especially in infants whose diet consists mainly of milk, may exert an effect within the animal body.

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The prevention of rickets in the rat by means of radiation with the mercury vapor quartz lamp.

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All the evidence as to the preventive and curative effects in the rickets of human beings of the radiations from the mercury vapor quartz lamp has been furnished by the X-ray. In order to determine the protective action of these radiations in experimental rickets in rats and also to examine the bones themselves we performed the following experiments.

Nineteen rats, mostly mixed black and white and about seven weeks old, were placed on diet 3143 which, as previous experience has shown, produces rickets comparable in every respect to the rickets manifesting itself in human beings.

Nine rats were kept as control animals under ordinary laboratory conditions in a room completely screened with windows of ordinary glass (cage "R" animals). Ten rats were exposed to the radiation from a Hanovia mercury vapor quartz lamp (Alpine type) (cage "U-V" animals). One animal (16Y) in cage "R" was found paralyzed thirty-eight days after being placed on diet (age about eighty-eight days) and was killed. We have previously pointed out that the development of paralysis of the posterior extremities not infrequently occurs in rats fed on diet 3143. Another animal (26Y) was killed fifty-eight days after being placed on the diet (age about one hundred and eight days); and