

of tissue growth. The radial growth of the capillaries, in contradistinction to the concentric growth of the connective tissue makes possible the nourishment and persistence of the newly formed tissue, and thus the definite organization of dead material.

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Experiments on antiscorbutics. Report of an antiscorbutic for intravenous use.

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At the last meeting of this Society we presented a paper on guinea-pig scurvy, which had been induced by a diet of oats, hay, and water. In the present paper we wish to report some protective and curative experiments on pigs which were fed on this diet, as well as on the use of various antiscorbutics in the scurvy of infants.

Guinea pigs developed scurvy on the above diet in spite of a daily per capita allowance of five grams of dried vegetables. Three lots of vegetables were used on three groups of pigs: (1) a commercial preparation of mixed vegetables; (2) carrots dried at room temperature last summer; (3) carrots rapidly dried a few weeks previously at a temperature of about 130° F. All the pigs in each group developed scurvy, those of group 3 developing the disease somewhat later than the others. A watery decoction of orange peel was able to protect against scurvy. A similar preparation, made from orange peel that had been dried at room temperature a few months, retained only mild antiscorbutic properties.

Orange juice proved to be a most effective antiscorbutic in very small amounts. If, however, it was kept in the refrigerator for about three months it lost considerable of its potency, the pigs to which it was fed failing to gain normally. Orange juice which had been subjected in an autoclave to 110° C., at ten to fifteen pounds pressure, although antiscorbutic, did not enable pigs to gain in weight as did the unheated juice. Orange juice that was

extracted with absolute or 95 per cent. alcohol, possessed anti-scorbutic qualities, whereas the residue was of no value in this respect. Neutralized orange juice, given subcutaneously to a group of guinea pigs, also failed in this respect. "Artificial orange juice," made up according to McCollum's formula, composed of the various salts, citric acid, and sucrose in the proportions which they are found in the natural juice, was given to numerous pigs, but was ineffective in protecting them against scurvy.

"Artificial orange juice" was likewise tried in the treatment of two infants suffering from scurvy. In both it failed absolutely to ameliorate the symptoms, which yielded rapidly to natural orange juice.

We wish to report especially that *orange juice may be given intravenously*, after it has been boiled, and made slightly alkaline to litmus, by the addition of normal sodium hydrate just before using, and that such injections produce no untoward reaction, and have a marked curative effect. This intravenous therapy is of interest from a practical standpoint, as its action has been found to be most rapid, and its dosage small; it is therefore especially indicated where the symptoms are urgent. It is also of theoretical interest in a consideration of the pathogenesis of scurvy, as it is the first time that this disorder has been cured by a therapy which was not introduced by way of the alimentary tract.

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A delicate method of determining invert activity.

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A delicate method of estimating invert activity (sucrase) would be of advantage in connection with a number of physiological problems. A substitution of one per cent. cane sugar for the one per cent. soluble starch or glycogen, employed by Myers and Killian,¹ in the estimation of the diastatic activity of the blood, furnishes a very delicate method for sucrase.

¹ Myers and Killian, *Jour. Biol. Chem.*, 1917, XXIX, 179.