action was approximately one-third that of the contents of the small intestine, on a comparable total solids basis.

In biological tests involving analyses of stomach and intestinal contents at frequent intervals after feeding dehydroascorbic acid, there was no evidence of a marked change in the stomach—neither reduction, decomposition, nor absorption was evident. In the small intestine, studied in one-third length segments, absorption and reduction were too rapid and irregular to follow satisfactorily with consistent quantitative data. The results with the stomach and intestine were in agreement, however, with the *in vitro* studies of reduction and stability, and also with the assay findings regarding antiscorbutic activity.

10861 P

Preferential Mottling of the Enamel of Rat Molars.

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Cox, Matuschak, Dixon, and Walker[1] produced mottled enamel in rat molars by daily individual feedings from birth of relatively high doses of fluorine to suckling rats. The first two molars, which normally are extruded at 19 days, were affected; the third molars, which appear on the thirty-fifth day, were apparently normal.

Miller[2] has shown that the development of dental caries is inhibited by 250 p.p.m. of sodium fluoride or 500 p.p.m. of calcium fluoride in a caries-producing ration fed to rats 28 days old. His ration was based on coarse rice.

In a confirmatory study of Miller's finding a ration of corn meal 66, whole milk powder 30, alfalfa meal 3, and sodium chloride 1 was fed to rats weaned at 21 days. Two groups, 22 and 23 rats, respectively, made up of litter mates, were used. One group had 250 p.p.m. of sodium fluoride in the ration. All were sacrificed after 8 weeks.

On examination of the teeth before they were sectioned, it was found that the enamel of the third molars of 19 out of 22 rats that had received added fluorine showed a faint diffuse milkiness. None

[1] Cox, G. J., Matuschak, M. C., Dixon, S. F., and Walker, W. E., *Science*, **1939, 90**, 83.

[2] Miller, B. F., PROC. SOC. EXP. BIOL. AND MED., 1938, **39**, 389.

of the first or second molars was affected. No milkiness was observed in any teeth of the control rats. No difference could be seen in the enamel when the teeth were sectioned by the method of Cox and Dixon.[3]

This discovery of mottled enamel in the third molars of rats makes it possible to produce preferential decay in a rat mouth if the protective action of fluorine[4] is exerted by such late inclusion in the diet. On the other hand, failure to prevent caries in the third molar would indicate that fluorine exerts its protective action earlier in tooth life. Similarly, other substances, for example, Vitamin D, can be used in a study of their relation to dental caries.

10862

Circulation Time Under Conditions of Work and Rest in Subjects with Normal and Abnormal Hearts.*

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The work of Blumgart, Weiss, and their associates on circulatory dynamics gave impetus to the investigation of the circulation time.[1] Since publication of their reports, it has been shown that the circulation time is influenced by exercise, the basal metabolism, digestion, the viscosity of the blood, the number of red blood corpuscles, the condition of the respiratory organs, the functional state of the myocardium, and many vasomotor factors.[2] Lucia and Aggeler[3] have shown that the intramuscular injection of adrenalin markedly shortens the circulation time. These factors cause fluctuations sufficient to cast doubt on the value of a single observation or uncontrolled measurements of the circulation time.

The substances in most common use for the subjective determination of the circulation time are calcium gluconate, decholin, saccharin, and ether; those for the objective determination include radioactive

3 Cox, G. J., and Dixon, S. F., *J. Dent. Res.*, 1939, **18**, 153.

4 Cox, G. J., Matuschak, M. C., Dixon, S. F., Dodds, M. L., and Walker, W. E., in press.

* Assisted by a grant from the Christine Breon Fund.

1 Blumgart, H. L., *et al.*, *J. Clin. Invest.*, 1927, **4**, 1, 15, 149, 173, 199, 389, 555.

2 Kunkel, P., Stead, E. A., and Weiss, S., *J. Clin. Invest.*, 1939, **18**, 225.

3 Lucia, S. P., and Aggeler, P. M., unpublished data.