human. The removal of the olfactory bulbs in young rabbits does not interfere with normal growth.

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Nature of Diet in Its Relationship to Control of Dental Caries.

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(Introduced by P. C. Jeans.)
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Previously it has been reported that dental caries may be arrested within 8 to 10 weeks through the regular ingestion of a diet high in protective foods, including a teaspoonful of cod liver oil daily.[1] This report correlates the response of the teeth with the level of intake of certain dietary constituents.

Five orphanage children between the ages of 3 and 6 years were observed in the metabolism ward for 7 months under varied intakes of vitamin D; concomitant dental examinations and balance studies were made at frequent intervals. Two had active caries of noteworthy extent and activity; one had 20, the other 6 cavities. A third child had one small proximal cavity. The remaining 2 children were free from demonstrable tooth decay. Activity of caries was determined on the basis of the permeability of the exposed dentin to the exploring tine; if at all permeable, the decay was considered active.

Throughout the studies the food intake was quantitatively controlled. During the fall months especially the children received considerable sunshine out of doors. Several dietary regimens were used progressively, each for a period of from 5 to 8 weeks.

Diet No. 1 was an approximation of that employed at the orphanage. It provided 800 gm. whole milk daily, with fair amounts of vegetables, fruits, meat and butter. The second diet was that employed in the Children's Hospital; it provided 1000 gm. of milk, and was higher in vegetables and fruits than the orphanage allowance. The third diet was similar to the second, except that 450 cc. of irradiated evaporated milk, suitably diluted (155 units of vitamin D), was substituted for the fresh whole milk. In the fourth period the second diet was supplemented with a teaspoonful of cod liver oil daily. The latter had an assayed content of 175 units of

[1] Boyd, J. D., Drain, C. L., and Nelson, M. V., *Am. J. Dis. Child.*, 1929, **38**, 721.

vitamin D per gram, which provided a daily intake of approximately 600 units.

Appreciable lessening of activity of caries was noted during the first few weeks of study, during the fall months. Subsequently for many weeks the status was virtually stationary, with minimal but definite activity, even after the children had received a diet of high protective value aside from its vitamin D content for 5 months. When this diet had been supplemented by cod liver oil for 9 weeks, the caries was finally adjudged arrested, and this was confirmed by subsequent examination. The 2 control subjects remained free from caries.

Another boy of 11 years was being observed simultaneously regarding the effects of vitamin A intake on dark adaptation. He had 3 cavities of moderate extent and of mild activity when first seen in mid-September. From that time until January he received a diet with a reduced content of vitamin A, with elimination of all cream, eggs, organ meats and carotene-containing fruits and vegetables. It supplied 1100 gm. skimmed milk daily, and designedly met basic requirements of all nutritional factors other than vitamins A and D, yet it was definitely poorer in protective foods than the routine hospital diet. The boy played out of doors in moderation. In order to reduce still further the intake of vitamin A, in January the skimmed milk allowance was reduced to 750 gm. and other minor alterations were made. On February 3rd was instituted the daily administration of 10 drops of viosterol (2400 units), 4 teaspoonfuls of 1% iron ammonium citrate, 250 units of vitamin B and 50 units of vitamin G. This final regimen was continued throughout the remainder of the period of observation. A new dental cavity was noted on an occlusal surface a month after the study was initiated. Possibly slight improvement occurred during the first 9 weeks, but 19 weeks after the first observation there had been slight increase in extent of caries, with minimal activity. Complete arrest did not obtain until early April, after 9 weeks of viosterol administration. A control subject of the same age but with no caries developed no demonstrable caries under the same regimen.

Significance is attached to the time required to establish arrest of caries in these subjects. The hospital diet seems adequate aside from its content of vitamin D; yet since caries was not arrested until the diet had been supplemented for 9 weeks with considerable amounts of that vitamin, one may conclude that the level of vitamin D was the determining factor. It also seems significant that a stage of near-arrest may be attained with moderate control of the diet, whereas more stringent measures are needed to complete and maintain the process of arrest.