

NUTRITION

# Dental Decay Caused by Lack Of Phosphorus and Vitamin D

**L**ACK of phosphorus and vitamin D in the diet is the chief cause of dental decay, Dr. R. Gordon Agnew of West China Union University reported to the Board of Governors of the university meeting in New York. Dr. Agnew's report summarized his four years of research in which he analyzed three thousand diets.

Depriving animals of these two food elements produced tooth decay in almost one hundred per cent. of the cases. Experience with the diet of four hundred and fifty children of a Toronto institution bore out the results of Dr. Agnew's studies on animals.

"Our extensive experiments on laboratory animals and humans indicate that phosphorus and vitamin D are the important nutrient elements in the prevention of dental caries. With the laboratory animal phosphorus assumes a major role, but in humans, vitamin D becomes of great importance," Dr. Agnew stated.

Dr. Agnew's findings check with observations made in the laboratories of Dr. E. V. McCollum of Johns Hopkins University. Dr. McCollum and associates found that definite proportions of vitamin D, phosphorus and calcium were needed in the diet in order to prevent tooth decay. They explained this on the theory that the phosphorus was needed in the saliva to enable this secretion to act as a buffer solution, keeping enamel-destroying acid from accumulating. Without the proper amounts of calcium and vitamin D, however, they believed the phosphorus would not get into the blood and then the saliva.

Commenting on Dr. Agnew's work, Dr. McCollum called it one of the more important chapters in the history of nutritional research.

"The inference drawn from the research," he stated, "shows that if we get an adequate supply of vitamin D, plenty of milk, vegetables and other foods rich in phosphorus, we can nearly all prevent dental caries. In that event attendant diseases attributed to caries will be materially lessened.

"It so happens that the average American diet is built around the protective foods rich in phosphorus and calcium.

With a little care we can obtain the elements necessary to nutritional well-being, with the exception of vitamin D which is found chiefly in fish oils. Its natural source is found in the skin when activated by the ultraviolet rays of the sun. Unfortunately the sun in this latitude is seldom strong enough, so the natural source must be supplemented."

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ASTRONOMY

## Ten-Year Sunspot Cycles Found in "Dearth" Periods

**S**UNSPOTS do not always grow more numerous at eleven-year intervals. There have also occurred periods in which the sun has very few spots at all, and during these "dearth" periods the low numbers that do show themselves probably reach their maxima at intervals of ten years instead of the usual eleven.

This was one of the points developed in a lecture at the Carnegie Institution in Washington by Dr. A. E. Douglass, astronomer at the University of Arizona. Dr. Douglass has done notable research on climatic cycles as revealed by the varying widths of growth-rings in trees, and by using these data in the examination of wooden beams he has been able to determine when Indian pueblos in the Southwest were built.

The most notable period of sunspot dearth since the beginning of modern astronomy, the speaker said, occurred in


the seventeenth and eighteenth centuries. During this time, the tree-ring records indicate, the eleven-year sunspot cycle was shortened to ten.

Indications of the occurrence of sunspot cycles have been found in tree-rings and other climatic records of prehistoric date at intervals for millions of years. These records have been studied in buried tree-stumps found in Southwestern canyons, in Ice Age trees excavated in Germany, in fossil redwoods in Yellowstone National Park that were green when three-toed horses roamed the earth, in the succession of thin clay layers of varves formed at the close of the Ice Age, and in certain Texas mineral deposits of Permian age, before the dinosaurs came.

Besides the eleven-year "normal" sunspot cycle, interrupted by occasional ten-year "dearth" cycles, sunspot maxima also show at least two other groupings, Dr. Douglass said. One of these is a period of a little over eight years, the other about fourteen years. These minor cycles often make the record hard to decipher, and it is only by mathematically "peeling them off" by means of what is called the cyclogram method, that the underlying main cycles become clearly distinguishable.

In his study of climatic cycles as recorded in tree rings, Prof. Douglass has examined and measured over a quarter of a million rings.

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