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THE EFFECT OF DIET ON DENTAL DEVELOPMENT

THE development of teeth, both as to speed of growth and structure, is greatly influenced by diet, studies reported to the American Dental Association by Drs. E. V. McCollum and Henry Klein, of the Johns Hopkins School of Hygiene and Public Health, have shown.

Teeth of swine fed on a deficient diet, such as would cause rickets in rats, developed more slowly and were poorer in structure and position than teeth of swine of the same age that had been fed a normal, balanced ration. A remarkable difference in size of teeth and lower jaw-bone was found in the animals as a result of the differences of diet.

The food of the low calcium diet was softer and less abrasive to the finger touch than that of the normal and high calcium diets, yet the teeth of animals fed the low calcium diet were ground down almost to the gum margin. This is further evidence pointing to the faulty structure of the teeth as a result of the low calcium diet.

Teeth of animals fed the deficient diet not only grew more slowly but were also less calcified as shown by X-ray examination, and there was more malposition of teeth among these animals than among the other two groups.

Of animals fed the normal diet 5 per cent., or about one twentieth, had malposition of the teeth, and of those fed the high calcium diet a few more, 6 per cent., had this condition. Among animals fed the low calcium diet the condition occurred in 17 per cent., or nearly one fifth. When the animals were fed for the first year on the deficient diet and for the second year on an adequate diet, the permanent erupted teeth showed a large amount of malocclusion.

Swine were chosen for the investigations because these animals have two sets of teeth, a temporary and a permanent, because they have omnivorous dietary habits, and because they have a comparatively long suckling period for the young. Three types of diet were fed: a normal one, one having a high calcium and low phosphorus content and one having a low calcium, high phosphorus content. The high calcium diet caused a slower growth of teeth and poorer structure than the normal diet, but the growth and structure were better than that of animals fed the low calcium diet.

All the comparisons were made on animals of the same age that had been fed these diets from the very beginning, the mothers having been given the diets while the young were suckling. The experiments were carried out with the cooperation of the U. S. Bureau of Animal Industry and under a grant from the Research Committee of the American Dental Association.

EFFECTS OF LACK OF CALCIUM IN THE BLOOD

CROSSNESS, tiredness, misbehavior and all the other symptoms of problem cases, both child and adult, result when the blood has too little calcium, Dr. Walter Timme, of the Neurological Institute, has concluded. But whether dietary efforts to increase the calcium, by taking lots of milk, fresh fruits, vegetables and cereals would relieve the condition Dr. Timme did not say in his recent address before the New York Academy of Medicine.

Scientists now think that the supply of calcium to the blood is controlled by the tiny parathyroid glands in the neck. When these glands reduce the supply of calcium there is apparently a disturbing effect on the nerves and subsequent conduct of the individual who then misbehaves, showing inordinate fatigability, irritability of temper and at times even incorrigibility, non-amenability to discipline and assaultiveness.

"They were easily aroused to a high pitch of anger at the slightest provocation," Dr. Timme said, "a word, an insinuation or even a glance being sufficient to arouse intense antagonistic reaction. These patients became problem cases at home, at school or in whatever environment they found themselves, because of their non-adaptability and uncompromising attitude. Occasionally their behavior became so exaggerated that apparently hypomanic states developed therefrom and several of these patients had to be confined in institutions until the symptoms were ameliorated. At home, a harsh word from any member of the family, at the table for instance, would result in a plate or knife or some other utensil being thrown at the aggressor. In school, a blow, a shout or a curse would be hurled at a fellow student or even at the teacher."

Upsets in the mutual relationships of the glands and nerves are responsible for many of the drug and alcohol habitues and the easily led characters among the criminal classes.

TEST FOR SCARLET FEVER CARRIERS

A SIMPLE new test for detecting carriers of scarlet fever was described by Dr. Ruth Tunnicliff, of Chicago, before the Laboratory Section of the American Public Health Association at its recent Minneapolis meeting. The test was devised to identify the organism of scarlet fever, and is well adapted for use in detecting carriers. By this test the organism can be identified in from 24 to 48 hours after the culture is made.

Results of a study of Drs. William D. Frost and Myrtle Shaw with R. C. Thomas and Mildred Gumm, from the University of Wisconsin, of the organism that causes septic sore throat were also presented to the laboratory section. Severe epidemics of the disease have been caused by infected milk. The organism may get into milk by outside contamination or it may come directly from infected cows that have a condition known as mastitis. In the latter case, the cows do not always show any symptoms of mastitis. This may be an important factor in the start of the disease even in communities where there is milk inspection. For four years routine examinations

of milk from all cows and of throats of all employees on farms supplying the Chicago district with certified milk have been made.

Seventeen cows, 8 from the certified herds and 9 from other herds, that were shedding *Streptococcus epidemicus* in their milk have been investigated. About half of them showed no signs of clinical mastitis, and there was such a slight abnormality in the cows and their milk that it was quite evident they would not have been excluded from the herd for a considerable time by a clinical examination.

THE NEW BRITISH AIRSHIP

THE world's largest airship, the *R–101,* built for service on the England-India air route by British governmental engineers, is a novel craft in structure, material, engines and other details. First of Britain's rigid lighter-than-air craft to take the air since the ships planned or started in wartime, the *R–101* in her tests and first long voyages will be watched by aeronautical engineers the world over.

Although some 50 feet shorter than the world-circling German airship, the *Graf Zeppelin,* the *R–101* is 130 feet in diameter, just 30 feet larger than the *Graf.* Its lifting gas displacement is 5,000,000 cubic feet as compared with the 3,710,000 cubic feet of the *Graf Zeppelin.* The *Los Angeles,* the German-built airship of the U. S. Navy, is a million cubic feet capacity smaller than the *Graf Zeppelin.*

The *R–101* is a sister in size to the other British airship, the *R–100* now nearly ready for flight. Whereas the *R–101* is government-built, the *R–100* is the product of the Airship Guarantee Company, a private firm that is building for the government. Slightly fatter and some 55 feet longer than both the *R–101* and the *R–100* are the two U. S. Navy airships that shortly will be laid down at Akron, Ohio, and finished several years hence.

Whereas all other airships built, even the *R–100,* rely on an aluminum alloy, duralumin, as the material for the structural members that form the frame of the airship, the *R–101* principal frames are made of stainless steel tubing, looking much like the frame of an ordinary bicycle. Aluminum alloy is used for minor structural members that support gas bags, walkways and cabins.

The whole of the two-deck passenger cabins, with dining, sleeping and recreational accommodations for one hundred, is contained within the hull in order to reduce the air resistance that would be caused by a car slung below the great cigar-shaped structure. In this construction detail the *R–101* anticipates the new U. S. Navy airship designs.

Hydrogen is the lifting gas used in the *R–101,* since America has a monopoly on the non-inflammable helium gas that holds the *Los Angeles* aloft. Although hydrogen is highly explosive when mixed with air, and voyagers on the *Graf Zeppelin* were rigidly prohibited from smoking, the *R–101* is equipped with a smoking room that would be a credit to an ocean liner. Special ventilating methods prevent any of the dangerous hydrogen gas, millions of feet of which are above the smokers' heads, from entering the smoking compartment. The dining-room on the *R–101* will seat 50 guests. There is a springy floor in the lounge or main cabin that is designed especially for dancing. About the size of a tennis court, the main saloon has a balcony at each end with non-splintering glass observation areas. The sleeping compartments are declared to be more luxurious than those of the ordinary European sleeping car.

For the first time in history a great airship is propelled by heavy oil engines, eliminating the highly inflammable gasoline which is considered as dangerous as hydrogen lifting gas. Five Beardmore engines, each developing 600 horse-power, especially designed for the *R–101,* provide the motive power. These Diesel engines, built for aircraft use, are self-igniting by the heat of fuel compression, and thus spark-plugs and their troubles are eliminated. Since heavy oil is used, carburetors are also lacking. Waste heat from the two engines, which are close to the cabins and saloons, is utilized in heating the quarters of crew and passengers. Fans drive air over a radiator serving both engines and the hot air is circulated in the living quarters.

HIGH-GRADE PAPERS FROM WOOD

HIGH-GRADE bond and permanent record papers, where permanence and durability are essential, have always been made from cotton rag fibers. As a result of an investigation by the U. S. Bureau of Standards, however, it is indicated that certain types of highly purified wood fibers are suitable for conversion into such papers. This will effect considerable saving since the wood fibers are much less expensive than cotton fibers.

Papers carefully prepared from high-grade cotton rags have always been used exclusively where permanence extending over hundreds of years was desired. The cotton fiber is the purest form of cellulose found in nature and cellulose, commonly called alpha cellulose, has a high degree of permanency.

Ordinary wood fibers, on the other hand, have impurities which seriously affect their permanence. By a series of chemical treatments these impurities can be removed, according to the Bureau of Standards, leaving a fiber similar in its chemical composition to the cotton fiber and having the desired paper-making characteristics.

Tests are being made at the Bureau of Standards of the various types of paper-making wood fibers and of several grades of rag fibers. The tests include purity, strength and whiteness.

Complete information can not be obtained by analysis alone. For this reason an accelerated aging test is considered a valuable supplementary test. This is made by heating the paper and finding the degree of deterioration of its physical and chemical properties. This treatment is presumed to simulate the chemical effect of many years of natural aging.

The fibers are baked in dry form at a temperature of 212 degrees Fahrenheit, then they are cooked with steam, and are exposed to intense light rays from a carbon-arc lamp which acts as an artificial sun. After such severe

treatment, the fibers are subjected to searching tests to find out how much they have deteriorated both chemically and physically.

A NEW PARIS MUSEUM

A NEW museum has been opened in Paris as the gift of the late Duke of Orleans. In it is a rare collection of mounted specimens of wild life, presented to the public exactly as they appear in real life. There are no glass cases. The animals and birds of each region occupy an enormous room, and are separated from the visitor by a modest railing of which he is almost completely unconscious. Down the middle of the rooms he walks, as it were, on a path through the Arctic and Africa, birds and animals on either side, grouped in life-like positions amid their native vegetation.

Here, in the central African room, stands a giraffe, biting off an interfering branch at the top of a tree, from a lower branch of which a large black snake hangs half-coiled. A monkey is characteristically searching his neighbor for fleas while a group of lions peer threateningly over the tall grass. There are several hundred specimens in this room alone. Every detail in grouping and in reproduction of natural environment has been considered to make the rooms veritable corners of life in the regions represented. Instead of the old method of stuffing with hay or bran, the best animal sculptors were engaged to produce plaster casts over which the skins were pulled. The atmosphere of reality is further enhanced by the paintings on the walls which were done from photographs taken of the regions where the animals and birds were found.

The collection was made, not by a great naturalist, but by a great hunter of royal birth, the late Duke of Orleans, great-grandson of King Louis Philippe of France. Exiled from his native land for fear of a royalist movement, the duke spent forty years of his life in hunting expeditions in the Far North and in Africa. Upon his death he bequeathed his collection to the French Natural History Museum and provided money for a new building in which to house it.

ITEMS

PRESERVATION of the Kaieteur Fall, in British Guiana, is promised in a bill which has recently been drawn up for introduction at the next meeting of the Legislative Council and which will be known as the Kaieteur National Park Ordinance, 1929. The Kaieteur Fall, on the Potaro River, in the County of Essequibo, plunges a sheer descent of 741 feet over a hard ledge of rock 370 feet wide, whose underlying softer layers are worn back into an enormous black cavern, against which the white spray appears with wonderful effect. The escarpment has been worn into a huge amphitheater whose rocky sides surround the whirlpool below, and the surrounding scenery is spectacular and picturesque.

THE Agricultural Experiment Station at Guam has found that sea-water is a cheap and effective means of killing the countless insects that gather in the folds of young, partly opened leaves of trees and shrubs. Certainly there will be no difficulty about a source of supply of the new insecticide. Palm trees, especially, have been benefited by "showers" of several gallons daily. Complete control of the scale insect infesting the coconut palm has been brought about, it is said, by the introduction of predacious lady-bird beetles from the Fiji Islands. Beetles of this family rendered similar service against the citrus scale in California several years ago.

FLOWERS, fruits and vegetables raised by artificial light only in underground hothouses are quite within the realm of possibility, so long as there is a plentiful supply of cheap electricity. So said Samuel G. Hibben, lighting specialist of the Westinghouse Lamp Company, in a report to the Illuminating Engineering Society. Natural sunlight is not necessary for the normal development of plant life, he said. Artificial light has been used with success in the experimental growing of plants in laboratories, and it is being used now as a regular commercial proposition in the speeding up of the maturing of vegetables grown under glass and the blossoming of cut flowers.

BERYLLIUM, a light metal now worth $200 a pound, is likely to find commercial utilization in future aircraft construction, Dr. W. H. Gillett, director of the Battelle Memorial Institute, Columbus, Ohio, has predicted in a report to the American Electrochemical Society. Although now in the rare metal class, beryllium, on account of its light weight, a third that of aluminum, would allow decreases in the weight of aircraft. Designers have estimated that it is worth $40 to reduce the weight of an airplane one pound. Rare as the metal is to-day, Dr. Gillett declared it could be obtained in quantity and at a price of about $25 to $50 a pound if there was demand for it. Geologists estimate that there is as much beryllium by weight in the earth's crust as there is lead or zinc, and much more by volume. Due to its present high cost, little is known about beryllium's ease of fabrication and endurance. It is known to have a higher modulus of elasticity than other light metals and this property, nearly equal that of steel, promises to allow aircraft designers to use methods of construction not now possible.

THE demonstration of the therapeutic effect of desiccated hog's stomach in pernicious anemia, recently reported by Drs. Cyrus C. Sturgis and Raphael Isaacs, of the University of Michigan, and Dr. Elwood A. Sharp, of Parke, Davis and Company, follows by just three years the announcement of the liver treatment for the same disease developed by Drs. G. R. Minot and W. P. Murphy, of Harvard University. Another Harvard scientist, Dr. William B. Castle, has made an epochal contribution to the understanding of the disease by his recent investigations which showed that the required antianemic factor is obtained from beef by the action of the normal gastric juice. Dr. Castle has done his work at the Thorndike Memorial Laboratory of the Boston City Hospital, but because it was reported in *The British Medical Journal*, it was incorrectly stated in *Science News* on September 27 that he was a British scientist.