DENTISTRY

Fluorine Precautions

Fluoride tablets, given to children as a preventive for tooth decay, must be taken in dosages prescribed by a doctor or dentist to avoid mottling the enamel on teeth.

➤ IF YOU are giving fluoride tablets to your children in the hope of protecting their teeth from decay, be sure to follow the doctor's or dentist's directions about the dosage. And don't leave the bottle around where the youngsters can help themselves.

This advice comes from Dr. F. J. McClure, of the U. S. National Institute of Dental Research, U. S. Public Health Service.

There is a relatively narrow margin between the amount of fluorine that may help prevent tooth decay and the amount that causes the ugly mottled enamel condition of teeth, he points out in a report prepared at the request of the American Medical Association and appearing in its JOURNAL (March 12).

For preventing tooth decay, best results are associated with one part per million of fluorine in the drinking water. But one and one-half parts per million or slightly more of fluorine in drinking water is the beginning of mottled enamel.

A "great number" of fluoride-containing tablets for daily consumption are now on the market, Dr. McClure reports. The object is to give children fluoride in this way instead of through fluorinated drinking water. They should not be used, he warns, where the drinking water contains from one-half to one part per million of fluorine.

Whether giving fluorine in this way will actually protect teeth against decay has not yet been determined. The idea has possibilities, Dr. McClure believes.

Drinking water is being fluorinated in at least nine cities: Grand Rapids, Mich.; Newburgh, N. Y.; Brantford, Ont., Canada; Midland, Mich.; Sheboygan and Madison, Wis.; Evanston, Ill.; Ottawa, Kans.; and Marshall, Texas. So far there is no conclusive evidence from these cities that the fluorination is doing any good, or, as Dr. McClure puts it, that "fluorine is an essential element for dental health." But the fluorination programs continue in the hope that in time evidence for or against will be forthcoming.

The idea that foods grown in areas where the local water is high in fluorine will also be high in fluorine content is false, Dr. McClure declares.

Neither can farmers expect to get more fluorine into their cows' milk by adding extra fluorine to the cows' feed or drinking water.

The tea leaf and certain sea foods are high in fluorine but in general no raw foods, Dr. McClure states, can be implicated as either causing mottled enamel from excessive fluorine or preventing tooth decay through their fluorine content.

Certain foods may pick up small amounts of fluorine when cooked in fluorine waters.

Science News Letter, March 19, 1949

STS Winner Writes

"For the past three years, I have spent the summers on Nantucket Island, Mass. During that time, I made a distributional and ecologic study of the mollusks of the area.

"The purposes of the study were as follows:

(1) To correlate the distributions of the various species with the ecologic zones they occupy.

(2) To ascertain to what region Nantucket is most nearly related in regard to the mollusks.

(3) To determine the extent of the influence of the Gulf Stream on the molluscan fauna.

(4) To prepare the way for a comparison of the Recent and Pleistocene shells.

(5) To increase the scanty list of mollusks already known from the island.

"Collecting in the different habitats was done in a variety of ways to ensure as complete a faunal picture as possible. Among the equipment used were nets, shovels, rakes, screens of various mesh-sizes, clammer's tongs, and dredges. I did not find all the species previously reported from Nantucket, but the methods used probably gave a fair sample of the populations existing when I collected. Since some flux was observed over the three-year period, it seems possible that the forms I did not find are not now present in as large numbers as they have been.

"Prior to this study, 46 species were known recent from the island, as compared to 66 in the Pleistocene. My collecting has increased the recent list to 120 species. The obtainment of accurate results from a comparison between the two is now made more certain."—From the essay of Dwight W. Taylor.

MEDICINE

Dangerous Cough Remedy

➤ DISCOVERY that a urethane-containing cough syrup, dangerous to users because it might make them easy prey to pneumonia, had gone on the market was due to the off-duty alertness of a U. S. Food and Drug Administration official.

Going into a couple of drug stores in New York City looking for a special kind of razor blade for himself, he noticed the cough syrup, called "syrup of urethane," displayed on the counters. He remembered the concern at Food and Drug Administration headquarters in Washington over a new drug application for a urethane preparation to be used in treatment of leukemia. So he immediately got in touch with headquarters. After a hectic four days of investigation and consultation with medical scientists, the Food and Drug Administration issued a warning on the cough syrup and ordered its agents in the field to seize all known supplies.

Urethane is a very old drug. It was used 100 years ago as a sedative or hypnotic. But it was not very dependable and was replaced by chloral hydrate. This in turn has been replaced by the barbiturates.

Recently urethane came into use in the treatment of leukemia, cancer-like disease in which there are too many white cells in the blood. Urethane reduces the number of these cells, and gives some relief in a chronic form of leukemia. It does not cure the disease, however.

Its effect on white blood cells is what makes it potentially dangerous as a cough syrup. The patient with a cough needs his white cells to help fight off the infection and guard him against other germs, such as those causing pneumonia.

So far, Food and Drug officials have not heard of any injuries or deaths due to use of the urethane cough syrup. Nor have they had any queries about it from physicians. The reason may be that a history of a cold and cough and the taking of cough syrup before coming to the doctor is the usual picture in pneumonia.

While urethane is known to cut down the abnormal white cells in leukemic patients, its effect on normal white cells in normal persons has not been extensively studied. The danger is considered sufficiently great, however, to warrant the Food and Drug action.

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ELECTRONICS

Electronic Tube Controls Power at High Frequencies

➤ A NEW type of electronic tube, called an electron coupler and developed for the modulation and control of power at the ultra-high frequencies, was revealed in New York to the Institute of Radio Engineers by C. L. Cuccia and J. S. Donal, Jr., of the Radio Corporation of America laboratories, Princeton, N. J.

STS Winner Writes

"Not until the past year have I acquired sufficient mathematical background to approach with any degree of understanding the classical works in mathematical physics. My studies have been for the most part confined to work parallel with Eddington's fine treatise, THE MATHEMATICAL THEORY OF RELATIVITY. *Recently, I have also been studying Weyl's discussion of gravitation and electromagnetic fields in* SPACE—TIME—MATTER, *a translation of his* MATHEMATISCHE ZEITSCHRIFT. *Naturally enough, with my necessarily limited knowledge of physics and higher mathematics, I have as of yet been incapable of much original work. However, there are problems which have occurred to me during my present studies which I have tentatively contemplated as to method of approach, and which I intend to attack in the future, after I have been reinforced by university training in mathematics. . . .*

"After a general study of the various phases in Einstein's work, e.g., the law of gravitation, electro-magnetic phenomena, curvature of space and time, relativity mechanics, and so on, I did some conjecturing on my own account. For one thing, a complete theory of relativity constrains us to produce an expression for the phenomenon of atomicity, that is, the tendency of matter to aggregate into particles, leaving relatively large regions of the universe devoid of matter. To the best of my knowledge no such result has been obtained as yet. This problem intrigues me.—From the essay of Caroline Stuart Littlejohn.

The basic tube consists of an electron gun, an input cavity which is connected to a power source and an output cavity which is connected to a load and a collector. These cavities are adjacent and are tuned to the cyclotron frequency of a magnetic field which is parallel to their axis of alignment. They have the property, when excited, of introducing an alternating electric field normal to the magnetic field. The electron beam passes through both cavities. It absorbs the radio frequency power in the input cavity, and delivers this power to the output cavity and load or to the collector.

The power transfer may be controlled by varying either the beam current or the electron transit time in the output cavity. Electron couplers capable of transferring several hundred watts at 800 megacycles with a power efficiency of 70% have been built and operated, they said.

As an ultra-high frequency modulator tube, the electron coupler is a radical departure from more conventional modulation techniques since it makes the modulation system independent of the power generator, and thus permits the most efficient and practical design of the generator.

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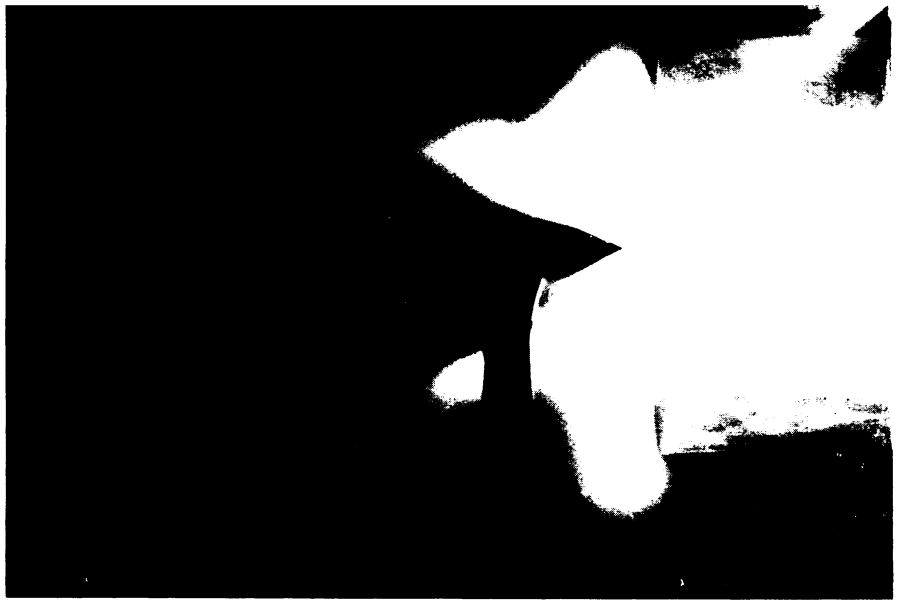

SHOCK WAVES—At 2.6 times the speed of sound, shock waves slant back sharply from edge of wedge-shaped model in test chamber of the University of California's new low pressure supersonic wind tunnel. Pressure at time of photograph was about one ten-thousandth of the atmospheric pressure at sea level.

AERONAUTICS

Near-Vacuum Wind Tunnel

➤ NEAR-VACUUM flight conditions, encountered by rockets from 50 to 80 miles above the earth, are to be studied under man-made conditions in a new type of wind tunnel installed at the University of California at Berkeley.

The ordinary wind tunnels of the world, now countable by the dozens, yield scientific flight data from subsonic to supersonic under conditions at sea level. They give little information of value in determining conditions in the far above atmosphere regions reached by modern rockets. Even the data obtained from rocket-borne instruments sent high aloft are not reliable, because the effects of the conditions on instruments at such altitudes are not accurately known.

These high-up conditions are duplicated in the five-by-seven foot test chamber of the new tunnel by powerful steam jet vacuum pumps. When the vacuum reaches the condition 80 miles above the earth, a molecule in motion in the chamber has a chance of bumping into another molecule every 10 feet. At sea level, molecules in the free air would strike another every one ten-thousandth of an inch.

When the vacuum in the test chamber of this new tunnel has been created, air or gas is poured into a four-inch test section which contains the model. Nitrogen, helium or other gases can be used for special studies. The gases are accelerated to supersonic speeds by a special nozzle.

This tunnel was designed by Dr. R. G. Folsom and E. D. Kane with assistance by other members of the university's staff. In addition to use in determining flight factors in the regions through which rockets will travel, it may also have some industrial applications, such as those concerned with the drying of blood plasma, food processing, and the distillation of vitamins from fish oils.

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GENERAL SCIENCE

Canadian Soldiers Soon To Be in "Well-Dressed" Class

➤ Canadian soldiers of the future will be in the "well-dressed" class, both "on duty" and "off parade."

In addition to smart uniforms, of both winter and summer weight, the soldiers will receive bedroom slippers and broadcloth pajamas between now and the spring of 1950. Bath towels, white cotton handkerchiefs and zippered overshoes are also to be issued to them.

Other new items of clothing planned include black fleece-lined gloves, brown leather waist belts, gabardine raincoats and new gymnasia suits. The soldiers will also benefit immediately by an increase in the present issue of underclothing, shirts, ties and socks.

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