

DENTISTRY

Dentist Suggests Formula To Check Tooth Decay

► A 3-3-3 formula for checking tooth decay has been developed by Dr. Chester J. Henschel, New York dentist. The formula is:

No eating between meals. Cleanse teeth for three minutes three times a day within three minutes after eating.

For the cleansing he advises a tooth powder containing carbamide, di-ammonium hydrogen phosphate, bentonite, sodium lauryl sulfoacetate, precipitated calcium carbonate, saccharin and methyl salicylate.

The first two ingredients are probably the most important, since the carbamide acts to prevent acid formation and the phosphate liberates ammonia which apparently is effective in checking tooth decay. The importance of ammonia comes from studies showing that persons who are immune to tooth decay have more ammonia in their saliva than persons susceptible to decay.

Following the 3-3-3 formula is "strict and difficult," and the ammonia-generating tooth powder is not a panacea, Dr. Henschel admitted in reporting it to the Tufts College Study Club. With "average cooperation and use" the artificial immunity to tooth decay created by the ammonium compounds may only amount to from 5% to 25%. But patients are encouraged by the pleasant-tasting, cleansing and potentially remedial tooth powder to spend more time cleansing their teeth.

Encouragement for using this new kind of tooth powder which promises to do more than merely clean the teeth is found, Dr. Henschel pointed out, in recent action of the American Dental Association. That organization has abandoned its former policy of rejecting any tooth powder or paste that claimed treatment or remedial properties and has admitted the probability that some acceptable ones are or soon will be available.

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DENTISTRY

Discover Small Amount of Citric Acid in Saliva

► IF anyone calls you a "sourmug", be not over-hasty with your retort discourteous. You are one—slightly at any rate—if you are physiologically normal. Citric acid, the stuff that makes lemons

sour, is present in human saliva, though in very low concentration.

Dr. Isadore Zipkin of the National Institute of Health has measured the citric acid concentrations in 180 saliva specimens contributed by 15 men, who chewed wads of paraffin to insure adequate production. (*Science*, Oct. 17.) The concentrations were very low, ranging from less than four to slightly over 20 parts of citric acid per million parts of saliva. The same individual showed considerable variation during the day, with highest concentration usually around noon.

Although salivary citric acid is small in amount, it may be potent in the mischief it can cause, Dr. Zipkin points out. Combining with the calcium of the teeth to form a highly soluble compound, it may play a considerable role in the production of dental caries.

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PLANT PHYSIOLOGY

Radioactivity Produces Changes in Plant Cells

► CHANGES in the developing male sex cells of plants have been produced for the first time with radioactive phosphorus taken up in water absorbed by the plants, in experiments carried out by Dr. Norman H. Giles, Jr., Yale University botanist. They may open the way to a new technique for producing evolutionary changes, and they definitely suggest caution in handling plants to which radioactive elements are being fed as part of their mineral ration. (*Proceedings of the National Academy of Sciences*, Oct.)

The plants used were a species of spiderwort—plants of open, sunny, moist places, with grass-like leaves and rather small, three-petaled blue flowers. Stems with groups of buds were cut off and placed in water containing a dissolved salt of radioactive phosphorus. They were inserted through holes in lead shields, to make sure that radiations direct from the solution did not reach the buds.

At intervals, buds were opened, and the cells that would have developed into pollen grains were examined under the microscope. Changes were evident in the chromosomes, or heredity-bearing structures, of a substantial number of the cells, the percentage of the total increasing with the length of time the stems had been absorbing the radioactive phosphorus.

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IN SCIENCE

METEOROLOGY-AERONAUTICS

New Instruments Measure Visibility in Fog

► HOW far the normal eye can see in fogs of varying densities can now be measured by a new instrument developed by the National Bureau of Standards. It is a visibility-measuring device called a transmissometer, designed for use at airports to decrease the human factor in visual estimates of distance.

The instrument has another important possible use in aviation. It is expected that it can be employed to control high-intensity airport approach lights, and also to control fog-dispersal equipment, such as the British FIDO system, by which fog is lifted by the heat from burning troughs of oil.

The transmissometer consists of a light transmitter, a photo-tube receiver, an amplifier and an indicator. The light transmitter and receiver are separated by a distance sometimes as great as 4,000 feet. The amount of light that reaches the receiver is determined by the fog density or other atmospheric conditions in a direct line between the two pieces of equipment. The light falling on the photo-tube in the receiver sets up an electronic circuit whose output is an electric current that varies exactly as the amount of light received.

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ORNITHOLOGY

Birds That Shine at Night Reported by Observers

► BIRDS that shine in the dark with a phosphorescent light like that given off by some fish and other sea creatures, are the near-incredible rarity reported by Dr. W. L. McAtee of the U. S. Fish and Wildlife Service. He has gathered the statements of a considerable number of reliable observers, who declare that they have seen the phenomena in such diverse birds as barn-owls, night-herons and Australian finches.

Dr. McAtee has not yet been able to discover what causes the light, but he suspects it comes from luminous bacteria or fungi eaten by the birds or attached to their tissues.

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CE FIELDS

CHEMISTRY

New Product Makes Jelly On Addition of Water

➤ JELLY without fuss or muss is promised to the housewife in U. S. patent 2,429,660, just issued to Alexander M. Zenzes of New York. In its finished form his preparation is a caked granular powder, which only requires the addition of water and flavoring, or of fruit juice instead. It doesn't even need to be boiled.

To prepare it, a thick sugar syrup is made up, and pectin added. Pectin is the stuff that makes jelly jell; it is prepared commercially from good but unmarketable fruit. After the pectin addition the syrup is re-concentrated; then tartaric acid or some other food acid is added.

As finally simmered down, the product consists of sugar crystals, each surrounded with a film containing sugar, pectin and food acid, plus about 10% of water. Its most convenient marketable form is as blocks or bricks, which need only to be dissolved in water and let stand a little while to make firm jelly.

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SAFETY

Two-Minute Firefighters Cut Toll in Air Crashes

➤ "TWO-MINUTE MEN", who form rescue crews which aim at removing air crash victims from burning planes in two minutes, are saving lives in both military and civilian air accidents, the Navy reported.

Using fog-foam firefighting equipment, the crews are being trained to rescue all persons in crashed planes at naval air fields within two minutes of the crash. In a recent crash of a Pan-American Airways transport at Floyd Bennett Field, New York City, a Navy crew controlled the flames to permit 41 passengers and crew members to escape unhurt, the Navy said.

When a plane crashes, trucks bring Navy firefighting and rescue equipment to the plane. Fog-foam equipment is used in three different ways to control the fire. If there is no fire at the moment of the crash, a water spray is used to cool the air to prevent combustion. If a fire

is burning, a heavy foam generated with water and a mechanical foam compound are sprayed to smother flame. In some cases both the foam and cooling spray are used.

Streams of low-pressure fog-foam are used on the center of the flame, with low-pressure foam and carbon dioxide on the outer edges.

A path is cleared for rescuers who enter the cockpit and cabin with special tools.

Latest Navy crash equipment includes the model FFN-5 truck, which carries 800 gallons of water and 80 gallons of mechanical foam compound. As much as 4,000 gallons of foam can be sprayed on a fire in one minute with this equipment.

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SAFETY

Fog-Foam Used to Fight Fire on Navy Ships

➤ FOG-FOAM firefighting systems are being installed on a number of Navy aircraft carriers and firefighting tugs. They are expected to reduce greatly the danger from gasoline fires aboard ships.

Gasoline fires are hard to extinguish by ordinary firefighting methods. The use of fog-foam, instead of water, has been found successful. The foam is a smothering mass of snowy bubbles which lasts for hours and can be spread several inches thick by use of special nozzles to seal inflammable gases and keep oxygen out.

This mechanical foam is made from soybeans, fish scales and iron salts. It is carried aboard ship in special containers but is mixed with water in use. Its adhesive qualities make it stick to anything; a gale will not blow it away, and it can be laid in dikes to confine a gasoline fire.

A special nozzle developed for the Navy can be adjusted to throw a solid stream or to send the water through jets to produce a fine mist-like spray. The advantages of fog lie in its superior heat absorption, its use of small quantities of water, protection of firefighters from heat, and reduced water damage.

A further use of mechanical foam is in fighting above-the-ground oil tank fires. The foam is pumped into the tank through the oil pumping line itself at the bottom of the tank, rises through the oil, cools the oil below ignition temperature, and kills the fire. In this application the foam cools rather than smothers the fire.

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GENETICS

X-Rays Alter Heredity of Dried, Inactive Bacteria

➤ EVOLUTIONARY changes have been produced by X-rays in bacteria that were in a dried, inactive state, a three-man research team at the Hannah Dairy Research Institute in Kirkhill, Scotland, report in the science journal, *Nature*, (Oct. 11) published in London. Hitherto such hereditary changes induced by X-rays have been in organisms that were fully alive and functioning at the time of exposure.

The bacteria used in the experiment were isolated from some dried milk; they belong to the species technically known as *Bacterium aerogenes*. Among the hereditary changes induced were differences from the parent strain in the kinds of food substances they were able to use. The X-ray treatment apparently altered in some way the production and use of certain enzymes or digestive ferments.

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ZOOLOGY

Chimps Have Keener Sense of Smell than Man

➤ CHIMPANZEES have a keener sense of smell than man. This finding, contrary to previously held scientific opinion, is reported by Thomas M. Blackman of Honolulu. (*American Journal of Physical Anthropology*).

Failure to take into account the chimpanzee's intelligence has misled previous observers into believing the chimp lacked a sense of smell.

When a chimpanzee pays no attention to an odor, it is because it is familiar to him and he takes it for granted, just as a man would, Mr. Blackman observes. But an unknown odor, even if too faint for a man to detect, will arouse the chimpanzee's fear.

His own three chimps refused to sleep on blankets that had been dried near a peculiar kind of paint, because the blankets had absorbed the odor of the paint. But they did not detect oranges hidden for the first time in their cages, because they were familiar with the orange odor. Similar observations over a period of five and one-half years have convinced Mr. Blackman that the intelligence of chimpanzees must be taken into account in studying them.

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