

toothpaste. When an order for some 14,000 dozen tubes was contemplated, a committee was appointed to write specifications for a safe and effective cleanser for the teeth. These specifications, now adopted for use, were reported to the meeting. The committee was composed of Capt. H. E. Harvey, of the Navy Dental Corps, Dr. M. M. Fowler of the Veterans Administration, and Dr. Souder.

Safety for the tissues of the mouth and the teeth was the first consideration of these men when they met to decide what must be contained in Uncle Sam's toothpaste. Next came the question of efficiency in removing foreign materials from the teeth. Last in importance was the matter of flavor or perfume.

A toothpaste must not be excessively either alkaline or acid, it was decided. It must not be caustic. It must not contain arsenic or other poisons. It must have a preservative that will insure that it keeps in good condition until used.

Turn Down Half

Twenty-five popular brands of toothpaste were tested against the specifications as adopted for use in Government purchasing. More than half failed to meet the requirements, Drs. Souder and Schoonover said. Hardening, separation of ingredients, and fermentation or spoiling were the most common faults. Some showed signs of chemical attack upon the tube container, and that was considered undesirable.

Ten toothpastes among those tested failed on the test for scratching. This test, as developed at the National Bureau of Standards, can be used by anyone who wants to be sure his dentifrice is not scratching the enamel of his teeth. A piece of glass and a piece of alloy metal of the size and hardness of a five-cent piece are all that are needed for the experiment. First test the glass for hardness by rubbing the edge of the metal piece over it to be sure that the metal alone does not scratch the glass. Human enamel and glass both vary in hardness. The grade of soda-lime glass used in a non-corrosive microscope slide was found to be harder than any of the enamel tested at the Bureau.

Place some of the toothpaste to be tested on the glass and rub again with the coin. If scratches result, then you may expect scratches on your teeth. This test is sensitive enough to detect one part of emery in one hundred thousand parts of paste.

False Teeth Cause Deafness

Most people when they acquire artificial dentures usually feel that their tooth troubles are over. But in one case at least, reported to the dental meetings, the incorrect fitting of false teeth led to deafness that was cured only when a new set of dental plates were made.

Dr. Harold L. Harris of St. Paul, Minn., described the case history of a woman, 50 years old, who came to his office with a loss of hearing of 56 per cent. in the left ear and 57 per cent. loss in the right ear. The woman wished to have a new denture made.

The old false teeth, it was found, thrust backward the mandible of the jaw, and decreased the amount of tongue room. This in turn lessened the activity of the tongue and all its associated parts in the mouth. The muscles in the neighborhood of the ear and its intricate working parts were also affected in activity and it is believed that this created the "dental" deafness.

The new plates made for the woman increased the vertical dimensions of her mouth by about one-half inch and gave "a rather strained appearance of the patient's face due to the lengthening of the striated muscle fibers of the muscles of expression."

But whatever the patient's expression the result, in terms of hearing, was vastly improved. Immediately after getting the new dentures the patient took another hearing test and showed a 44 per cent. improvement in the left ear and 41 per cent. improvement in the right. At the end of a year hearing in the left ear was completely normal and the loss of hearing in the right was only 9 per cent.

Facilities Inadequate

Combined facilities of schools, public clinics, and private practice are not sufficient to care for the enormous number of dental defects among the people of the United States, Dr. F. C. Cady, of the U. S. Public Health Service, told the dental association in reporting the results of a dental survey of 1,400,000 school children in 26 states and another survey of dental facilities.

"Combined educational and clinical facilities of governmental and private practice are unable to cope with the high rate of dental defects among the people of this country," said Dr. Cady. "More and better methods will have to be instituted by the dental profession if the number of dental cripples is to be materially reduced."

Evidence of a 52-toothed man was

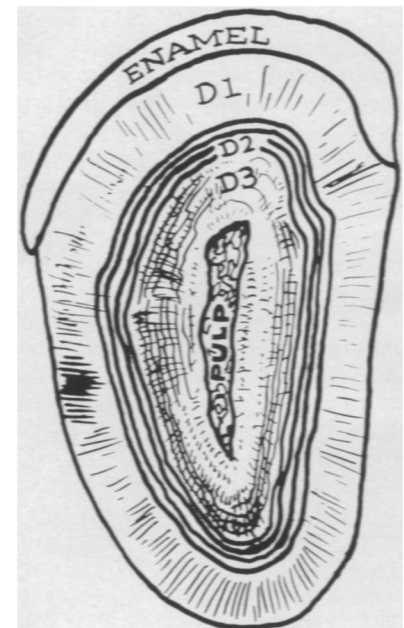
shown by Dr. George B. Winter of St. Louis, past president of the American Dental Association, in the exhibits at the meeting. The normal number for the adult is 32. But Dr. Winter's X-ray shows 52 in this patient, much to his discomfort. All 52 were imbedded in the bone, some were almost microscopic in size and they had to be removed surgically. The man wore a complete set of artificial teeth, in addition.

Ancient Sufferers

Jaw bones from the Egyptian pyramids allowed Dr. Winter to demonstrate to fellow dentists that ancient dwellers near the Nile suffered from impaired wisdom teeth.

"Like men and women living today," said Dr. Winter, "the Egyptians and other ancient people evidently suffered not only the inconvenience or pain that such teeth may cause when retained, but even deafness or insanity, which have been known to result from impacted wisdom teeth."

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TOOTH RINGS

Drawn as seen under a microscope, the rings in a rat's tooth show a marked likeness to tree rings. D₁ shows the normal dentin just under the hard enamel. D₂ is the dentin, with ring structure, formed during experiment. D₃ is again normal dentin formed after the experiment. The four dark bands represent fluoride injections. Fourteen light and hard bands can also be counted (in original photograph) which are the daily growth rings formed during the days between the last fluoride injection and the death of the animal.

PHYSIOLOGY

Teeth, Like Trees, Show Their History in Rings

Vitamin Lack, Glandular Malfunction, Even Birth Is Shown in Rings Formed Four Days Apart in Man

WANTED: Baby teeth. Not just any baby teeth, but those with a complete medical history of their young owners.

The man who wants them is Dr. Isaac Schour of the University of Illinois College of Dentistry. Dr. Schour has discovered that teeth, like trees, carry records of their owner's growth and medical history in rings that are laid down at regular intervals beginning even before birth. He wants to investigate tooth ring records further and has been telling his doctor friends to send him the first or baby teeth of their little patients.

Mothers are warned not to send Johnny's or Susie's teeth directly but to carry on negotiations through their family physician or dentist, because without a complete medical history of Johnny or Susie the teeth will be of no use to Dr. Schour.

The tooth ring discovery was made as a result of studies of mottled enamel which Dr. Schour made with Dr. Margaret Cammack Smith of the University of Arizona. This highly disfiguring condition affects the teeth in children who drink water containing fluorine. It is a serious problem in the Southwest and other parts of the country where the only available water supply contains objectionable amounts of fluorine. In order to learn more about this condition, Drs. Schour and Smith gave fluorine to rats, either in the diet or by injection and then studied the animal's teeth.

Injections Show

Every injection of fluorine was followed by a typical mark on the rat's teeth, they found. Rats' teeth are particularly useful for such studies because the large incisor teeth continue growing throughout the animal's life. As Dr. Schour expressed it, these teeth "roll along like ticker tape," carrying on them the record of the fluorine injections and, as he subsequently found, of other events in the animal's medical history.

The regularity of the markings interested Dr. Schour, and he next injected a red dye called alizarin. As in the case

of the fluorine, every injection was recorded by a marking on the teeth. When the teeth are sectioned or sliced up horizontally, these marks are rings, looking like the rings that tell the age of a tree.

Studying these teeth, Dr. Schour found there were other rings besides those of the dye injections. These also were at regular intervals and spaced at a distance of 16 micra from each other. One micron is one twenty-five thousandth of an inch.

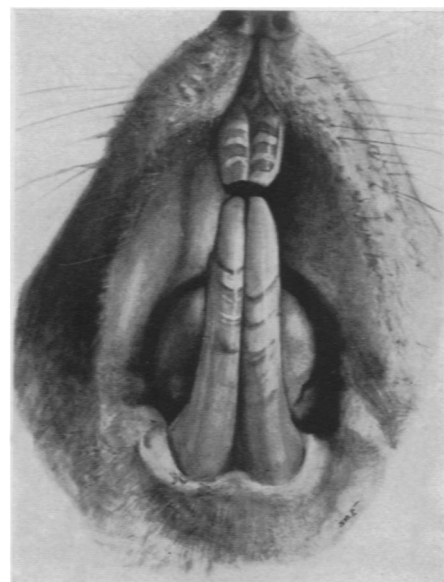
Tree rings are annual records of the tree's growth, one ring forming every year. In the incisor of the rat, teeth rings are daily records, one tooth ring forming every day, but in man and monkeys, which grow more slowly, the tooth rings are spaced four days apart. This difference just about corresponds to the difference in the rates of growth of rats and men. The rings are not visible to the naked eye. Special preparation makes them visible under the microscope.

Neonatal Ring

One special tooth ring is called the neonatal ring because it is formed at birth. Birth is such a tremendous experience in the life of an individual when the change is made from a dependent to an independent life, that it is not surprising, Dr. Schour explained, that it leaves a definite mark—a sort of birth certificate—on the teeth. This birth ring appears in the portion of the baby teeth that was forming at the time of birth and makes it possible to compare the amount and quality of the tooth before and after birth.

Other experiences are also recorded on the teeth. One child had convulsions at one year of age, due to underfunctioning of the parathyroid glands. These glands play an important part in the calcification or hardening of bones and teeth and due to their underfunctioning left a mark on the child's teeth. Special rings were formed at the time of the convulsions.

The teeth rings show in both enamel, the hard outer covering of teeth, and the dentin, which is the inner part.



THE BANDS SHOW UP

Injection of sodium fluoride every 48 hours made the bands seen on the teeth.

Starting from the fourth month before birth, when the teeth begin forming, until the sixteenth year of life, there is always one tooth or another, Dr. Schour said, which records what is going on in the body. If certain glands (pituitary, thyroid or adrenals) do not function properly, or if the diet is lacking in vitamin A, C, or D, definite and characteristic changes may be found in the teeth. These have been observed in rats and Dr. Schour wants to investigate human teeth to see how they show body disturbances. That is why he wants baby teeth with complete medical histories of their young owners.

Tree-ring analysis has given scientists information about weather conditions in past centuries and the age of pre-historic buildings in Southwestern America as well as the age and history of the trees themselves. Tooth-ring analysis will be equally valuable, Dr. Schour believes, in giving information about the medical and biological history of an individual.

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A new valve device is intended to prevent buses and trucks from giving off waves of smelly gas when the driver takes his foot from the throttle.

Rubber trees have stood several winters in southern Florida, where government scientists are testing wastelands to see if they might be useful as a rubber reserve, in times of military or economic shortage of rubber.