

## FLUORIDATION OF PUBLIC DRINKING WATER

It has been said by many dentists that "Defective teeth are the most common symptom of poor nutrition." Dr. Weston A. Price of Cleveland and later of Redlands, California, saw in that defective nutrition more health irregularities than just defective teeth. He said, "While tooth decay has proved to be almost entirely a matter of nutrition of the individual at the time and prior to the activity of that disease, a group of affections have expressed themselves in physical form. These have included facial and dental arch changes which, heretofore, have been accounted for as mixtures of different racial stocks. My investigations have revealed that the same divergencies from normal are reproduced in all these various racial stocks while the blood is still pure. Indeed, these even develop in those children of the family that are born after the parents adopted the modern nutrition."

Faulty teeth are certain to be the most universal human affliction. And that begins to show up early in the life of many of us. Our hopes for prevention, therefore, ought to call for all the careful thinking any of us can do. If any community can stir up a controversy like that concerning itself with fluoridation; one which will make each of us become more concerned about his own health because his teeth are degenerating; and one which will make each of us realize his responsibility for that degeneration coming by way of what he puts into his stomach and what he keeps out of it; then the educational value of this matter brought before the city officials will be worth more than the time and money it takes to prompt us to become concerned about our nutrition as a basis for our health. Your health is your concern. My health is my concern. Such is not the responsibility of those who supply the city water and of whom we ask only that they be responsible for its purity. Scarcely any of us are ready to ask them to provide a medicated drink for guarantee against all the possible irregularities of our health.

Good health is a natural phenomena carried out by the body itself. We are not conscious of the processes by which the body brings this about, hence we do not know why or how good health results. When we observe Nature in action, we may fall into serious error in explaining why certain things happen which we observe. This is most apt to occur when in that phenomenon we see potential economic advantage or a situation on which we may capitalize. This impending danger of error in our interpretation of causes and effects in Nature is an old one. It was recognized as far back as the time of the Romans when they gave us the Latin quotation, "Post hoc, propter hoc". Translated into the English, we would say,

"After this, because of this." That says that when one fact precedes another the latter must be caused by the former. But all too often, and in our interpretation of Nature, such is not necessarily the case.

I. Belief in the value of fluoridation rests on erroneous reasoning.

The belief that the presence of the inorganic chemical element, fluorine, in well waters is responsible for good teeth, rests heavily on the observation of good teeth in the geographical area of the Panhandle of Texas where fluorine is present in the supplies of such water. Because that area, especially Hereford, Texas, in Deaf Smith County, was publicized as "The Town Without a Tooth-ache," there has come the contention that the fluorine in the drinking water is the cause of the good teeth.

That reasoning is erroneous. This observation cannot be considered as basis for insisting that fluorine should be added to drinking water as a guarantee of sound teeth.

Such a contention illustrates a very common fallacy when one reasons that in the case of two contemporaneous happenings, the one must be the cause of the other. There is, of course, a possibility that they may be so connected. But they may also be happening at the same time because they have a common cause. Should you and a policeman be going down the street together, that observation does not prove that he is the cause of your going in that particular direction. Let us hope that he is not, but that both are going to the same barbershop, which you do regularly by similar schedules after work on a particular day of the fortnight, between trips for tonsorial attention. Both of you are closely related in your actions because of a common cause, and not because one is the cause of the other's behavior.

(Additional illustrations from supposed "science" in practice may be illustrated by the following: (a) Limestone is used on soils supposedly with benefit by its removing soil acidity, when it nourishes crops with calcium and magnesium. (b) Bordeaux mixture as a plant spray may be feeding the crop copper to grow its antibiotic. (c) Blue vitriol for stomach worms in sheep may do likewise when the worms come out late and alive. (d) Epsom salts as a purge may function by exchanging magnesium for calcium in the intestinal wall and blood stream until the latter recovers to re-establish intestinal conditions. (e) Brucellosis is said to be a contagious "disease" yet good soil treatment eliminates both the infection and abortion, etc.)

In line with the fallacy of saying, "post hoc, propter hoc" it is important to note that Herford, Texas, was once a

part of the bison, or buffalo, area. It was famous later for its fine cattle. Both are facts which rest on the highly nutritious grass that grew on those soils of naturally higher concentrations of calcium and phosphorus, in that particular area of limited rainfall.

As a consequence of those geological and climatic settings, the natural soil mineral, namely, apatite, which is composed of calcium, phosphorus and fluorine, may be considered the common cause of the good teeth of the people and the presence of the fluorine in the water of the wells. We make the mistake in reasoning that the fluorine in the water is the cause of the better teeth, when we should look to the presence of liberal amounts of the calcium-bearing and phosphorus-bearing apatite putting more calcium and more phosphorus into the foods at the same time that by decomposition it is putting fluorine into the water percolating down through the soil.

Better health in general, of plants, animals and man, as well as better teeth, result from foods grown on soils well stocked with calcium and phosphorus through the weathering within the soil of the original mineral, apatite. When serious deficiencies of calcium are so common as to require the liming of humid soils to supply this element (and also magnesium), and with serious shortages of phosphorus for crops to require application of phosphates almost universally, we must interpret the better teeth as the result of the calcium-rich and phosphorus-rich crops as foods and feeds grown on those soils rather than as the result of the fluorine in the well waters. The bison drank surface waters and not well waters.

When the mineral, apatite, decomposes by weathering within the soil, the fluorine is the most soluble of the three elements concerned. This element has but a single valence, or combining power. It is highly soluble, and, as a consequence, goes out of the surface soil in solution in the waters percolating down through the soil into the wells and underground water supplies. But the calcium represents a double valence, or higher combining power, and is less soluble and less active in water. The phosphorus with a triple valence, or combining power, is the least soluble and least chemically active of these three elements.

In addition, after the fluorine goes out of the apatite to leave behind the calcium and phosphorus these remaining two will combine with each other to be both more readily available, thereby, to the crop plants than these two essential elements were in the original apatite. They are thus retained in the soil and are also made more active for their nutrition

of the mineral-rich, high-protein crops by which healthier bodies are built, with better teeth as exposed parts of better skeletons.

For us to reason that fluorine in the drinking water is the cause of the good teeth misses the great fact that calcium and phosphorus are the two elements highly essential for all living forms, and taken by them most abundantly from the soil which serves as the foundation of creation via plants. Their presence in the soil is the logical reason for good teeth rather than the presence of the fluorine in the drinking water.

It is a sad error in reasoning for anyone to believe that the addition of the fluoride of sodium to the water we drink would make good teeth from those made defective because of poor nutrition brought on by deficiencies of calcium and phosphorus in the food. The matter of good health is one of a healthy birth; of good food grown on good soils; and of our own concern about building our individually healthy bodies by means of self-guarded nutrition. We certainly dare not expect to grow a healthy body that will build sound teeth through mass medication prescribed and enforced by elected officials of our municipalities, or of any other political division of us.

## II. The element fluorine and its properties.

The element fluorine is the most active of all the nearly one-hundred known elements. It will combine with most any one of the others. As a consequence, it is found in at least small amounts in numerous combinations. Thereby, it occurs almost anywhere. Its presence may be due to its association with other elements as a "contaminant" rather than because it is rendering any essential function in living organisms. To date, none of the research tests have shown fluorine to be required by plants for their growth, when studies in the essentiality of elements found in plants by chemical analyses of them have been going on for a long time.

It is significant to note the fact that calcium and phosphorus serve more effectively in plant growth after they have been separated from their combination with fluorine as the mineral apatite in which form most of the original phosphorus occurred in Nature. According to our knowledge to date, we may well view the presence of fluorine in warm-blooded bodies, not as an essential, but rather, perhaps, as a disturbing contaminant, and one which living bodies store or hide away in its most inactive chemical combinations to prevent its disturbances. Might not fluorine be a physiological discard via enamel of the teeth? This might be a fitting question that has not yet been refuted.

III. Fluorides in their ionically active forms are highly poisonous to living bodies.

The chemical activity of the element fluorine in solution varies widely according to the other elements with which it occurs as compounds. Elements occur seldom in Nature as individual elements. If they do, they are not chemically active. They become active in their separation from, but yet in closely associated relation to, another element or elements in their compounds put into solution. They are then ionically active. As a result, fluorine in combination with the divalent calcium, as calcium fluoride is much less active (reported to be reduced by one hundred) than when combined with the highly soluble, mono-valent element sodium. It is in this last mentioned combination that fluorine has served in commerce as rat-poison, lice-powder for poultry, or as a general pesticide. It is this chemical form in which it is the source for fluoridation of water supplies for drinking purposes.

In Nature, fluorine occurs mainly in combination with the divalent, less soluble calcium. Consequently, if water contains calcium, as it commonly does as we know from lime-choked heater coils, fluorine introduced as sodium fluoride will be made much less effective or active. Effective fluorine will vary then with the variation of the amount of calcium naturally present in the water supply.

Iron, a trivalent and highly insoluble element, is attacked by fluorine also and reduces the activity of fluorine even more than calcium does. These are factors modifying the amount of active fluorine delivered at the water tap of the customer. These are the factors by which natural waters have given us unappreciated protection against this dangerous element, were the amounts found in the water as compounds present as all completely chemically active fluorine, as is the case of sodium fluoride in chemically pure water. They are also the factors making it impossible to guarantee delivery of a specific amount of fluorine after water has been in steel pipes for widely different periods of time.

IV. The legality of the fluoridation of water supplies.

The legality of mass-medication is a matter which is now coming up for decision in more areas and by more people. But, unfortunately, it is coming under what seems to be mainly the pressure for sales of an accumulating by-product of the technical processes giving other commodities. Unfortunately, more and more drugs seem to be going to the public under a similar pressure through which even the professional public seems to be providing ill-considered endorsement. But, recently, the circuit judge of St. Louis County ruled "the county's fluoridation ordinance invalid and unconstitutional". He placed it

in the latter category "because it attempts to fluoridate the entire water system when some residents have had no opportunity to vote on the measure." Up to this moment, mass-medication has been and is still illegal. Every patient, even at the point of death in a hospital, still has the individual right to protest drug or other treatments. It would be an unfortunate day when matters of such importance as drug administration were decided by councils of our municipalities by their majority votes. Such matters must still be legally left to the decision of the individual citizens and to each by his or her separate choices, as we trust they always will.

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July 18, 1961  
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Franklin C. McLean, "The Ultrastructure and function of bone" Science 127:451-456 - 2/28/58

"The small amounts of such ions as Na<sup>+</sup>, K<sup>+</sup>, Mg<sup>++</sup>, Cl<sup>-</sup> and F<sup>-</sup> found in the mineral are regarded as impurities, resulting from the body fluids, from which these ions are deposited during the process of crystallization."

#### How It All Got Started

After the preceding had been mimeographed, there came to attention the paper "New Concepts in Bone Healing," by Lewis E. Earnett, M.D. Jour. of Applied Nutrition VII:218-223, 1954. Dr. Earnett, as a practicing physician in Deaf Smith County, Texas, presented the above paper before the Orthopedic Section of the annual meeting of the Texas Medical Association, Dallas, Texas, May 6, 1952.

"It was at his suggestion" says Dr. Earnett, "that Dr. Edward Taylor, of the Texas State Department of Health, and his staff made an extensive survey of dental conditions in that county. The results of that survey were first reported in the Journal of the American Dental Association in August 1962.\* At that time, the school children of Deaf Smith County revealed 1.02 DMF teeth per child. This was by far the lowest rate of dental decay ever reported in a civilized country. Following the report, the U. S. Public Health Service Department did an extensive survey on water in the high plains area. From their findings, it was deducted that this unusually low rate of tooth decay was due to fluorine in the drinking water. It was considered that the Deaf Smith County area had the optimum fluorine for good dental health. It is from this study that the American Medical Association, the U. S. Department of Health, and other similar

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\* Edward Taylor, D.D.S. Texas State Health Dept., Studies of Caries Immunity in Deaf Smith County. Jour. Amer. Dent. Assn. Aug. 1942.

societies have approved the fluoridation of all drinking water in the United States. To some of us it was apparent that factors other than fluorine were, at least partially, responsible for these findings."

That such a highly tenuous correlation, of fluorine at 1 ppm in the drinking water and the low dental caries of 1.02 DMF per child, should be considered cause and prescription of the former for the latter, would certainly be hesitatingly taken as the universal logic among members of a professional society according to which alone we can be born, or can die, legally. Yet it seems that it is on the basis of such fallacious logic, considering no other factors affecting dental health, that the fluoridation of public drinking water is premised, and legally enforced.

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June, 1964  
(Second Mimeograph)