The truth about water fluoridation

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Forward
The author of this book, Charles Eliot Perkins, is a biochemist and physiologist, and is one of the few scientists in this country who has a thorough and specific knowledge of the fluorides and the pathological effects they produce in the human body.

Mr. Perkins is internationally known for his original discoveries in the field of cancer research. He has written many books on scientific and health subjects, among them being "The Conquest of Cancer," "Enzymes, Hormones, and Vitamins," "The Chemistry of Life," "What Price Civilization." This latter book has been said, by many scientists and doctors, to be one of the greatest contributions ever made toward solving the problem of the causes and prevention of human cancer. It is being used as a reference work in the research laboratories of many universities throughout the country, and by the American Cancer Society.

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Summary
"Ye shall know the truth, and the truth shall make ye free."

Part 1. Natural fluorides in soil and water
The human body is a chemical machine and it is composed entirely of organic chemicals, all of which are derived from the soil on which we live and the water which we drink. In the wear and tear of the operation of this chemical machine its constituent parts are continuously being used up and must be replaced by the food we eat and the water we drink. Therefore, it is obvious that in order to maintain the human body in a healthy state it is necessary that we eat the right foods in the right combinations, and drink the right water.

From a biological standpoint human beings may be classified into well-defined groups according to the geographical areas in which the individuals are born and live. This is so because the food that is eaten, and the water that is drunk, vary considerably in chemical content according to the geographical area in which the food is grown and the water is formed. For example, a given cereal, or vegetable, or fruit that is grown in one type of soil will vary greatly in its chemical composition from the same kind of cereal, vegetable, or fruit that may be grown in a widely different type of soil.

Similarly, water that flows through the earth in a given geographical area will contain in solution, or otherwise, different chemicals which it derives from the earth through which it flows and these chemicals will vary in character and combinations in each geographical area. It is clearly understandable, therefore, that persons born and living in one geographical area with its particular type of soil and water will eat foods and drink water...
containing different amounts of different chemicals than persons living in other geographical areas that may be widely separated. Inasmuch as we are what we eat and drink, human beings will vary mentally, physically and emotionally, according to the geographical area in which they are born and live.

*For the purposes of this book, the words "fluoride" and "fluorine" are to be considered as being synonymous.

Some of the chemical elements found in food and water are necessary to the maintenance and welfare of the human body since each is needed to replace the same element which is a necessary constituent of the body. Other chemicals found in food and water are not necessary in the economy of the body as they are not normal bodily constituents.

The chemical plan and mechanism of the body, under normal conditions, selects those chemical elements in food and water which are necessary to its maintenance, and rejects and disposes of the chemical elements that are not necessary to its normal functioning. It has been noticed that natives living in certain geographical regions, particularly in central Africa, parts of southern Europe, Mongolia and southwestern China, and in some sections of central and southwestern United States, have mottled and ugly teeth. This phenomenon has puzzled scientists for many centuries and, from time to time, efforts have been made to determine the cause of mottled teeth, but it was not until 1931 that the true cause of endemic mottling of tooth enamel was definitely established.

Prior to 1931 fluorine, a chemical of the halogen group, which is an abundant constituent of the earth's crust in certain geographical areas, had been suspected as the causal agent of mottled teeth. In 1925 Dr. F. S. McKay, of the United States Public Health Service, and an associate, examined the teeth of the school children of Oakley, Idaho, and found that every child who had used the city water supply had mottled tooth enamel, while the teeth of every child outside of the city were free from mottling.

The drinking water of the city contained natural fluoride, and fluorine was strongly suspected of being the cause of the mottling. The town found a method of removing most of the fluorine from its water supply and it now has less than 0.5 parts per million of fluoride.

Eight years after the fluorine was removed from the town's drinking water, Dr. McKay again examined the teeth of Oakley's children and found that every child born after the removal of the fluorine was free from mottled teeth.

In 1930 Dr. McKay investigated the occurrence of mottled teeth of children in Bauxite, Arkansas. He stated that the mottled teeth of children in that district was definitely caused by the water supply but the causal agent responsible for the mottling was unknown.

In 1931 H. V. Smith, M. C. Smith and Lantz, (1) working at the Arizona Agricultural Experiment Station, investigated the occurrence of mottled tooth enamel at St. David, Arizona. They found that every child exposed to the environmental conditions of the community during the years of growth of the permanent teeth had mottled enamel, and that dogs and rats also developed mottled teeth when made to drink the St. David water.

A critical analysis of the St. David water showed that it contained fluorine, as calcium fluoride. The investigators then determined positively that the occurrence of mottled teeth in men and animals was caused by certain small concentrations of fluorides in drinking water. Biologists and physiologists were at first skeptical, because it was difficult to believe that such minute concentrations of fluorine salts could cause such serious physiological disturbances. Exhaustive and thorough biochemical and physiological tests, however, very definitely established the fact that mottled teeth in human beings and in animals is caused by fluorine, usually as calcium fluoride, in drinking water.

When it had been proved beyond doubt that fluorine in drinking water was the cause of mottled teeth, the communities in the West and Southwest having naturally fluoridated drinking water set about finding ways and means of removing the fluorine from their water supplies in order to protect the teeth of their children from mottling.

In 1934 Kramer(2) said: "Since it has been established that the dental disease in man known as mottled tooth enamel is due to the drinking of water containing fluorine, the removal of fluorides by filtration has become an important problem."

In Science News Letter of November 2, 1943, it was reported that fluorine poisoning was a grave public health problem.

McClure, (21) in 1939, said:

"The presence of fluorides in drinking water is the cause of endemic mottled enamel, and there may be other toxic effects resulting from the ingestion of fluorides."
In 1935 Dr. M. C. Smith, (3) a distinguished scientist, who with her husband Prof. H. V. Smith, have contributed more to our knowledge of the relationship of fluorine to mottled teeth than have any other investigators in this field, said:

"The widespread occurrence of mottled enamel, a defect of the teeth, which is caused by the action of fluorine present in many public and private water supplies, makes fluorine poisoning a public health problem. It is obvious that mottled teeth are very disfiguring and ugly, for the stain which commonly filters into porous areas is usually rust colored.

In addition mottled teeth are defective in formation and calcification, and are therefore structurally weak. The defect is irreparable and permanent. It has been estimated by the Tucson (Arizona) Dental Association that it would cost $1,000 for the dental care of the teeth of the average person up to adulthood, at which time the teeth must usually be replaced by false ones."

The concentration of fluorine that causes mottled teeth

Twenty-three states in the United States have fluorine, in varying percentages, in their rocks and soils, and most of the communities in these states have naturally fluoridated water. The fluorine is present, almost invariably, as calcium fluoride. It is reported that most of the native-born inhabitants in these areas are afflicted with mottled teeth.

The states having natural fluorides in their soils and waters are:


Smith states that "As little as one part per million of fluorine in drinking water will cause mottled enamel."

The tests made by Sanchis, Ross, Reynolds and Jacobs in the 1930's indicated that up to 0.8 parts per million of natural fluoridated water did not cause mottling, but any higher concentration did cause mottling.

Fletcher(4) said that concentrations from 0.5 ppm to 0.8 ppm will cause mild mottling. Certain communities in the South and Southwest which have as low a concentration as 0.5 ppm have a large percentage of mottled teeth.

Prof. Howard Y. Smith, (5) in testifying before a Congressional committee investigating fluoridation, said: "Drinking waters containing 1 to 1.5 ppm of fluorine, or even less than that amount, have been found to be associated with mottled teeth in varying degrees of severity in far too many of its users to justify the value of the protection afforded against tooth decay."

Williamson (6) says: "Concentrations of fluoride in drinking water from 0.5 ppm to 0.9 ppm will cause mild mottling in approximately 50 percent of the children of any given community, while concentrations of 1 ppm, or more, will cause mottling in practically all children."

A consensus of available information on the subject indicates that the point at which mottling appears in the average child is 0.5 ppm, although climatic conditions bringing varying temperatures and humidity have an important bearing on the concentration threshold.

Investigators examining the teeth of children born in the communities that have naturally fluoridated drinking water reported that although the teeth of practically all the children were mottled and ugly, the mottled teeth seemed to have fewer cavities than the teeth of children of the same age in communities where the drinking water contained no fluorine.

The conclusion was then reached by some dental authorities that naturally fluoridated drinking water, in some way, prevents, or retards, the occurrence of tooth decay in children 8 years of age and under. Most dental authorities are of the opinion that naturally fluoridated drinking water does not produce any beneficial effects in preventing tooth decay in children over 8 or 9 years of age, when the enamel of the teeth becomes set.

It appears, therefore, that parents have to decide whether they want to let their children have mottled and ugly teeth that may be less susceptible to decay, when their drinking water contains 1 ppm of fluorine, or more, or whether they would rather their children have attractive white teeth and take a chance on caries appearing when they drink water that does not contain fluorides. And it is obvious that that decision should be made by the parents, themselves, and not by any agency of the State or Federal government.

So much for the children. Now let us see what happens to the rest of the population - the adults - and to the children when they grow up to adulthood, in communities having naturally fluoridated water. Mottled teeth in children under 8 years of age may be less subject to caries than normal teeth, but mottled teeth are subnormal teeth and are structurally defective and weak.

As the child grows up its teeth become brittle and jagged, the dentine foundation of the teeth after continued exposure to the corrosive action of the fluorine in the drinking water deteriorates, and the teeth have to be
extracted. It is a fact, easily verified, that there are more defective and false teeth among the native adults in communities having naturally fluoridated drinking water than there is among adults living in communities where the drinking water does not contain fluorides. (In Part 3 of this book the chemical and physiological action of fluorine on the teeth will be described in detail.)

If the United States adopts compulsory artificial fluoridation of its drinking water supplies it is entirely possible, even probable, that within a comparatively short time most of the adults in our nation will have lost their natural teeth and will be forced to use false teeth. That is not a pleasant situation to contemplate, but fluoridation of our drinking water can bring it about. It is no wonder that a very large majority of the proponents of water fluoridation are members of the dental profession!

Part 2
The fluoridation crusade

Despite the well-known fact that the communities in our country afflicted with naturally fluoridated waters have for many years been using every means possible to remove fluorine from their drinking water in order to save the teeth of their residents, and in defiance of the warnings and advice of physicians and biochemists that fluorine is a dangerous poison capable of causing serious pathological disturbances that might become a grave menace to the public health, and with a contemptuous disregard of the constitutional rights of the individual citizen, the U. S. Public Health Service launched in 1944 a nation-wide campaign to persuade or induce every city, town and community in the United States to adopt artificial fluoridation of their drinking water supplies.

The U. S. Public Health Service has pressed its compulsory fluoridation program with the zeal, ardor, enthusiasm and grim determination of an ideological crusade. The public funds have been used to hire high-paid professional propagandists who have deluged civic and health officials throughout the country with booklets, pamphlets, folders, broadsides, letters and posters extravagantly promoting and praising artificial fluoridation. Teams of lecturers have traveled over the country exhorting parent-teachers associations, civic associations, dental association health officers and other public officials to immediately fluoridate the drinking water supplies of their respective communities.

The campaign has been characterized by gross deception, misstatements, untruths and half-truths, a total disregard of human rights, and intolerance and arrogance toward all who oppose their program. The professional proponents of fluoridation, as a rule, refuse to discuss the subject in public meetings or debate fluoridation with anyone who opposes it in public forums.

An example of the tactics being used by proponents of fluoridation may be seen in the manner fluoridation has been forced upon the residents of Washington, D. C. Early in 1952, while a committee of the Congress was investigating the subject of fluoridation, and before the committee could file a report of its findings, the water supplies of the city of Washington were fluoridated. Few of the inhabitants of the city knew that fluoridation was to be installed, and fewer still had any idea what is meant by fluoridation.

Shortly after the proponents of fluoridation had "jumped the gun," as one Congressman put it, and installed fluoridation, the Congressional committee which had been investigating the whole subject of water fluoridation, filed its report, which was unfavorable to fluoridation. Having performed a neat fait accompli, the proponents of the program refused to discuss the matter. When asked to appear on a local radio forum to defend fluoridation, along with three members of a citizen's organization who were opposed to it, a high official purported to be connected with the U. S. Public Health Service is reported to have said to a representative of the radio station: "Let sleeping dogs lie."

So, 802,178 "sleeping dogs" in Washington, who are deprived of the right to vote, are lying and waiting for their health to be ruined, and their children to have mottled and ugly teeth, while a small group of fanatical advocates of artificial water fluoridation, who at the moment have control of certain of our governmental agencies, proceed with their Communistic experiment in mass medication on the unsuspecting and compliant people who have been deceived and lulled to sleep by their cleverly contrived propaganda.

In the formulation of their campaign much twisted thinking, a naive lack of reasoning and an appalling ignorance of the real facts involved, have been indulged in by the proponents of national artificial fluoridation. The sole reason that is advanced in support of artificial fluoridation is that fluorides in drinking water will retard or prevent the incidence of dental caries in most children 8 years of age and under by as much as 50 to 60 percent. In support of this contention they produce certain statistics to show that children up to the age of 8 years, in communities having naturally fluoridated drinking water, have 50 to 60 percent fewer dental caries than children of the same age in communities where the drinking water is not fluoridated. Independent observers have, to some extent,
confirmed this finding, but they have also stated that while the children's teeth in naturally fluoridated communities have fewer cavities, the teeth of a large proportion of these children are mottled and unattractive.

It should be remembered that the water in naturally fluoridated areas contains calcium fluoride, in combination with other organic natural minerals and salts that, to some extent, counteract certain physiological effects of the fluorine, whereas the artificially fluoridated water that is proposed by the advocates of compulsory fluoridation contains sodium fluoride, or sodium fluoro-silicates which, from a physiological standpoint, is a much different proposition.

It is true that the proponents of artificial fluoridation have assembled some abstract statistics, compiled by ardent advocates of artificial fluoridation which purport to show that sodium fluorides in drinking water produce the same effects in reducing dental caries in children as naturally fluoridated waters, but not one shred of independent, objective evidence, or valid statistics has been produced to support this contention.

The proponents of artificial fluoridation contend that it makes no difference what form of fluoride is used, that it is the fluorine ion that does the work and it is immaterial how ion is introduced into the water.

From a strictly chemical standpoint this is absolutely true. When sodium fluoride is placed in water, of the required volume, it goes into solution and the fluorine ion is released from the sodium. The fluorine ion then combines with the hydrogen of the water and forms hydrofluoric acid. When sodium fluoride is placed in a community’s water supply system, the form of fluorine which the resident drinks is hydrofluoric acid, an extremely active and dangerous poison.

It is important to note in this respect that the water thus artificially fluoridated does not contain calcium, and the other organic salts found in naturally fluoridated waters. As a chemist, I have asked why the proponents of artificial fluoridation advocated the use of sodium fluoride instead of calcium fluoride, which is the form of fluoride found in naturally fluoridated waters. It is commonly believed that calcium fluoride is not soluble in water, but this is not true. As a matter of fact, calcium fluoride is soluble in water in amounts up to 6 or 7 parts per million parts of water, and this is much higher than the concentration of fluoride advocated by the proponents of artificial fluoridation.

It has been suggested in some quarters that sodium fluoride, which hitherto has been a comparatively worthless by-product of the manufacture of aluminum, lends itself more readily to profitable commercial exploitation. Aluminum is secured from the mineral cryolite. Cryolite is sodium aluminum fluoride, and when the aluminum is extracted by a process largely controlled by the Aluminum Company of America, that which is left is sodium fluoride.

**Endorsing each other's opinion**

Referring to the methods being pursued by the U. S. Public Health Service in its efforts to force universal water fluoridation on the American people, Dr. A. L. Miller, (7) Congressman from the State of Nebraska, an eminent physician and a former Health Director of the State of Nebraska, said:

"Despite my best efforts, and from the evidence before my committee, I cannot find any public evidence that gave me the impression that the American Medical Association, the Dental Association, or several other health agencies, now recommending the fluoridation of water, had done any original work of their own. These groups were simply endorsing each other's opinions. I am certain that the dental profession merely echoes and endorses the opinions of the Public Health Service. They have done little experimental work themselves.

In my opinion the U. S. Public Health Service has been premature in urging universal use of fluorides in water. They have gone beyond the scope of their duties, or what is expected of them by Congress and the people, in urging communities to adopt the universal fluoridation of water without knowing the results of experiments that are now in progress.

The Public Health Service should concern itself with good public health measures and the prevention of disease. If it goes into the propaganda field, it will lose its effectiveness and the confidence of the public."

In commenting on the high pressure methods used to force fluoridation on the City of Washington, Dr. Miller said:

"The Commissioners did not wait for a hearing on the bill; and without legislative authority, and under the prodding from the Health Department, they appeared before the Appropriations Committee requesting moneys to put the plan into operation."

As a typical example of the befuddled reasoning and absurd economics involved in the artificial fluoridation program sponsored by the U. S. Public Health Service, and affiliated organizations operating within its sphere of influence, let us take the case of Washington, D. C., where artificial fluoridation was installed about July 1, 1952.
According to the latest figures of the U. S. Census Bureau (1950), the population of Washington was 802,178 persons. The proponents of artificial fluoridation admit that children up to the age of 8 years are the only persons who can possibly derive any benefit from the fluoridation of public drinking water supplies. There are 101,044 children eight years of age and under in the city of Washington. This is approximately 12.5 percent, or one-eighth, of the total population.

Figures obtained from the office of the Chief Engineer of the District of Columbia Water Department show that the water consumption in Washington is approximately 153,000,000 gallons daily. From the same source came the information that less than 10 percent of this amount, or 15,300,000 gallons daily, is used for drinking purposes. In other words, the total population of Washington, 802,178 persons, consume 15,300,000 gallons of water each day in drinking and cooking. The 101,044 children in the city 8 years of age and under, consume approximately 1,912,500 gallons of water each day.

Therefore, we are confronted with the ridiculous fact that the city of Washington is fluoridating 153,000,000 gallons of water each day, at an approximate annual cost to the taxpayers of $100,000, in order to provide only 1,912,500 gallons of water to the 101,044 children 8 years of age and under, who admittedly are the only persons in the city who can possibly derive any benefit from artificial fluoridation.

In other words, the total population of more than 800,000 persons is being compelled to drink poisoned water in order that 101,044 children may possibly have fewer dental caries, and the city's entire water supply of 153,000,000 gallons is treated with the fluoride poison in order to provide 1,912,500 gallons to the children who allegedly are to be benefited.

In the light of these figures, the thinking man and woman may well say to themselves: "How can the U. S. Public Health Service, an important agency of our Federal Government, sponsor, or even remotely entertain, such an obviously ridiculous and unsound project?" The answer is fairly simple once all of the pertinent facts are understood.

**Water fluoridation is a technique of Communist Philosophy**

It has been said that the seemingly helpful purpose which is advanced by the proponents of mass fluoridation that it will help to prevent caries in a few children's teeth is simply a blind and a subterfuge to fool the people, and that this is not a sincere public health project to save children's teeth, but is a highly organized and ably financed movement to force, by devious means, a totally un-American and vicious foreign ideology on the American people. It is a planned experiment in mass medication which is part of the technique of Communist philosophy to implant itself in America through mass control of the people by the State.

**Mass medication, involving the fluoridation of public water supply systems, has long been known as an important technique of the Communist philosophy of mass control.** The scheme of water fluoridation was taken to England by the English-born Russian Communist Kreminoff in 1935. Laski, believed to be the head of the English radical socialists at that time, mentioned it in an article he wrote for HARPER'S MAGAZINE in that year.

Shortly thereafter the English socialists, who had many sympathetic supporters and followers in high places in this country, introduced the fluoridation movement in the United States. In the early 1940's the U. S. Public Health Service, and affiliated agencies, took over the movement and have enthusiastically sponsored it ever since.

Of course, not all of those who are in favor of water fluoridation are Communists, or even Communist sympathizers. Far from it. Although the movement is an integral part of the Communist philosophy of mass control and was originated and is being guided in this country by persons who are alleged to believe in the Communist philosophy, many of the advocates of artificial water fluoridation are well-meaning, public spirited persons of fine repute who believe they are doing a noble work by helping to give children better teeth.

All movements of this character may be divided into three classifications as follows:

1. The zealous and fanatical ideologists who originate and guide the movement, and who will adopt any means, fair or foul, they think are necessary to accomplish their purpose, believing the result justifies any means used to achieve it.
2. Opportunists who may, or may not, believe in the movement but see in it an opportunity for personal profit, financially, politically or socially. They will vigorously promote and propagandize the movement and take every advantage of it for their own personal gain.
3. Well-meaning, sympathetic "do-gooders," who wish to help their fellow men, or perform an unselfish service for their community, their country, humanity, or some alleged helpless or "under-privileged" segment of it. These persons often are well educated, sometimes wealthy, usually quite gullible, and are willing to give liberally of their time and efforts to put the movement over "for the good of the cause." In most movements this group is by
far the most numerous, most vocal and most active. Without them no movement requiring mass approval could hope to succeed.

The Newburgh-Kingston "Study"
In June 1944 the New York State Department of Health, in cooperation with the U. S. Public Health Service, set up what is known as the Newburgh-Kingston Experimental Study. The ostensible purpose of this study was to conduct a series of researches, experiments and tests into the advantages, and disadvantages, of artificial water fluoridation, and the experiment was to cover a minimum period of ten years. It is believed by many, however, that the real purpose of the Newburgh-Kingston project is to furnish corroboration and support for the universal water fluoridation program which is being sponsored by the U. S. Public Health Service, and affiliated organizations.

For the purposes of the study the water supply of the City of Newburgh, with a population of approximately 30,000 persons, was treated with sodium fluoride, whereas the water supply of the nearby City of Kingston, having approximately the same number of residents, remained unfluoridated, as a "control."

The Newburgh-Kingston project was conceived, planned, set up by, and is under the supervision of ardent and enthusiastic proponents of artificial water fluoridation. The study is headed up and directed by Dr. David B. Ast, a distinguished dental authority. His staff consists, for the most part, of dentists, X-ray technicians, statisticians and social workers who, presumably, also are in favor of artificial water fluoridation.

It is difficult to understand how any unbiased and objective results can possibly be achieved by such a setup, especially when we take into consideration the vast amount of misinformation regarding water fluoridation that has been given out from time to time, and the devious methods that are alleged to have been pursued, by the sponsors of the fluoridation movement.

Dr Ast, Director of the Newburgh-Kingston project, published an article in the American Journal of Public Health, Volume 40, No. 6, June 1950 (page 716) in which he said:

"On May 2, 1945, sodium fluoride was added to Newburgh's water supply to bring its fluorine content up to 1.0 to 1.2 parts per million, while Kingston's water supply remains fluorine-free. It is expected that the study will take 10 to 12 years to determine adequately the efficacy and safety of this caries prophylactic measure."

In another article in the same issue of the American Journal of Public Health, Dr. Ast said:
"Final conclusions regarding the possible systemic effects of fluoride in the dosage employed should not be drawn before termination of the 10-year study. More refined techniques may also be available in the future in studying pertinent aspects of the problem. It must be emphasized, however, that a longer period of observation is required before final conclusions can be drawn. The possibility of demonstrated cumulative effects of the fluorides in the final years of the 10-year study cannot be eliminated at this time."

According to these articles, written by Dr. Ast and published in 1950, it is quite evident that at that time Dr. Ast was very definitely of the opinion that at least 10 years' study and research would be necessary to determine the merits and safety of water fluoridation. Yet, just two years later, in March, 1952, Dr. Ast appeared before the Delaney Congressional Committee investigating fluoridation and testified that he was now wholeheartedly in favor of the immediate adoption of universal water fluoridation.

He would not say that he had changed his mind about the 10-year period. If the head and director of the Newburgh-Kingston 10-year study project, and presumably his staff, are now in favor of the immediate adoption of water fluoridation, what useful purpose can be accomplished by continuing the project any further? From now on can it be expected that any objective or unbiased information or knowledge that could be used in arriving at a decision as to the advantages or disadvantages of universal fluoridation, can come from a project that is directed, and presumably staffed, by persons who have now made up their minds on the subject and are strongly in favor of the immediate adoption of artificial water fluoridation?

It is important to note that during his examination before the Congressional Committee investigating fluoridation Dr. Ast was asked by the counsel of the committee whether or not he thought the amount of fluorine that may be retained in the body, and not excreted, is an important consideration. Dr. Ast replied: "No, I don't think so."

This is a rather startling statement to be made by the head and director of a project, the sole purpose of which, supposedly, is to investigate and evaluate the effects of fluorine that is retained by the human body. If the fluorine that is retained within the human body is of no importance then why all this high-powered propaganda telling us
about the great benefits it produces in saving children's teeth? Surely Dr. Ast cannot contend that it is the fluorine that is excreted that reduces caries in children's teeth! And why, the taxpayer may ask, was the Newburgh-Kingston "study" initiated, if the amount of fluorine that is retained in the human body from the ingestion of water containing fluorides, is of no importance?

As a matter of fact, of course, the most important thing about the whole subject of fluoridation is what happens in the human body when fluorine is retained in it. In evaluating the studies that are being pursued in the Newburgh-Kingston project, we must keep in mind, also, that these studies are concerned, almost wholly, with children, the emphasis being placed on the value of fluorine as a prophylaxis for dental caries in children up to 8 or 9 years of age.

Children in this age group comprise approximately one-eighth of the population of any given community in the United States. What about the other seven-eighths of the population? Apparently nothing is being done in the Newburgh-Kingston experiment to determine what pathological effects, if any, artificially fluoridated water has upon adults, those suffering from chronic diseases and elderly persons. In the literature issued by the U. S. Public Health Service the following organizations are listed as having endorsed artificial water fluoridation:

American Dental Association
State and Territorial Dental Health Directors American Association of Public Health Dentists State and Territorial Health Directors
American Public Health Association
American Water Works Association

It will be noted that these organizations are of a nature that could bring them within the sphere of influence of the Public Health Service of the Federal Security Agency. It is significant that the American Medical Association, the American Chemical Society, The American Biochemical Society and the American Nutritional Society have not endorsed artificial water fluoridation.

The Congressional Committee, composed of duly elected representatives of the people, which investigated the whole subject of water fluoridation, after listening to the testimony of 18 of the foremost authorities on fluoridation in the United States, issued a report which was unfavorable to artificial water fluoridation. When the true facts regarding fluoridation are presented to the average American citizen he, undoubtedly, will arrive at the same conclusion.

Part 3
The pathological action of fluorine in the human body

The difference between naturally fluoridated water and artificial fluoridation

The true facts regarding water fluoridation and its effects on human health can better be grasped by the reader if he starts out with a clear understanding of the difference between naturally fluoridated water and artificially fluoridated water.

Naturally fluoridated water contains fluorine, as calcium fluoride, in an organic form, plus other organic salts and minerals which operate to offset, to a large extent, the physiological disturbances caused by the fluorine. Nature takes ages of time to form this natural water, and the leavening influence of time has blended the constituents of the water into an organic state wherein the physiological effects of fluorine are neutralized in a large measure, so that when this water is drunk by the natives in the area in which it appears the physiological and biochemical action of the fluorine is usually kept within the threshold tolerance of the natives who drink the water.

Artificially fluoridated water is ordinary water to which has been added "raw" sodium fluoride or sodium silicofluoride. The fluorine is in an inorganic state and is not combined with other salts or minerals. Nowhere in Nature does sodium fluoride or sodium silicofluoride exist as such. Both are artificial compounds. When artificially fluoridated water is ingested in the human body the "unconditioned" fluorine ion in the water is liberated. The fluorine ion cannot exist in the human body as such. It must combine with a molecule of calcium in order to form calcium fluoride, for calcium fluoride is the only form of fluorine that can be utilized, or excreted, by the human body.

Therefore, when artificially fluoridated water is ingested the fluorine ions in that water immediately seek a combination with the calcium which is in the body. The fluorine steals calcium from the body's tissues where the calcium is needed for normal functioning of the body and transfers the calcium, now as calcium fluoride, to the teeth and the bones.

This depletes the body's tissues of calcium and increases the deposition of calcium in the teeth and bones, making the bones brittle and robbing the tissues, principally the muscles of the heart, which normally need a
steady supply of calcium for their proper functioning. The disassociated fluorine ion in the artificially fluoridated water inhibits phosphate metabolism and disturbs the calcium-phosphorus balance in the body, whereas the calcium fluoride in naturally fluoridated water does not do this to the same extent.

In other words, the human body has a far greater tolerance for the organic calcium fluoride in naturally fluoridated water than it has for the unnatural and inorganic sodium fluoride of artificially fluoridated water. When artificially fluoridated water containing sodium fluoride is ingested in the human body some of the fluorine is retained within the body and some is excreted, and that which is excreted is in the form of calcium fluoride.

This is absolute proof that sodium fluoride in drinking water robs the body of its calcium. When naturally fluoridated water is ingested it contains calcium in addition to the fluorine, and this calcium in the naturally fluoridated water supplies the calcium that otherwise would have to be stolen from the tissues, as is the case when artificially fluoridated water is drunk.

Naturally fluoridated waters usually contain, in addition to calcium, traces of iron and manganese in organic form. These minerals in the naturally fluoridated water partially replace the metallic elements of enzyme systems that are destroyed by the fluorine, and thereby minimize certain pathological influences caused by fluorine in the tissues.

The Chemistry of the Fluorides
Sodium fluoride is derived from sodium aluminum fluoride, usually; and sodium silicofluoride is a compound formed by the addition of the element silicon to water which has been treated with sodium fluoride to form hydrofluoric acid. The silicon dissolves in the hydrofluoric acid, which is the only known chemical compound in which it will dissolve. In the artificial fluoridation of water, sodium silicofluoride is cheaper in cost because, volume for volume, it contains approximately one-third more fluorine.

In order to have an adequate understanding of the effects of fluorine, and its salts, sodium fluoride and sodium silicofluoride, on the human body it is necessary that we have some knowledge of the chemical nature and properties of these chemical compounds, for everything that happens within the human body takes place because of the action, reaction and interaction of certain chemical properties.

Fluorine is a pale yellowish-green gas having an extremely unpleasant odor. It is the most powerfully reactive element known. It decomposes all organic solvents with violence, and also decomposes water. Its vapor, even when highly diluted, is extremely injurious to the respiratory organs.

In nature fluorine is never found in the uncombined condition but always in combination with other elements, usually with calcium, as calcium fluoride (CaF2). It also is found in the mineral, cryolite, which is sodium aluminum fluoride. Fluorine combines with most metals to form fluorides. Fluorides are salts of hydrofluoric acid. They are absent from sea water because alkali metallic fluorides are not soluble in water. Sodium fluoride is a highly poisonous and dangerous substance. It is a yellowish-white powder containing 54.76 percent of sodium and 45.24 percent of fluorine.

Sodium silicofluoride is an active poisonous compound formed by the addition of silicon, a non-metallic element, which is a grayish black earth, with hydrofluoric acid. Silicon is insoluble in water, but when it is added to hydrofluoric acid, and if the water contains chlorine (practically all public drinking systems today contain chlorine) silicon tetrachloride is formed. Silicon tetrachloride is a fuming, suffocating substance used to produce smoke screens in warfare. It is extremely poisonous and highly damaging to respiratory tissues and mucous surfaces.

Sodium silicofluoride is a white powder containing 24.46 percent of sodium, 14.92 percent of silicon, and 60.62 percent of fluorine. When two chemicals are brought together three reactions always take place - the reaction inherent in each of the two elements plus a third reaction which is caused by the combination of the two. Water, as most everyone knows, is formed by the union of two gases, hydrogen and oxygen, in a certain critical proportion.

Now, let us see what happens when sodium fluoride is added to water. Fluorine does not combine with oxygen, but it does combine with hydrogen. Only one combine of fluorine and hydrogen is possible and that is hydrogen fluoride, or hydrofluoric acid (H2F2). Hydrofluoric acid is a poisonous, fuming liquid that attacks glass or stone ware dissolving the silica. It is very irritating to all mucous surfaces, particularly the eyes, and even in highly dilute concentration it is capable of causing painful sores on the skin.

The difference between chlorine and fluorine
One of the adroit pieces of deception practiced on the general public by the advocates of artificial water fluoridation is to say that no one objects to chlorine being placed in drinking water supplies, and therefore there should be no objection to its sister element, fluorine, being used also. Although chlorine and fluorine closely
resemble each other in many chemical properties, since both belong to the halogen group of chemical elements, they are two completely different chemical entities.

If some method was not used to purify the water coming from the storage reservoirs into a community's water system, disease epidemics would arise from the bacteria, fungi, and other impurities in the water. Chlorine is put into the water as a gas to purify it, and the concentration of chlorine that will safely accomplish this purpose is very low, and it has been demonstrated repeatedly that the concentration of chlorine necessary to purify drinking water has absolutely no deleterious effects on human health. As the water which is treated with chlorine comes from the faucet much of the chlorine is dissipated into the air, and when used for cooking purposes the heat dissipation that which is left.

Fluorine, on the other hand, is added to the water as a fluoride, usually sodium fluoride, or sodium silicofluoride, and it remains in the water permanently. It is not dissipated by the air, or heat. On the contrary, heat increases the concentration and activity of fluorine, whereas it dissipates chlorine. Fluorine is added to the water for purposes of affecting a part of the body, the teeth.

It therefore is being used as a medication. Chlorination of water is a safety measure to protect the public from disease epidemics, and not for the purposes of medication. Hence, it can be seen that there is absolutely no connection whatever between adding chlorine to public drinking water supplies to make the water safe for drinking, and the addition of fluorides to the water for the purposes of mass medication of a definite bodily tissue.

The physiology of Fluorine

Notwithstanding the fact that fluorine is found in the teeth, the bones and in most tissues, it is not a normal or necessary constituent of the human body, as is its sister halogens iodine and chlorine. Iodine is necessary in the normal functioning of the thyroid gland, and chlorine, as hydrochloric acid, is a necessary agent in the processes of digestion. Fluorine, however, is not a normal constituent of any tissue and is not needed in the functioning of the body. It exists in the body as an invading poison, and its presence, in any amount, is detrimental to the economy of the body as a whole, and to certain tissues in particular.

The question may be asked, "If fluorine is not a constituent element of the human body why do we find it in the teeth, bones and most tissues?" The answer to that question is two-fold:

1. We do not find fluorine in the teeth, bones and tissues of all persons everywhere. We find it only in persons living in geographical regions where the soil and the water contain fluorine, or who eat foods or drink water that comes from those regions. There are many persons throughout the world whose teeth, bones and tissues do not contain fluorine and who have beautiful, sound teeth, normal bones and healthy tissues.

2. The human body contains many elements and chemical compounds that are not its constituents, and are prejudicial and harmful to its maintenance and economy. The foods we eat, and the water we drink, contain ingredients that are not necessary to the maintenance or functioning of the body, and these materials must be disposed of in some manner by the body's processes, or they will stay in the body and interfere with its welfare. The human body, within certain limitations, has remarkable resilience and pliancy. It can, and does, adapt itself to practically any, and all, conditions of environment to which it is subjected. This is true of the foods and water it ingests as well as to thermal and climatic conditions.

In this respect the human body may be compared to a bacterium. It is known that certain antibiotics are poisons to certain bacteria. At first all of the bacteria will be killed by the antibiotic. After a few generations only some will be killed. In a comparatively short time the bacteria will develop a resistance to that particular antibiotic, and from that point on the bacteria are immune to the poison of that antibiotic. This phenomenon of self-immunization seems to be characteristic of all living things.

Persons who are born and raised in areas where the soil and water are naturally fluoridated build up resistance to systemic poisoning by fluorine, and their bodily machinery finds a way to offset, and eliminate fluorine, and the tolerance of these persons to fluorine is higher than those persons living in areas free from fluorine. This resistance and tolerance, however, applies only to naturally fluoridated soils and waters.

If these persons were to move into fluorine-free areas and be subjected to artificial fluoridation of foods or water, they would be susceptible to practically the same degree as other persons to the pathological effects of fluorine poisoning.

It must not be supposed that persons living in naturally fluoridated regions develop a complete immunity to the pathological effects of fluorine. They do not. They, too, suffer from the effects but to a much less extent. Twenty-three states, covering more than two-thirds of the area of the United States, have naturally fluoridated soils and water in some, or all, areas of each state.
The vegetables, fruits, grain and other foodstuffs grown in soil that contains fluorine will have fluorine in them. The amount of fluorine contained in the foods grown in these areas will vary from a slight trace to a considerable percentage according to the fluorine content of the soil, the climatic conditions and the inherent factor of fluorine absorption peculiar to each food.

### Some foods that contain fluorine

<table>
<thead>
<tr>
<th>Food</th>
<th>Fluorine Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tea</td>
<td>50.0 ppm</td>
</tr>
<tr>
<td>Tobacco (grown in fluoridated soils)</td>
<td>0.25 ppm</td>
</tr>
<tr>
<td>Butter</td>
<td>1.5 ppm</td>
</tr>
<tr>
<td>Pork</td>
<td>2.1 ppm</td>
</tr>
<tr>
<td>Oysters &amp; Fish</td>
<td>1.5 ppm</td>
</tr>
<tr>
<td>Cheese</td>
<td>1.5 ppm</td>
</tr>
<tr>
<td>Chicken</td>
<td>1.5 ppm</td>
</tr>
<tr>
<td>Whole Wheat</td>
<td>1.3 ppm</td>
</tr>
<tr>
<td>Rye</td>
<td>1.5 ppm</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>1.0 ppm</td>
</tr>
<tr>
<td>Apricots</td>
<td>1.0 ppm</td>
</tr>
<tr>
<td>Grapes</td>
<td>1.7 ppm</td>
</tr>
<tr>
<td>Apples</td>
<td>1.0 ppm</td>
</tr>
<tr>
<td>Peaches</td>
<td>0.8 ppm</td>
</tr>
<tr>
<td>Cabbage</td>
<td>1.2 ppm</td>
</tr>
<tr>
<td>Rice</td>
<td>1.2 ppm</td>
</tr>
<tr>
<td>Watermelon</td>
<td>2.0 ppm</td>
</tr>
</tbody>
</table>

Fluorine exists in these foods in organic form as calcium fluoride, and the other chemical and mineral components of these foods are in an organic state compatible with the fluorine content. If inorganic sodium fluoride was to be added to these foods the picture, from a physiological standpoint, would be entirely different.

Fluorine is the most radical of all chemical elements. It has great affinities and equally as great antagonisms. It has four outstanding physical peculiarities:

1. A very positive and consuming affinity for calcium.
2. A strong and selective affinity for certain metallic elements.
3. A very definite antagonism toward oxygen and any tissue that has anything to do with oxygen or respiration.
4. The faculty of additive accumulation in living organisms.

In the human body the physiological systems that are affected most by fluorine are the teeth, bones, skin, circulatory systems, the cardio-vascular system and the genito-urinary tract. The physiological effects of fluorine in the human body are accomplished in three different ways:

1. The most characteristic action of fluorine in the human body is to interfere with the functioning of enzyme systems. Enzymes are complex bodies that are composed of proteins, vitamins and a metallic component. Fluorine has a selective affinity for metals and it attacks all enzyme systems having certain metallic components.
2. Fluorine even in minute concentration is exceedingly irritating to the mucous surfaces of the body, particularly the respiratory tract and the linings of the stomach, duodenum, intestine, kidneys and bladder, and its continued action in this respect can cause inflammation and ulceration of these tissues. Fluorine acts as a catalyst in accelerating certain pathological processes.

### What Is "Safe" Fluoride Concentration?

Perhaps the most effective argument advanced by advocates of artificial water fluoridation is that a concentration of fluorine of the order of only 1 part of sodium fluoride to 1 million parts of water is so infinitesimal that it cannot possibly be injurious to the health of the individual. They claim that while this very low concentration is sufficiently active and potent to reduce dental caries in children it is much too weak a concentration to cause any harm whatsoever to the health of the child, or the adult.

This argument is very plausible to the average person, especially to mothers who have children of the age period during which their permanent teeth are being formed, and who have no knowledge of fluoride chemistry or physiology. When the facts are known the argument loses its plausibility and becomes a propagandistic misstatement. There can be no "safe" concentration of fluorine any more than there can be a "safe" concentration of dynamite, or any other dangerous explosive or poison.

Harris, (8) in testifying before the House Committee investigating fluoridation, said:

"The scientific controversy is not involved in the question as to whether or not fluorine in water supplies will effectively reduce dental caries, but rather whether or not the toxic effects of fluorine at about 1 part per million in public water supplies is significant. I think it is important to know whether people with the diseases with which humanity is usually afflicted are more sensitive to fluorine than people who are healthy. Until we know about that I think we are on dangerous ground in fluoridating the water supplies."

Further in his testimony before the House Committee, Dr. Harris said there is plenty of evidence to indicate that fluorine in the amount of 1 part per million or slightly more "interferes with enzyme systems, and these enzyme systems are involved in the growth of bones, in the functioning of nerve tissue and so forth, and it is difficult by population surveys to get any precise evidence on this question."
Kay (20) in 1930 brought forth evidence to show that the plasma phosphatase increased in such bone diseases as rickets and osteomalacia. It has been shown that fluorine poisons the enzyme phosphatase, and chronic fluorine poisoning may be indicated in osteomalacia. Robinson (19) showed that an enzyme capable of splitting phosphoric acid esters was instrumental in bone deposition.

The U. S. Public Health Service, which is the sponsor of the artificial water fluoridation program and is the most active force behind it, has stated that a fluorine concentration of from 1.0 ppm to 1.5 ppm will give the maximum protection against caries. Their figures are based on studies of mass groups in which the individual is important only as a member of that group.

Based on similar studies, it has frequently been reported that continuous use of domestic water supplies with a fluoride content of 1 ppm will result in mild dental fluorosis (mottled teeth) in 10% to 12% of the inhabitants of that community. As a matter of fact, certain communities in the South and Southwest that have as low a concentration as 0.5 ppm have a large percentage of mottled teeth.

McClure (22) reported: "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 the teeth."

In 1949, McClure (9) said that so far there is no conclusive evidence from the cities using fluoridation that the fluorination is doing any good or, as he put it, that "fluorine is an essential for dental health."

Dr. M. C. Smith (10) says:

"I think we have plenty of evidence, without any further experiments, to show that 1. ppm is too high a level to be universally accepted."

Dean has reported finding mottled tooth enamel in Georgia produced by water containing only 0.5 ppm of fluorine of the same type as is produced in the vicinity of Chicago where the fluorine content is about 1.2 ppm. The respective annual temperatures of the two locations is 88° and 49°. This clearly shows that in summer temperatures, or in communities having higher average temperatures, fluorine is much more active and toxic in its effects.

The tests made by Fisher, Williams, Sanchis, Ross, Reynolds and Jacobs, who investigated the effect of naturally fluoridated water on tooth enamel in the 1930's apparently established the fact that up to 0.8 ppm naturally fluoridated water did not cause mottling, but any higher concentration did cause mottling.

Therefore, it seems to have been established beyond any reasonable doubt that a concentration of fluoride in the drinking water beyond 0.8 ppm can cause physiological disturbances in the human body.

If all human beings were normal, and their bodies functioned perfectly, the fluorine content of the food or water ingested would present no problem at all. The fluorine being an invading poison and harmful to the body, would be disposed of by the normal physiological processes and the fluorine would be excreted in the urine and through the sweat glands. It is common knowledge, of course, that few, if any, of us are absolutely normal or have bodies that function perfectly.

The conditions under which modern man lives produce stresses and strains which wear out the human machine as life progresses and make it less capable of defending itself against invading poisons. Just as there cannot be any safe concentration of fluorine in the human body, there cannot be any average tolerance to the poison. No two persons have the same degree of tolerance to anything, and one's tolerance to any specific thing varies with the age, sex, heredity, and environmental factors.

Children have a higher tolerance to fluorine poisoning than do adults, and the tolerance in adults falls off sharply as the age increases. Women have much less tolerance to fluorine poisoning than do men.

Rapp (11) reported that "The absorption of fluoride takes place largely from the undissociated hydrogen fluoride molecule, and the rate of absorption is influenced by the pH (acid-alkaline state) of the medium from which the absorption is to take place, and the concentration of fluoride in the source. More important even than the absorption of fluorine is the retention of the poison in the body."

"In general, the greater the amount ingested, the greater the amount will be retained. It is important to remember in this connection that more fluoride will be retained if it is given in small multiple doses than when a similar quantity is given in a smaller number of large doses."

In other words, minute amounts of fluorine in drinking water taken many times a day will insure greater retention and greater damage to the body, than if larger doses were taken less regularly.

While we are on the subject of the concentration of fluorides in water, it is well to point out that it is exceedingly difficult to make accurate tests of the fluorine content of water.

There are at least four different methods of determining the fluorine content of water. These are the Fairchild, Foster, Willard and Sanchis methods, and there is considerable variation in the results arrived at between these
different methods. The author uses the method of Sanchis, having found this method of analysis more consistently accurate in his laboratory work.

As the concentration of fluorine in water is of a critical order, insofar as its pathological effects on the human body is concerned, great care must be taken in arriving at an accurate analysis. The difference of 0.5, or even less, in estimating the fluorine content of any given water supply can be the difference between non-saturation and the saturation point in some tissues of the body.

Too much emphasis is being placed, in the whole subject of water fluoridation, on the alleged properties of artificial fluoridation to reduce the incidence of dental caries in children below the age of 8 years. Of far more importance is what happens to the health, and the future welfare of these children, as well as the adults who comprise 7/8 of the total population, when this extremely active and dangerous poison is added to their drinking water supplies.

In 1937 Abbott(23) reported: "Fluoride may possibly cause other pathological effects. Drinking of waters high in fluorine is a matter not to be lightly disregarded." The human body is very sensitive to fluorine, even when present in infinitesimal concentrations, and the threshold tolerance of each tissue to fluorine is so delicate that the balance between safety and pathology, in some tissues, is of the order of one-tenth of one part per million, or less. Most tissues of the human body contain some fluorine.

The fluoride ion is so small and so diffusable it may be found throughout the entire body. The amount of the concentration of fluorine in any given tissue is highly critical and must be maintained within the tolerance of that tissue. For example, in adult persons, eating an average diet, the normal concentration of fluorine in the blood is 3.5 parts per million, but a concentration of 3.6 parts per million in the blood can be fatal. The normal concentration of fluorine in the brain is 0.6 parts per million, but a concentration of 1.6 parts per million of fluorine in the brain brings death.

The concentration of fluorine in the kidney is 4.5 parts per million, although a concentration of 4.6 parts per million in the kidney is lethal. The normal concentration of fluorine in the heart is 1.6 parts per million, but a concentration of 2.1 parts per million in the heart brings death. Therefore, it is very clear that the tolerance of the various tissues of the body to fluoride is exceedingly critical. The diet of the average adult person usually contains a considerable amount of fluorine.

The fluorides are cumulative in their effects on the organs and tissues of the human body. When the intake of foods, and water, containing fluorine produces a concentration of fluorine in the body in excess of the body's tolerance, one of two courses follows. Either the excess fluorides must be eliminated, principally through the kidneys, or there will be a progressive degeneration of the tissues of the body which will bring about certain definite disease patterns.

The assimilation and elimination of fluorine has a direct relation to the age of the individual. The older one gets, the greater will be the retention of fluorine in the body. Females retain a greater proportion of fluorine than do males. This possibly is due to the higher metabolic rate in females. The fluoride concentration of urine in persons living on water free from fluorides ranges from 0.3 ppm to 1.0 ppm, depending upon the age of the individual. When sodium fluoride is added to the drinking water in the proportion of 1.0 ppm the urinary concentration rises to as high as 3.0 within twenty-four hours. This is just another indication of the body's extreme sensitivity to fluorides.

Much of the experimentation in fluoride concentration, and its effects on certain tissues, has been done with laboratory animals. It should be remembered that rats and hamsters (the animals that are usually used in laboratory experiments) have more than twice the tolerance to sodium fluoride than have human beings. Therefore, if a value of 1 ppm is established as a "safe" concentration in these animals, the value should be interpreted as of the order of 0.5 ppm in human beings. According to Rapp: (12)

"When an experimental animal is first placed on a fluoride-containing diet he retains virtually one-half of the absorbed fluoride. As the concentration in the diet is increased there is a progressively greater output through the excretory organs and above a given level virtually all of the additional fluoride in the food is apparently excreted. These data point toward a saturation phenomenon. In humans it has been found that a total daily fluoride intake of from 4 to 6 milligrams produces saturation."

In this connection it is well to remember, too, that laboratory animals other than special strains used for special work, are normal animals with normal functioning kidneys and excretory organs. Human beings with defective kidney functioning will retain much more of the fluoride that is ingested than will these experimental animals. The U. S. Department of Agriculture has made careful analyses of the fluorine residue on food material. Apples sprayed with barium silicofluoride showed an average fluorine content of 5.6 ppm before washing.
The best washing procedures do not remove more than 85 percent of the fluorine. Other fruits, such as peaches, apricots and pears, also are sprayed with fluorine compounds to kill insects and molds, and when marketed the fluorine can never be entirely removed, so that the consumer must add this to his fluorine ingestion.

Perkins (13) shows that the average adult person, eating an average diet, ingests approximately 5 milligrams of fluorine daily. Therefore it can be seen that the average person is living up to, or above, his saturation point in the ingestion of fluorine, and during the summer months when his diet usually includes foods high in fluorine content such as iced tea, tomatoes, rhubarb and melons, he is well above his tolerance in fluorine intake.

During the summer months the average individual drinks 3 or 4 times as much water as ordinarily, and if his drinking water contains even as small a concentration as 1 ppm of fluoride this extra added amount of fluorine may well cause serious pathological consequences. If we assume an average water intake from 4 to 8 glasses a day, the average fluorine intake per day, from this source alone, will be 2 milligrams per person.

Fluorine affects human teeth
The bulk of the structure of human teeth is composed of a substance called dentine, which is very similar to bone. The dentine is covered by a hard enamel on the crown, which is composed, mainly, of calcium phosphate and calcium fluoride. The enamel is composed of fine hexagonal prisms arranged at right angles to the surface of the teeth. This structural formation of the tooth enamel, which makes it exceedingly hard and resistant to wear, is gradually built up from birth to the age of 8 or 10 years. It then becomes set. Under normal conditions the layers of hexagonal prisms which form the structure of the enamel are "fused" together by the phosphorus content, thus forming a structural material that is almost impervious to wear and has a certain property of toughness. Fluorine has a very strong affinity for calcium, and an excess of unexcreted fluorine will find its way to the bones and teeth, which are composed largely of calcium.

Because of its selective action in inhibiting and destroying phosphatase, the enzyme responsible for the body's phosphorus metabolism, fluorine interferes with the calcium-phosphorus equilibrium in the bones and teeth, reducing the phosphorus and increasing the deposition of calcium. This action of fluorine on the chemical composition of the teeth interferes with the "fusing" properties of the phosphorus cement between the fine hexagonal prisms of the structure of the enamel, thus making the teeth harder but more brittle. The quality of toughness is destroyed and the teeth break off and wear out in early adulthood.

They have to be extracted and false teeth substituted in a large percentage of natives in areas that have fluoridated soils and waters. In adults fluorine attacks the dentine foundation of the teeth, and its corrosive action, over a period of time, deteriorates the dentine and destroys the teeth from within.

Fluorine replaces the hydroxyl group in calcium apatite, which is the major component of tooth enamel, forming a much less soluble fluoapatite. This change makes the enamel of the teeth more resistant to acids of the mouth and therefore renders the teeth less subject to decay, inasmuch as the major part of tooth decay is due to an acid condition of the mouth resulting from improper diet and defective carbohydrate metabolism.

It is quite evident, therefore, that the action of fluorine, in naturally fluoridated water, in helping to reduce dental caries is a masking action, and not a normal physiological occurrence. In other words, the fluoride masks the effects of a disturbed calcium-phosphorus balance, and a defective carbohydrate intake and metabolism which produces an acid oral environment, without removing the cause.

It is the replacement of the hydroxyl group in the calcium apatite of the enamel that causes the enamel to lose its surface gloss and becomes porous and mottled. In this connection it may well be asked what does it profit a child to have fewer dental caries in its early youth if it must lose its teeth when it reaches adulthood and live the rest of its life with false teeth?

The Relation of Fluorine to Cancer
The pathological syndrome known as cancer is a profound degenerative process that occurs in two distinct stages. The first stage covers a long period of years and is characterized by a gradual breakdown in the metabolic processes of the body involving the endocrine gland system, more particularly the thyroid-parathyroid, liver-gallbladder and adrenal-kidney combinations. This stage usually culminates in the breaking loose of one cell, or a group of closely associated cells, which initiates an uncontrolled proliferation. During most of this stage the individual in whom the process is taking place usually is totally unaware that the cancer process is working in his body.

The second stage of cancer is concerned with the malignant growth itself which results from the first stage. There are two different causal agents which are responsible for the actual initiation of the malignant growth. In the case of cancer in tissues associated with sex, the principal causative factor is an excess of cholesterol (a fatty substance found in milk, cheese, eggs and many other foods) in the system and in misfunctioning of the chemistry
of the endocrine glands that converts cholesterol into a polycyclic hydrocarbon similar to, or identical with, methylcholanthrene which is the actual agent that invades susceptible cells and converts them into the malignant growth of cancer.

All other cancer is caused by a form of pyridine, a chemical compound which is produced in the human body from certain constituents of the bile by a morbid functioning of the liver and gallbladder. Seemingly, there is no possible way in which fluorine can play any direct part in initiating the second stage, or the malignant growth, of cancer. No evidence has been produced thus far to show that the fluorides can directly cause the malignant growth of cancer.

However, I have repeatedly produced clear and conclusive evidence to prove that fluorine can, and does, play an important part in promoting the first stage of cancer and in accelerating the second stage, or the malignant growth, after it has been initiated. Chronic fluorine poisoning, brought about by the ingestion of foods and water containing fluoride, more particularly sodium fluoride, can affect the first stage of the cancer process in four different, but synergistic, ways:

The presence of fluorine, in sufficient concentration, in any given tissue, over a period of time, will inhibit cellular respiration in that tissue and prevent the individual cells from properly oxidizing their waste products. In cancer-susceptible cells these waste products will remain in the tissue, weakening the surrounding cells, making them less able to resist the process of malignant proliferation.

Fluorine has a selective and progressive damaging action on the kidneys and the adrenal glands which sit astride of each kidney. Malfunctioning of the adrenal cortex is an invariable characteristic of the cancer process. Chronic fluorine poisoning produces a calcium deficiency in the body, as well as a dystrophy of calcium deposition in the bones and tissues. A calcium deficiency always is associated with cancer.

Chronic fluorine poisoning inhibits the utilization of Vitamin B2 by the human body. Vitamin B2, or riboflavin, is a yellow dye which plays a very important role in protein metabolism, and is concerned in the operation of the vagus nerve system which controls the functioning of the heart, stomach and digestive tract. Riboflavin is an oxygen carrier, and as such, it plays an important part in the oxidation process in living cells. It increases the oxygen consumption and decreases the lactic acid formation in the tissues. It has been established that there is a very definite deficiency of Vitamin B2 in cancer.

The reader should understand that the deficiency of Vitamin B2 in cancer is not necessarily caused by fluorine, for both stages of cancer can, and do, occur in the absence of fluorine. However, chronic fluorine poisoning can, and does, contribute very definitely to a deficiency of Vitamin B2 in the human body. Perhaps the most obvious characteristics of cancer, from a biochemical standpoint are the excess of cholesterol, and the deficiency of calcium, invariably found in cancer patients. Insofar as the cancer process is concerned, fluorine is not an important factor in the excess cholesterol found in all cancer patients, but it is very positively concerned in producing a calcium deficiency in the human body.

The manner in which chronic fluorine poisoning produces a calcium deficiency is somewhat complex in its operation. Calcium is absorbed by the body in the form of soluble salts, and the only site through which it is absorbed is a very small area of the upper, and somewhat acidic, portion of the intestinal tract. It so happens that this particular area of the intestinal tract is one of the first tissue areas that is affected by chronic fluorine poisoning. Fluorine concentration in this tissue prevents the proper absorption of calcium into the bloodstream.

Approximately one-half of the blood calcium is bound to protein, while the remaining half is in the ionic state and is balanced by phosphate ions. Calcium ions play a regulating role in nerve reactions, the regulation of heart functioning, and in mental stability. Fluorine, by inhibiting phosphatase (the enzyme which regulates phosphate metabolism and utilization) interferes with the phosphate ions in the blood and produces an unbalanced calcium-phosphorus equilibrium which affects markedly the overall calcium metabolism. This brings about a gradual deterioration in the nerve tissues of the body, particularly the brain tissues, and degenerates the tissues of the heart and circulatory system.

It has been clearly established that the circulatory system of the cancer cell is defective. The cell cannot properly utilize oxygen, and the more defective the circulatory system, the more rapidly the cancer mass will proliferate. Hence it can be seen that chronic fluorine poisoning, brought about by ingestion of fluorides in food and water, can become a potent factor in accelerating the cancer process.

An evaluation of repeated experiments and tests with cancer strains of rats, under laboratory controlled conditions, and interpreting these tests in terms applicable to the human body, we arrive at the conclusion that daily ingestion of approximately 2.0 ppm of sodium fluoride (equivalent to approximately 1.0 ppm in human beings) over a period of time will speed up the cancer process in human beings as follows:
If a person would die of cancer at the age of 80 on a water intake free from fluorine, the same person would die at the age of 65.6 years on a water intake containing approximately 1.0 ppm of sodium fluoride.

If a person would die of cancer at the age of 70 on a water intake free from fluorine, the same person would die at the age of 57.4 years on a water intake containing approximately 1.0 ppm of sodium fluoride.

If a person would die of cancer at the age of 60 on a water intake free from fluorine, the same person would die at the age of 49.2 years on a water intake containing approximately 1.0 ppm of sodium fluoride.

If a person would die of cancer at the age of 50 on a water intake free from fluorine, the same person would die at the age of 41 years on a water intake containing approximately 1.0 ppm of sodium fluoride.

These figures are valid in tests and experiments made in my laboratories, if we assume that experiments on cancer-susceptible rats are applicable to cancer-susceptible persons, and that the water intake of the persons in the first group was free from fluorine from the time the cancer process started in them, and that the persons in the second group ingested water containing approximately 1.0 ppm of sodium fluoride from the time the cancer process was initiated in them. Taylor (14) has done some very interesting work with fluorides in connection with rats of known cancer susceptibility, which in many respects has paralleled my own work in this field. He reports the conclusion that the ingestion of water containing sodium fluoride by rats in which the cancer process has already been initiated acts to accelerate the process.

A careful examination of the vital statistics of the City of Grand Rapids, Michigan, which is the first, and only, large city that has had artificial fluoridated drinking water for a period of five years, or more, tends to fully substantiate the conclusions herein, as well as those of Dr. Taylor, and others, that sodium fluoride added to drinking water tends to speed up the cancer process and thereby producing earlier deaths in cancer patients. The drinking water supply of the City of Grand Rapids was fluoridated in January 1945.

The vital statistics provided by the health authorities of that city to the United States Public Health Service and published in "VITAL STATISTICS OF THE UNITED STATES, PART II, TABLE 14" for the year 1945 (the year fluoridation was installed in Grand Rapids) show that 252 persons died of cancer. Four years later, the same sources showed that the deaths in that city from cancer totaled 349. This is an increase of approximately 39 percent in cancer deaths during the first five years of fluoridation in Grand Rapids. It is significant that the records for the five years previous to the adoption of fluoridation showed an actual decrease in the cancer death rate of approximately 6 percent.

Therefore, it is logical to assume that the artificial fluoridation of the drinking water supply of the City of Grand Rapids has had something to do with the 39 percent increase in cancer deaths that has taken place since fluoridation was installed in that city. It is prophetic irony that the State of Wisconsin, which has the largest number of towns and communities that have adopted artificial water fluoridation, also has the highest cancer death rate of all the states.

How fluoride produces arthritis and diabetes

Arthritis and diabetes are a part of the systemic pathological syndrome that leads to cancer. They are not really diseases at all, but rather are symptoms of altered metabolism brought about by biochemical changes in the body. Arthritis is caused by an inflammation of the mucoid lining of the arteries by irritating materials in the bloodstream, usually the end-products of faulty carbohydrate metabolism. These inflamed mucous linings form an ideal surface for the deposition of excess cholesterol in the body.

The cholesterol forms a hard coating on the inner walls of the arteries, restricting the flow of blood, which adds an extra burden on the muscles of the heart. The excess cholesterol in the body is due principally to a breakdown in fat metabolism.

Cholesterol is a fatty substance that deposits itself on the linings of the arteries, and at the joints. When this condition becomes chronic the deposit of cholesterol flakes becomes hard and solidified. Gallstones and renal calculi are composed largely of cholesterol.

Fatty acids play an important role in being the source of cholesterol in the body. An intermediary in fatty-acid metabolism is acetic acid. It has been clearly demonstrated that cholesterol can be synthesized in the human body from acetic acid, and that fluorine, in some manner, can act as a catalyst in this synthesis. Therefore, chronic fluorine poisoning, by increasing blood cholesterol, plays a very important part in arthritis. It is significant that arthritis, in its various forms, is quite prevalent in areas having naturally fluoridated soils and water.
The homeostatic mechanism governing the metabolism of cholesterol, and other fats, is closely associated with the carbohydrate metabolism, since when carbohydrate metabolism decreases, lipid (fat) metabolism is increased. Fats can be converted to glucose in the liver under certain conditions; similarly, carbohydrates may under certain conditions be converted to fats.

Carbohydrate metabolism is intimately connected with Vitamin B1 (thiamine). The breakdown in carbohydrate metabolism, which is so characteristic of diabetes, can be traced directly to a deficiency of Vitamin B1. As a cell constituent, this vitamin plays a very important part in the oxidation-reduction system concerned with the metabolism of carbohydrates. Vitamin B1 is necessary in the respiratory, or oxidative, phase of the cell's carbohydrate metabolism. Vitamin B1 functions as a co-carboxylase in the respiratory system of the cell. Fluorine in the tissues inhibits carboxylase activity. Every day each person must decarboxylate a certain number of pyruvic acid molecules during his carbohydrate metabolism. In order to do this a certain number of Vitamin B1 molecules is needed.

The intestinal bacteria that synthesize Vitamin B1 (thiamine) are killed by 1 ppm of sodium fluoride. It is the deficiency of Vitamin B1, coupled with a hormonal deficiency of the pancreas, that produces diabetes.

**Stomach and Duodenal Ulcers**

The principal ingredient of the digestive juices of the stomach is hydrochloric acid. Hydrochloric acid is a very powerful solvent and its purpose in the stomach is to dissolve the food that is ingested, breaking it down so that the digestive ferments and enzymes can go to work on it. This acid will attack and dissolve practically anything, and it would dissolve the walls of the stomach itself if it were not for the fact that Nature has provided against this with tiny little cells in the mucous lining of the stomach which produce a buffer substance that prevents the hydrochloric acid from attacking the walls of the stomach. This buffer substance is specific to neutralizing hydrochloric acid, and no other acid.

Artificially fluoridated water contains hydrofluoric acid, which is many times stronger and more violent in its action than hydrochloric acid. The buffer substance in the stomach does not protect the lining of the stomach against hydrofluoric acid and the cumulative effect of minute quantities of this acid causes inflammation of the mucous lining of the stomach which can lead to ulceration in certain types of individuals.

The stomach empties the food, which is now called chyme, into the duodenum, where the actual digestion of the food takes place. The hydrochloric acid of the stomach produces an acid condition in the stomach, but the digestive enzymes of the duodenum work in an alkaline environment. As the food leaves the stomach it contains some hydrochloric acid, and when it enters the duodenum this acid is neutralized by the alkaline environment found there.

However, before the hydrochloric acid can be neutralized in the duodenum it can, and sometimes does, cause serious inflammation and ulceration of the mucous lining of the duodenum. To prevent this from happening there are tiny cells in the mucous lining of the duodenum, similar to those found in the stomach, which manufacture a substance to protect it against injury by hydrochloric acid.

The hydrofluoric acid in artificially fluoridated water can cause ulceration of the mucous lining of the duodenum, as well as the stomach.

**How fluorine causes kidney diseases**

Since the human body is put together according to a bilateral plan, each human being, normally, has two kidneys. The function of the kidneys is to get rid of most of the toxins and poisons generated by the body itself, as well as the poisons that are ingested in the body in food and drink. With the exception of ammonia, which is a base and alkaline in character, most of the toxins and poisons excreted through the kidneys are acid in character, the principal one being uric acid.

Uric acid is a very irritating substance, and if Nature had not provided against such a contingency, uric acid would irritate and inflame the mucoid linings of the kidneys, causing inflammation and ulceration which can develop into the usually fatal disease of the kidneys known as nephritis.

Just as Nature provides a buffering substance to protect the linings of the stomach and duodenum from the ravages of hydrochloric acid contained in the stomach juices, so the mucous lining of the kidneys is protected against the irritating action of uric acid by a substance that is manufactured in tiny cells on the interior walls of the kidneys. This substance is specific in counteracting the injurious effects of uric acid on the kidneys.

Most of the sodium fluoride added to drinking water in artificial fluoridation must be excreted through the kidneys. In these days and times few persons have perfectly functioning kidneys. Weinstein and Perkins reported
that 301 out of 304 persons examined for diseases other than kidney diseases, had impaired kidney functioning to a greater or lesser extent.

Impaired kidneys cannot excrete fluorine and the fluorine, having an affinity for mucous surfaces, accumulates in the kidneys, inflames the mucous lining of the kidneys and creates a pathological environment in the kidneys that can lead to ulceration and acute nephritis. Sitting astride the top of each kidney there is a small gland called the adrenal gland. The adrenal glands, in many respects, are the most important glands in the human body. Aside from determining, and maintaining, the primary and secondary sex characteristics, the adrenal glands control, to a large extent, the functioning of the pituitary and thyroid glands and the pancreas.

They play an important part in sugar metabolism, cholesterol metabolism, the storage of Vitamin C, and many other vital functions of the body. The adrenal glands are divided into three major sections - the outer bark, which is called the cortex, the interior section, called the medulla, and the interstitial membrane which separates the two parts.

The hormones manufactured in the cortex function to suppress those that are produced in the medulla section, and vice versa. Fluorine has a very definite and specific damaging action on the adrenal glands. It inhibits some of the hormonal factors produced in the cortex, while stimulating the production of some other cortical factors. The adrenal cortex is the seat of the mechanism which controls pigmentation, or color, of the eyes, hair, and skin.

Chronic fluorine poisoning has a tendency to promote melanism, which is a darkening of the skin, and occasional black patches on the face, neck, and torso. This condition usually is accompanied by hirsutism, or the growth of hair, on the face and other parts of the body. In the female, this condition is sometimes accompanied by certain masculine tendencies, such as deepening of the voice, roughness of the skin, and a masculine-like expression of the features.

The medulla section of the adrenal glands plays a major part in sugar metabolism and controls the retention, or non-retention, of water in the kidneys. This is highly important because the suppression of the adrenal medulla by chronic fluorine poisoning influences the retention of water in the body, thereby operating to increase the accumulation of fluorine in the body's tissues.

Nucleoproteins, which are components of all tissues, and occur in large amounts in glandular tissues, put a heavy strain on kidney functioning in middle aged and elderly persons. Upon digestion the nucleoproteins yield a number of compounds in addition to the amino acids, of which they are composed. Two of these are related to the amino acids and are an integral part of protein metabolism. They are the pyrimidine and purine bases. These compounds also occur in tea and coffee.

During the catabolism of these bases they are converted into urea, carbon dioxide and water, as are the amino acids. The body can only partly oxidize the purines. This oxidation of the purines yields the compound uric acid which is excreted in the urine.

Fluorine interferes with the oxidation of the purines and thereby promotes renal calculi (kidney stones) and a high percentage of uric acid in the blood, causing gout and rheumatic conditions. In the processes of metabolism the level of the blood sugar is maintained within certain limits through what may be called the homeostatic mechanism, which is controlled by an interplay between the adrenal medulla and the pancreas. Phosphate and oxygen are necessary in this process.

Corticosterone, a hormone of the adrenal cortex, and epinephrine, from the adrenal medulla influence carbohydrate metabolism by promoting glycogenesis. Fluorine inhibits the production of both of these hormones. Thiamine (Vitamin B1) is essential to the complete utilization of the carbohydrates, since it is a part of the coenzyme necessary for the oxidation of pyruvic acid (a by-product which occurs in carbohydrate metabolism). Chronic fluorine poisoning interferes with phosphate metabolism and inhibits the utilization by the body of both Vitamins B1 and B2.

The most injurious effects of fluorine on the human body are found in the impaired functioning and pathological conditions it causes in the kidneys and adrenals, and these serious effects, alone, should be sufficient cause to stop the artificial fluoridation of public water supplies.

During the last five years deaths from kidney diseases, all types, in the City of Grand Rapids, Michigan, which is the only city that has had artificial water fluoridation for a period of five years or longer, have increased approximately 50 percent over the year 1944, which was the last year prior to the installation of fluoridation in that city.

The effects of fluorine on the thyroid and parathyroids

The greatest pathological effects of fluorine on the human body are found in the thyroid, the parathyroids, the kidneys and adrenals, the heart, nerve tissues, and calcium-phosphorus metabolism.
Chronic fluorine poisoning severely damages the thyroid gland. At first there is inflammation of the lining of the gland, followed by edema, and often cysts on one or both lobes of the thyroid.

It has been noticed for some time that in the Central West of the United States there is a high incidence of endemic goitre. It has been supposed that this is due to a deficiency of iodine. Matthews and Perkins (16) pointed out that the endemic goitre in the Middle West appeared almost entirely in the areas that had fluoridated soils and waters, and they expressed the opinion that it was chronic fluorine poisoning in these areas, rather than a deficiency of iodine, that was responsible for endemic goitre.

Investigators have observed goitre in some parts of Georgia and Tennessee, where there is no iodine deficiency but where the soils and waters are naturally fluoridated. Also, in some parts of England, notably in Nottingham and Suffolk, where there is no iodine deficiency, but rather the opposite, there is a prevalence of goitre in women. The cause of goitre in these English women, very probably, is the excessive drinking of tea, which is a custom in these regions.

In the parathyroids fluorine causes marked inflammation. At first the gland is swollen, and later, in some instances, there has been atrophy of the glands. The age of the individual often determines the seriousness of the pathological action of fluorine. In children the parathyroids are affected to a greater extent than the thyroid. In adults, the thyroid seems to be affected in an equal degree with the parathyroids. The injury brought about by chronic fluorine poisoning in these tissues results in impaired protein metabolism and a distinct disturbance of the calcium-phosphorus utilization by the bones and tissues. There is dystrophy of calcification in the bones.

**Nervous diseases caused by fluorine**

By inhibiting the enzyme phosphatase, disturbing the calcium-phosphorus equilibrium, altering the phosphorus content, and inhibiting the utilization of Vitamin B1, fluorine exerts a progressively degenerative influence on nerve tissues throughout the body, particularly in the cerebrum.

Chronic fluorine poisoning has a tendency to affect the seat of the brain that is concerned with volition and the will to resist. It is this same area in the brain that is affected by the phenomenon of hypnotism.

Rats of the second and third generation from mothers who have been fed foods high in fluorine content, and drinking water containing 2 ppm of sodium fluoride, show a marked deterioration in mental alertness accompanied by a state of passiveness and bewilderment when subjected to the usual tests for mental alertness in these animals.

To determine whether or not these tests with laboratory animals apply to human beings, Waldman (17) in 1935 conducted an experimental study. He selected twenty school children between the ages of 7 and 10 in the town of Mt. Vernon, New York, where the drinking water contains no fluoride, and twenty children of the same ages in a town in Arkansas, where the drinking water contains approximately 1.8 ppm of natural fluoride. The children in both communities were given the same I.Q. tests.

It was found that the average I.Q. in the school children selected in Mt. Vernon was 69.7, whereas the average in the children in the Arkansas town was 51.4. One boy in the Arkansas group had a higher I.Q. average than any of the children in the Mt. Vernon group, which greatly boosted the average of the Arkansas group. This test was of little value, and should not be accepted as conclusive. In the first place, there were not enough children used in the test, and in the second place, the town that was selected in Arkansas was more or less isolated from a large city, while the town of Mt. Vernon is an urban community close to the City of New York.

Nevertheless, this test, in some respects, has a tendency to substantiate tests made by other investigators. In the early part of this century, Matthews, (18) a missionary physician, reported that in parts of Mongolia and China, in areas having soils and waters of high fluoride content, the natives were sub-normal in intelligence, and he ventured the opinion that inasmuch as the natives in these areas subsisted almost entirely on rice grown in marshes containing water of high fluoride content, and drinking fluoridated water, and tea (which contains 50 ppm of fluorine), there was something in the food and water that contributed to the sub-normal intelligence of these natives.

It is significant, too, that pellagra, poliomyelitis, and other diseases usually ascribed to an impairment of nerve tissues, are largely prevalent only in areas of the world where the soils and waters contain fluorides.

**Diseases of the eye that may be caused by fluoridation**

While experimenting with animals of the second generation of mothers having a high placental fluorine concentration, in order to determine the mental alertness of these animals, a maze, or labyrinth, was used by the author. Normal animals, fed a normal diet free from fluorine, made their way through the openings in the maze without difficulty, but it was noticed that the test animals from mothers having a high fluorine concentration in the placenta, and which were fed a diet containing approximately 3 ppm of sodium fluoride, ran into the sides of the openings.
At first this was thought to be due to a confused mental condition observed in these animals. Later it was decided to use this maze experiment on normal animals from normal mothers. In this experiment the control animals, which were fed a diet free from fluorine, had no difficulty in getting through the openings, but the animals that were given drinking water containing approximately 3 ppm of sodium fluoride, bumped into the sides of the openings as they made their way through the maze.

The experiment was repeated with the same results. It was then decided that the difficulty of the animals in getting through the openings was not due to mental confusion but to defective eyesight. A series of experiments was then undertaken to determine what effect, if any, sodium fluoride added to the drinking water of normal strains of rats had on the eyesight of the animals. Most animals, including rats, have a much higher tolerance to fluorine toxicity than do human beings, so that when 3 ppm of sodium fluoride is used in experimenting with these test animals, it is practically equivalent to 1 ppm of sodium fluoride in the drinking water of human beings.

One group of rats was fed a normal diet with 3 ppm of sodium fluoride added to the drinking water. Another group was placed on a normal diet and water free from sodium fluoride, and the eyes of the animals in the second group were swabbed three times daily with cotton saturated with water containing 3 ppm of sodium fluorosilicate.

In the first group 3 of the 5 animals showed unmistakable signs of blindness in 45 days and the other two animals exhibited signs of impaired vision.

The animals in the second group, which had their eyes bathed in water containing 3 ppm of sodium fluorosilicate, developed scleritis (inflammation of the sclera, or outer layer, of the eyes), of more or less severity, within 20 to 30 days. Post mortem examination of the eyes of the animals in the first group showed that 4 of the 5 animals had developed something similar to glaucoma, and in the other animal in this group the retina (the inner layer of the eye which is a delicate membrane in the form of a cup containing the vitreous humour) had undergone considerable degeneration.

The retinas were "spongy" and detached in several spots. An effort was made some years later to check eye conditions in the residents of several cities which had installed artificial water fluoridation but, although this survey produced some evidence to indicate there had been an increase in glaucoma in these areas, the survey was incomplete in many respects due to the fact that it was made through the mails, and the results obtained could not be considered as conclusive.

Much more definite and conclusive evidence has been produced recently in the City of Washington, D. C. Artificial water fluoridation was installed in this city on about July 1, 1952. Within six months thereafter a survey made by the author disclosed that there had been a noticeable increase in degenerative eye conditions in the Nation's Capital. One of the city's eye hospitals reported three cases of detached retina in one month, which is unusual, and a prominent eye physician reported that 20 percent of his patients were glaucoma cases.

A check made of several communities in the South and Southwest which have naturally fluoridated water supplies also disclosed a high incidence of glaucoma among their residents. In communities where artificial water fluoridation has been installed it is well to remember that the residents are drinking hydrofluoric acid, inasmuch as each glass of water that has been treated with 1 ppm of sodium fluoride, contains 0.25 milligrams of hydrofluoric acid.

In evaluating the high toxicity of hydrofluoric acid and the serious damage this poison can cause to the human eye, the following information contained in THE MERCK INDEX(24), a reference book that is universally recognized and accepted as a standard authority in the chemical, biochemical, pharmaceutical, medical, and allied professions, is revealingly important: "HYDROFLUORIC ACID-Toxicity: Liquid or vapor causes severe irritation of eyes and eyelids which may result in prolonged or permanent visual defects or total destruction of the eyes."

**How fluoridated water affects food in cooking**

In communities using artificially fluoridated waters it is important for the housewife to know what happens to the foods she cooks, and eats, when they are cooked in artificially fluoridated water. Water containing 1 ppm of fluorine, when boiled for 20 minutes, contains 2 ppm of fluorine. When tea, which contains 50 ppm of fluorine, is boiled for 10 minutes in water containing 1 ppm of sodium fluorine, the cup of tea the housewife drinks contains 52 ppm of fluorine.

Cabbage boiled in water containing 1 ppm of fluoride for half an hour contains approximately 4 ppm of fluorine. Apples, baked in the oven with their skins on, in water containing 1 ppm of fluorine, for a period of 45 minutes, contain approximately 4 ppm of fluorine. Fluorine attacks all metals, particularly tin, copper, iron and aluminum, and all foods cooked in utensils containing these metals, with fluoridated water, will be affected.
Foods canned in communities using artificially fluoridated water will be contaminated, particularly rhubarb, peaches, apricots and cherries.

Part 4
The unconstitutionality of water fluorination
There can be no question whatever but that the compulsory artificial fluoridation of public drinking water supplies invades the private rights, religious freedom, and the privilege of personal volition, guaranteed by the Constitution of the United States, and therefore is an unconstitutional procedure.
Article IV, Section 2, of the Constitution says:
"1. The citizens of each State shall be entitled to all privileges and immunities of citizens in the several States."
It is clear, therefore, that no State, and no community within that State, has the right to enact a law, or to exercise a municipal or civil right that will deprive its citizens of any rights and privileges, under the Constitution, which are enjoyed by citizens in other States that do not have compulsory water fluoridation. Also, the Constitution specifically guarantees that the citizens in each State are entitled to the privileges of non-fluoridation of their drinking water supplies that are enjoyed by the citizens in the States that do not have compulsory water fluoridation.
Article I of the Bill of Rights states:
"Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof."
Artificial water fluoridation unquestionably is mass medication. The fluorides are placed in the public water supply system for the purpose of treating, or affecting, a certain specific part of the human body, i.e., the teeth of young children, and all persons living in the community having water that has been thus fluoridated, are compelled, whether they want to or not, to drink this medicated water. This is in direct violation of Article I of the Bill of Rights of the United States Constitution, which guarantees to every citizen the right to worship God as he may see fit, and to subscribe to any religious concept in which he has faith without interference of that right by civil authorities.

There is at least one recognized religion in the United States, the Christian Science religion, the followers of which do not believe in using medicine in any form. Christian Scientists are honestly and sincerely opposed to medication in any form, and it is a direct violation of their rights to religious freedom to impose on them the mass medication of the water supplies which they are compelled to use. They have a right to their belief, and Article I of the Bill of Rights specifically guarantees and upholds that right. It is clear, therefore, that artificial water fluoridation violates Article I of the Bill of Rights.

The 14th Amendment to the Constitution definitely states that "No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States". Compulsory mass medication through water fluoridation abridges each citizen's rights under this amendment, and it is very clear that artificial water fluoridation is in direct conflict with and violation of this amendment to the Constitution.

Citizens in communities that have adopted artificial water fluoridation, or are contemplating doing so, should contest the legality of this procedure as being unconstitutional, and if redress is not speedily secured from the civic authorities involved, a referendum should be demanded so that the citizens may have a chance to vote for or against this violation of their constitutional rights.

Summary
Evidence has been produced to show that mottled tooth enamel is caused by fluorine in drinking water, and that the minimum concentration of fluorine that causes mottling is 0.8 parts of fluorine to a million parts of water. There is valid evidence to show that naturally fluoridated drinking water has a tendency to reduce the incidence of dental caries in children up to the age of 8 or 9 years by as much as 50 percent, but no objective evidence has been produced to prove that artificially fluoridated water will produce the same results.
It has been shown that the method by which fluorine reduces tooth decay in young children is by the chemical action of fluorine in replacing the hydroxyl group in the calcium-apatite of the tooth enamel and that this replacement renders the enamel less subject to the destructive action of acids in the mouth which are caused by excessive ingestion of carbohydrate foods and faulty carbohydrate metabolism, the major cause of tooth decay being an acid environment of the mouth.

On the pretext that sodium fluoride, and sodium silicofluoride, added to drinking water will reduce dental caries at least 50 percent in children up to the age of 8 or 9 years, the U. S. Public Health Service, and other agencies and organizations operating under its influence, have inaugurated a nation-wide campaign to fluoridate public drinking water supplies.
The only reason or excuse advanced by the advocates of artificial water fluoridation in support of their program is their claim that fluorides in water have a tendency to check, by as much as 50 percent, tooth decay in children up to the age of 8 or 9 years. Children 8 or 9 years of age and under comprise, approximately, 1/8 of the population of any given community in the United States. It is a fact that only 1/10 of the water supply of any given community is used for drinking purposes.

Therefore, the advocates of fluoridation propose to fluoridate 100 percent of the water supply of a community and force 100 percent of its inhabitants to drink the fluoridated water in order to benefit 1/8 of the population who drink 1/8 of the 10 percent of the water that is used for drinking purposes.

In other words, in order to reduce the incidence of dental caries in 1/8 of the residents of a community who drink only 1 1/4 percent of its water, 100 percent of the water supply of that community is fluoridated and all of the residents of the community are compelled to drink the poisoned water. Not only is this procedure thoroughly unsound economically, but it constitutes a departure from common sense that is absurd and indefensible.

Fluorine and its salts, sodium fluoride and sodium silicofluoride are powerful and extremely dangerous poisons and are capable, even in minute dilution, of causing serious pathological effects in the human body.

Naturally fluoridated water does not cause as serious pathological disturbances in the human body as does artificially fluoridated water, and natives living in areas that have naturally fluoridated soils and water develop a high resistance to chronic fluorine poisoning.

All foodstuffs grown in soils that contain fluorides will have a fluorine content in proportion to the concentration of fluorine in the soils and water where they are grown. Twenty-three states in the United States have naturally fluoridated soils and waters. The most damaging pathological disturbances caused by chronic fluorine poisoning are the depletion of the body's supply of calcium, inhibition and destruction of enzyme systems, particularly phosphatase and carboxylase, injury to thyroid and parathyroid glands and degeneration of nerve tissues.

There is evidence to prove that fluorine speeds up the cancer processes and causes earlier deaths in cancer patients. The diseases that can be caused by chronic fluorine poisoning are heart, arterial, kidney diseases, stomach and duodenal ulcers, and mental degeneration. It is pointed out that pellagra, poliomyelitis, and beri-beri occur, almost exclusively, in geographical areas that have fluoridated soils and water.

It is common knowledge that artificial water fluoridation is a technique in mass control through mass medication, which is an integral part of Communist philosophy. Compulsory artificial fluoridation of public water supplies is unconstitutional in the United States, as it violates the personal freedom and liberty of the individual guaranteed to him by the Constitution and Bill of Rights.