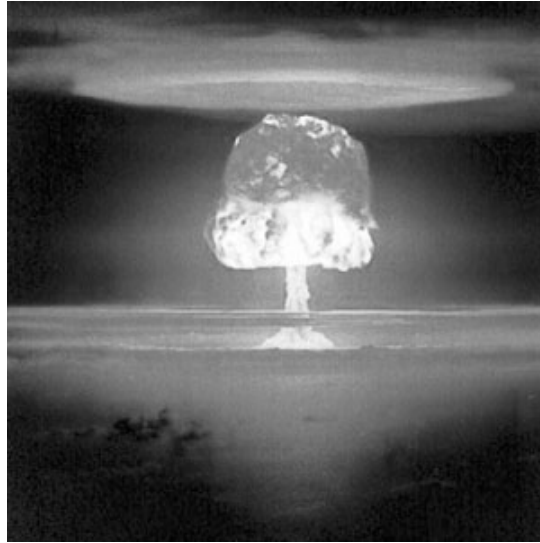


# TOXIC FLUORIDE SECRETS

## Fluoride & the Atomic Bomb Program



**During the ultra-secret Manhattan Project, a report was commissioned to assess the effect of fluoride on humans. That report was classified "secret" for reasons of " (alleged) national security".**

Joel Griffiths and Chris Bryson 1997

**S**ome 50 years after United States authorities began adding fluoride to public water supplies to reduce cavities in children's teeth, recently discovered declassified government documents are shedding new light on the roots of that still-controversial public health measure, **revealing a surprising connection between the use of fluoride and the dawning of the nuclear age.** Today, two-thirds of US public drinking water is fluoridated. **Many municipalities still resist the practice, disbelieving the government's assurances of safety.**

Since the days of World War II when the US prevailed by building the world's first atomic bomb, the nation's public health leaders have maintained that low doses of fluoride are safe for people and good for children's teeth.

That safety verdict should now be re-examined in the light of hundreds of once-secret WWII-era documents obtained by these reporters [authors Griffiths and Bryson], including declassified papers of the Manhattan Project-the ultra-secret US military program that produced the atomic bomb.

**Fluoride** was the key chemical in atomic bomb production, according to the documents. Massive quantities-millions of tons-were essential for the manufacture of bomb-grade uranium and plutonium for nuclear weapons throughout the Cold War. **One of the most toxic chemicals known, fluoride emerged as the leading chemical health hazard of the US atomic bomb program, both for workers and for nearby communities, the documents reveal.**

**Other revelations include:**

€Much of the original proof that fluoride is safe for humans in low doses was generated by A-bomb program scientists who had been secretly ordered to provide "evidence useful in litigation" against defense contractors for fluoride injury to citizens. **The first lawsuits against the American A-bomb program were not over radiation, but over fluoride damage, the documents show.**

Human studies were required. Bomb program researchers played a leading role in the design and implementation of the most extensive US study of the health effects of fluoridating public drinking water, conducted in Newburgh, New York, from 1945 to 1955. Then, in a classified operation code-named "Program F", they secretly gathered and analyzed blood and tissue samples from Newburgh citizens with the cooperation of New York State Health Department personnel.

The original, secret version (obtained by these reporters) of a study published by Program F scientists in the August 1948 Journal of the American Dental Association **shows that evidence of adverse health effects from fluoride was censored by the US Atomic Energy Commission (AEC)**-considered the most powerful of Cold War agencies-for reasons of "national security".

The bomb program's fluoride safety studies were conducted at the University of Rochester-site of one of the most notorious human radiation experiments of the Cold War, in which unsuspecting hospital patients were injected with toxic doses of radioactive plutonium. The fluoride studies were conducted with the same ethical mindset, in which "national security" was paramount.

### **EVIDENCE OF FLUORIDE'S ADVERSE HEALTH EFFECTS**

The US Government's conflict of interest and its motive to prove fluoride safe in the furious debate over water fluoridation since the 1950s has only now been made clear to the general public, let alone to civilian researchers, health professionals and journalists. **The declassified documents resonate with a growing body of scientific evidence and a chorus of questions about the health effects of fluoride in the environment.**

Human exposure to fluoride has mushroomed since World War II, due not only to fluoridated water and toothpaste but to environmental pollution by major industries, from aluminum to pesticides, where fluoride is a critical industrial chemical as well as a waste by-product.

The impact can be seen literally in the smiles of our children. Large numbers (up to 80 per cent in some cities) of **young Americans now have dental fluorosis**, the first visible sign of excessive fluoride exposure according to the US National Research Council. (The signs are whitish flecks or spots, particularly on the front teeth, or dark spots or stripes in more severe cases.)

Less known to the public is that **fluoride also accumulates in bones**. "The teeth are windows to what's happening in the bones," explained Paul Connett, Professor of Chemistry at St Lawrence University, New York, to these reporters. In recent years, pediatric bone specialists have expressed alarm about an increase in stress fractures among young people in the US. Connett and other scientists are concerned that fluoride-linked to bone damage in studies since the 1930s-may be a contributing factor.

The declassified documents add urgency: much of the original 'proof' that low-dose fluoride is safe for children's bones came from US bomb program scientists, according to this investigation.

Now, researchers who have reviewed these declassified documents fear that Cold War national security considerations may have prevented objective scientific evaluation of vital public health questions concerning fluoride.

"Information was buried," concludes Dr Phyllis Mullenix, former head of toxicology at Forsyth Dental Center in Boston and now a critic of fluoridation. Animal studies which Mullenix and co-workers conducted at Forsyth in the early 1990s indicated **that fluoride was a powerful central nervous system (CNS) toxin** and might adversely affect human brain functioning even at low doses.

(New epidemiological evidence from China adds support, showing a **correlation between low-dose fluoride exposure and diminished IQ in children**.) Mullenix's results were published in 1995 in a reputable peer-reviewed scientific journal.<sup>2</sup>

During her investigation, Mullenix was astonished to discover **there had been virtually no previous US studies of fluoride's effects on the human brain**. Then, her application for a grant to continue her CNS research was turned down by the US National Institutes of Health (NIH), when an NIH panel flatly told her that "fluoride does not have central nervous system effects".

Declassified documents of the US atomic bomb program indicate otherwise. A Manhattan Project memorandum of 29 April 1944 states: **"Clinical evidence suggests that uranium hexafluoride may have a rather marked central nervous system effect..."**

It seems most likely that the F [code for fluoride] component rather than the T [code for uranium] is the causative factor." The memo, from a captain in the medical corps, is stamped SECRET and is addressed to Colonel Stafford Warren, head of the Manhattan Project's Medical Section. Colonel Warren is asked to approve a program of animal research on CNS effects. "Since work with these compounds is essential, it will be necessary to know in advance what mental effects may occur after exposure... This is important not only to protect a given individual, but also to prevent a confused workman from injuring others by improperly performing his duties."

On the same day, Colonel Warren approved the CNS research program. This was in 1944, at the height of World War II and the US

nation's race to build the world's first atomic bomb.

For research on fluoride's CNS effects to be approved at such a momentous time, the supporting evidence set forth in the proposal forwarded along with the memo must have been persuasive. The proposal, however, is missing from the files at the US National Archives. "If you find the memos but the document they refer to is missing, it's probably still classified," said Charles Reeves, chief librarian at the Atlanta branch of the US National Archives and Records Administration where the memos were found. Similarly, no results of the Manhattan Project's fluoride CNS research could be found in the files.

After reviewing the memos, Mullenix declared herself "flabbergasted". "How could I be told by NIH that fluoride has no central nervous system effects, when these documents were sitting there all the time?" She reasons that the Manhattan Project did do fluoride CNS studies: "That kind of warning, that fluoride workers might be a danger to the bomb program by improperly performing their duties-I can't imagine that would be ignored."

But she suggests that the results were buried *because of the difficult legal and public relations problems they might create for the government*. In other words, the government could be (should be) charged with murder !!

The author of the 1944 CNS research proposal attached to the 29 April memo was Dr Harold C. Hodge-at the time, chief of fluoride toxicology studies for the University of Rochester division of the Manhattan Project.

Nearly 50 years later at the Forsyth Dental Center in Boston, Dr Mullenix was introduced to a gently ambling elderly man, brought in to serve as a consultant on her CNS research. This man was Harold C. Hodge. By then, Hodge had achieved status emeritus as a world authority on fluoride safety. "But even though he was supposed to be helping me," said Mullenix, "he never once mentioned the CNS work he had done for the Manhattan Project."

The "black hole" in fluoride CNS research since the days of the Manhattan Project is unacceptable to Mullenix who refuses to abandon the issue. **"There is so much fluoride exposure now, and we simply do not know what it is doing. You can't just walk away from this."**

Dr Antonio Noronha, an NIH scientific review advisor familiar with Dr Mullenix's grant request, told us that her proposal was rejected by a scientific peer-review group. He termed her claim of institutional bias against fluoride CNS research "far-fetched". He then added: "We strive very hard at NIH to make sure politics does not enter the picture."

## **THE NEW JERSEY FLUORIDE POLLUTION INCIDENT**

The documentary trail begins at the height of World War II, in 1944, when a severe pollution incident occurred downwind of the E.I. DuPont de Nemours Company chemical factory in Deepwater, New Jersey. The factory was then producing millions of pounds of fluoride for the Manhattan Project whose scientists were racing to produce the world's first atomic bomb.

The farms downwind in Gloucester and Salem counties were famous for their high-quality produce. Their peaches went directly to the Waldorf Astoria Hotel in New York City; their tomatoes were bought up by Campbell's Soup.

But in the summer of 1944 the farmers began reporting that their crops were blighted: "Something is burning up the peach crops around here." They said that poultry died after an all-night thunderstorm, and that farm workers who ate produce they'd picked would sometimes vomit all night and into the next day. "I remember our horses looked sick and were too stiff to work," Mildred Giordano, a teenager at the time, told these reporters. Some cows were so crippled that they could not stand up; they could only graze by crawling on their bellies.

The account was confirmed in taped interviews with Philip Sadtler (shortly before he died), of Sadtler Laboratories of Philadelphia, one of the nation's oldest chemical consulting firms. Sadtler had personally conducted the initial investigation of the damage.

Although the farmers did not know it, the attention of the Manhattan Project and the federal government was riveted on the New Jersey incident, according to once-secret documents obtained by these reporters.

A memo, dated 27 August 1945, from Manhattan Project chief Major-General Leslie R. Groves to the Commanding General of Army Service Forces at the Pentagon, concerns the investigation of crop damage at Lower Penns Neck, New Jersey.

**It states: "At the request of the Secretary of War, the Department of Agriculture has agreed to cooperate in investigating complaints of crop damage attributed...to fumes from a plant operated in connection with the Manhattan Project."**

After the war's end, Dr Harold C. Hodge, the Manhattan Project's chief of fluoride toxicology studies, worriedly wrote in a secret memo (1 March 1946) to his boss, Colonel Stafford L. Warren, chief of the Medical Section, about "problems associated with the question of fluoride contamination of the atmosphere in a certain section of New Jersey".

"There seem to be four distinct (though related) problems:

"1. A question of injury of the peach crop in 1944.

"2. A report of extraordinary fluoride content of vegetables grown in this area.

"3. A report of abnormally high fluoride content in the blood of human individuals residing in this area.

"4. A report raising the question of serious poisoning of horses and cattle in this area."

## **FLUORIDE DAMAGE: THE FIRST LAWSUITS**

The New Jersey farmers waited until the war was over before suing DuPont and the Manhattan Project for fluoride damage-reportedly the first lawsuits against the US atomic bomb program. Although seemingly trivial, the lawsuits shook the government, the secret documents reveal.

Under the personal direction of Major-General Groves, secret meetings were convened in Washington, with compulsory attendance by scores of scientists and officials from the US War Department, the Manhattan Project, the Food and Drug Administration, the Agriculture and Justice departments, the US Army's Chemical Warfare Service and Edgewood Arsenal, the Bureau of Standards, as well as lawyers from DuPont.

Declassified memos of the meetings reveal a secret mobilization of the full forces of the government to defeat the New Jersey farmers.

In a memo (2 May 1946) copied to General Groves, Manhattan Project Lt Colonel Cooper B. Rhodes notes that these agencies "are making scientific investigations to obtain evidence which may be used to protect the interest of the Government at the trial of the suits brought by owners of peach orchards in...New Jersey".

Regarding these lawsuits, General Groves wrote to the Chairman of the Senate Special Committee on Atomic Energy in a memo of 28 February 1946, advising that "the Department of Justice is cooperating in the defense of these suits".

Why the national security emergency over a few lawsuits by New Jersey farmers? In 1946 the United States began full-scale production of atomic bombs. No other nation had yet tested a nuclear weapon, and the A-bomb was seen as crucial for US leadership of the postwar world. The New Jersey fluoride lawsuits were a serious roadblock to that strategy. "The specter of endless lawsuits haunted the military," wrote Lansing Lamont in *Day of Trinity*, his acclaimed book about the first atomic bomb test.<sup>3</sup>

"If the farmers won, it would open the door to further suits which might impede the bomb program's ability to use fluoride," commented Jacqueline Kittrell, a Tennessee public interest lawyer who examined the declassified fluoride documents. (Kittrell specializes in nuclear-related litigation and has represented plaintiffs in several human radiation experiment cases.) "**The reports of human injury were especially threatening because of the potential for enormous settlements-not to mention the PR problem,**" she added.

Indeed, DuPont was particularly concerned about the "possible psychological reaction" to the New Jersey pollution incident, according to a secret Manhattan Project memo of 1 March 1946. Facing a threat from the Food and Drug Administration (FDA) to embargo the region's produce because of "high fluoride content", DuPont dispatched its lawyers to the FDA offices in Washington, DC, where an agitated meeting ensued.

According to a memo sent next day to General Groves, DuPont's lawyer argued that "in view of the pending suits...**any action by the Food and Drug Administration...would have a serious effect on the DuPont Company and would create a bad public relations situation**". After the meeting adjourned, Manhattan Project Captain John Davies approached the FDA's Food Division chief and "impressed upon Dr White the substantial interest which the Government had in claims which might arise as a result of action which might be taken by the Food and Drug Administration".

There was no embargo. Instead, according to General Groves' memo of 27 August 1946, new tests for fluoride in the New Jersey area were to be conducted **not** by the Department of Agriculture **but by the US Army's Chemical Warfare Service (CWS)**-because "work done by the Chemical Warfare Service would carry the greatest weight as evidence if...lawsuits are started by the complainants".

Meanwhile, the public relations problem remained unresolved: local citizens were in a panic about fluoride.

The farmers' spokesman, Willard B. Kille, was personally invited to dine with General Groves (then known as "the man who built the atomic bomb") at his office at the War Department on 26 March 1946. Although diagnosed by his doctor as having fluoride poisoning, Kille departed the luncheon convinced of the government's good faith. Next day he wrote to the general, expressing his wish that the other farmers could have been present so that "they too could come away with the feeling that their interests in this particular matter were being safeguarded by men of the very highest type whose integrity they could not question".

A broader solution to the public relations problem was suggested by Manhattan Project chief fluoride toxicologist Harold C. Hodge in a second secret memo (1 May 1946) to Medical Section chief Colonel Warren: "Would there be any use in making attempts to counteract

the local fear of fluoride on the part of residents of Salem and Gloucester counties through lectures on F toxicology and perhaps the usefulness of F in tooth health?" Such lectures were indeed given, not only to New Jersey citizens but to the rest of the nation throughout the Cold War.

The New Jersey farmers' lawsuits were ultimately stymied by the government's refusal to reveal the key piece of information that would have settled the case: how much fluoride DuPont had vented into the atmosphere during the war. "Disclosure would be injurious to the military security of the United States," Manhattan Project Major C. A. Taney, Jr, had written in a memo soon after the war's end (24 September 1945).

The farmers were pacified with token financial settlements, according to interviews with descendants still living in the area. "All we knew is that DuPont released some chemical that burned up all the peach trees around here," recalled Angelo Giordano whose father James was one of the original plaintiffs. "The trees were no good after that, so we had to give up on the peaches."

Their horses and cows acted and walked stiffly, recalled his sister Mildred. "Could any of that have been the fluoride?" she asked. (The symptoms she detailed are cardinal signs of fluoride toxicity, according to veterinary toxicologists.)

**The Giordano family has also been plagued by bone and joint problems**, Mildred added. Recalling the settlement received by the family, Angelo Giordano told these reporters that his father said he "got about \$200".

The farmers were stonewalled in their search for information about fluoride's effects on their health, and their complaints have long since been forgotten. But they unknowingly left their imprint on history: their complaints of injury to their health reverberated through the corridors of power in Washington and triggered intensive, secret, bomb program research on the health effects of fluoride.

## **"PROGRAM F": SECRET FLUORIDE RESEARCH**

A secret memo (2 May 1946) to General Groves from Manhattan Project Lt Colonel Rhodes states: "Because of complaints that animals and humans have been injured by hydrogen fluoride fumes in [the New Jersey] area, although there are no pending suits involving such claims, the University of Rochester is conducting experiments to determine the toxic effect of fluoride."

Much of the proof of fluoride's alleged safety in low doses rests on the postwar work done at the University of Rochester in anticipation of lawsuits against the bomb program for human injury.

For the top-secret Manhattan Project to delegate fluoride safety studies to the University of Rochester was not surprising. During WWII the US Federal Government became involved for the first time in large-scale funding of scientific research at government-owned labs and private colleges. Those early spending priorities were shaped by the nation's often-secret military needs.

The prestigious upstate New York college in particular had housed a key wartime division of the Manhattan Project to study the health effects of the new "special materials" such as uranium, plutonium, beryllium and fluoride which were being used in making the atomic bomb. That work continued after the war, with millions of dollars flowing from the Manhattan Project and its successor organization, the Atomic Energy Commission (AEC). (Indeed, the bomb left an indelible imprint on all of US science in the late 1940s and 1950s. Up to 90 per cent of all federal funds for university research came from either the Department of Defense or the AEC in this period, according to Noam Chomsky in his 1997 book, *The Cold War and the University*.<sup>4</sup>)

The University of Rochester Medical School became a revolving door for senior bomb-program scientists. The postwar faculty included Stafford Warren, the top medical officer of the Manhattan Project, and Harold C. Hodge, chief of fluoride research for the bomb program.

But this marriage of military secrecy and medical science bore deformed offspring. The University of Rochester's classified fluoride studies, code-named "Program F", were started during the war and continued up until the early 1950s.

They were conducted at its Atomic Energy Project (AEP), a top-secret facility funded by the AEC and housed at Strong Memorial Hospital. It was there that one of the most notorious human radiation experiments of the Cold War took place, in which unsuspecting hospital patients were injected with toxic doses of radioactive plutonium. Revelation of this experiment—in a Pulitzer Prize-winning account by Eileen Welsome—led to a 1995 US presidential investigation and a multimillion-dollar cash settlement for victims.

Program F was not about children's teeth. **It grew directly out of litigation against the bomb program**, and its main purpose was to furnish scientific ammunition which the government and its nuclear contractors could use to defeat lawsuits for human injury. Program F's director was none other than Dr Harold C. Hodge— who led the Manhattan Project investigation of alleged human injury in the New Jersey fluoride pollution incident.

Program F's purpose is spelled out in a classified 1948 report. It reads: "To supply evidence useful in the litigation arising from an alleged loss of a fruit crop several years ago, a number of problems have been opened. Since excessive blood-fluoride levels were reported in

human residents of the same area, our principal effort has been devoted to describing the relationship of blood fluorides to toxic effects."

The litigation referred to and the claims of human injury were of course against the bomb program and its contractors. Thus the purpose of Program F was to obtain evidence useful in litigation against the bomb program. The research was being conducted by the defendants.

**The potential conflict of interest is clear.** If lower dose ranges were found hazardous by Program F, this might have opened the bomb program and its contractors to public outcry and lawsuits for injury to human health.

Lawyer Jacqueline Kittrell commented further: "This and other documents indicate that the University of Rochester's fluoride research grew out of the New Jersey lawsuits and was performed in anticipation of lawsuits against the bomb program for human injury. Studies undertaken for litigation purposes by the defendants would not be considered scientifically acceptable today because of their inherent bias to prove the chemical safe."

Unfortunately, much of the proof of fluoride's safety rests on the work performed by Program F scientists at the University of Rochester. During the postwar period, that university emerged as the leading academic centre for establishing the safety of fluoride as well as its effectiveness in reducing tooth decay, according to Rochester Dental School spokesperson William H. Bowen, MD. The key figure in this research, Bowen said, **was Dr Harold C. Hodge-who also became a leading national proponent of fluoridating public drinking water.**

## **THE A-BOMB AND WATER FLUORIDATION**

Program F's interest in water fluoridation was not just "to counteract the local fear of fluoride on the part of residents", as Hodge had earlier written to Colonel Warren. The bomb program required human studies of fluoride's effects, just as it needed human studies of plutonium's effects. Adding fluoride to public water supplies provided one opportunity.

Bomb-program scientists played a prominent, if unpublicized, role in the nation's first-planned water fluoridation experiment in Newburgh, New York. The Newburgh Demonstration Project is considered the most extensive study of the health effects of fluoridation, supplying much of the evidence that low doses are allegedly safe for children's bones and good for their teeth.

Planning began in 1943 with the appointment of a special New York State Health Department committee to study the advisability of adding fluoride to Newburgh's drinking water. The chairman of the committee was, again, Dr Harold C. Hodge, then chief of fluoride toxicity studies for the Manhattan Project. Subsequent members of the committee included Henry L. Barnett, a captain in the Project's Medical Section, and John W. Fertig, in 1944 with the Office of Scientific Research and Development-the super-secret Pentagon group which sired the Manhattan Project.

Their military affiliations were kept secret. Hodge was described as a pharmacologist, Barnett as a pediatrician. Placed in charge of the Newburgh project was David B. Ast, chief dental officer of the New York State Health Department. Ast had participated in a key secret wartime conference on fluoride, held by the Manhattan Project in January 1944, and later worked with Dr Hodge on the Project's investigation of human injury in the New Jersey incident, according to once-secret memos.

The committee recommended that Newburgh be fluoridated. It selected the types of medical studies to be done, and it also "provided expert guidance" for the duration of the experiment.

The key question to be answered was: "Are there any cumulative effects, beneficial or otherwise, on tissues and organs other than the teeth, of long-continued ingestion of such small concentrations?" According to the declassified documents, this was also key information sought by the bomb program. In fact, the program would require "long-continued" exposure of workers and communities to fluoride throughout the Cold War.

In May 1945, Newburgh's water was fluoridated, and over the next 10 years its residents were studied by the New York State Health Department, in tandem, Program F conducted its own secret studies, focusing on the amounts of fluoride Newburgh citizens retained in their blood and tissues-information called for by the bomb program in connection with litigation.

**"Possible toxic effects of fluoride were in the forefront of consideration,"** the advisory committee stated. Health department personnel cooperated, shipping blood and placenta samples to the Program F team at the University of Rochester. The samples were collected by Dr David B. Overton, the department's chief of pediatric studies at Newburgh.

The final report of the Newburgh Demonstration Project, published in 1956 in the Journal of the American Dental Association,<sup>5</sup> concluded that "small concentrations" of fluoride were safe for US citizens. The biological proof, "based on work performed...at the University of Rochester Atomic Energy Project", was delivered by Dr Hodge.

Today, news that scientists from the A-bomb program secretly shaped and guided the Newburgh fluoridation experiment and studied the citizens' blood and tissue samples is greeted with incredulity.

"I'm shocked...beyond words," said reporter Mayor Audrey Carey, commenting on these reporters' findings. "It reminds me of the Tuskegee experiment that was done on syphilis patients down in Alabama."

As a child in the early 1950s, Mayor Carey was taken to the old Newburgh firehouse on Broadway which housed the public health clinic. There, doctors from the Newburgh fluoridation project studied her teeth, and a peculiar fusion of two fingerbones on her left hand which she's had since birth. (Carey said that her granddaughter has white dental-fluorosis marks on her front teeth.)

Mayor Carey wants answers from the government about the secret history of fluoride and the Newburgh fluoridation experiment. "I absolutely want to pursue it," she said. "It is appalling to do any kind of experimentation and study without people's knowledge and permission."

When contacted by these reporters, the now 95-year-old David B. Ast, former director of the Newburgh experiment, said he was unaware that Manhattan Project scientists were involved. "If I had known, I would have been certainly investigating why, and what the connection was," he said. Did he know that blood and placenta samples from Newburgh were being sent to bomb-program researchers at the University of Rochester? "I was not aware of it," Ast replied. Did he recall participating in the Manhattan Project's secret wartime conference on fluoride in January 1944, or going to New Jersey with Dr Hodge to investigate human injury in the DuPont case, as secret memos state? He told these reporters he had no recollection of any such events.

Bob Loeb, a spokesperson for the University of Rochester Medical Center, confirmed that blood and tissue samples from Newburgh had been tested by the University's Dr Hodge. On the ethics of secretly studying US citizens to obtain information useful in litigation against the A-bomb program, he said: "That's a question we cannot answer." He referred inquiries to the US Department of Energy (DOE), successor to the Atomic Energy Commission.

Jayne Brady, a spokesperson for the Department of Energy in Washington confirmed that a review of DOE files indicated that a "significant reason" for fluoride experiments conducted at the University of Rochester after the war was "impending litigation between the DuPont company and residents of New Jersey areas". However, she added: "DOE has found no documents to indicate that fluoride research was done to protect the Manhattan Project or its contractors from lawsuits."

On Manhattan Project involvement in Newburgh, Brady stated: "Nothing that we have suggests that the DOE or predecessor agencies- especially the Manhattan Project-authorized fluoride experiments to be performed on children in the 1940s."

When told that these reporters have several documents that directly tie the AEP-the Manhattan Project's successor agency at the University of Rochester-to the Newburgh experiment, DOE spokesperson Brady later conceded her study was confined to "the available universe" of documents.

Two days later, Brady faxed a statement for clarification. "My search only involved the documents that we collected as part of our human radiation experiments project; fluoride was not part of our research effort."

"Most significantly," the statement continued, "relevant documents may be in a classified collection at the DOE Oak Ridge National Laboratory, known as the Records Holding Task Group.

This collection consists entirely of classified documents removed from other files for the purpose of classified document accountability many years ago [and was] a rich source of documents for the human radiation experiments projects."

## **SUPPRESSION OF ADVERSE HEALTH FINDINGS**

The crucial question arising from the investigation is whether adverse health findings from Newburgh and other bomb-program fluoride studies were suppressed. All AEC-funded studies had to be declassified before publication in civilian medical and dental journals. Where are the original classified versions?

The transcript of one of the major secret scientific conferences of World War II-on "fluoride metabolism"-is missing from the files of the US National Archives and is "probably still classified", according to the librarian. Participants in the January 1944 conference included key figures who promoted the safety of fluoride and water fluoridation to the public after the war: Harold Hodge of the Manhattan Project, David B. Ast of the Newburgh Demonstration Project, and US Public Health Service dentist H. Trendley Dean, popularly known as "the father of fluoridation".

A WWII Manhattan Project classified report (25 July 1944) **on water fluoridation is missing from the files of the University of Rochester Atomic Energy Project, the US National Archives**, and the Nuclear Repository at the University of Tennessee, Knoxville. The next four numerically consecutive documents are also missing, while the remainder of the "M-1500 series" is present.

"Either those documents are still classified, **or they've been 'disappeared' by the government**," said Clifford Honicker, Executive Director of the American Environmental Health Studies Project in Knoxville, Tennessee, which provided key evidence in the public

exposure and prosecution of US human radiation experiments.

Seven pages have been cut out of a 1947 Rochester bomb project notebook entitled "DuPont Litigation". "Most unusual," commented the medical school's chief archivist, Chris Hoolihan.

Similarly, Freedom of Information Act (FOIA) requests lodged by these reporters over a year ago with the DOE for hundreds of classified fluoride reports have failed to dislodge any. "We're behind," explained Amy Rothrock, chief FOIA officer at Oak Ridge National Laboratories.

So, has information been suppressed? These reporters made what appears to be the first discovery of the original classified version of a fluoride safety study by bomb program scientists.

A censored version of this study was later published in the August 1948 Journal of the American Dental Association.<sup>6</sup> Comparison of the secret version with the published version indicates that the US AEC did censor damaging information on fluoride-to the point of tragicomedy. This was a study of the dental and physical health of workers in a factory producing fluoride for the A-bomb program; it was conducted by a team of dentists from the Manhattan Project.

**The secret version** reports that most of the men had no teeth left. The published version reports only that the men had fewer cavities. **The secret version** says the men had to wear rubber boots because the fluoride fumes disintegrated the nails in their shoes. The published version does not mention this.

**The secret version** says the fluoride may have acted similarly on the men's teeth, contributing to their toothlessness. The published version omits this statement and concludes that "the men were unusually healthy, judged from both a medical and dental point of view".

After comparing the secret and published versions of the censored study, toxicologist Phyllis Mullenix commented: "This makes me ashamed to be a scientist." Of other Cold War-era fluoride safety studies, she asked: "Were they all done like this?"

Asked for comment on the early links of the Manhattan Project to water fluoridation, Dr Harold Slavkin, Director of the National Institute for Dental Research-the US agency which today funds fluoride research-said: "I wasn't aware of any input from the Atomic Energy Commission." Nevertheless, he insisted that fluoride's efficacy and safety in the prevention of dental cavities over the last 50 years is well proved. "The motivation of a scientist is often different from the outcome," he reflected. "I do not hold a prejudice about where the knowledge comes from."

---

REFERENCE SET:

## THE THYROID & FLUORIDE

[Part 1: A to L](#)

[Part 2: M to Z](#)

**All fluoride compounds - inorganic and organic - affect thyroid hormone function.**

© PFPC 2000

Here are several hundred studies showing this in great detail, with links to a few thousand more. Included are studies on the effects of fluoride on hormone transport, inhibition of hormone synthesis, G protein activation, fluorosis and goiter, fluoride concentration in the thyroid gland, thyroid cancer, fluoride as TSH agonist, fluoride-iodine antagonism, I131 uptake, etc..

For a summary, click [here](#).

Ahn CS, Rosenberg IN - "Iodine metabolism in thyroid slices - effects of TSH, dibutyryl cyclic 3',5'-AMP, NaF and prostaglandin E1" Endocrinology 86(2):396-405 (1970)

**(Fluoride = TSH)**

Amir S, Menezes-Ferreira M, Shimohigashi Y, Chen HC, Nisula B, Weintraub BD - "Activities of deglycosylated thyrotropin at the thyroid membrane receptor-adenylate cyclase system" J Endocrinol Invest 8(6):537-41 (1985) [MEDLINE](#)

**(HF deglycosylates TSH)**

Amir SM, Kubota K, Tramontano D, Ingbar SH, Keutmann HT - "The carbohydrate moiety of bovine thyrotropin is essential for full bioactivity but not for receptor recognition" Endocrinology 120(1):345-52 (1987) [MEDLINE](#)

**(HF deglycosylates TSH)**

Anbar M, Guttman S, Lewitus Z - "Effect of monofluorosulphanate, difluorophosphate, and F borate ions on the iodine uptake of the thyroid gland" Nature 183:1517 (1959)

**(monofluorosulfonate, difluorophosphate inhibit iodine transport)**

Anbar M, Guttman S, Lewitus Z- "The accumulation of fluoroborate ions in thyroid glands of rats" *Endocrinology* 66:888 (1960)

**(-> fluoroborate concentrates in thyroid gland, inhibits iodide transport)**

Anbar M, Inbar M - "The application of F18 labelled fluoroborate ions to problems in thyroid physiology" Israel Atomic Energy Com. Report IA-754 (1962)

Arellano M, Malet-Martino M, Martino R, Gires P - "The anti-cancer drug 5-fluorouracil is metabolized by the isolated perfused rat liver and in rats into highly toxic fluoroacetate" *Br J Cancer* 7(1):79-86 (1998) [MEDLINE](#)

Auskaps AM, Shaw JH - "Hemoglobin concentration, thyroid weight and growth rate in rats during minimum fluoride ingestion" *J Nutr* 55:611-621 (1955)

Ayelli Edgar V, Genaro AM, Cremaschi GA, Sterin Borda L - "Fluoxetine action upon human T lymphocyte proliferation" *Acta Physiol Pharmacol Ther Latinoam* 48(4):191-7 (1998) [MEDLINE](#)

**(Prozac)**

Bachinskii PP, Gutsalenko OA, Naryzhniuk ND, Sidora VD, Shliakhta AI - "Action of the body fluorine of healthy persons and thyroidopathy patients on the function of hypophyseal-thyroid the system" *Probl Endokrinol (Mosk)* 31(6):25-9 (1985) [MEDLINE](#)

**(-> reduced T3, increased TSH and I 131 uptake)**

Balabolkin MI, Mikhaillets ND, Lobovskaia RN, Chernousova NV - "The interrelationship of the thyroid and immune statuses of workers with long-term fluorine exposure" *Ter Arkh* 67(1):41-2(1995) [MEDLINE](#)

Ballicu P, Floris M, Frongia L - "Fluoride poisoning and thyroid function" *Minerva Stomatol* 5(1):1-5 (1966)

Bartholmes P, Senkel H, Spranger H - "Inhibition of glycolytic enzymes by fluoride ions" *Dtsch Zahnarzt Z* 42(10):916-9 (1987)

Banovac K, De Forteza R - "The effect of mast cell chymase on extracellular matrix: studies in autoimmune thyroiditis and in cultured thyroid cells" *Int Arch Allergy Immunol* 99(1):141-9 (1992) [MEDLINE](#)

Baume LJ, Becks H - "Hormonal Control of Tooth Eruption" Part I, *J Dent Res* 33:80-103 (1954)

Baume LJ, Becks H - "Hormonal Control of Tooth Eruption" Part III, *J Dent Res* 33:104-114 (1954)

Baumgartner A, Dubeyko M, Campos-Barros A, Eravci M, Meinhold H - "Subchronic administration of fluoxetine to rats affects triiodothyronine production and deiodination in regions of the cortex and in the limbic forebrain" *Brain Res* 635(1-2):68-74 (1994) [MEDLINE](#)

**(Prozac)**

Bech K, Madsen SN - "Human thyroid adenylate cyclase in non-toxic goitre: sensitivity to TSH, fluoride and thyroid stimulating immunoglobulins" *Clin Endocrinol (Oxf)* 8(6):457-66 (1978)

Beex L, Ross A, Smals P, Kloppenborg P - "5-Fluorouracil-induced increase of total thyroxine and triiodothyronine" *Cancer Treat Rep* 61:1291-1295 (1977) [MEDLINE](#)

**(Fluoride increases thyroglobulin (TBG) concentration-> Total T4 increased)**

Beex LV, Ross A, Smals AG, Kloppenborg PW - "Letter: 5-fluorouracil and the thyroid" *Lancet* (7964):866-7 (1976)

Benagiano A, Colasanti A, De Simone G - "Studio della funzionalita tiroidea in soggetti residenti in zone fluorotiche" *Ann Stomatol* 1:513 (1959)

Benagiano, A - "The effect of sodium fluoride on thyroid enzymes and basal metabolism of the rat" *Ann Di Stomatol* 14:601-619 (1965)

Benagiano A, Fiorentini S - "Ricerca sperimentali e cliniche sui rapporti tra fluore e tirodi" *Annali di Stomatol* 4:3-16(1955)

**"Fluorine can produce considerable functional and anatomic changes in the thyroid under the following conditions:**

1. its action must be prolonged for a period of time inversely proportional to the administered dose
2. the further this dose is from the toxic level, the longer will it take for the anatomic-functional manifestations of the thyroid to appear.
3. when the doses are minimal there is a variable period of latency before the setting up of the thyroid changes
4. at an early period these changes manifest themselves by an increased function of the thyroid and an altered thyroid-hypophyseal balance; later by a parenchymatous hypertrophy which leads to a hypofunction of the thyroid, and finally by a strumiform degeneration of the gland"

Berman MI, Thomas CG Jr, Manjunath P, Sairam MR, Nayfeh SN - "The role of the carbohydrate moiety in thyrotropin action" *Biochem Biophys Res Commun*

133(2):680-7 (1985) [MEDLINE](#)

**(HF - deglycosylates TSH)**

Berry MN, Gregory RB, Grivell AR, Henly DC, Phillips JW, Wallace PG, Welch GR - "Evidence that stimulation of gluconeogenesis by fatty acid is mediated through thermodynamic mechanisms." FEBS Lett 231(1):19-24 (1988) [MEDLINE](#)

Bian J, Ye P, Xian S, Ji Q - "Accumulation and excretion of fluorine and effect of selenium on them in rats with chronic fluorosis" Wei Sheng Yen Chiu 26(4):233-8 (1997)[MEDLINE](#)

**(antagonism fluoride - selenium. In China it is well-established that fluoride causes selenium deficiency!)**

Bircher E - Z Exper Path u. Ther 11:1 (1911); cited in: Kraft K - "Beiträge zur Biochemie des Fluors I. Über den Antagonismus zwischen Fluor und Thyroxin." Hoppe-Seglers Z. Physiol. Chem 245:58 -65 (1937)

Bobek S, Kahl S, Ewy Z - "Effect Of Long Term Fluoride Administration on Thyroid Hormone Levels In Rats" Endocrinol Exp (Bratisl)10:289-295 (1976)[MEDLINE](#)

**"The effect of 2 months fluoride administration (0.1 and 1.0 mg daily/rat) on thyroxine and triiodothyronine level in blood and T3-resin uptake ratio was investigated in rats. In addition, free thyroxine index was calculated from serum thyroxine level and T3-resin uptake ratio. It was found that fluoride administration caused:**

1. **decrease in thyroxine and triiodothyronine level in plasma**
2. **decrease in free thyroxine index values**
3. **Increase in T3-resin uptake ratio.**

Bollen M, Stalmans W - "Fluorine compounds inhibit the conversion of active type-1 protein phosphatases into the ATPMg-dependent form" Biochem J 255(1):327-33 (1988) [MEDLINE](#)

- **"The effectiveness of the proteinase inhibitor was not due to production of free fluoride...With the catalytic subunit a half-maximal effect of either fluorine compound was obtained at 25-50 microm". - > 0.47-0.95mg/l... The use of analogues of PMSF showed that the fluorine atom was essential..."**

(see also: Brtko et al, below)

Brown OA, Sosa YE, Bolognani F, Goya RG - "Thymulin stimulates prolactin and thyrotropin release in an age-related manner" Mech Ageing Dev 104(3):249-62 (1998) [MEDLINE](#)

**"...The cAMP enhancers, caffeine, NaF and forskolin, significantly increased the thymulin-stimulated release of PRL and TSH".**

Brtko J, Knopp J, Baker ME - "Inhibition of 3,5,3'-triiodothyronine binding to its receptor in rat liver by protease inhibitors and substrates" Mol Cell Endocrinol 93(1):81-6 (1993) [MEDLINE](#)

**(PMSF inhibits T3 binding to its receptor in the liver by acting as protease inhibitor)**

SEE: [PROTEASE INHIBITOR FLUORIDE \(1240+ studies\)](#)

see also: PMSF/PFOS

Budde R, Gunther M, Schaefer HE, Fischer R - "Cytochemical investigations of phagocytes in thyroid gland cysts" Anal Quant Cytol 4(1):25-32 (1982)

Bumgarner JR, Ramkumar V, Stiles GL - "Altered thyroid status regulates the adipocyte A1 adenosine receptor-adenylate cyclase system" Life Sci 44(22):1705-12 (1989) [MEDLINE](#)

Burke G - "Comparison of thyrotropin and sodium fluoride effects on thyroid adenylyl cyclase" Endocrinology 86(2):346-52 (1970)

Burke G - "Effects of thyrotropin, sodium fluoride and ions on thyroid slice metabolism" Metabolism 9(1):35-42(1970)

Burkov T - "Changes in the P32 and I-131 deposit in animals under the effect of water with various fluorine content" Nauchni Tr Nauchnoizled Stomatol Inst (Sofia) 12:7-16 (1969)

Burkov T - "Changes in the inclusion of C14-carbonate into mineralized tissues and radioiodine into the thyroid gland of the rat under the influence of sodium fluoride" Stomatologiia (Mosk) 47(5):1-5 (1968)

Call RA, et al. - "Histological And Chemical Studies In Man On Effects Of Fluoride", Public Health Reports, Vol.80, No.6, pp 529-538 (1965)

**(F- concentrated in thyroid gland)**

Casterra H - "Erfahrungen mit einem neuen organischen Fluorpräparat bei Hyperthyreosen" Das Deutsche Gesundheitswesen 2(22):704-705 (1947)

**(describes use of Knoll's "K 17" - later named Capacin - in his successful treatment of over 500 hyperthyroid patients. K 17 => 3-fluoro-4-hydroxyphenylacetic acid)**

Chaneles J - "Action de l'iode sur la fluorose chronique" Compt Rend Soc Biol (Paris) 102:863 (1929)

Chang CY, Phillips PH, Hart EB, Bohstedt G - "The effect of feeding raw rock phosphate on the fluorine content of the organs and tissues of dairy cows" J Dairy Sci 17:695-700 (1934)

**(F- concentrated in thyroid gland)**

Chinoy NJ, Narayana MV - "Studies On Fluorosis In Mehsana District Of North Gujarat" Proc Zool Soc , Calcutta 45(2):157-161 (1992)

Chinoy NJ, Narayana MV, Sequeria E, Joshi SM, Barot JM, Purohit RM, Parikh DJ, Ghodasara NB - "Studies On Effects Of Fluoride In 36 Villages" Fluoride 25, No.3 (1992)

Chinoy NJ, Barot VV, Mathews M, Barot JM, Purohit RM, Ghodasara NG, Parikh DJ - "Fluoride Toxicity Studies In Mehsana District, North Gujarat" Jour Environ Biol, 15(3):163-170(1994)

Data also in:

- Gupta SK, Deshpande RD - "Project Report: Depleting Groundwater Levels and Increasing Fluoride Concentration in Villages of Mehsana District, Gujarat, India: Cost to Economy and Health", Habitat and Environment Committee (HEC) of the Habitat International Coalition (HIC) S/C Enda TM/Rup-BP, 3370 Dakar-Senegal (1998)  
[http://www.globenet.org/preceup/pages/ang/chapitre/capi\\_tali/cas/indmehs.htm](http://www.globenet.org/preceup/pages/ang/chapitre/capi_tali/cas/indmehs.htm)

Chinoy NJ, Barot VV, Mathews M, Barot JM, Purohit RM, Ghodasara NG, Parikh DJ - "Fluoride toxicity studies in Mehsana District, North Gujarat" Jour Environ Biol 15(3):163-170 (1994)

*Chinoy et al. reported in their studies on effect of fluoride in 36 villages of Mehsana district, North Gujarat that, the concentration of sialic acid was decreased significantly ( $P < 0.01$ ) in the fluorotic population as compared to control population. Sialic acid concentration is now a marker for detection of fluorosis. This is another obvious sign of impaired thyroid hormone activity as it has been clearly shown that thyroid hormones regulate prostatic glycoprotein metabolism.*

- see: Maran RR, Senthilkumaran B, Udhayakumar RC, Arunakaran J, Aruldas MM - "Thyroidectomy modulates rat prostatic monosaccharides" Int J Androl 23(3):156-62 (2000) [MEDLINE](#)
- van den Hove MF, Beckers C, Devlieger H, de Zegher F, De Nayer P - "Hormone synthesis and storage in the thyroid of human preterm and term newborns: effect of thyroxine treatment" Biochimie 81(5):563-70 (1999) [MEDLINE](#)

*The thyroid hormone disturbance becomes obvious when one looks at the thyroid hormone values:*

Thyroid hormones	Control	Fluorosis patients
T3	0.7 - 2	0.3 - 1.5
T4	5.4 - 13.5	9.4 - 11.5
TSH	0.2 - 5	0.3 - 2

Clark OH, Gerend PL - "Thyrotropin regulation of adenylate cyclase activity in human thyroid neoplasms" Surgery 97(5):539-46 (1985) [MEDLINE](#)

***(Fluoride promotes thyroid cancer growth...low versus high doses)***

Cnubben NH, Soffers EM, Peters MA, Vervoort J, Rietjens IM - "Influence of the halogen-substituent pattern of fluoronitrobenzenes on their biotransformation and capacity to induce methemoglobinemia" Toxicol Appl Pharmacol 139(1):71-83 (1996)

Condorelli G, Formisano P, Miele C, Beguinot F - "Thyrotropin regulates autophosphorylation and kinase activity in both the insulin and the insulin-like growth factor-I receptors in FRTL5 cells" Endocrinology 130(3):1615-25(1992) [MEDLINE](#)

***(TSH & IGF 1...also see [Soy Formula](#), and [IGF-1](#))***

Corvilain B, Laurent E, Lecomte M, Vansande J, Dumont JE - "Role of the cyclic adenosine 3',5'-monophosphate and the phosphatidylinositol-Ca<sup>2+</sup> cascades in mediating the effects of thyrotropin and iodide on hormone synthesis and secretion in human thyroid slices" J Clin Endocrinol Metab 79(1):152-9 (1994) [MEDLINE](#)

Cristiani H - "Alteration de la glande thyroïde dans l'intoxication fluoree" Compt Rend Soc Biol 103:554-556 (1930)

Curti JT et al. - "Influence of 5-fluorouracil on thyroid function" Proc Soc Exp Biol Med 125(4):1125-6 (1967)

Dacremont G, De Baets M, Kaufman JM, Elewaut A, Vermeulen A - "Inhibition of adenylate cyclase activity of human thyroid membranes by gangliosides" Biochim Biophys Acta 770(2):142-7 (1984) [MEDLINE](#)

Day TK, Powell-Jackson PR - "Fluoride, Water Hardness, and Endemic Goitre" Lancet 1:1135-1138 (1972)

***[A study on 648 people in 13 mountainous regions in Nepal where the iodine content in the water was low found a close relationship between fluoride intake and the incidence of goiter. Goitre prevalence was much higher when drinking water was "fluorine-rich" than when it was "fluorine-poor"]***

Delemer B, Dib K, Saunier B, Haye B, Jacquemin C, Correze C - "Alteration of the functional activity of Gs protein in thyrotropin-desensitized pig thyroid cells." Mol Cell Endocrinol 75(2):123-31 (1991) [MEDLINE](#)

Delemer B, Dib K, Patey M, Jacquemin C, Correze C - "Modification of the amounts of G proteins and of the activity of adenylate cyclase in human benign thyroid tumours" Endocrinol 132(3):477-85 (1992) [MEDLINE](#)

***(Thyroid cancer)***

de Menidoza D, Farias RN - "Effect of cold exposure on rat erythrocyte membrane-bound acetylcholinesterase. Role of thyrotropin in the thyroid hormones interplay." J Biol Chem 253(17):6249-54 (1978) [MEDLINE](#)

Desai VK, Solanki DM, Bansal RK "Epidemiological study of goitre in endemic fluorosis district of Gujarat" Fluoride 26(3):187-190 (1993)

- **"Soft tissue fluoride toxicity is well established. Several animal and human studies of the effect of fluoride on the thyroid**

gland have shown conflicting results. Endemic fluorosis and goitre are widespread in India with considerable overlapping in different geographical zones. We examined 22,276 individuals for presence of goitre and dental fluorosis and estimated the fluoride and iodine content of their drinking water. Overall goitre and dental fluorosis prevalences were 14.0% and 12.2%, respectively, and were significantly and positively correlated. No significant relationship was observed between water iodine level and goitre. In the study area only 0.3% of cases were visible goitre (Grade-II and above) and all goitre cases were euthyroid. This suggests that fluoride-induced goitres are brought about by anatomical or structural changes rather than functional changes."

Dodd DE, Leahy HF, Feldmann ML, English JH, Vinegar A - "Reproductive Toxicity Screen of Trifluoroiodomethane (CF<sub>3</sub>I) in Sprague-Dawley Rats" *Inhal Toxicol* 11(11):1041-1055 (1999)

***(->concentration-related increases in TSH, T(4), and rT(3). T(3) levels decreased)***

Dolci G, D'Angelo G, D'Antonio A - "Considerazioni su alcuni casi di disfunzione tiroidea in individui abitanti in zona altamente fluorotica" *Ann Stomatol* 24:273-276 (1966)

***(Prevalent dental fluorosis AND increased goitre rate in fluoridated Italian villages)***

Domagk GF - "Experiments on the inhibition of glycolytic enzymes by diisopropylfluorophosphate" *Hoppe Seylers Z Physiol Chem.* 348(4):381-4 (1967)

Domzalska E - "Influence of sodium fluoride on hypophysis, thyroid gland, parathyroid, and adrenal gland in the white rat" *Czas Stomatol* 19(8):839-44 (1966)

Domzalska E - "Effect of sodium fluoride on endocrine glands in the white rat" *Ann Acad Med Stetin* 11:237-57 (1965)

Dugad LB, Gerig JT - "NMR studies of carbonic anhydrase-4-fluorobenzenesulfonamide complexes" *Biochemistry* 27(12):4310-6 (1988)[MEDLINE](#)

Dugad LB, Cooley CR, Gerig JT - "NMR studies of carbonic anhydrase-fluorinated benzenesulfonamide complexes" *Biochemistry* 28(9):3955-60 (1989)[MEDLINE](#)

Eravci M, Pinna G, Meinhold H, Baumgartner A - "Effects of pharmacological and nonpharmacological treatments on thyroid hormone metabolism and concentrations in rat brain" *Endocrinology* 141(3):1027-40 (2000)[MEDLINE](#)

Esteban L, Rigalli A, Puche RC - "Metabolism of the complex monofluorophosphate-alpha 2-macroglobulin in the rat" *Medicina (B Aires)* 59(2):151-6 (1999) [MEDLINE](#)

Euler H, Eichler O, Hindemith H - "Über die Wirkung einiger organischer Fluoride bei chronischer Darreichung" *Arch exp. Path u Pharmacol.* Bd.206:75-82 (1949), also cited in: Steyn DG - The problem of dental caries and the fluoridation of public water supplies - Johannesburg (1958)

***(All organic compounds inhibit thyroid function, all compounds act on liver - activity only differentiated by amplitude)***

Evans RJ, Philipps PH - "The fluorine content of the thyroid gland in cases of hyperthyroidism" *J Am Med Assoc* 111:300-302 (1938)

Eravci M, Pinna G, Meinhold H, Baumgartner A - "Effects of pharmacological and nonpharmacological treatments on thyroid hormone metabolism and concentrations in rat brain" *Endocrinology* 141(3):1027-40 (2000) [MEDLINE](#)

Felt V, Nedvidkova J, Hynie S, Mosinger B, Vavrinkova M - "Effect of thyrotoxicosis on adrenergic receptors, cyclic adenosine monophosphate, glycogen and enzymes of the myocardium" *Z Gesamte Inn Med* 35(10):395-400 (1980)[MEDLINE](#)

Faenzi C - "Effect of sodium fluoride on the enzymatic activity of the thyroid and on the basal metabolism of the rat" *Ann Stomatol (Roma)* 14(8):601-19 (1965)

Frada G, Mentessana G, Guajana U - "On the behaviour of thyroid function in subjects with hydrofluorosis in an endemic center in Sicily" *Minerva Med* 60(13):545-9 (1969)

Fradkin JE, Cook GH, Kilhoffer MC, Wolff J - "Forskolin stimulation of thyroid adenylate cyclase and cyclic 3',5'-adenosine monophosphate accumulation" *Endocrinology* 111(3):849-56 (1982)[MEDLINE](#)

Galletti PM, Joyet G - "Effect of fluoride on thyroidal iodine metabolism in hyperthyroidism" *J Clin Endocrinol* 18:1102-1110 (1958)

Galetti P, Held HR, Korrodi H, Wegmann T - "Etude expérimentale de l'antagonisme iode-fluor chez l'homme" *Rev Suisse Odont* 65:753 (1955)

Galetti P, Joyet G, Jallut O - "Effets du fluorure sodium sur la fonction thyroïdienne dans la maladie de Basedow" Helvet Med Acta 24:209 (1957)

Garren L, Greep R - "Effects of thyroid hormones and propylthiouracil on eruption rate of upper incisor teeth in rats" Proc Soc Exp Biol Med 90:652-655 (1955)

Gaur DR, Sood AK, Gupta VP - "Goitre in school girls of the Mewat area of Haryana" Indian Pediatr 26(3):223-7 (1989) [MEDLINE](#)

Gautier - Bull Soc Chim 13:909 (1913), cited in: Kraft K - "Beiträge zur Biochemie des Fluors I. Über den Antagonismus zwischen Fluor und Thyroxin." Hoppe-Seglers Z.Physiol. Chem 245:58 -65 (1937)

Gautier - Bull Soc Chim 14:241 (1914); cited in: Kraft K - "Beiträge zur Biochemie des Fluors I. Über den Antagonismus zwischen Fluor und Thyroxin." Hoppe-Seglers Z.Physiol. Chem 245:58 -65 (1937)

Gedalia I, Brand N - "The relationship of fluoride and iodine in drinking water in the occurrence of goiter" Arch Int Pharmacodyn 142:312-5 (1963)

Gelb MH, Svaren JP, Abeles RH - "Fluoro ketone inhibitors of hydrolytic enzymes" Biochemistry 24(8):1813-7 (1985) [MEDLINE](#)

<http://www.ncbi.nlm.nih.gov/htbin-post/Entrez/query?uid=2990>

Goldhammer A, Wolff J - "Interactions of fluoride and guanine nucleotides with thyroid adenylate cyclase" Biochim Biophys Acta 701(2):192-9 (1982) [MEDLINE](#)

Goldemberg L - "Action physiologique des fluorures" Compt Rend Soc Physiol (Paris) 95:1169 (1926)

**(reports a 5 to 6-fold increase in thyroid weight in rats fed 0.9mg fluoride/day for 8 months)**

also in:

Goldemberg L - La Semana Med 28:628 (1921) - cited in Wilson RH, DeEds F - "The Synergistic Action Of Thyroid On Fluoride Toxicity" Endocrinology 26:851 (1940)

Goldemberg L - J Physiol et Path 25:1 (1927)

Goldemberg L - "Comment agirait-ils therapeutiquement les fluors dans le goitre exophtalmique et dans l'hyperthyroidisme" Semana Med 39:1659 (1932)

Goldemberg L - "Traitement de la maladie de Basedow et de l'hyperthyroidisme par le fluor" Presse Méd 102:1751 (1930)

Goldemberg L - Compt Rend Soc Biol (Paris) 104:1031 (1930)

Goldemberg L - Revista de Especialidad, T.V. No.6 (1930)

Goldhammer A, Cook GH, Wolff J - "Preactivation as a determinant for the size of thyroid adenylate cyclase" Biol Chem 255(14):6918-22 (1980) [MEDLINE](#)

Gorban' GP, Karpilov'ska ED, Loevs'ka LI, Plis MB - "Dependence of glycolysis in the liver of tumor bearing rats on the fluorine content of their food" Ukr Biokhim Zh. 45(4):473-6 (1973)

Gordonoff T (Ed) - "Fluor und die Schilddrüse", Toxikology des Fluors (Toxicology of fluorine) Symposium, Ber, Oct.15-17 1962, Schwabe Verlag, Basel/Stuttgart, pp.111-123 (1964)

Gordonoff T, Minder W - "Fluoride and the thyroid gland" in "World Review of Nutrition and Dietetics" Pitman Medical Co, Vol 2:234-247 (1960)

Gordonoff T, Minder W - "Caries prophylaxis with fluorine as a physiological problem" Schweiz Med Wochenschr. 82:972-973 (1952)

Gordonoff T - "Zum Fluorproblem" Osterr Z Stomatol 54:561:571 (1957)

Gorlitzer von Mundy, V - "Einfluss von Fluor und Jod auf den Stoffwechsel, insbesondere auf die Schilddrüse" Münch Med Wochenschr 105:182-186 (1963); also in Gordonoff, T. - Fluor und die Schilddrüse, Toxikology des Fluors Basel/Stuttgart, pp.111-123 (1964)

Gorlitzer von Mundy V - Arch f. exper.Path 165 (1932)

Gorlitzer V - "Die Beeinflussung des Stoffwechsels durch die Halogenwasserstoffsäuren im Tierexperiment, mit besonderer Berücksichtigung der Fluorwasserstoffsäure" Arch Exp Pathol 165:443- 461 (1932)

**(describes his 1500 investigations on fluoride use in inhibition of metamorphosis in tadpoles, mice experiments, etc.)**

Gorlitzer V - "Ein neuer Weg zur Behandlung der Thyreotoxikose mit Fluorwasserstoffsäure" Med Klin 21:&17-719 (1932)

**(reports on his successful use of baths containing HF in the treatment of hyperthyroidism)**

Gorlitzer von Mundy V - Med. Klin.47:911 (1952), cited in Gorlitzer von Mundy, V - "Einfluss von Fluor und Jod auf den Stoffwechsel, insbesondere auf die Schilddrüse" Münch Med Wochenschr 105:182-186 (1963)

Gorlitzer von Mundy V - J. Physiol. et Path. gen 25:1 (1927)

**(3 mg NaF- fluoride intake in rabbits and rats results in goiter and cretinism-like conditions)**

Graff I, Mockel J, Laurent E, Erneux C, Dumont JE - "Carbachol and sodium fluoride, but not TSH, stimulate the generation of inositol phosphates in the dog thyroid" FEBS Lett 210(2):204-10 (1987) [MEDLINE](#)

Guan ZZ - "An experimental study of blood biochemical diagnostic indices for chronic fluorosis" Chung Hua Yu Fang I Hsueh Tsa Chih 25(1):33-5 (1991) [MEDLINE](#)

see also:

Guan ZZ, Zhuang ZJ, Yang PS, Pan S - "Synergistic action of iodine-deficiency and fluorine-intoxication on rat thyroid" Chin Med J (Engl) 101(9):679-84 (1988)

Guan ZZ, Wang YN, Xiao KQ, Dai DY, Chen YH, Liu JL, Sindelar P, Dallner G - "Influence of chronic fluorosis on membrane lipids in rat brain" Neurotoxicol Teratol 20(5):537-42 (1998) [MEDLINE](#)

Guan ZZ - "Morphology of the brain of the offspring of rats with chronic fluorosis" Chung Hua Ping Li Hsueh Tsa Chih 15(4):297-9 (1986)

Guan ZZ - "Studies on the DNA and RNA content of the heart, liver and kidney of rats with chronic fluorosis" Chung Hua Yu Fang I Hsueh Tsa Chih 21(2):90-1 (1987)

Guminska M, Sterkowicz J - "Effect of sodium fluoride on glycolysis in human erythrocytes and Ehrlich ascites tumour cells in vitro" Acta Biochim Pol 23(4):285-91 (1976) [MEDLINE](#)

Gushchin SK - "Effect of calcium and fluorine in drinking water on the iodine metabolism and status of the thyroid in iodine insufficiency in food" Gig Sanit 25:93-5 (1960)

Gutshall DM, Pilcher GD, Langley AE - "Mechanism of the serum thyroid hormone lowering effect of perfluoro-n-decanoic acid (PFDA) in rats" Toxicol Environ Health 28(1):53-65 (1989)

**(-> "PFDA displaced radiolabeled T4 from rat albumin with an affinity similar to thyroxine")**

Hara K - "Studies on fluorosis, especially effects of fluoride on thyroid metabolism" Koku Eisei Gakkai Zasshi. 30(1):42-57 (1980)

**(increase of T4 at 1ppm in water when diet was low in F-, decrease in T4 and T3 when diet was high in F-)**

Harris MW, Uraih LC, Birnbaum LS - "Acute toxicity of perfluorodecanoic acid in C57BL/6 mice differs from 2,3,7,8-tetrachlorodibenzo-p-dioxin" Fundam Appl Toxicol 13(4):723-36 (1989) [MEDLINE](#)

**(Total T3 and T4 increased with increasing dose)**

Hatfield JD, Shrewsbury CL, Andrews FN, Doyle LP - "Iodine-fluorine relationship in sheep nutrition" J Anim Sci 3:71-77 (1944)

Hein JW, Smith FA, Brudevold F - "Distribution of 1ppm Fluoride As Radioactively Tagged NaF in Soft Tissues of Adult Female Albino Rats" J Dent. Res. 33:709-710 (1954)

Hein JW, Bonner JF, Brudevold F, Smith FA, Hodge HC - "Distribution in the soft tissue of the rat of radioactive fluoride administered as sodium fluoride" Nature 175:1295-1296 (1956)

Henning K, Fritz H - "Fluor und Schilddrüse" Schweiz Med Wochenschr 91:79-81

Hershman JM - "Human chorionic gonadotropin and the thyroid: hyperemesis gravidarum and trophoblastic tumors" Thyroid 9(7):653-7 (1999)

Hillman D, Bolenbaugh DL, Convey EM - "Hypothyroidism and anemia related to fluoride in dairy cattle" J Dairy Sci 62(3):416-23 (1979) [MEDLINE](#)

Hoermann R, Amir SM, Nomura T, Ingbar SH - "Design of a long-lived thyrotropin antagonist from derivatives of human chorionic gonadotropin" Endocrinology 124(1):223-32 (1989) [MEDLINE](#)

**(HF desialylates hCG - > inhibits binding to TSH receptors)**

**NOTE:**

- Human chorionic gonadotropin (hCG) is a hormone that is produced by the developing placenta and by the fertilized egg

after implantation in the uterine wall. This is the hormone which is measured in the blood to determine pregnancy. Human chorionic gonadotrophins increase in quantity through the first trimester of pregnancy and begin to taper off after 85 days. High hCG levels are what causes "morning sickness" during pregnancies (hyperemesis gravidarum, a condition commonly seen in the first 12 weeks of pregnancy that is characterised by episodic vomiting, more pronounced in the morning. hCG has thyroid-stimulating activity that influences thyroid function early in pregnancy when hCG levels are high. Excessive hCG secretion may cause hyperthyroidism in patients with hyperemesis gravidarum or trophoblastic tumors.

Ippolito JA, Christianson DW - "The contribution of halogen atoms to protein-ligand interactions" *Int J Biol Macromol* 14(4):193-7 (1992) [MEDLINE](#)

Israel H, et al. - "Skeletal and dental development in the endemic goitre and cretinism areas of Ecuador" *J Trop Med Hyg.* 72(5):105-13 (1969)

Jackson IM, Luo LG - "Antidepressants inhibit the glucocorticoid stimulation of thyrotropin releasing hormone expression in cultured hypothalamic neurons" *J Investig Med* 1998 Dec;46(9):470-4 (1988) [MEDLINE](#)

*(Prozac ->...also decreased TRH content in a dose dependent manner...)*

Jenq SF, Jap TS, Hsieh MS, Chiang H - "The characterization of adenylyl cyclase activity in FRTL-5 cell line." *Chung Hua I Hsueh Tsa Chih (Taipei)* 51(3):159-65 (1993) [MEDLINE](#)

**KEY STUDY - 10 microM sufficient for G protein activation:**

"Sodium fluoride stimulation study demonstrated dual actions of fluoride on adenylate cyclase; when the cells were assayed with increasing concentration of NaF, the AC activity increased as the concentration of NaF increased from 0.01 to 1 mM, but decreased strikingly as that concentration increased from 1 mM to 100 mM."

Jentzer, A - "Effet du fluor et du fluor-iod sur la teneur en iode de la thyroïde de lapin" *Bull Schweiz Akad Med Wiss* 15:412-422 (1959).

*(In rabbits fed 0.05mg F- per day [!] iodine content in thyroid was reduced by 25%. Also showed that the iodine uptake in the pituitary gland was greatly reduced under the influence of fluoride)*

Jentzer A - "Action du fluor sur le relais thyroïdohypophysaire demontree par l'iode 131" *Bull Schweiz Akad Med Wiss* 10:211-220 (1954)

*(Less than normal amounts of thyroid hormone are deposited in the pituitary gland when rabbits are given fluoride in water at levels corresponding to that of artificially fluoridated water)*

Jonderko G, Kita K, Pietrzak J, Primus-Slowinska B, Ruranska B, Zylka-Wloszczyk M, Straszecka J - "Effect of subchronic sodium fluoride poisoning on the thyroid gland of rabbits with normal and increased supply of iodine" *Endokrynol Pol* 34(3):195-203 (1983)

Kahl S, Bobek S - "Effect of fluoride administration on radiothyroxine turnover in rats" *Endokrynol Pol* 26(4):391-6 (1975)

Kalderon AE, Sheth V - "Secretion and adenylate cyclase in thyroid nodules" *Arch Pathol Lab Med* 102(7):381-86 (1978) [MEDLINE](#)

Kanwar KC, Singh M - "Zinc Depletion following experimental fluorosis in mice" *Sci Total Environ* 22(1):79-83 (1981) [MEDLINE](#)

Kanwar KC, Singh M - "Zinc, copper and manganese levels in various tissues following fluoride administration" *Experientia* 37(12):1328-9 (1981) [MEDLINE](#)

see also:

Singh M, Kanwar KC - "Effect of fluoride on copper, manganese and zinc in bone and kidney" *Bull Environ Contam Toxicol* 26(3):428-31 (1981)

Kariya T, Kotani M, Field JB - "Effects of sodium fluoride and other metabolic inhibitors on basal and TSH-stimulated cyclic AMP and thyroid metabolism" *Metabolism* 23(10):969-73 (1974)

Kato T, Okada M, Nagatsu T - "Distribution of post-proline cleaving enzyme in human brain and the peripheral tissues" *Mol Cell Biochem* 32(3):117-21 (1980)

Kazakov VM, Malakhovskii VK, Khokhlov AP, Mikhailov KP, Lozovskii VT - "The possible role of disruptions of the cyclic AMP system in the pathogenesis of thyrotoxic myopathies" *Vopr Med Khim* 29(6):69-73 (1983)

Kasai K, Field JB - "Discrimination of multiple forms of phosphoprotein phosphatase in bovine thyroid" *Metabolism* 32(3):296-307 (1983) [MEDLINE](#)

Kasai K, Field JB - ""Properties of enzyme activities involved in proteinphosphorylation-dephosphorylation of thyroid plasma membranes" *Biochim Biophys Acta* 18(2):125-34 (1982) [MEDLINE](#)

Kimm MH, Hardin JA, Gall DG - "Transport of albumin into the intestinal lumen of the rat" *Can J Physiol Pharmacol* 75(3):193-8 (1997)

***(Fluoride inhibits albumin transport - > thyroid hormone carrier)***

Kinlen L - "Cancer incidence in relation to fluoride level in water supplies" Community Health 6: 69 (1974) [LINK](#)

data also in:

Kinlen L - "Cancer incidence in relation to fluoride level in water supplies" Br Dent J 138(6):221-4 (1975)

***(19% more thyroid cancers observed in fluoridated areas as compared non-fluoridated areas)***

Kolomiitseva MG - "The content of fluorine in the external environment of the Upper Altai autonomous region and its role in the etiology of endemic goiter" Gig Sanit 26:101-3 (1961)

Korrodi H, Wegman T, Galletti P, Held HR- "Sind bei der Cariesprophylaxe mit Fluor Rueckwirkungen auf die Schilddruese zu erwarten?" Schweiz Med Wochenschr 85:1016 (1955)

Korrodi H, Wegman T, Galletti P, Held HR - "Fluor und Schilddruese" Z Praeventivmed 1:285-296 (1956)

Kraft K - "Beiträge zur Biochemie des Fluors I.Über den Antagonismus zwischen Fluor und Thyroxin." Hoppe-Seglers Z.Physiol. Chem 245:58 -65 (1937)

Kraft K - "Über die Synthese einiger aromatischer Fluorverbindungen" Knoll Research, Chem Ber. 84(2):150-156 (1951)

***(describes manufacturing processes of numerous organic fluorides, after it was shown that all organic fluoride compounds displayed stronger anti-thyroid activity than the fluoride ion)***

Kraft K, Dengel F - "Über die Synthese einiger aromatischer Fluorverbindungen, II. Mitteilung" Chem Ber 85(6):577-582 (1952)

***(more reports on organic fluoride investigations... "in regards to their characteristics in lowering BMR as well as anti-bacterial activity")***

Laglia G, Zeiger MA, Leipricht A, Caturegli P, Levine MA, Kohn LD, Saji M - "Increased cyclic adenosine 3',5'-monophosphate inhibits G protein-coupled activation of phospholipase C in rat FRTL-5 thyroid cells" Endocrinology 137(8):3170-6 (1996) [MEDLINE](#)

Lakey T, Mac Neil S, Humphries H, Walker SW, Munro DS, Tomlinson S - "Calcium and calmodulin in the regulation of human thyroid adenylate cyclase activity." Biochem J 225(3):581-9 (1985)[MEDLINE](#)

Langley AE - "Thyroid and Biochemicaletabolic Effects of PFDA

(Perfluoro-n-decanoic Acid)" Govt Reports Announcements & Index (GRA&I), Issue 16 (1988)

**".... a precipitous fall in serum thyroxine was observed as early as 12 hours following PFDA. Early experiments indicated that a hypothyroid-like state resulted from PFDA treatment. PFDA induced decreases in serum thyroid hormones, anorexia, bradycardia, hypothermia, as well as alterations in myocardial catecholamine metabolism. Liver enzymes alpha-glycerolphosphate dehydrogenase and malic enzyme were measures to evaluate tissue thyroid state, the activity of both enzymes was significantly elevated as early as 24 hours and remained so throughout the experiment. A possible conclusion based on interpretation of these data is the PFDA alters biochemical processes at the cellular level which produces confused messages concerning metabolic status, thus leading to anorexia and metabolic inefficiency."**

Ledent C, Parmentier M, Maenhaut C, Taton M, Pirson I, Lamy F, Roger P, Dumont JE - "The TSH cyclic AMP cascade in the control of thyroid cell proliferation: the story of a concept" Thyroidology 3(3):97-101 (1991)[MEDLINE](#)

Leipuviene S - " Trace elements fluorine and iodine in water in Lithuania" Sveik Apsaug 54:52-53 (1963)

Levine MA, Feldman AM, Robishaw JD, Ladenson PW, Ahn TG, Moroney JF, Smallwood PM - "Influence of thyroid hormone status on expression of genes encoding G protein subunits in the rat heart" Biol Chem 265(6):3553-60 (1990)[MEDLINE](#)

Lewitus Z, Guttman S, Anbar M - "Effect of thyroidstimulating hormone (TSH) on the accumulation of perchlorate and fluoroborate ions in the thyroid glands of rats." Endocrinology 70:295-7 (1962)

Lin Fa-Fu, Aihaiti, Zhao Hong-Xin, Lin Jin, Jiang Ji-Yong, Maimaiti, and Aiken - "The Relationship of a Low-Iodine and High-Fluoride Environment to Subclinical Cretinism in Xinjiang" ICCIDD Newsletter, Volume 7 Number 3 August (1991) [LINK](#)

Litzka G - "Die experimentellen Grundlagen der Behandlung des Morbus Basedow und der Hyperthyreose mittels Fluortyrosin" Med Wochenschr 63:1037-1040 (1937)

***(discusses the basis of the use of fluorides in anti-thyroid medication, documents activity on liver, inhibition of glycolysis, etc.)***

Litzka G - "Erfolgskontrolle bei Behandlung der Schilddrüsenüberfunktion" Z. klin. Med.131:791-799 (1937)

Litzka G - "Die antithyreotische Wirkung des Fluortyrosins" Arch. exp. Pathol. u. Pharmacol. 183:436-458 (1936)

Litzka G - "Fluortyrosine" Klin Wochenschr. 15:1568-1569 (1936)

Littich J - "Klinische Untersuchungen zur Behandlung von Hyperthyreosen mit dem fluorhaltigen Prothyrysat" Med Monatsschr 6:520-522(1937)

Lochhead KM, Kharasch ED, Zager RA - "Spectrum and subcellular determinants of fluorinated anesthetic-mediated proximal tubular injury." Am J Pathol 150(6):2209-21 (1997) [MEDLINE](#)

Londos C, Salomon Y, Lin MC, Harwood JP, Schramm M, Wolff J, Rodbell M - "5'-Guanylylimidodiphosphate, a potent activator of adenylate cyclase systems in eukaryotic cells" Proc Nat Acad Sci USA 71(8):3087-3090 (1974) [FULL TEXT](#)

Lustbader JW, Pollak S, Lobel L, Trakht I, Homans S, Brown JM, Canfield RE - "Three-dimensional structures of gonadotropins" Mol Cell Endocrinol 125(1-2):21-31 (1996) [MEDLINE](#)

*(HF deglycosylates hCG... "Unfortunately this form of hCG is not biologically active, and exhibits immunochemical differences from native hormone.")*

Lustbader JW, Wu H, Birken S, Pollak S, Gawinowicz Kolks MA, Pound AM, Austen D, Hendrickson WA, Canfield RE - "The expression, characterization, and crystallization of wild-type and selenomethionyl human chorionic gonadotropin" Endocrinology 1995 Feb;136(2):640-50

## Endnotes:

1. Dale, Peter P., and McCauley, H. B, "Dental Conditions in Workers Chronically Exposed to Dilute and Anhydrous Hydrofluoric Acid", Journal of the American Dental Association, vol. 37, no. 2, August 1948, pp. 131-140. Note that Dale and McCauley were both Manhattan Project and, later, Program F personnel; they also authored the secret Manhattan Project paper.
2. Mullenix, Phyllis et al., "Neurotoxicity of Sodium Fluoride in Rats", Neurotoxicology and Teratology, vol. 17, no. 2, 1995, pp. 169-177.
3. Lamont, Lansing, Day of Trinity, Atheneum, New York City, 1965.
4. Chomsky, Noam, The Cold War and the University, New Press, New York City, 1997 (distributed by W.W. Norton & Co. Inc., NYC).
5. Hodge, H. C., "Fluoride metabolism: its significance in water fluoridation", in "Newburgh-Kingston caries-fluorine study: final report", Journal of the American Dental Association, vol. 52, March 1956.
6. Dale and McCauley, *ibid*.

## Resources:

Copies of 155 pages of supporting documents, including all the declassified papers referred to in this article, can be obtained from the following contacts for a small fee to cover copying and postage:

Australia: Australian Fluoridation News, GPO Box 935G, Melbourne, Victoria 3001, phone (03) 9592 5088, fax (03) 9592 4544.

New Zealand: New Zealand Pure Water Association, 278 Dickson Road, Papamoa, Bay of Plenty, phone (07) 542 0499.

UK: National Pure Water Association of the UK, 12 Dennington Lane, Cragglistone, Wakefield, WF4 3ET, phone 01924 254433, fax 01924 242380.

USA: Waste Not newsletter, 82 Judson Street, Canton, NY 13617, phone (315) 379 9200, fax (315) 379 0448, e-mail

[wastenot@northnet.org](mailto:wastenot@northnet.org).

- [Professional Regulatory and FDA Information](#)
- [Home](#)
- [Pharmaceutical Deceptive Practices](#)
- [public-health-information-research](#)
- [The True Story of Aspartame and other Food Toxins](#)
- [Corruption - Criminal Acts Regarding Aspartame 1](#)
- [Fluoride and the Pineal Gland](#)
- [Fluoride and the Atomic Bomb](#)
- [Corruption-Criminal Acts Regarding Aspartame 2](#)
- [Poking Fun At Pharmaceutical Ads](#)
- [The Nuremberg Code - Human Testing Ethics](#)
- [Actual Drug Costs and Mark-Up](#)
- [TRUVIA Sweetener - Our Continuing Investigation](#)